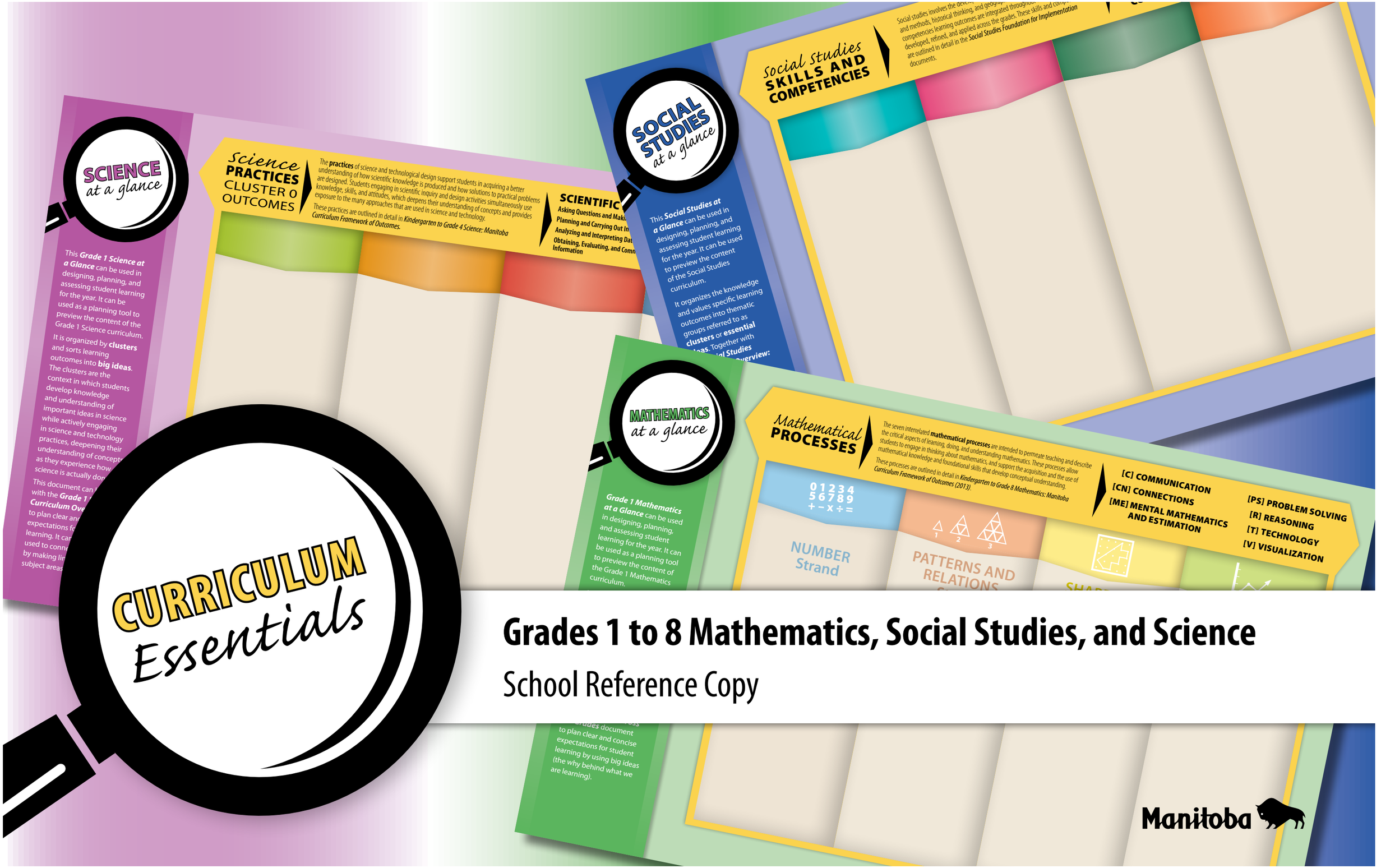

Grades 1 to 8 Mathematics, Social Studies, and Science

School Reference Copy

Manitoba

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Introduction

Curriculum Essentials are resources designed to provide a "quick start" guide to the Manitoba curriculum for mathematics, science, and social studies in Grades 1 to 8. Teachers need to plan and assess student learning using diverse curricular concepts that are organized in different ways. These resources present the essentials—the big ideas, as well as the foundational processes, practices, and skills that support the acquisition of knowledge and deepening of understanding—in a consistent visual format that still respects the unique nature of each discipline. These resources help educators

- manage and organize learning outcomes
- see links among the curriculum areas
- maintain a strong focus on foundational learning

Curriculum Essentials provide a pathway into the provincial curricula for different subject areas and are versatile resources that

- provide a quick overview of grade-level learning for teachers new to a grade or subject area
- identify concepts, skills, processes, practices, and competencies that are foundational to subsequent learning
- help planning for student learning and assessment of and for learning
- facilitate cross-curricular and cross-grade connections
- assist planning in multi-level classrooms
- present opportunities for literacy and numeracy learning
- highlight links with the provincial report card categories
- identify the ways of thinking and doing that are characteristic of a discipline and that will be developed across the grades
- support other aspects of curricular thinking, such as identifying "essential questions" and "enduring understandings"
- help learning support and EAL teachers identify relevant topics for vocabulary development and other literacy supports

Curriculum Essentials do not replace curriculum and do not eliminate or sequence learning outcomes. They provide a view from above the terrain, helping educators see pathways and signposts through the curriculum, while encouraging pedagogical choices informed by knowledge of specific learners, context, and resources. The *Curriculum Essentials* posters cluster learning outcomes into essential concepts or "big ideas" and highlight the foundational skills and ways of thinking that students need to develop along the way. Once educators have the overview of the curriculum, the provincial curriculum documents provide specific details and support for implementation.

The organization of various essentials in these posters may not be the only way that curricular learning outcomes can be organized, but the posters are presented as a catalyst for deeper conversation about curriculum.

The following questions may provide a starting point for professional conversations:

- How do the big ideas help you to plan, support, and assess student learning?
- What types of evidence are likely to show that the student has acquired a thorough understanding of the big ideas?
- How should you integrate the practices, skills, processes, or discipline-specific skills into the development of concepts in order to deepen students' understanding?
- How can this document give you an overview of what the students should learn at a given grade level and as a progression of learning over the years?
- How do your tasks, your activities, and your daily assessments compare with what is presented in the *Grades at a Glance* and *Curriculum Overviews*? Are you missing something or is there something you've added in that is not there?

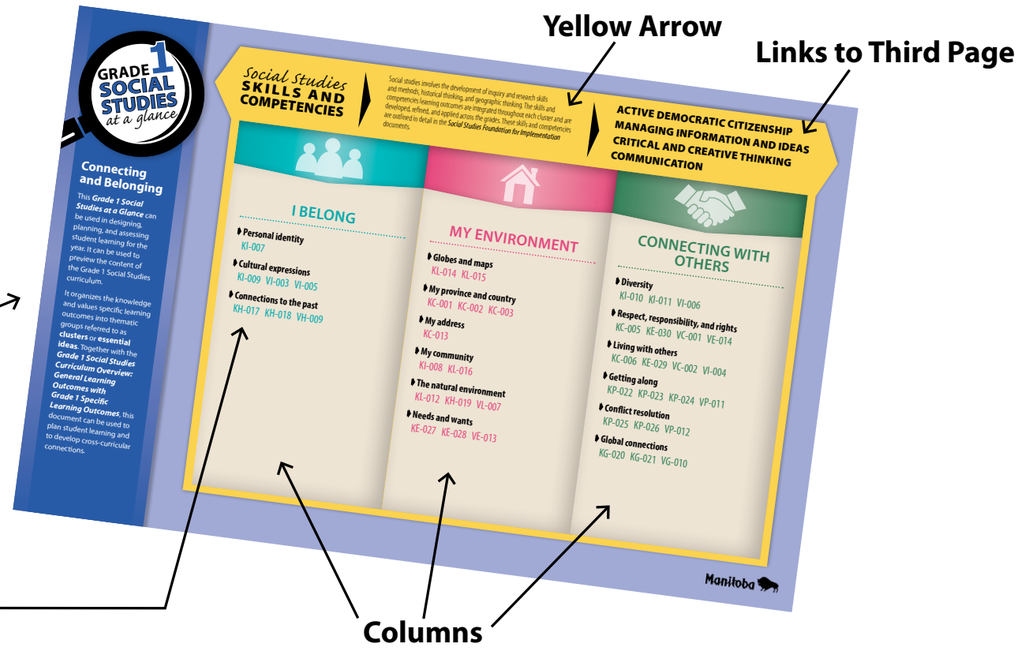
To participate in professional discussion, join the Manitoba Professional Learning Environment (Maple) *Curriculum Essentials* group.

Guide to Reading the Pages

These *Curriculum Essentials* are available as interactive PDFs on the Manitoba Education and Advanced Learning website (www.edu.gov.mb.ca/k12/cur/essentials/). Each PDF provides three pages, with links to the provincial curriculum documents and to more detailed descriptions of the processes, skills, practices, and/or competencies that are developed within each curriculum at that grade level.

The ***Grade at a Glance*** infographic is the first layer that provides the visual consistency across curricula and synthesizes multiple learning outcomes to the barest essentials within strands or clusters. The big ideas and related grade-level specific learning outcomes appear in **columns**. In mathematics, the columns contain the strands; in science, the columns contain the clusters; and in social studies, the columns contain the thematic clusters of learning outcomes from across the GLOs.

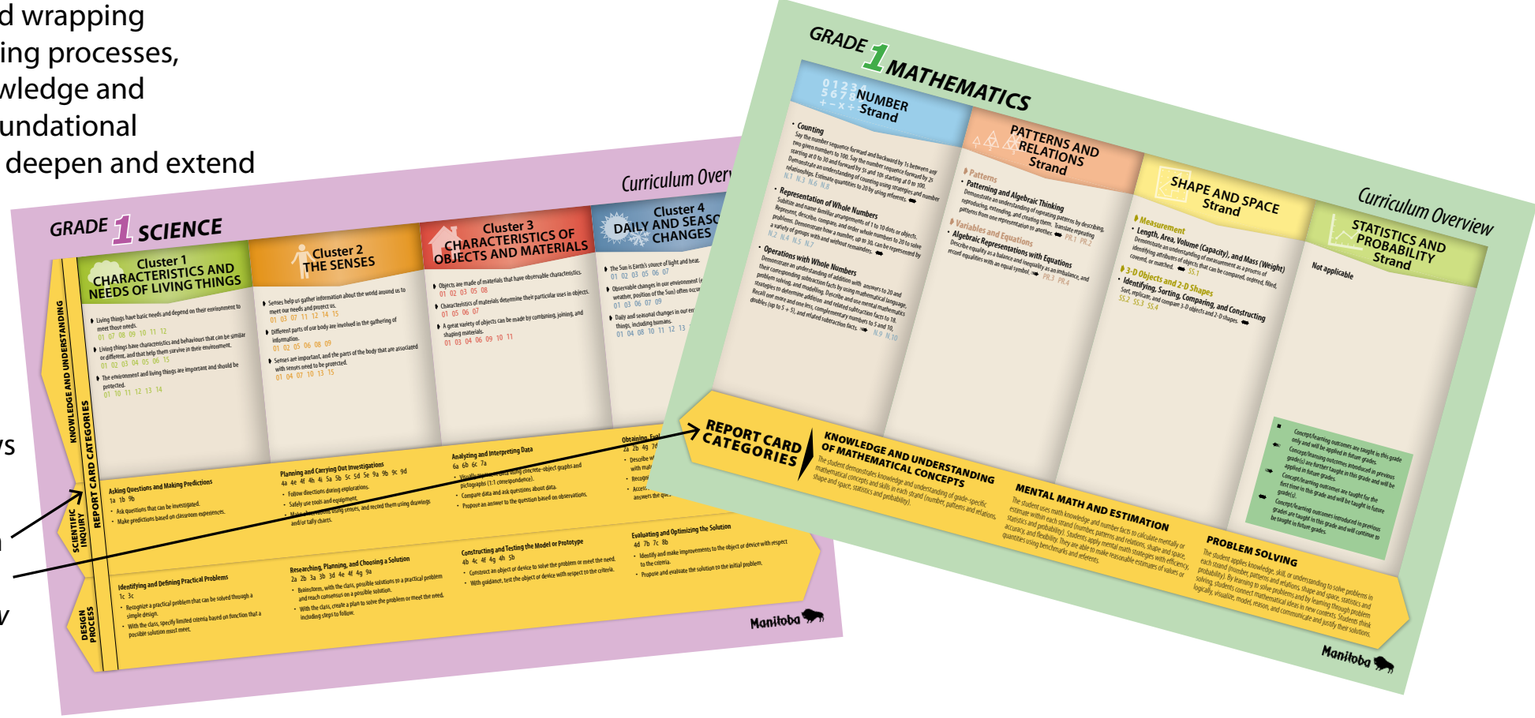
Specific learning outcomes related to each big idea/curriculum essential are listed (and, on the interactive PDF, linked) to the corresponding curriculum document.



Grade at a Glance has a **yellow arrow** across the top of the columns and wrapping around the columns. This arrow highlights the foundational and enduring processes, skills, practices, or competencies of each subject area. Grade-level knowledge and understanding are important, but they are achieved in tandem with foundational practices, processes, skills, competencies, and mental dispositions that deepen and extend throughout the grades. In the interactive PDFs, these are **linked** to a description of the item. These descriptions are also included in this document as a third page for use in professional learning sessions.

The ***Curriculum Overview*** supports the *Grade at a Glance* infographic. Because each subject's curriculum framework is structured differently, the supporting overviews are a bridge between the infographic and the provincial curriculum document. The overviews are arranged in ways that reflect each subject area's curriculum.

The **Report Card Categories** are clearly indicated along the left side in social studies and science. In mathematics, the Report Card Categories are shown in the arrow shape at the bottom of the *Curriculum Overview* because the math processes are interwoven throughout the strands, rather than organized as specific learning outcomes.



CURRICULUM Essentials

Grade 1

GRADE 1 MATHEMATICS at a glance

Grade 1 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 1 Mathematics curriculum.

It is organized by **strands** and **substrands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Counting**
  Number sequence and estimation of quantities to 100 N.1 N.3 N.6 N.8
- **Representation of Whole Numbers**
  Subitize to 10 N.2
  Whole numbers to 20 N.4
  Problems involving whole numbers to 20 N.5
  Equal groupings to 30 N.7
- **Operations with Whole Numbers**
  Addition with answers to 20 and their corresponding subtraction facts N.9
  Addition and related subtraction facts to 18 N.10

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Repeating patterns PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  Equality and inequality PR.3 PR.4

SHAPE AND SPACE Strand

Measurement

- **Length, Area, Volume (Capacity), and Mass (Weight)**
  A process of comparison SS.1

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  3-D objects and 2-D shapes
  SS.2 SS.3 SS.4

STATISTICS AND PROBABILITY Strand

Not applicable

Substrands
- **Learning Targets**

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GRADE 1 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Counting**
  Say the number sequence forward and backward by 1s between any two given numbers to 100. Say the number sequence forward by 2s starting at 0 to 30 and forward by 5s and 10s starting at 0 to 100. Demonstrate an understanding of counting using strategies and number relationships. Estimate quantities to 20 by using referents. ⬌
  N.1 N.3 N.6 N.8

- **Representation of Whole Numbers**
  Subitize and name familiar arrangements of 1 to 10 dots or objects. Represent, describe, compare, and order whole numbers to 20 to solve problems. Demonstrate how a number, up to 30, can be represented by a variety of groups with and without remainders. ⬌
  N.2 N.4 N.5 N.7

- **Operations with Whole Numbers**
  Demonstrate an understanding of addition with answers to 20 and their corresponding subtraction facts by using mathematical language, problem solving, and modelling. Describe and use mental mathematics strategies to determine addition and related subtraction facts to 18. Recall one more and one less, complementary numbers to 5 and 10, doubles (up to 5 + 5), and related subtraction facts. ➡ N.9 N.10

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Demonstrate an understanding of repeating patterns by describing, reproducing, extending, and creating them. Translate repeating patterns from one representation to another. ⬌ PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  Describe equality as a balance and inequality as an imbalance, and record equalities with an equal symbol. ➡ PR.3 PR.4

SHAPE AND SPACE Strand

Measurement

- **Length, Area, Volume (Capacity), and Mass (Weight)**
  Demonstrate an understanding of measurement as a process of identifying attributes of objects that can be compared, ordered, filled, covered, or matched. ⬌ SS.1

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Sort, replicate, and compare 3-D objects and 2-D shapes. ⬌
  SS.2 SS.3 SS.4

STATISTICS AND PROBABILITY Strand

Not applicable

■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.

⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.

➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).

⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 1 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 1 SCIENCE at a glance

This ***Grade 1 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 1 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 1 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use knowledge, skills, and attitudes, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Kindergarten to Grade 4 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and Testing the Model or Prototype
- Evaluating and Optimizing the Solution

CHARACTERISTICS AND NEEDS OF LIVING THINGS

- **Needs of living things**
  01 07 08 09 10 11 12
- **Characteristics and behaviours of living things**
  01 02 03 04 05 06 15
- **Protection of the environment and of living things**
  01 10 11 12 13 14

THE SENSES

- **Role of the senses**
  01 03 07 11 12 14 15
- **Parts of the body involved with senses**
  01 02 05 06 08 09
- **Protection for our senses**
  01 04 07 10 13 15

CHARACTERISTICS OF OBJECTS AND MATERIALS

- **Objects and materials**
  01 02 03 05 08
- **Characteristics of materials**
  01 05 06 07
- **Construction of objects by combining, joining, and shaping materials**
  01 03 04 06 09 10 11

DAILY AND SEASONAL CHANGES

- **The Sun as a source of light and heat**
  01 02 03 05 06 07
- **Cycles and changes in our environment**
  01 03 06 07 09
- **Effects of daily and seasonal changes on living things**
  01 04 08 10 11 12 13 14 15 16 17

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GRADE 1 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 CHARACTERISTICS AND NEEDS OF LIVING THINGS

- Living things have basic needs and depend on their environment to meet those needs.
  01 07 08 09 10 11 12
- Living things have characteristics and behaviours that can be similar or different, and that help them survive in their environment.
  01 02 03 04 05 06 15
- The environment and living things are important and should be protected.
  01 10 11 12 13 14

Cluster 2 THE SENSES

- Senses help us gather information about the world around us to meet our needs and protect us.
  01 03 07 11 12 14 15
- Different parts of our body are involved in the gathering of information.
  01 02 05 06 08 09
- Senses are important, and the parts of the body that are associated with senses need to be protected.
  01 04 07 10 13 15

Cluster 3 CHARACTERISTICS OF OBJECTS AND MATERIALS

- Objects are made of materials that have observable characteristics.
  01 02 03 05 08
- Characteristics of materials determine their particular uses in objects.
  01 05 06 07
- A great variety of objects can be made by combining, joining, and shaping materials.
  01 03 04 06 09 10 11

Cluster 4 DAILY AND SEASONAL CHANGES

- The Sun is Earth's source of light and heat.
  01 02 03 05 06 07
- Observable changes in our environment (e.g., day and night, seasons, weather, position of the Sun) often occur in cycles.
  01 03 06 07 09
- Daily and seasonal changes in our environment affect all living things, including humans.
  01 04 08 10 11 12 13 14 15 16 17

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 1b 9b

- Ask questions that can be investigated.
- Make predictions based on classroom experiences.

Planning and Carrying Out Investigations
4a 4e 4f 4h 4i 5a 5b 5c 5d 5e 9a 9b 9c 9d

- Follow directions during explorations.
- Safely use tools and equipment.
- Make observations using senses, and record them using drawings and/or tally charts.

Analyzing and Interpreting Data
6a 6b 6c 7a

- Visually represent data using concrete-object graphs and pictographs (1:1 correspondence).
- Compare data and ask questions about data.
- Propose an answer to the question based on observations.

Obtaining, Evaluating, and Communicating Information
2a 2b 4g 7d 7e 8a 9a

- Describe what was done and what was observed orally, in pictures, or with materials.
- Recognize that learning can come from careful observations.
- Access information from a variety of sources and recognize when it answers the questions asked.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 3c

- Recognize a practical problem that can be solved through a simple design.
- With the class, specify limited criteria based on function that a possible solution must meet.

Researching, Planning, and Choosing a Solution
2a 2b 3a 3b 3d 4e 4f 4g 9a

- Brainstorm, with the class, possible solutions to a practical problem and reach consensus on a possible solution.
- With the class, create a plan to solve the problem or meet the need, including steps to follow.

Constructing and Testing the Model or Prototype
4b 4c 4f 4g 4h 5b

- Construct an object or device to solve the problem or meet the need.
- With guidance, test the object or device with respect to the criteria.

Evaluating and Optimizing the Solution
4d 7b 7c 8b

- Identify and make improvements to the object or device with respect to the criteria.
- Propose and evaluate the solution to the initial problem.

GRADE 1 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, etc.).

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND TESTING THE MODEL OR PROTOTYPE

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or model against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

GRADE 1 SOCIAL STUDIES at a glance

Connecting and Belonging

This ***Grade 1 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 1 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 1 Social Studies Curriculum Overview: General Learning Outcomes with Grade 1 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

I BELONG

- **Personal identity**
  KI-007
- **Cultural expressions**
  KI-009 VI-003 VI-005
- **Connections to the past**
  KH-017 KH-018 VH-009

MY ENVIRONMENT

- **Globes and maps**
  KL-014 KL-015
- **My province and country**
  KC-001 KC-002 KC-003
- **My address**
  KC-013
- **My community**
  KI-008 KL-016
- **The natural environment**
  KL-012 KH-019 VL-007
- **Needs and wants**
  KE-027 KE-028 VE-013

CONNECTING WITH OTHERS

- **Diversity**
  KI-010 KI-011 VI-006
- **Respect, responsibility, and rights**
  KC-005 KE-030 VC-001 VE-014
- **Living with others**
  KC-006 KE-029 VC-002 VI-004
- **Getting along**
  KP-022 KP-023 KP-024 VP-011
- **Conflict resolution**
  KP-025 KP-026 VP-012
- **Global connections**
  KG-020 KG-021 VG-010

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GRADE 1 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 1 Specific Learning Outcomes

Grade 1 students learn about connections and relationships in their local community, Canada, and the world. They become aware of their responsibilities and rights as citizens and discover how they can contribute to their groups and communities. Children become more aware of Canada as a country and consider the connections that bring people together in communities, past and present. They learn about diversity, interdependence, and the importance of connecting and belonging.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

CITIZENSHIP

Fundamental to citizenship is an understanding that people are all part of a community. As members of the community, people have both rights and responsibilities.

As individuals people all contribute to the well-being of provincial and national communities. Anthems and ceremonies contribute to a sense of community. Besides French and English, First Nations, Métis, and Inuit languages are spoken in Canada.

KC- 001 002 002A 003 003A 004 005 006
VC- 001 002

IDENTITY, CULTURE, AND COMMUNITY

Many factors influence identity and life in communities, including culture, history, and language. Identity is shaped by families as well as local, regional, and national communities. Through the study of their own and other cultures, students enhance their understanding of diverse perspectives and deepen their appreciation that community is strengthened by human interaction and interdependence, cultural diversity, and pluralism.

KI- 007 007A 007F 008 009 010 011
VI- 003 004 005 006

THE LAND: PLACES AND PEOPLE

Geographic literacy deepens students' understanding of the relationship between people and the land. Spatial and physical characteristics affect human life, cultures, and societies. Physical and human structures are "landmarks" of time and place. Groups such as Aboriginal people have taught that people have a responsibility to protect and sustain their environment.

KL- 012 013 014 015 016 016A 016F
VL- 007 007A 008

HISTORICAL CONNECTIONS

Stories, traditions, and celebrations deepen students' historical understanding of how the past shapes who people are today. Through an exploration of personal as well as local and national histories, students can use the past to understand the present and to live with regard for the future.

KH- 017 017F 018 019
VH-009

GLOBAL INTERDEPENDENCE

People, communities, societies, nations, and environments are interconnected. An exploration of this interdependence enhances students' global consciousness and helps them develop empathy for each other's concerns, needs, and wants.

KG- 020 021
VG-010

POWER AND AUTHORITY

Power and authority influence all human relationships. Power and authority are exerted in everyday life and in formal settings. Rules and laws, both formal and traditional, exist to protect people as well as to serve people's needs to live together peacefully and equitably.

KP- 022 023 024 025 026
VP- 011 011A 012

ECONOMICS AND RESOURCES

There are diverse ways in which communities meet their members' needs and wants. Students learn to respect and care for personal and others' property. Media offers many choices on how to live; it is up to people to make sustainable choices.

KE- 027 028 029 030
VE- 013 014

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207

- Gather, organize, and represent information from a variety of sources and in various ways.
- Use appropriate terms to describe time and locations.

Communicating

S- 400 401 402 403 404

- Listen actively and respectfully to others.
- Present information in a variety of ways.
- Give reasons for ideas and opinions.
- Tell events and stories chronologically.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303

- Use comparison in investigations.
- Identify consequences of decisions and actions.
- Use information and observations to form and revise opinions.

Being an Active Democratic Citizen

S- 100 101 102 103

- Cooperate and collaborate with others fairly and respectfully, considering their needs.
- Make decisions that reflect care and responsibility for the environment.

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GRADE 1 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 2

GRADE 2 MATHEMATICS at a glance

Grade 2 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 2 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Counting**
  Number sequence and estimation of quantities to 100 N.1 N.6
- **Representation of Whole Numbers**
  Whole numbers to 100
  N.2 N.3 N.4 N.5 N.7
- **Operations with Whole Numbers**
  Addition of numbers with answers to 100 and the corresponding subtraction N.8 N.9

  Addition and related subtraction facts to 18
  N.10

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Repeating and increasing patterns
  PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  Equality and inequality PR.3 PR.4

SHAPE AND SPACE Strand

Measurement

- **Length, Area, Volume (Capacity), and Mass (Weight)**
  Measure of length and mass using non-standard units SS.2 SS.4

  Comparison of objects according to length and mass using non-standard units SS.3

  Orientation of objects in relation to measurement SS.5
- **Time**
  Relationship of the passage of time using standard units SS.1

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  2-D shapes and 3-D objects
  SS.6 SS.7 SS.8 SS.9

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Collection and recording of data SP. 1

  Problems involving concrete graphs and pictographs SP. 2

Substrands
- **Learning Targets**

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GRADE 2 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Counting**
  Say the number sequence forward and backward by 2s, 5s, and 10s using starting points that are multiples of 2, 5, and 10 to 100. Say the number sequence using starting points from 1 to 9 by 10s to 100. Say the number sequence forward by 2s starting from 1 to 100. Estimate quantities to 100 using referents. ⬌ N.1 N.6

- **Representation of Whole Numbers**
  Demonstrate if a number up to 100 is even or odd. Describe relative position using ordinal numbers. Represent, describe, compare, and order whole numbers to 100. Illustrate the meaning of place value for numbers to 100. ⬌ N.2 N.3 N.4 N.5 N.7

- **Operations with Whole Numbers**
  Demonstrate and explain the effect of adding zero to or subtracting zero from any number. Demonstrate an understanding of addition (limited to 1- and 2-digit numerals) with answers to 100 and corresponding subtraction by using personal strategies, by creating and solving problems, and by explaining that the order in which numbers are added does not affect the sum, but that the order in which numbers are subtracted may affect the difference. Recall facts to 10, doubles to 9 + 9, and related subtraction facts. Apply mental mathematics strategies to develop recall of addition and related subtraction facts to 18. ⬌ N.8 N.9 N.10

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Predict an element in a repeating pattern using a variety of strategies. Demonstrate an understanding of increasing patterns by describing, reproducing, extending, and creating patterns using a variety of representations and numbers to 100. ⬌ PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  Demonstrate and explain the meaning of equality and inequality, and record equalities and inequalities using the equal and not-equal symbol. ⬌ PR.3 PR.4

SHAPE AND SPACE Strand

Measurement

- **Length, Area, Volume (Capacity), and Mass (Weight)**
  Using non-standard units of measure, relate the size used to measure length and mass, compare and order the attributes of objects, make statements of comparison, and measure using multiple and single (iteration process) copies of a unit. Demonstrate that changing the orientation of an object does not alter the measurement of its attributes. ⬌ SS.2 SS.3 SS.4 SS.5

- **Time**
  Relate the number of days to a week and the number of months to a year in a problem-solving context. ➡ SS.1

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Sort, describe, compare, and construct 2-D shapes and 3-D objects. Identify 2-D shapes as parts of 3-D objects in the environment. ⬌ SS.6 SS.7 SS.8 SS.9

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Gather and record data to answer questions about self and others. Construct and interpret concrete graphs and pictographs to solve problems. ➡ SP. 1 SP. 2

- ■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.
- ⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.
- ➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).
- ⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 2 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 2 SCIENCE at a glance

This ***Grade 2 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 2 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 2 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use knowledge, skills, and attitudes, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Kindergarten to Grade 4 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and Testing the Model or Prototype
- Evaluating and Optimizing the Solution

GROWTH AND CHANGES IN ANIMALS

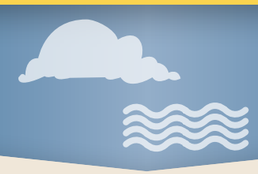
- **Needs of animals to grow and develop**
  01 04 12 15 16
- **Plants or other animals as a source of food**
  01 04 05 06 07
- **Characteristics, growth, and changes in animals**
  01 02 03 08 09 10 11 12 14 15
- **Importance of reproduction**
  01 08 13

PROPERTIES OF SOLIDS, LIQUIDS, AND GASES

- **States of matter**
  01 02 03 04 05 11 12 13
- **Changes of state**
  01 14 15
- **Properties of matter**
  01 06 07 08 09 10 16 17 18 19

POSITION AND MOTION

- **The position of objects**
  01 02 03 04 05
- **Effects of pushes or pulls on the position or motion of an object**
  01 03 06 07 08
- **Technologies used to change the position of objects**
  01 09 10 11 12 13 14



AIR AND WATER IN THE ENVIRONMENT

- **Air and its effects on us and the environment**
  01 02 03 04 05 08
- **Importance of water and the water cycle**
  01 06 07 08
- **Importance of clean air and water**
  01 09 10 11 13
- **Impacts of humans on the quality of air and water**
  01 12 13 14

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GRADE 2 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 GROWTH AND CHANGES IN ANIMALS

- Animals, including humans, are living things and, like all living things, they have certain needs so they can stay alive, grow, and develop.
  01 04 12 15 16
- Animals, including humans, obtain food, which is essential for growth and development, from plants or other animals.
  01 04 05 06 07
- Animals, including humans, grow, change, have specific characteristics and behaviours, and have offspring similar to themselves.
  01 02 03 08 09 10 11 12 14 15
- Reproduction is essential to every kind of living thing. Parents often engage in behaviours that help their offspring survive, but the offspring of some animals are independent at birth.
  01 08 13

Cluster 2 PROPERTIES OF SOLIDS, LIQUIDS, AND GASES

- Matter can exist in different states (solid, liquid, or gas), each state having specific properties.
  01 02 03 04 05 11 12 13
- Matter can change from one state to another (e.g., by melting, freezing, boiling) by heating or cooling.
  01 14 15
- Different types of solids, liquids, and gases can be described and classified by their observable properties and interactions with other solids, liquids, and gases (e.g., absorption of water, floatability, ability to dissolve), which can determine their uses.
  01 06 07 08 09 10 16 17 18 19

Cluster 3 POSITION AND MOTION

- The position of an object can be described using a variety of reference points.
  01 02 03 04 05
- The position or motion of an object can be changed by a push or a pull, and the size of the change depends on the strength of the push or pull.
  01 03 06 07 08
- Certain technologies can facilitate the motion of objects (e.g., inclined planes, wheels and axles).
  01 09 10 11 12 13 14

Cluster 4 AIR AND WATER IN THE ENVIRONMENT

- Air is a major part of the environment; it can move and affect us and the environment.
  01 02 03 04 05 08
- Water is a major part of our environment and can change states as part of the water cycle.
  01 06 07 08
- Clean air and water are necessary for humans, plants, and animals to survive.
  01 09 10 11 13
- Our actions can have an impact on the quality of air and water, and on its ability to sustain life.
  01 12 13 14

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 1b

- Ask questions that can be investigated.
- Make predictions based on prior experiences and observations.

Planning and Carrying Out Investigations
4a 4e 4f 4h 4i 5a 5b 5c 5d 5e 9a 9b 9c

- Follow directions during explorations and understand their purpose.
- Safely use tools and equipment to make observations that are relevant to a question.
- Record observations in writing, by drawing, and/or with charts.

Analyzing and Interpreting Data
6a 6b 6c 7a

- Visually represent data using concrete-object graphs, pictographs, and bar graphs (1:1 correspondence).
- Discuss data and ask questions based on data.
- Propose an answer to the question based on observations.

Obtaining, Evaluating, and Communicating Information
2a 2b 4g 7d 7e 8a 9a

- Describe what was done and what was observed orally, in pictures, or with materials.
- Recognize that learning can come from careful observations.
- Access information from a variety of sources and recognize when it meets research needs.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 3c

- Use prior knowledge to describe potential problems that can be solved through a simple design.
- With the class, define the problem by specifying limited criteria based on function and aesthetics.

Researching, Planning, and Choosing a Solution
2a 2b 3a 3b 3d 4e 4f 4g 9a

- With the class, brainstorm possible solutions to a practical problem and reach consensus on a solution to implement.
- With the class, create a plan to solve the problem or meet the need, including steps to follow and/or a drawing of the object to be constructed.

Constructing and Testing the Model or Prototype
4b 4c 4f 4g 4h 5b

- Construct an object or device to solve the problem or meet the need.
- Test the object or device with respect to the criteria.

Evaluating and Optimizing the Solution
7b 7c 8b

- Identify and make improvements to the object or device with respect to the criteria.
- Propose and evaluate the solution to the initial problem.

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GRADE 2 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, etc.).

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND TESTING THE MODEL OR PROTOTYPE

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or model against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

GRADE 2 SOCIAL STUDIES at a glance

Communities in Canada

This ***Grade 2 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 2 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 2 Social Studies Curriculum Overview: General Learning Outcomes with Grade 2 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

OUR LOCAL COMMUNITY

- **Characteristics of communities**
  KI-004 KI-005 KL-018
- **Natural resources**
  KL-016 KL-017
- **Stories of the past**
  KH-025 VH-008
- **Culture and heritage**
  KI-006 KI-010
- **Personal identity**
  KI-007 KI-008 KI-009 VI-005
- **Contributing to our communities**
  KC-001 VC-001 VC-002
- **Leadership**
  KP-033 KP-034 VP-011
- **Remembrance Day**
  KC-003 KP-035 VP-012

COMMUNITIES IN CANADA

- **Diverse peoples**
  KH-027 KH-028
- **Features of Canadian communities**
  KI-012 KL-019 KL-023
- **Natural resources**
  KL-020 KL-021 KL-022 VH-009
- **Work, goods, and products**
  KE-036 KE-037 VE-013
- **Diversity and change**
  KH-026 VI-006

THE CANADIAN COMMUNITY

- **Canadian symbols**
  KC-002
- **Historical influences**
  KH-029 KH-030
- **Cultural communities**
  KI-013 KI-014 KI-015 VC-003
- **Canadian diversity**
  KI-011 VI-004 VL-007
- **Canadian needs, choices, and decisions**
  KE-038 KE-039
- **Global connections**
  KL-024 KG-031 KG-032 VG-010

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GRADE 2 SOCIAL STUDIES *Curriculum Overview: General Learning Outcomes with Grade 2 Specific Learning Outcomes*

Grade 2 students explore the cultural and geographic diversity in Canada. They begin with their own community, past and present, including how people interact with the natural environment. They also learn about an Aboriginal (First Nations, Métis, or Inuit) community and one other Canadian community. Students come to understand the concept of community, including differences and similarities among Canadian communities. Through this exploration, students discover the diversity and commonalities that link Canadian communities.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

KNOWLEDGE AND UNDERSTANDING

REPORT CARD CATEGORIES

CITIZENSHIP

Fundamental to citizenship is an understanding that people are all part of a community. As members of the community, people have both rights and responsibilities.

As individuals, people all contribute to the well-being and sustainability of their communities. Civic monuments and buildings as well as local and national ceremonies contribute to a sense of community.

KC- 001 002 003
VC- 001 002 003

IDENTITY, CULTURE, AND COMMUNITY

Many factors influence identity and life in communities, including culture, history, and language. Identity is shaped by one's past as well as one's present, and one's local, regional, and national location. Family heritage is also important in shaping identity. Community is strengthened by human interaction and interdependence, cultural diversity, and pluralism.

KI- 004 005 006 007 008 008A 009 010 010A 010F 011 012 013 014 015

VI- 004 005 006 006A 006F

THE LAND: PLACES AND PEOPLE

People exist in dynamic relationships with the land. The land influences people's identities and defines their role as citizens. Cultural expressions are often shaped by the physical environment and its resources. As citizens, people have a responsibility to protect and sustain their environment.

KL- 016 017 018 019 020 021 022 023 024

VL-007

HISTORICAL CONNECTIONS

The past shapes who people are. Students can appreciate the rich and enduring contributions of Canada's founding nations—First Nations, Métis, and Inuit; French; and British. Canada's diverse history continues to shape Canadian identity.

KH- 025 026 027 028 029 030

VH- 008 008A 008F 009

GLOBAL INTERDEPENDENCE

People, communities, societies, nations, and environments are interconnected. As global citizens, people's rights and responsibilities to resolve issues peacefully and to care for the environment need to become more interconnected.

KG- 031 032

VG-010

POWER AND AUTHORITY

Power and authority influence all human relationships. There are diverse forms of governance in Canadian communities. As active, democratic citizens, Canadians all share a role to ensure this country is governed in a fair and equitable manner.

KP- 033 034 035

VP- 011 012

ECONOMICS AND RESOURCES

There are diverse ways in which communities meet their members' needs and wants. The management and distribution of resources and wealth have a direct impact on quality of life.

Each member must work to contribute to the well-being of their families and their community.

KE- 036 037 038 039

VE-013

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207

- Select, organize, record, and represent information from a variety of sources and in various ways.
- Construct and interpret maps that include a title, legend, and symbols.
- Use tools and technologies to accomplish tasks.
- Use appropriate terms to describe time and cardinal directions to describe locations.

Communicating

S- 400 401 402 403 404

- Listen actively and respectfully to others.
- Present information in a variety of ways.
- Give reasons for ideas and opinions.
- Tell events and stories chronologically.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303

- Formulate questions for research.
- Consider advantages and disadvantages of solutions to a problem.
- Use information and observations to form and revise opinions.

Being an Active Democratic Citizen

S- 100 101 102 103 104

- Cooperate and collaborate with others.
- Resolve conflicts peacefully and fairly.
- Make decisions that reflect care and responsibility for the environment.
- Interact fairly and respectfully with others, considering their rights and opinions.

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GRADE 2 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 3

GRADE 3 MATHEMATICS at a glance

Grade 3 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 3 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Counting**
  Number sequence and estimation of quantities to 1000 N.1 N.4
- **Representation of Whole Numbers**
  Whole numbers to 1000 N.2 N.3 N.5
- **Representation of Rational Numbers**
  Fractions as part of a whole N.13
- **Operations with Whole Numbers**
  Mental math and estimation strategies of addition and subtraction (two 2-digit numerals) N.6 N.7 N.8
  Addition and subtraction of numbers with answers to 1000 N.9
  Recall of addition and related subtraction facts to 18 N.10
  Multiplication and related division facts to 5 x 5 N.11 N.12

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Increasing and decreasing patterns PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  One-step addition and subtraction equations PR.3

SHAPE AND SPACE Strand

Measurement

- **Length**
  Measure of length using standard units (cm and m) SS.3
  Perimeter SS.5
- **Mass (Weight)**
  Measure of mass using standard units (g and kg) SS.4
- **Time**
  Passage of time using non-standard and stardard units SS.1
  Relationships between units of measure SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  3-D objects SS.6
  Regular and irregular polygons SS.7

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  First-hand data SP. 1
  Problems involving bar graphs SP. 2

Substrands
- **Learning Targets**

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GRADE 3 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Counting**
  Say the number sequence forward and backward by 10s and 100s between any two given numbers and by multiples of 5 and 25 to 1000. Say the forward number sequence by multiples of 3 and 4 to 100. Estimate quantities to 1000 using referents. ⬅ N.1 N.4

- **Representation of Whole Numbers**
  Represent, describe, compare, and order whole numbers to 1000. Illustrate the meaning of place value for numbers to 1000. ⬌ N.2 N.3 N.5

- **Representation of Rational Numbers**
  Demonstrate an understanding that fractions represent a part of a whole divided into equal parts. Describe everyday situations where fractions are used. Compare fractions of the same whole with like denominators. ➡ N.13

- **Operations with Whole Numbers**
  Describe and apply mental mathematics and estimation strategies for adding and subtracting two 2-digit numerals. Demonstrate an understanding of addition and subtraction with answers to 1000 (limited to 1-, 2-, and 3-digit numerals). ⬌ N.6 N.7 N.8 N.9

  Recall addition and related subtraction facts to 18 (9 +9). ⬅ N.10

  Demonstrate an understanding of multiplication (up to 5 x 5) and of division (limited to division related to multiplication facts up to 5 x 5) by representing and explaining multiplication (equal groups and arrays) and division (equal sharing and equal grouping), by creating and solving problems, modelling, and relating multiplication to repeated addition and to division and relating division to repeated subtraction. ➡ N.11 N.12

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Demonstrate an understating of increasing and decreasing patterns by describing, extending, comparing, and creating patterns. ⬌ PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  Solve one-step addition and subtraction equations involving symbols representing an unknown number. ➡ PR.3

SHAPE AND SPACE Strand

Measurement

- **Length and Mass (Weight)**
  Demonstrate an understanding of measuring length (cm, m) and mass (g, kg) by selecting and justifying referents, modelling and describing the relationship between units of measure, estimating, and recording the measures. ⬌ SS.3 SS.4

  Demonstrate an understanding of perimeter (cm, m) of regular and irregular shapes by estimating using referents, measuring and recording, and constructing different shapes for a given perimeter to demonstrate that many shapes are possible for a perimeter. ➡ SS.5

- **Time**
  Relate the passage of time to common activities using standard and non-standard units. Use relationships between the standard unit of measures of time in a problem-solving context. ⬌ SS.1 SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Describe 3-D objects according to the shape of the faces, and the number of edges and vertices. Sort regular and irregular polygons according to the number of sides. ⬌ SS.6 SS.7

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Collect and organize first-hand data using tally marks, line plots, charts, and lists. Construct, label, and interpret bar graphs to solve problems. ⬌ SP. 1 SP. 2

- ■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.
- ⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.
- ➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).
- ⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 3 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 3 SCIENCE at a glance

This ***Grade 3 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 3 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 3 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use knowledge, skills, and attitudes, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Kindergarten to Grade 4 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and Testing the Model or Prototype
- Evaluating and Optimizing the Solution

GROWTH AND CHANGES IN PLANTS

- **Needs of plants to grow and develop**
  01 04 06 10 11 12
- **Sun as the source of energy for plants**
  01 05 06
- **Characteristics and adaptations of plants**
  01 02 07 08 09 11 16 17
- **Interactions of plants with their environment**
  01 03 13 14 15 16 18

MATERIALS AND STRUCTURES

- **Properties of materials**
  01 02 03 04 08 09 12 13
- **Strength and stability of structures**
  01 05 06 07 08 09 12 13
- **Effects of forces on structures**
  01 10 11

FORCES THAT ATTRACT OR REPEL

- **Force as a push or a pull**
  01 02 03 19
- **Forces that act at a distance**
  01 03 14 16 17 19
- **Interactions of forces with objects and living things**
  01 04 05 06 07 08 09 10 11 12 13 14 15 18 19

SOILS IN THE ENVIRONMENT

- **Components of soil**
  01 02 03 04 05 06
- **Effects of soil characteristics on plants**
  01 04 07 08 10 11 12
- **Interactions between animals/humans and soil**
  01 08 09 10 11 12

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GRADE 3 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 GROWTH AND CHANGES IN PLANTS

- Plants are living things and, like all living things, they have certain needs so that they can stay alive, grow, and develop.
  01 04 06 10 11 12
- Plants get their energy from the Sun to produce food.
  01 05 06
- Plants have adaptations that help them survive in their environment, and these adaptations can be harmful or helpful to humans.
  01 02 07 08 09 11 16 17
- Plants are a vital component of the environment and help to sustain the well-being of all other living things.
  01 03 13 14 15 16 18

Cluster 2 MATERIALS AND STRUCTURES

- Materials have different properties that are suited to different purposes. Many objects and structures can be built up from different materials that are joined together.
  01 02 03 04 08 09 12 13
- The characteristics of materials as well as shapes of structures provide strength and stability to natural and human-built structures from various cultures and communities around the world.
  01 05 06 07 08 09 12 13
- Different forces can have an effect on the strength and stability of structures.
  01 10 11

Cluster 3 FORCES THAT ATTRACT OR REPEL

- A force is a push or a pull that can attract or repel objects.
  01 02 03 19
- Some forces can act at a distance (e.g., gravitational, magnetic, electrostatic) and move certain objects without touching them directly.
  01 03 14 16 17 19
- Gravitational, magnetic, and electrostatic forces interact with objects and living things in predictable ways.
  01 04 05 06 07 08 09 10 11 12 13 14 15 18 19

Cluster 4 SOILS IN THE ENVIRONMENT

- Soils are made of various components, and different types of soils are made of different components and different amounts of these components.
  01 02 03 04 05 06
- The composition of soil determines its characteristics. These characteristics affect plant growth and can determine how humans use the soil to grow plants or make objects.
  01 04 07 08 10 11 12
- Animals are important to maintaining the quality of soil and the actions of humans can have positive or negative effects on soil quality.
  01 08 09 10 11 12

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 1b

- Ask questions that can be investigated.
- Make predictions based on observations and data.

Planning and Carrying Out Investigations
3a 3b 3c 4a 4e 4f 4g 4h 5a 5b 5c 5d 5e 6a 9a 9b 9c

- With the class, create a plan to answer a question.
- With the class, identify variables that could affect an investigation.
- Safely use tools to make observations and collect data.
- Record observations in a variety of ways.

Analyzing and Interpreting Data
6a 6b 6c 7a 7b 8a

- Represent data using concrete-object graphs, pictographs, and bar graphs, and interpret them.
- Discuss data and ask questions based on data.
- Draw a conclusion based on the data gathered.

Obtaining, Evaluating, and Communicating Information
2a 2b 4g 7d 7e 8b 9a

- Communicate results and conclusions in a variety of ways.
- Recognize that explanations have to be supported by the available evidence and by knowledge considered scientific.
- Access and review, with support, information from a variety of reliable sources.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 2a 2b 3f

- Use prior knowledge to describe potential problems that can be solved through a simple design.
- In small groups, define the problem by developing criteria for measuring success based on function and aesthetics.

Researching, Planning, and Choosing a Solution
2a 2b 3d 3e 4e 4f 4g 9a

- In small groups, brainstorm possible solutions to a practical problem, and reach consensus on a solution to implement.
- In small groups, create a plan to solve the problem or meet the need, including steps to follow and a diagram.

Constructing and Testing the Model or Prototype
4b 4c 4e 4f 4g 4h 5b

- Construct an object or device to solve the problem or meet the need.
- Test the object or device with respect to the criteria.

Evaluating and Optimizing the Solution
4d 7c 8c

- Identify and make improvements to an object or device with a rationale for making the changes.
- Recognize that designing a solution to a simple problem may have considerations, such as cost, materials, time, and space.

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GRADE 3 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, etc.).

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND TESTING THE MODEL OR PROTOTYPE

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or model against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

GRADE 3 SOCIAL STUDIES at a glance

Communities of the World

This ***Grade 3 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 3 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 3 Social Studies Curriculum Overview: General Learning Outcomes with Grade 3 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

CONNECTING WITH CANADIANS

- **Canadian citizenship**
  KC-001 KC-002 VC-002
- **Canadian national anthem and Remembrance Day**
  KC-003 KC-004
- **Personal identity**
  KI-007
- **Leadership**
  KP-032 VP-011
- **Conflict resolution**
  KP-033 KP-034

EXPLORING THE WORLD

- **Mapping the world**
  KL-014 KL-015 KL-016
- **Community connections**
  KI-008 KG-030
  VG-009 VG-010
- **Human rights and personal responsibilities**
  KC-005 KC-006 KG-027
  KG-028 KG-029 KG-031
  VC-001 VC-003

COMMUNITIES OF THE WORLD

- **Locate and describe world communities**
  KL-020 KE-037 KE-038 VE-012
- **Living with the land and its resources**
  KL-017 KL-018 KL-019 KE-035
  KE-036 VL-005 VL-006
- **World communities**
  KE-037 KE-038 VE-012
- **Cultural diversity and daily life**
  KI-009 KI-010 KI-011 KI-012
  KI-013 VI-004

EXPLORING AN ANCIENT SOCIETY

- **Daily life in an ancient society**
  KH-023 VH-007
- **Cultural expressions in an ancient society**
  KH-024 KH-025
- **Contributions, continuity, and change**
  KH-021 KH-022 KH-026
  VH-008

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GRADE 3 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 3 Specific Learning Outcomes

Grade 3 students explore ways of life in selected communities of the world, past and present. They are introduced to world geography, and they enrich their appreciation of global diversity as they explore communities and cultures. Students study physical, social, and cultural characteristics of two contemporary communities of the world, one of which is an Indigenous community. They also explore life in an ancient society selected from Egypt, China, Japan, the Vikings, Incas, Mayas, or Aztecs. Through this exploration, students discover the connections linking diverse communities, past and present, and develop an appreciation of the enduring contributions of communities of the world.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

KNOWLEDGE AND UNDERSTANDING

REPORT CARD CATEGORIES

CITIZENSHIP

Students are empowered to be knowledgeable and responsible citizens who contribute to their communities. They recognize that people around the world have basic human rights and understand the importance of fairness and sharing in groups and community.

KC- 001 002 003 004 005 006
VC- 001 002 003

IDENTITY, CULTURE, AND COMMUNITY

The people of local and global communities, past and present, have made enduring cultural and artistic contributions that shape communities today. As Canadians, students can be proud of their cultural identities, including their identities as First Peoples, and celebrate the diversity of cultures around the world.

KI- 007 007A 007F 008 009 009A 010 011 012 013
VI- 004

THE LAND: PLACES AND PEOPLE

People and the natural environment are interrelated. The physical geography of the world is as diverse as the human geography. As citizens, people have a responsibility to protect and sustain their environment.

KL- 014 015 016 017 018 019 020
VL- 005 006 006A

HISTORICAL CONNECTIONS

People, events, and ideas of Canada and societies of the past shape the present and influence the future of Canadian communities. Students can appreciate the rich and diverse history as well as the enduring contributions of ancient societies.

KH- 021 022 023 024 025 026
VH- 007 008

GLOBAL INTERDEPENDENCE

There are many similarities and connections among communities around the world. As citizens of Canada, students have a global responsibility and connections to people elsewhere in the world.

KG- 027 028 029 030 031
VG- 009 010

POWER AND AUTHORITY

Canada is a democracy with three distinct levels of government. Informal and formal power and authority influence students' lives in a variety of ways. Canadians have learned to resolve their differences in a variety of ways and have both rights and responsibilities.

KP- 032 033 034
VP- 011 011A

ECONOMICS AND RESOURCES

People's needs are met in various ways through both public and private means.

There are diverse ways in which communities around the world meet their members' needs, and as Canadians, students value the contributions individuals make to their communities.

KE- 035 036 037 038
VE- 012

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207

- Select, organize, record, and represent information from a variety of sources and in various ways.
- Reference sources appropriately.
- Construct and interpret maps that include a title, legend, and compass rose.
- Use tools and technologies to accomplish tasks.
- Use appropriate terms to describe time and cardinal directions to describe relative locations on maps and globes.

Communicating

S- 400 401 402 403

- Listen actively and respectfully to others to understand diverse perspectives.
- Present information in a variety of ways.
- Support ideas and opinions with information or observations.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303 304

- Formulate questions for research.
- Consider advantages and disadvantages of solutions to a problem.
- Use information and observations to draw conclusions and revise ideas and opinions.
- Distinguish fact from opinion.

Being an Active Democratic Citizen

S- 100 101 102 103 104

- Cooperate and collaborate with others to share ideas, decisions, and responsibilities.
- Resolve conflicts peacefully and fairly.
- Make decisions that reflect care and responsibility for the environment.
- Interact fairly and respectfully with others, considering their rights and opinions.

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GRADE 3 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 4

GRADE 4 MATHEMATICS at a glance

Grade 4 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 4 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Representation of Whole Numbers**
  Whole numbers to 10 000 N.1 N.2
- **Representation of Rational Numbers**
  Fractions as part of a whole or a set N.8
  Decimals to hundredths N.9
  Relationships between decimals and fractions N.10
- **Operations with Whole Numbers**
  Addition and subtraction to 10 000 N.3
  Multiplication and related division facts to 9 x 9 N.4 N.5
  Multiplication 2- or 3-digit by 1-digit numerals N.6
  Division 1-digit divisor and up to 2-digit dividends N.7
- **Operations with Rational Numbers**
  Problems involving addition and subtraction of decimals to hundredths N.11

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Problems involving patterns and relationships using tables, charts, and diagrams
  PR.1 PR.2 PR.3 PR.4

Variables and Equations

- **Algebraic Representations with Equations**
  One-step equations PR.5 PR.6

SHAPE AND SPACE Strand

Measurement

- **Area**
  Area of 2-D shapes SS.3
- **Time**
  Time and calendar dates SS.1 SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Problems involving 2-D shapes and 3-D objects
  SS.4 SS.5

Transformations

- **Position and Motion**
  Line symmetry SS.6

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Many-to-one correspondence SP. 1
  Pictographs and bar graphs SP. 2

Substrands
- **Learning Targets**

Manitoba

GRADE 4 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Representation of Whole Numbers**
  Represent, describe, order, and compare whole numbers to 10 000. ⬌ N.1 N.2

- **Representation of Rational Numbers**
  Demonstrate an understanding of fractions less than or equal to one, using representations of part of a whole or a set. Name, record, compare, and order fractions. Model and explain that for different wholes, two identical fractions may not represent the same quantity. ⬌ N.8

  Describe and represent decimals and relate decimals to fractions to hundredths. ➡ N.9 N.10

- **Operations with Whole Numbers**
  Demonstrate an understanding of addition and subtraction to 10 000 (limited to 3- and 4- digit numerals) using personal strategies, estimation, and standard algorithms. ⬌ N.3

  Describe and apply mental math strategies to develop an understanding of multiplication facts and related division facts to 9 x 9. Recall multiplication and related division facts to 5 x 5. Demonstrate an understanding of multiplication (2- or 3-digit numerals by 1-digit numerals) and division (1-digit divisor and up to 2-digit dividends) to solve problems by using personal strategies, estimation, and arrays, by connecting concrete and symbolic representations, and by relating division to multiplication. Explain the properties of 0 and 1 for multiplication and the property of 1 for division. ⬌
  N.4 N.5 N.6 N.7

- **Operations with Rational Numbers**
  Demonstrate an understanding of addition and subtraction of decimals (limited to hundredths) using compatible numbers, estimation, and mental math strategies to solve problems. ➡ N.11

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Identify, describe, reproduce, represent, and explain patterns and mathematical relationships found in tables, charts, and diagrams to solve problems. ⬌
  PR.1 PR.2 PR.3 PR.4

Variables and Equations

- **Algebraic Representations with Equations**
  Express a problem as an equation using a symbol. Solve one-step equations involving a symbol to represent an unknown. ⬌
  PR.5 PR.6

SHAPE AND SPACE Strand

Measurement

- **Area**
  Demonstrate an understanding of area (cm^2, m^2) of regular and irregular 2-D shapes by recognizing that area is measured in square units, selecting and justifying referents, estimating, determining and recording area, and constructing different rectangles for a given area in order to demonstrate that many different rectangles may have the same area. ➡ SS.3

- **Time**
  Read and record calendar dates in a variety of ways, and read and record time using digital and analog clocks, including 24-hour clocks. ⬅ SS.1 SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Solve problems involving 2-D shapes and 3-D objects. Describe and construct rectangular and triangular prisms. ⬌ SS.4 SS.5

Transformations

- **Position and Motion**
  Demonstrate an understanding of line symmetry by identifying and creating symmetrical 2-D shapes and drawing lines of symmetry. ➡ SS.6

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Demonstrate an understanding of many-to-one correspondence in order to construct and interpret pictographs and bar graphs to draw conclusions. ⬌ SP.1 SP.2

- ■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.
- ⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.
- ➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).
- ⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

Manitoba

GRADE 4 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 4 SCIENCE at a glance

This ***Grade 4 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 4 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 4 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use knowledge, skills, and attitudes which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Kindergarten to Grade 4 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and Testing the Model or Prototype
- Evaluating and Optimizing the Solution

HABITATS AND COMMUNITIES

- **Habitats**
  01 02 03 04 05 07 08 14 15
- **Systems interactions among organisms**
  01 09 10 11 12 13 14 15
- **Contributions of traditional knowledge**
  01 05 17
- **Advancing understanding through technological development**
  01 06 08 16

LIGHT

- **Light as a form of energy**
  01 02 03 06
- **Properties of light**
  01 05 07 14
- **Interactions between light and materials**
  01 04 08 09 10 11 12 13 14 15 16

SOUND

- **Sound as a form of energy**
  01 02 03 05 06
- **Properties of sound**
  01 04 06 07 08 13 14
- **Function of the ear and potential harmful effects of sounds on the ear**
  01 09 10 11 12
- **Interactions between sound and materials**
  01 13 14 15 16 17 18

ROCKS, MINERALS, AND EROSION

- **Properties of rocks and minerals**
  01 02 03 04 07
- **Classification of rocks**
  01 05 06 08 4-0-6c 6d
- **Fossils and geological time**
  01 09 10
- **Processes that shape the landscape over time**
  01 11 12 13 14 15

Manitoba

GRADE 4 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 HABITATS AND COMMUNITIES

- Living things are suited to their habitat, a specific part of the natural environment where they can meet their specific needs. Living things respond to changes in their environment, both natural and human-induced.
  01 02 03 04 05 07 08 14 15
- Populations of living things interact among themselves in communities, which have interconnected systems of food chains and thus, a continuous flow of energy from the Sun to producers and consumers.
  01 09 10 11 12 13 14 15
- Traditional Indigenous knowledge provides reliable, evidence-based views of our understanding of interactions among plants and animal populations.
  01 05 17
- Technological developments have advanced human understanding of habitats and their populations; this knowledge of plant and animal adaptations has led to new products that mimic these adaptations.
  01 06 08 16

Cluster 2 LIGHT

- Light, whether natural or artificial (depending on the source), is a form of energy (like heat, food, and sound) that is experienced in all aspects of daily life.
  01 02 03 06
- Light has specific properties, such as travelling in a straight path, bending (refracting) when moving at an oblique angle from one transparent medium to another, and reflecting from surfaces.
  01 05 07 14
- Interactions between light and various materials produce observable effects such as the separation of white light into its component colours; bending, reflection, and absorption of light; and the casting of shadows. Understanding these interactions enables the design of materials and devices that use or emit light for a specific purpose.
  01 04 08 09 10 11 12 13 14 15 16

Cluster 3 SOUND

- Sound is a form of energy produced by vibrations and experienced in a variety of forms in all aspects of daily life.
  01 02 03 05 06
- Sound travels in waves in all directions from its source and has specific properties, such as pitch, loudness, and the ability to travel through, be absorbed by, or be reflected by some material objects.
  01 04 06 07 08 13 14
- The ear acts to receive and process sound waves within a range that is characteristic to the organism; there are potentially harmful effects from excessive exposure to high intensity sounds produced by human-designed technologies.
  01 09 10 11 12
- Interactions between sound and various materials can change its properties. Understanding these interactions enables the design of materials and devices that use or emit sound for a specific purpose.
  01 13 14 15 16 17 18

Cluster 4 ROCKS, MINERALS, AND EROSION

- Rocks are composed of minerals that have identifiable properties such as colour, hardness, and lustre, which can determine their uses.
  01 02 03 04 07
- The classification of rocks into three broad categories (sedimentary, igneous, and metamorphic) identifies the environment in which the rock formed and is important to the understanding of geological processes.
  01 05 06 08 4-0-6c 4-0-6d
- Fossilization of past life forms provides an understanding of the length of geologic time and the way in which organisms have changed throughout Earth's history.
  01 09 10
- Both very slow and sometimes sudden and catastrophic processes inside Earth and at its surface shape the landscape over time and can affect the relationship between human communities and their natural surroundings.
  01 11 12 13 14 15

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 1b 9b

- Ask questions that can be investigated.
- Make and justify predictions based on prior experiences and observations.

Planning and Carrying Out Investigations
3a 3b 3c 4a 4e 4f 4g 4h 5a 5b 5c 9b

- In a small group, create a plan to answer a question.
- In a small group, identify variables that could affect an investigation.
- Select and safely use tools to make observations and collect data.
- Record observations and represent data in a variety of ways.

Analyzing and Interpreting Data
6a 6b 6c 6d 6e 7a 7b 8a 9b 9c

- Represent data using bar graphs and pictographs (many to one correspondence), and interpret them.
- Identify patterns in data and suggest explanations for discrepancies in data.
- Draw a conclusion based on the data gathered.
- Evaluate, with guidance, the method(s) used to answer a question.

Obtaining, Evaluating, and Communicating Information
2a 2b 4g 7d 7e 8b 9a 9b

- Communicate results and conclusions in a variety of ways.
- Recognize that explanations have to be supported by the available evidence and by knowledge considered scientific.
- Access and review, with support, information from a variety of reliable sources.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 2a 3f 9b

- Use prior knowledge to describe potential problems that can be solved through a simple design.
- Define the problem by developing criteria for measuring success based on function and aesthetics, and by identifying constraints such as available materials, time, or cost.

Researching, Planning, and Choosing a Solution
2a 2b 3d 3e 4f 4g 9b

- Brainstorm possible solutions to a practical problem, and identify and justify which solution to implement.
- Create a plan to solve the problem or meet the need, including steps to follow and a labelled diagram.

Constructing and Testing the Model or Prototype
4b 4c 4e 4f 4g 4h 5a 9b

- Construct an object, device, or system that addresses a possible solution to the design problem.
- Test the proposed object, device, or system with respect to the criteria and constraints.

Evaluating and Optimizing the Solution
4d 7b 7c 8c 9b

- Identify and make improvements to the object, device, or system with a rationale for making the changes.
- Recognize that designing a solution to a simple problem may have considerations such as cost, materials, time, and space.

Manitoba

GRADE 4 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, etc.).

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND TESTING THE MODEL OR PROTOTYPE

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or model against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Kindergarten to Grade 4 Science: A Foundation for Implementation*.

GRADE 4 SOCIAL STUDIES at a glance

Manitoba, Canada, and the North: Places and Stories

This ***Grade 4 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 4 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 4 Social Studies Curriculum Overview: General Learning Outcomes with Grade 4 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

GEOGRAPHY OF CANADA

- **Mapping Canada and Manitoba**
  KL-015 KL-018 KL-019
- **Geographic regions of Canada**
  KL-016 KL-017 VL-005

LIVING IN CANADA

- **Symbols, monuments, and important days**
  KC-001 KC-003
- **Canadian citizenship**
  KC-004 KE-049 VC-002
- **Public and private property**
  KE-047 VE-012
- **Power and authority**
  KP-045 KP-046 VC-001 VP-011
- **Government**
  KC-002 KP-041 KP-042 KE-048
- **Elected leaders**
  KP-043 KP-044

CANADA'S NORTH

- **Physical features and natural resources**
  KL-028 KL-029
- **Changes in the North**
  KL-031 KH-037
- **People of the North**
  KI-014 KL-030
- **Ways of life in the North**
  KL-032 KH-038
- **Northern contributions**
  KI-013 KH-036 VL-007

LIVING IN MANITOBA

- **Geographic features and natural resources**
  KL-020 KL-021
- **Environmental stewardship and sustainability**
  KL-023 KL-024 VL-006
- **Cultural communities in Manitoba**
  KI-005 KI-007 KI-008
- **Identity and culture**
  KI-009 KL-022 VI-003
- **Artistic and cultural achievements**
  KI-006 KL-025 VI-004

HISTORY OF MANITOBA

- **Early life and settlement**
  KL-026 KL-027 KH-034
- **People and events that shaped Manitoba**
  KH-033 VH-008
- **Historical cultural contributions**
  KI-010 KI-011 KI-012
- **Changes in ways of life**
  KH-035 VH-009

Manitoba

GRADE 4 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 4 Specific Learning Outcomes

Grade 4 students explore life in Canada, Manitoba, and Canada's North. They enhance their knowledge of Canada's physical and human geography and develop an awareness of Canadian citizenship and governance. Students explore the places, stories, and cultures of Manitoba and discover the diversity and shared experiences of Manitobans, past and present. They also develop an awareness of life in Canada's North through a study of the physical and human geography of one of the northern territories. Through this exploration, students develop a sense of belonging and enrich their understanding of citizenship in Manitoba and Canada.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

CITIZENSHIP

Students are empowered to be active, responsible citizens who contribute to their communities. Every individual has a unique and individual understanding of what it means to be a citizen of Canada.

KC- 001 002 003 004 004A 004F
VC- 001 002

IDENTITY, CULTURE, AND COMMUNITY

The people of Manitoba and the North have made enduring cultural and artistic contributions to their communities, province, and the Canadian society. Manitobans can be proud of their own cultural identities and the diversity of cultures in the province.

KI- 005 006 006A 006F 007 007A 008 008F 009 009A 009F 010 011 011A 012 012F 013 014
VI- 003 004

THE LAND: PLACES AND PEOPLE

Canada has distinct physical features and natural resources. People and the natural environment are interrelated. All Manitobans have a responsibility to protect and sustain their environment.

KL- 015 016 017 018 019 020 020A 021 022 023 024 025 026 027 028 029 030 031 032
VL- 005 006 006A 007

HISTORICAL CONNECTIONS

Canada has a rich and diverse history. People, events, and ideas of Canada's past shape the present and influence the future of Canadian communities.

KH- 033 034 035 036 037 038
VH- 008 009

GLOBAL INTERDEPENDENCE

Citizens of Manitoba have a global responsibility and are globally interdependent.

KG- 039 040
VG-010

POWER AND AUTHORITY

Canada is a democracy with three distinct levels of government. Informal and formal power and authority influence our lives in a variety of ways. Canadians have both rights and responsibilities.

KP- 041 042 043 044 044A 045 046
VP-011

ECONOMICS AND RESOURCES

People's needs are met in various ways through both public and private means.

KE- 047 048 049
VE-012

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207 208

- Select, organize, record, and represent information from a variety of sources and in various ways.
- Reference sources appropriately.
- Construct and interpret maps that include a title, legend, compass rose, and grid.
- Select and use appropriate tools and technologies to accomplish tasks.
- Use appropriate terms to describe time, and cardinal and intermediate directions to locate and describe places on maps and globes.
- Orient oneself by using observation, traditional knowledge, and a compass or other technologies.

Communicating

S- 400 401 402 403

- Listen actively and respectfully to others to understand diverse perspectives.
- Present information and ideas in a variety of ways.
- Support ideas and opinions with information or observations.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303 304 305

- Formulate questions for research.
- Consider advantages and disadvantages of solutions to a problem.
- Use information and observations to draw conclusions and evaluate personal assumptions.
- Distinguish fact from opinion.
- Observe and analyze evidence for research.

Being an Active Democratic Citizen

S- 100 101 102 103 104

- Collaborate with others to share ideas, decisions, and responsibilities.
- Resolve conflicts peacefully and fairly.
- Make decisions that reflect care and responsibility for the environment.
- Interact fairly and respectfully with others.
- Negotiate to build consensus.

Manitoba

GRADE 4 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 5

GRADE 5 MATHEMATICS at a glance

Grade 5 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 5 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Representation of Whole Numbers**
  Whole numbers to 1 000 000 N.1
- **Representation of Rational Numbers**
  Equivalent fractions and fractions with like and unlike denominators N.7

  Decimals to thousandths N.8 N.10

  Relationships between decimals and fractions N.9
- **Operations with Whole Numbers**
  Mental math and estimation strategies N.2 N.4

  Recall of multiplication and related division facts up to 9 x 9 N.3

  Problems involving multiplication of 1- or 2-digit multipliers and up to 4-digit multiplicands N.5

  Problems involving division of 1- or 2-digit divisors and up to 4-digit dividends N.6
- **Operations with Rational Numbers**
  Addition and subtraction of decimals to thousandths N.11

PATTERNS AND RELATIONS Strand

Patterns
- **Patterning and Algebraic Thinking**
  Pattern rules PR.1

Variables and Equations
- **Algebraic Representations with Equations**
  Problems involving one-step equations PR.2

SHAPE AND SPACE Strand

Measurement
- **Length and Area**
  Construction of rectangles SS.1

  Relationship between the units of measure (mm, cm, and m) SS.2
- **Volume (Capacity)**
  Estimation and measurement SS.3 SS.4

3-D Objects and 2-D Shapes
- **Identifying, Sorting, Comparing, and Constructing**
  Edges, faces, and sides SS.5

  Quadrilaterals SS.6

Transformations
- **Position and Motion**
  Single transformation SS.7 SS.8

STATISTICS AND PROBABILITY Strand

Data Analysis
- **Collection, Organization, and Analysis of Data**
  First- and second-hand data SP. 1

  Double bar graphs SP. 2

Chance and Uncertainty
- **Probability**
  Terminology SP. 3 SP.4

Substrands
- **Learning Targets**

Manitoba

GRADE 5 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Representation of Whole Numbers**
  Represent and describe whole numbers to 1 000 000. ⬌ N.1
- **Representation of Rational Numbers**
  Demonstrate an understanding of fractions to create sets of equivalent fractions and to compare fractions with like and unlike denominators. ⬌ N.7

  Describe, represent, compare, and order decimals to thousandths using benchmarks, place value, and equivalent decimals. Relate decimals to fractions to thousandths. ⬌ N.8 N.9 N.10
- **Operations with Whole Numbers**
  Apply estimation strategies using addition, subtraction, multiplication, and/or division in problem-solving contexts. Apply mental math strategies for multiplication. ⬌ N.2 N.4

  Apply mental math strategies to determine and recall multiplication and related division facts to 81 (9 x 9). ⬅ N.3

  Demonstrate an understanding of multiplication (1- and 2-digit multipliers and up to 4-digit multiplicands) and division (1- and 2-digit divisors and up to 4-digit dividends) using personal strategies, the standard algorithms, and estimation to solve problems. ⬅ N.5 N.6
- **Operations with Rational Numbers**
  Demonstrate an understanding of adding and subtracting decimals to thousandths, by using personal strategies, the standard algorithms, and estimation, and by solving problems. ⬌ N.11

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Determine the pattern rule to make predictions about subsequent elements. ⬌ PR.1

Variables and Equations

- **Algebraic Representations with Equations**
  Solve problems involving one-step and one-variable (expressed as symbol or letter) equations. ⬌ PR.2

SHAPE AND SPACE Strand

Measurement

- **Length and Area**
  Design and construct rectangles given perimeter or area or both, and draw conclusions. ⬌ SS.1

  Demonstrate an understanding of measuring length (mm) by using referents and the relationship between units. ⬅ SS.2
- **Volume (Capacity)**
  Demonstrate an understanding of volume (cm^3 or m^3) by selecting, justifying, and estimating using referents, measuring and recording, and constructing rectangular prisms for a given volume. ➡ SS.3

  Demonstrate an understanding of capacity (mL or L) by selecting, justifying, and estimating using referents, measuring and recording, and describing the relationship between units. ■ SS.4

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Describe and provide examples of edges and faces of 3-D objects and sides of 2-D shapes that are parallel, intersecting, perpendicular, vertical, and horizontal. ➡ SS.5

  Identify and sort quadrilaterals according to their attributes. ⬅ SS.6

Transformations

- **Position and Motion**
  Perform and identify a single transformation of a 2-D shape, and draw and describe the image. ➡ SS.7 SS.8

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Differentiate between first- and second-hand data. Construct and interpret double bar graphs to draw conclusions. ⬌ SP.1 SP.2

Chance and Uncertainty

- **Probability**
  Describe the likelihood of a single outcome occurring and compare the likelihood of two possible events occurring. ➡ SP.3 SP.4

■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.

⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.

➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).

⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 5 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 5 SCIENCE at a glance

This ***Grade 5 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 5 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 5 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use both knowledge and skills, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and/or Testing the Prototype or Consumer Product
- Evaluating and Optimizing the Solution

MAINTAINING A HEALTHY BODY

- **Importance of healthy eating habits**
  01 02 03 04 05 13
- **Functions of body systems**
  01 06 07 08 09 10 11 12
- **Personal decision making related to health**
  01 13 14 15
  5-0-9f

PROPERTIES OF AND CHANGES IN SUBSTANCES

- **Characteristics and properties of matter**
  01 02 04 05 06 07
- **Physical and chemical changes**
  01 03 08 09 10 11
- **Properties of substances that determine their use or application**
  01 12 13 14
  5-0-8c 8g 9e

FORCES AND SIMPLE MACHINES

- **Effects of forces on objects**
  01 02 14
- **Use of simple machines to accomplish tasks**
  01 03 04 05 06 07 08 09 10 11 12 13 14
  5-0-8d

WEATHER

- **Daily weather conditions**
  01 03 04 08 13 14 15
- **Role of technology in our understanding of weather and climate**
  01 02 05 06 07 09 10 11 12
  5-0-8b 8c 8d 8e 8g 9a 9b
- **Weather and climate**
  01 16 17 18
  5-0-8b 8g 9e

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GRADE 5 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 MAINTAINING A HEALTHY BODY

- A balanced diet is necessary to maintain a healthy body.
  01 02 03 04 05 13
- Humans have body systems that serve various functions and work together to ensure a healthy functioning of the body.
  01 06 07 08 09 10 11 12
- The choices we make and the environments in which we live affect our health.
  01 13 14 15
  5-0-9f

Cluster 2 PROPERTIES OF AND CHANGES IN SUBSTANCES

- Matter is defined as anything that takes up space and has mass; it can exist in three states (solid, liquid, and gas), each having specific properties.
  01 02 04 05 06 07
- Chemical reactions involve substances reacting to form new substances, while physical reactions do not involve the formation of a new substance; both types of reactions can be reversible or non-reversible.
  01 03 08 09 10 11
- Substances have different properties and behave in different ways, which can allow them to be distinguished from one another and can determine their uses as well as their potential effects on society and the environment.
  01 12 13 14
  5-0-8c 8g 9e

Cluster 3 FORCES AND SIMPLE MACHINES

- Forces act on objects and can change their motion.
  01 02 14
- Simple machines can change the intensity and direction of the force exerted on objects to help us accomplish various tasks.
  01 03 04 05 06 07 08 09 10 11 12 13 14
  5-0-8d

Cluster 4 WEATHER

- Weather conditions change daily and are caused by complex interactions between energy from the Sun and the atmosphere, water systems, and landforms.
  01 03 04 08 13 14 15
- Weather conditions affect us every day, and the development of technologies has enabled us to better understand and predict weather.
  01 02 05 06 07 09 10 11 12
  5-0-8b 8c 8d 8e 8g 9a 9b
- Climate refers to long-term weather patterns of a region and can change through both natural and human-made processes.
  01 16 17 18
  5-0-8b 8g 9e

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 3a 9c

- Ask specific questions that lead to investigations.
- Make a prediction or hypothesis that can be investigated scientifically.

Planning and Carrying Out Investigations
1b 3b 3c 4a 4c 4d 4e 5a 5c 5d 5e 5f 9c

- Create a plan to answer a specific question.
- Identify variables that could affect an investigation and variables that should be held constant to ensure a fair test.
- Select and safely use tools to observe and measure.
- Make observations that are relevant, and record them in a variety of ways.

Analyzing and Interpreting Data
6a 6c 6f 7a 7b 7c 7h 9c 9d

- Represent data in a variety of ways and interpret it.
- Interpret patterns and discrepancies in data.
- Draw a conclusion based on data that explains the results of the investigation and supports or rejects the hypothesis.
- Evaluate the methods used to answer a question, and identify potential applications of investigation results.

Obtaining, Evaluating, and Communicating Information
2a 2b 2c 7f 7g 8a 8b 9c

- Communicate results and conclusions in a variety of ways.
- Recognize that science is a way of answering questions about the world and that there are questions that science cannot answer.
- Access and review information from a variety of sources.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 3d 9c

- Identify and describe a practical problem that can be solved.
- Define the problem by developing criteria for evaluating a prototype or a consumer product based on function, reliability, and aesthetics, and by identifying constraints such as available materials, time, or cost.

Researching, Planning, and Choosing a Solution
1d 2a 3b 3c 3e 4d 9c

- Identify various ways to solve a practical problem, and select and justify one to implement.
- Create a plan for the chosen solution, including materials, safety considerations, labelled diagrams, and steps to follow.

Constructing and/or Testing the Prototpe or Consumer Product
4b 4c 4d 4e 5a 5b 5c 5d 9c 9d

- Construct a prototype.
- Test a prototype or consumer product with respect to the criteria.

Evaluating and Optimizing the Solution
6d 6e 7d 7e 8c 9c

- Identify and make improvements to the prototype, and explain the rationale for changes.
- Evaluate the strengths and weaknesses of a consumer product with respect to criteria.
- Propose and justify a solution to the initial problem.

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GRADE 5 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, cost, environmental impact, etc.).

At the Middle Years level, a second facet of the design process is introduced to students. The evaluation of consumer products does not involve the construction of a model or prototype, but rather simulates the decision-making process of a consumer when purchasing a product.

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions or to make the best choice. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND/OR TESTING THE PROTOTYPE OR CONSUMER PRODUCT

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or consumer product against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design or decision is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

GRADE 5 SOCIAL STUDIES at a glance

People and Stories of Canada to 1867

This ***Grade 5 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 5 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 5 Social Studies Curriculum Overview: General Learning Outcomes with Grade 5 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

FIRST PEOPLES

- **Origins of First Peoples of North America**
  KI-004 KL-014 VH-008
- **Connections to the land**
  KL-015 KL-016 KL-017
- **Pre-contact cultures**
  KI-005 KI-006 KH-024
- **First Peoples governance**
  KP-046 KE-050 VP-014

EARLY EUROPEAN COLONIZATION (1600 TO 1763)

- **Early European exploration and colonization**
  KL-018 KH-025 KG-043 KP-047
- **Nouvelle-France**
  KI-008 KL-018 KL-019 KH-033 KP-048
- **Cultural interaction in early Canada**
  KH-026 KE-051 VH-009 VE-015
- **French-British colonial rivalry**
  KI-007 KH-027 KH-028 KH-029 VH-011 VH-012

FUR TRADE

- **European expansion in the North and West**
  KL-020 KH-030 KH-031 KG-044
- **Importance of the land in the fur trade**
  KL-020 KL-021 KH-034 VL-007
- **Life during the fur trade era**
  KI-009 KL-020 KH-032 KE-053 VI-003
- **Métis Nation and culture in the fur trade era**
  KL-020 KH-035 KH-036 KP-049 KE-052

FROM BRITISH COLONY TO CONFEDERATION (1763 TO 1867)

- **Early immigration and the impact of the Loyalists**
  KI-010 KI-011 KH-037 VI-006
- **Sharing the land**
  KL-023 KH-039 KG-045 VI-005 VG-013
- **Conflict and reform**
  KI-013 KH-038 KH-040 VI-004
- **Negotiating Confederation**
  KL-022 KH-041 KH-042 VH-010
- **Citizenship then and now**
  KC-001 KC-002 KC-003 KI-012 VC-001 VC-002

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GRADE 5 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 5 Specific Learning Outcomes

Grade 5 students learn about people and events before 1867 when Canada became a nation. They focus on First Peoples, French and British colonization of Canada, and the birth of Canada as a nation. Students study First Nations cultures and governance, the fur trade, the rise of the Métis people, and the interaction of cultures in early Canada. They also look at how history and geography have helped to shape Canada.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

KNOWLEDGE AND UNDERSTANDING

REPORT CARD CATEGORIES

CITIZENSHIP

Citizenship education is fundamental to living in a democratic society, enabling students to explore democratic values, and to determine their responsibilities and rights as participants in civil society. Students compare what it meant to be a citizen in the past and present, as well as in the future. As they enhance their understanding of citizenship, they are empowered to be active citizens who contribute to the local, national, and global communities to which they belong.

KC- 001 002 003

VC- 001 002

IDENTITY, CULTURE, AND COMMUNITY

Identity is subject to time and place, and is shaped by a multiplicity of personal, social, and economic factors. Students will have the opportunity to explore the institutions and cultural expressions of the communities of the past and how they have shaped Canada today. Through a study of the ways people lived together in the past, students will enhance their understanding of diverse perspectives and the historical roots of the multicultural nature of Canada.

KI- 004 005 006 007 008 009 010 011 012 013

VI- 003 004 005 006

THE LAND: PLACES AND PEOPLE

The history of Canada has been influenced by the dynamic relationships of people and the land. The exploration of people's relationships with places and environments creates an understanding of human dependence and impact upon the natural environment. Students explore how spatial and physical characteristics of the environment affect human settlement, economics, and societies, locally, nationally, and globally. They explore concepts such as sustainability and stewardship, and how, as citizens, we have a responsibility to protect and sustain our environment.

KL- 014 015 016 017 018 019 020 021 022 023

VL-007

HISTORICAL CONNECTIONS

The past shapes who people are. An exploration of Canadian and world history enables students to acquire knowledge and an appreciation of the past, to understand the present, and to live with regard for the future. An important aspect of this process is the disciplined investigation and interpretation of history. As they explore people, events, ideas, and evidence of the past, they learn to think historically. They learn to reflect upon diverse perspectives, personal narratives, parallel accounts, and oral and social histories, and develop the historical understanding that provides a foundation for active democratic citizenship.

KH- 024 025 026 027 028 029 030 031 032 034 035 036 037 038 039 040 041 042

VH- 008 009 010 011 012

GLOBAL INTERDEPENDENCE

People, communities, societies, nations, and environments are interdependent. Canadian history has been shaped by this interdependence. Knowledge and understanding of global connections that have influenced history enables students to expand their global consciousness and responsibility.

KG- 043 044 045

VG-013

POWER AND AUTHORITY

Power and authority have influenced human relationships in the past as they do in the present. Students critically examine the diverse forms of governance and leadership through time, and inquire into issues of fairness and equity. This exploration helps students develop a sense of personal empowerment so that, as active democratic citizens, they can shape their future.

KP- 046 047 048 049

VP-014

ECONOMICS AND RESOURCES

The management and distribution of resources and wealth have a direct impact on Canadian history and continue to influence Canadian society today. Students explore the effects of economic interdependence on individuals and on local and global communities. They examine historic economic factors that affect decision making, the use of resources, and the development of technologies. Students will critically consider the social and environmental implications of the distribution of resources and technologies, locally, nationally, and globally.

KE- 050 051 052 053

VE- 015

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207 207A 208

- Select, organize, record, and represent information from a variety of sources and in various ways.
- Reference sources appropriately.
- Distinguish between primary and secondary sources.
- Construct and interpret maps that include a title, legend, compass rose, grid, and scale.
- Select and use appropriate tools and technologies to accomplish tasks.
- Use appropriate terms to describe time, and latitude and longitude to locate and describe places on maps and globes.
- Orient oneself by using observation, traditional knowledge, and a compass or other technologies.

Communicating

S- 400 401 402 403 404 405

- Listen actively and respectfully to others to understand diverse perspectives.
- Present information and ideas in a variety of ways.
- Support ideas and opinions with information or observations.
- In discussions, elicit and clarify questions and ideas, and articulate beliefs and perspectives.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303 304 305 306 307 308 309 310

- Plan topics and goals for research.
- Evaluate advantages and disadvantages of solutions to a problem.
- Use research and evidence to draw conclusions.
- Evaluate personal assumptions based on new information and ideas.
- Distinguish fact from opinion and interpretation.
- Observe and analyze evidence for research.
- Assess the validity of sources.
- Compare different accounts of events and diverse perspectives.
- Interpret information and ideas, and recognize that interpretations change with new information.

Being an Active Democratic Citizen

S- 100 101 102 103 104 105 106

- Collaborate with others to establish and carry out group goals.
- Resolve conflicts peacefully and fairly using a variety of strategies.
- Make decisions that reflect care and responsibility for the environment, and reflect fairness and equality toward others.
- Negotiate to build consensus and solve problems.
- Recognize bias and discrimination and propose solutions.
- Treat historically significant places and objects with respect.

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GRADE 5 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 6

GRADE 6 MATHEMATICS at a glance

Grade 6 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 6 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Representation of Whole Numbers**
  Whole numbers greater than one million N.1
  Integers N.7
- **Representation of Rational Numbers**
  Numbers less than one thousandth N.1
  Relationships between improper fractions and mixed numbers N.4
  Ratio N.5
  Percent N.6
- **Operations with Whole Numbers**
  Problems involving large numbers using technology N.2
  Factors and multiples N.3
  Order of operations N.9
- **Operations with Rational Numbers**
  Multiplication and division of decimals N.8

PATTERNS AND RELATIONS Strand

Patterns
- **Patterning and Algebraic Thinking**
  Patterns and relationships using tables and graphs PR.1 PR.2

Variables and Equations
- **Algebraic Representations with Equations**
  Number relationships and preservation of equality PR.3 PR.4

SHAPE AND SPACE Strand

Measurement
- **Length, Area, and Volume (Capacity)**
  Formulas for perimeter, area, and volume SS.3
- **Angles**
  Measuring angles SS.1 SS.2

3-D Objects and 2-D Shapes
- **Identifying, Sorting, Comparing, and Constructing**
  Triangles SS.4
  Regular and irregular polygons SS.5

Transformations
- **Position and Motion**
  Single transformations, combinations of transformations, and the Cartesian plane SS.6 SS.7 SS.8 SS.9

STATISTICS AND PROBABILITY Strand

Data Analysis
- **Collection, Organization, and Analysis of Data**
  Line graphs SP. 1
  Methods of collecting data SP. 2
  Problems involving graphs and data SP.3

Chance and Uncertainty
- **Probability**
  Experimental and theoretical probability SP.4

Substrands
- **Learning Targets**

Manitoba

GRADE 6 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Representation of Whole Numbers**
  Demonstrate an understanding of place value for numbers greater than one million. ⬌ N.1

  Demonstrate an understanding of integers. ➠ N.7

- **Representation of Rational Numbers**
  Demonstrate an understanding of place value for numbers less than one-thousandth. ⬌ N.1

  Relate improper fractions to mixed numbers. ➠ N.4

  Demonstrate an understanding of ratio and percent (limited to whole numbers). ➠ N.5 N.6

- **Operations with Whole Numbers**
  Solve problems involving large numbers, using technology. ■ N.2

  Demonstrate an understanding of factors and multiples by determining multiples and factors (of numbers less than 100), identifying prime and composite numbers, and solving problems. Explain and apply the order of operations, excluding exponents (limited to whole numbers). ➠ N.3 N.9

- **Operations with Rational Numbers**
  Demonstrate an understanding of multiplying and dividing decimals (1-digit whole-number multipliers, 1-digit natural number divisors, and multipliers and divisors that are multiples of 10), by using personal strategies, the standard algorithms, estimation, and solving problems. ➠ N.8

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Demonstrate an understanding of the relationships within tables of values to solve problems. Represent and describe patterns and relationships using graphs and tables. ⬌ PR.1 PR.2

Variables and Equations

- **Algebraic Representations with Equations**
  Represent generalizations arising from number relationships using equations with letter variables. Demonstrate and explain the meaning of preservation of equality. ⬌ PR.3 PR.4

SHAPE AND SPACE Strand

Measurement

- **Length, Area, and Volume (Capacity)**
  Develop and apply a formula for determining the perimeter of polygons, the area of rectangles, and the volume of right rectangular prisms. ➠ SS.3

- **Angles**
  Demonstrate an understanding of angles by identifying, classifying, estimating, drawing, labelling, and determining the measure of angles in degrees. Demonstrate that the sum of interior angles for triangles is 180° and for quadrilaterals is 360°. ➠ SS.1 SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Construct and compare triangles in different orientations. Describe and compare the sides and angles of regular and irregular polygons. ➠ SS.4 SS.5

Transformations

- **Position and Motion**
  Perform and identify a combination of transformations on a single 2-D shape to create a design, and then draw and describe the image. ⬌ SS.6 SS.7

  Identify and plot points in the first quadrant of the Cartesian plane using whole-number ordered pairs. Perform and describe single transformations of a 2-D shape in the first quadrant of the Cartesian plane. ➠ SS.8 SS.9

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Construct and interpret line graphs to draw conclusions. ⬌ SP.1

  Select, justify, and use appropriate methods of collecting data. Graph collected data and analyze the graph to solve problems. ➠ SP.2 SP.3

Chance and Uncertainty

- **Probability**
  Demonstrate an understanding of probability by identifying all possible outcomes of a probability experiment. Differentiate between and determine experimental and theoretical probability. Compare experimental results with theoretical probability. ➠ SP.4

■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.

⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.

➠ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).

⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 6 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 6 SCIENCE at a glance

This ***Grade 6 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 6 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 6 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use both knowledge and skills, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and/or Testing the Prototype or Consumer Product
- Evaluating and Optimizing the Solution

DIVERSITY OF LIVING THINGS

- **Classification systems**
  01 02 03 04 05 08 6-0-8f
- **Kingdoms and their characteristics**
  01 06 07 08 09 10 11 12 13
- **Importance of gathering evidence for our comprehension of diversity today and in the past**
  01 14 15 6-0-8e 8f 9b

FLIGHT

- **Properties of air**
  01 02 03 06 07 13
- **Adaptations or features that make use of the properties of air for flight**
  01 03 04 05 08 09 11 13 14 15 6-0-8c 8d
- **Forces involved in flight**
  01 04 05 06 08 09 10 11 12 15

ELECTRICITY

- **Transformation of electrical energy into other forms of energy**
  01 02 03 04 12 13 14
- **Electrical circuits**
  01 03 06 07 08 09 10 11
- **Sources of energy that can be transformed into electrical energy**
  01 15 16
- **Importance and impacts of electrical energy**
  01 05 17 18 19 6-0-8g 9e 9f

EXPLORING THE SOLAR SYSTEM

- **Space exploration and the development of related technologies**
  01 02 03 04 05 06 6-0-8c 8d 8e 8g 9b
- **Conceptions of Earth's position in space and related phenomena**
  01 07 08 09 10 11 16 17 6-0-8b 8d 9a
- **Motions of the Sun, Earth, and moon**
  01 12 13 14 15

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GRADE 6 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 DIVERSITY OF LIVING THINGS

- Classification systems help us organize and understand the diversity of life on Earth.
  01 02 03 04 05 08
  6-0-8f
- There is a wide variety of living things in the world, which can be grouped in different ways, according to similarities and differences among organisms.
  01 06 07 08 09 10 11 12 13
- Fossils provide evidence about the types of organisms that lived long ago, and can be compared with one another and to living organisms to help us understand diversity today and in the past.
  01 14 15
  6-0-8e 8f 9b

Cluster 2 FLIGHT

- Air has specific properties that, when applied to surfaces, have an effect on flight.
  01 02 03 06 07 13
- Living things that fly and technologies designed to fly have adaptations or features that make use of the properties of air.
  01 03 04 05 08 09 11 13 14 15
  6-0-8c 8d
- Four forces (lift, gravity, thrust, drag) act on devices and living things that fly.
  01 04 05 06 08 09 10 11 12 15

Cluster 3 ELECTRICITY

- Electrical energy can be transformed into new forms of energy such as motion, sound, light, or heat.
  01 02 03 04 12 13 14
- Electrical circuits provide a way of moving energy from one place to another and transforming it into new forms of energy.
  01 03 06 07 08 09 10 11
- Energy from different sources can be used to generate electricity.
  01 15 16
- Electrical energy plays a significant role in society, and its production has an impact on the environment.
  01 05 17 18 19
  6-0-8g 9e 9f

Cluster 4 EXPLORING THE SOLAR SYSTEM

- Space exploration and the technologies developed for it impact our lives and our understandings of Earth and space.
  01 02 03 04 05 06
  6-0-8c 8d 8e 8g 9a 9b
- Human conception of the position of Earth in space has changed over time, and the models representing Earth's position help explain patterns of motion of the objects in the solar system. These patterns have been used in a variety of ways by ancient and present-day cultures.
  01 07 08 09 10 11 16 17
  6-0-8b 8d 9a
- The relative positions of the Sun, Earth, and moon are responsible for predictable phenomena on Earth (e.g., seasons, phases of the moon, eclipses).
  01 12 13 14 15

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 3a 9c

- Ask testable questions that lead to investigations.
- Make a prediction or hypothesis that identifies a cause-and-effect relationship.

Planning and Carrying Out Investigations
1b 3b 3c 4a 4c 4d 4e 5a 5c 5d 5e 5f 9c

- Create a plan to answer a specific question.
- Identify variables that could affect an investigation and variables that should be held constant to ensure a fair test.
- Select and safely use tools to observe and measure.
- Make observations that are relevant, and represent data in a variety of ways.

Analyzing and Interpreting Data
6a 6c 6f 7a 7b 7c 7h 9d

- Interpret and suggest explanations for patterns and discrepancies in data.
- Draw a conclusion based on evidence that explains the results of the investigation and supports or rejects the hypothesis.
- Evaluate the methods used to answer a question, and identify potential applications of investigation results.

Obtaining, Evaluating, and Communicating Information
2a 2b 2c 7f 7g 8a 8b

- Communicate results and conclusions in a variety of ways.
- Recognize that science is a way of answering questions about the world and that there are questions that science cannot answer.
- Access and review information from a variety of sources.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 3d 9c

- Identify and describe a practical problem that can be solved through a simple design.
- Define the problem by developing criteria for evaluating a prototype or a consumer product based on function, reliability, and aesthetics, and by identifying constraints such as available materials, time, or cost.

Researching, Planning, and Choosing a Solution
1d 2a 3e 7d 9c

- Identify various ways to solve a practical problem, and select and justify one to implement.
- Create a plan for the chosen solution, including materials, safety considerations, labelled diagrams, and steps to follow.

Constructing and/or Testing the Prototype or Consumer Product
4b 4c 4d 4e 5b 5c 5d 9c 9d

- Construct a prototype.
- Test the prototype or consumer product with respect to the criteria and the constraints.

Evaluating and Optimizing the Solution
6d 6e 7d 7e 8c 9c

- Identify and make improvements to a prototype with respect to the criteria, and explain the rationale for changes.
- Evaluate the strengths and weaknesses of a consumer product with respect to criteria.
- Propose and justify a solution to the initial problem.

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GRADE 6 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, cost, environmental impact, etc.).

At the Middle Years level, a second facet of the design process is introduced to students. The evaluation of consumer products does not involve the construction of a model or prototype, but rather simulates the decision-making process of a consumer when purchasing a product.

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions or to make the best choice. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND/OR TESTING THE PROTOTYPE OR CONSUMER PRODUCT

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or consumer product against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design or decision is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

GRADE 6 SOCIAL STUDIES at a glance

Canada: A Country of Change (1867 to Present)

This ***Grade 6 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 6 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 6 Social Studies Curriculum Overview: General Learning Outcomes with Grade 6 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

BUILDING A NATION (1867 TO 1914)

- **A new nation**
  KC-001 KC-002 KL-022 KL-023 VC-001
- **Manitoba enters Confederation**
  KH-027 KH-033 VH-012
- **"A mari usque ad mare" (From sea to sea)**
  KH-029 KH-030 KH-031 KH-033 KH-034
- **Aboriginal Peoples and the growing nation of Canada**
  KI-007 KH-028 KH-032
- **Immigration**
  KI-008 KI-009 KI-010 KH-034 VI-005
- **Farming the land**
  KI-011 KE-055 VL-010 VE-018

AN EMERGING NATION (1914 TO 1945)

- **World War I**
  KC-003 KH-036 KG-039 KG-040
- **Social change**
  KH-035 KH-037 KP-046 KE-057 VI-006 VH-013
- **Depression**
  KL-024 KH-036 KE-056
- **World War II**
  KI-012 KH-036 KG-041 KG-042 VG-014

SHAPING CONTEMPORARY CANADA (1945 TO PRESENT)

- **Overview of contemporary Canada**
  KL-025 KH-038
- **Changing and diverse population**
  KI-013 KI-014 KI-015 VI-007 VI-008
- **A modern industrialized nation**
  KE-058 KE-059
- **Canada on the world stage**
  KG-043 KG-044 KG-045

CANADA TODAY: DEMOCRACY, DIVERSITY, AND THE INFLUENCE OF THE PAST

- **Expressions of Canadian identity**
  KI-017 KI-018 KI-019 KL-026 VI-009 VL-011
- **Government in Canada**
  KP-049 KP-050 KP-051 KP-052 KP-053 VP-016
- **Community of communities**
  KI-016 KI-020 KP-048
- **Creating a just society**
  KC-005 KC-006 KP-054 VC-003 VC-004 VP-017
- **Canadian democracy in the world context**
  KC-004 KI-021 KG-047 VC-002 VG-015

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GRADE 6 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 6 Specific Learning Outcomes

Grade 6 students learn about Canadian history from Confederation to the present. This includes the expansion of Canada, immigration, industrialization, the environment, and the changing relationships between the government and First Nations, Métis, and Inuit peoples. Students examine world events including the Depression and Canadian involvement in the two world wars. They explore Canadian identity and the growth of Canada as a culturally diverse, bilingual, and democratic society. They study questions related to the responsibilities and rights of citizenship in Canada and the contemporary world.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

CITIZENSHIP

Citizenship education is fundamental to living in a democratic society, enabling students to explore democratic values, and to determine their responsibilities and rights as participants in civil society. Students compare what it means to be a citizen in the past and present, as well as in the future. As they enhance their understanding of citizenship, they are empowered to be active citizens who contribute to the local, national, and global communities to which they belong.

KC- 001 002 003 004 005 006

IDENTITY, CULTURE, AND COMMUNITY

Identity is subject to time and place, and is shaped by a multiplicity of personal, social, and economic factors. Students will have the opportunity to explore the institutions and cultural expressions of the communities of the past and how they have shaped Canada today. Through a study of the ways people lived together in the past, students will enhance their understanding of diverse perspectives and the historical roots of the multicultural nature of Canada.

KI- 007 008 009 010 011 012 013 013F 014 015 015F 016 016F 017 018 019 020 020A 020F 021

THE LAND: PLACES AND PEOPLE

The history of Canada has been influenced by the dynamic relationships of people and the land. The exploration of people's relationships with places and environments creates an understanding of human dependence and impact upon the natural environment. Students explore how spatial and physical characteristics of the environment affect human settlement, economics, and societies, locally, nationally, and globally. They explore concepts such as sustainability and stewardship, and how, as citizens, Canadians have a responsibility to protect and sustain our environment.

KL- 022 023 024 025 026 026A

HISTORICAL CONNECTIONS

The past shapes who people are. An exploration of Canadian and world history enables students to acquire knowledge and an appreciation of the past, to understand the present, and to live with regard for the future. An important aspect of this process is the disciplined investigation and interpretation of history. As they explore people, events, ideas, and evidence of the past, they learn to think historically. They learn to reflect upon diverse perspectives, personal narratives, parallel accounts, and oral and social histories, and develop the historical understanding that provides a foundation for active democratic citizenship.

KH- 027 027F 028 029 030 031 032 033 034 035 036 037 038

GLOBAL INTERDEPENDENCE

People, communities, societies, nations, and environments are interdependent. Canadian history has been shaped by this interdependence. Knowledge and understanding of global connections that have influenced history enable students to expand their global consciousness and responsibility.

KG- 039 040 041 042 043 044 045 047

POWER AND AUTHORITY

Power and authority have influenced human relationships in the past as they do in the present. Students critically examine the diverse forms of governance and leadership through time, and inquire into issues of fairness and equity. This exploration helps students develop a sense of personal empowerment so that, as active democratic citizens, they can shape their future.

KP- 046 048 049 050 051 052 053 053A 054

ECONOMICS AND RESOURCES

The management and distribution of resources and wealth have a direct impact on Canadian history and continue to influence Canadian society today. Students explore the effects of economic interdependence on individuals and on local and global communities. They examine historic economic factors that affect decision making, the use of resources, and the development of technologies. Students will critically consider the social and environmental implications of the distribution of resources and technologies, locally, nationally, and globally.

KE- 055 056 057 058 059

RESEARCH AND COMMUNICATION

CRITICAL THINKING AND CITIZENSHIP

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207 207A 208

- Select, organize, record, and represent information from a variety of sources and in various ways.
- Reference sources appropriately.
- Distinguish between primary and secondary sources.
- Construct, select, and interpret maps that include a title, legend, compass rose, grid, scale, and latitude and longitude for specific purposes.
- Select and use appropriate tools and technologies to accomplish tasks.
- Use appropriate terms to describe time, and latitude and longitude to locate and describe places on maps and globes.
- Use traditional knowledge to read the land.
- Orient oneself by using observation, traditional knowledge, and a compass or other technologies.

Communicating

S- 400 401 402 403 404 405

- Listen actively and respectfully to others to understand diverse perspectives.
- Persuasively express differing viewpoints.
- Present information and ideas in a variety of ways.
- In discussions, elicit and clarify questions and ideas, and articulate beliefs and perspectives.

Thinking Critically and Creatively

S- 300 301 302 303 304 305 306 307 308 309 310

- Plan topics, goals, and methods for research.
- Evaluate advantages and disadvantages of solutions to a problem.
- Use research and evidence to draw conclusions.
- Evaluate personal assumptions based on new information and ideas.
- Distinguish fact from opinion and interpretation.
- Observe and analyze evidence for research.
- Assess the validity of sources.
- Compare different accounts of events and diverse perspectives.
- Interpret information and ideas, and recognize that interpretations change with new information.

Being an Active Democratic Citizen

S- 100 101 102 103 104 105 106

- Collaborate with others to establish and carry out group goals.
- Resolve conflicts peacefully and fairly using a variety of strategies.
- Make decisions that reflect care and responsibility for the environment, and reflect fairness and equality toward others.
- Negotiate to build consensus and solve problems.
- Recognize bias and discrimination and propose solutions.
- Treat historically significant places and objects with respect.

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GRADE 6 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 7

GRADE 7 MATHEMATICS at a glance

Grade 7 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 7 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Representation of Rational Numbers**
  Relationships between decimals and fractions N.4
  Fractions, decimals, and integers N.7
- **Operations with Whole Numbers**
  Divisibility rules N.1
  Addition and subtraction of integers N.6
- **Operations with Rational Numbers**
  Problems involving the operations of decimals N.2
  Problems involving percents N.3
  Addition and subtraction of fractions N.5

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Patterns and their relations PR.1
  Problems involving tables of values and their graphs PR.2

Variables and Equations

- **Algebraic Representations with Expressions and Equations**
  Preservation of equality PR.3
  Expressions and equations PR.4
  Variables PR.5
  Problems involving linear equations PR.6 PR.7

SHAPE AND SPACE Strand

Measurement

- **Length and Angles**
  Circles SS.1
- **Area**
  Formulas SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Geometric constructions SS.3

Transformations

- **Position and Motion**
  The Cartesian plane and transformations SS.4 SS.5

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Central tendency and range SP.1 SP.2
  Problems involving circle graphs SP.3

Chance and Uncertainty

- **Probability**
  Expression of probability SP.4
  Experimental and theoretical probabilitites and independent events SP.5 SP.6

Substrands
- **Learning Targets**

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GRADE 7 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Representation of Rational Numbers**
  Demonstrate an understanding of the relationship between repeating decimals and fractions, and terminating decimals and fractions. ➡ N.4

  Compare and order fractions, decimals (to thousandths), and integers by using benchmarks, place value, and equivalent fractions and/or decimals. ⬌ N.7

- **Operations with Whole Numbers**
  Determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9, or 10, and why a number cannot be divided by 0. ■ N.1

  Demonstrate an understanding of addition and subtraction of integers. ➡ N.6

- **Operations with Rational Numbers**
  Demonstrate an understanding of addition, subtraction, multiplication, and division with decimals to solve problems. ➡ N.2

  Solve problems involving percents from 1% to 100%. ➡ N.3

  Demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators (limited to positive sums and differences). ➡ N.5

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Demonstrate an understanding of oral and written patterns and their corresponding relations. ⬌ PR.1

  Construct and graph a table of values from a relation, and analyze the graph to draw conclusions and solve problems. ⬌ PR.2

Variables and Equations

- **Algebraic Representations with Expressions and Equations**
  Demonstrate an understanding of preservation of equality by modelling it and applying it to solve equations. ⬅ PR.3

  Explain the difference between an expression and an equation. ■ PR.4

  Evaluate an expression given the value of the variable(s). ➡ PR.5

  Model and solve problems that can be represented by linear equations in the form:
  - $x + a = b$ where a and b are integers

  and
  - $ax + b = c$
  - $ax = b$
  - $\frac{x}{a} = b, a \neq 0$

  where a, b, and c are whole numbers. ➡ PR.6 PR.7

SHAPE AND SPACE Strand

Measurement

- **Length and Angles**
  Demonstrate an understanding of circles by describing relationships among and solving problems with radii, diameters, and circumferences, by relating circumference to pi (π), by determining the sum of central angles, and by constructing circles given radius or diameter. ➡ SS.1

- **Area**
  Demonstrate and apply a formula for determining the area of triangles, parallelograms, and circles. ■ SS.2

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Perform geometric constructions, including perpendicular and parallel line segments, and perpendicular and angle bisectors. ■ SS.3

Transformations

- **Position and Motion**
  Identify and plot points using integral ordered pairs, and perform and describe transformations of a 2-D shape, in the four quadrants of a Cartesian plane. ⬅ SS.4 SS.5

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Demonstrate an understanding of central tendency (mean, median, mode) and range by determining the measures of central tendency and the range, and by determining the most appropriate measure of central tendency to report findings. Determine the effect on central tendency when an outlier is included in a data set. ■ SP.1 SP.2

  Construct, label, and interpret circle graphs to solve problems. ■ SP.3

Chance and Uncertainty

- **Probability**
  Express probabilities as ratios, fractions, and percents. ■ SP.4

  Identify a sample space and conduct a probability experiment to compare the theoretical and experimental probabilities of two independent events. ➡ SP.5 SP.6

■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.

⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.

➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).

⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 7 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 7 SCIENCE at a glance

This ***Grade 7 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 7 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 7 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use both knowledge and skills, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and/or Testing the Prototype or Consumer Product
- Evaluating and Optimizing the Solution

INTERACTIONS WITHIN ECOSYSTEMS

Ecosystems and their changes
01 02 03 04 05 06 07
7-0-8d 8f 8g 9a 9b 9e 9f

The transfer of energy in ecosystems
01 08 09 10 11

The role of decomposers in ecosystems
01 12 13 14 15

PARTICLE THEORY OF MATTER

The particle theory of matter
01 03 04 05 06 13 14 15
16 17 20 21 22 23

Temperature and energy transfer
01 02 07 08 09 10 11 12

Pure substances and mixtures
01 13 14 18 19
7-0-8d

FORCES AND STRUCTURES

Internal and external forces
01 03 04 05 06 07 11 12

Shapes and components of structures
01 02 08 09 10 11 12

EARTH'S CRUST

Earth's structure
01 02 03 05

Erosion and weathering
01 04 09 10

Geological resource extraction and its impact
01 06 07 08 11 15
7-0-8d 8e 8g 9e

Theories explaining continental movement and geological activity on Earth
01 12 13 14 15
7-0-8b 9a 9b

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GRADE 7 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 INTERACTIONS WITHIN ECOSYSTEMS

- Living things are dependent on their environmental interactions with other living things and with non-living factors; natural processes as well as human actions can have impacts on ecosystems.

  01 02 03 04 05 06 07
  7-0-8d 8f 8g 9a 9b 9e 9f
- Ecosystems are sustained by a continuous flow of energy, the main source of which is the Sun. Solar energy is transformed by producers into chemical energy through a process called photosynthesis. This energy is then transferred among producers, consumers, and decomposers.

  01 08 09 10 11
- Decomposers (which include micro-organisms) recycle organic matter from dead plant or animal matter and their waste products back into the environment.

  01 12 13 14 15

Cluster 2 PARTICLE THEORY OF MATTER

- Scientific theories provide explanations for observable phenomena; they become accepted by the scientific community when they are shown to be the best explanation for the phenomena. For example, many properties of matter can be explained using the particle theory of matter.

  01 03 04 05 06 13 14 15 16 17 20 21 22 23
- Temperature is a measure of the kinetic energy of particles in matter, while heat is the transfer of energy between objects due to the temperature difference between them.

  01 02 07 08 09 10 11 12
- Mixtures contain a combination of pure substances, which can be separated using a variety of techniques.

  01 13 14 18 19
  7-0-8d

Cluster 3 FORCES AND STRUCTURES

- Internal and external forces act on structures.

  01 03 04 05 06 07 11 12
- The shape of a structure and its components can increase its strength and stability.

  01 02 08 09 10 11 12

Cluster 4 EARTH'S CRUST

- Earth consists of a hot but solid inner core, a liquid outer core, a mantle, and a crust. The processes that occur within Earth and on Earth's surface form different types of rock.

  01 02 03 05
- Erosion and weathering cause changes in the landscape over time, breaking down rocks, soils, and sediments into smaller particles and moving them around.

  01 04 09 10
- Humans extract geological resources for many purposes including as sources of energy. All forms of resource extraction have economic, social, and environmental impacts.

  01 06 07 08 11 15
  7-0-8d 8e 8g 9e
- Scientific theories provide explanations for observable phenomena; they become accepted by the scientific community when they are shown to be the best explanation for the phenomena. For example, the theory of plate tectonics explains past and present geological processes on Earth (e.g., mountain formation, earthquakes, volcanoes, distribution of land and sea).

  01 12 13 14 15
  7-0-8b 9a 9b

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 3a 9c

- Ask testable questions that lead to investigations.
- Make a prediction or hypothesis that identifies a cause and effect relationship between the dependent and independent variables.

Planning and Carrying Out Investigations
1b 3b 3c 4a 4c 4d 4e 4f 5a 5c 5d 5e 5f 9c

- Create a plan to answer a specific question.
- Identify independent and dependent variables, as well variables that should be held constant to ensure a fair test.
- Select and safely use tools to observe and measure.
- Make observations that are relevant, and record observations and data using an appropriate format.

Analyzing and Interpreting Data
6a 6b 6c 6f 7a 7b 7c 7h 9c 9d

- Represent data using appropriate graphs, and interpret and evaluate these and other graphs.
- Interpret patterns and trends in data, and infer and explain relationships.
- Draw a conclusion based on evidence that explains the results of the investigation and supports or rejects the prediction or hypothesis.
- Evaluate the methods used to answer a question, and identify potential applications of investigation results.

Obtaining, Evaluating, and Communicating Information
2a 2b 2c 7f 7g 8a 8b 8d 9c

- Communicate results and conclusions in a variety of ways.
- Distinguish between science and technology and describe how scientific knowledge and technologies have evolved over time.
- Access and review information from a variety of sources.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 3d 9c

- Identify and describe a practical problem that can be solved.
- Define the problem by developing criteria for evaluating a prototype or consumer product based on function, aesthetics, and efficiency, and by identifying constraints such as available materials, environmental considerations, time, or cost.

Researching, Planning, and Choosing a Solution
1d 2a 3e 7d 9c

- Identify various ways to solve a practical problem, and select and justify one to implement.
- Create a plan for the chosen solution, which includes materials, safety considerations, labelled diagrams, and steps to follow.

Constructing and/or Testing the Prototype or Consumer Product
4b 4c 4d 4e 5b 5c 9c 9d

- Construct a prototype.
- Test the prototype or consumer product with respect to the criteria and the constraints.

Evaluating and Optimizing the Solution
6d 6e 6f 7d 7e 9c

- Identify and make improvements to a prototype with respect to the criteria, and explain the rationale for changes.
- Evaluate the strength and weaknesses of a consumer product with respect to criteria.
- Propose and justify a solution to the initial problem.

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GRADE 7 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, cost, environmental impact, etc.).

At the Middle Years level, a second facet of the design process is introduced to students. The evaluation of consumer products does not involve the construction of a model or prototype, but rather simulates the decision-making process of a consumer when purchasing a product.

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions or to make the best choice. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND/OR TESTING THE PROTOTYPE OR CONSUMER PRODUCT

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or consumer product against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design or decision is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

GRADE 7 SOCIAL STUDIES at a glance

People and Places in the World

This ***Grade 7 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 7 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 7 Social Studies Curriculum Overview: General Learning Outcomes with Grade 7 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

WORLD GEOGRAPHY

- **Mapping the globe**
  KL-015 KL-020 KL-021 KP-038
- **The global national environment**
  KL-016 KL-017 VL-008
- **Global population trends**
  KL-018 KL-019 KG-032

GLOBAL QUALITY OF LIFE

- **What is the good life?**
  KC-002 KC-004 KI-006 KG-034 KP-039 VC-004
- **Universal human rights**
  KI-007 KI-008 KG-037 VC-001 VI-005
- **Democratic citizenship and quality of life**
  KC-001 KC-003 KC-005 VC-002 VC-003
- **Power, wealth, and justice**
  KP-040 KP-041 KP-042 KE-045 VP-013 VP-014 VE-016
- **Global cooperation**
  KG-033 KG-035 KG-036 VG-011

WAYS OF LIFE IN ASIA, AFRICA, OR AUSTRALASIA

- **Elements of societies**
  KI-009 VI-006 VG-012
- **Natural environment**
  KL-022 KL-023
- **Cultural influences and expressions**
  KI-010 KI-011 KI-012 KI-014 VI-007 VP-015
- **Historical and political influences**
  KH-030 KP-043
- **Economy and well-being**
  KI-013 KE-046 KE-047 KE-048 KE-049

HUMAN IMPACT IN EUROPE OR THE AMERICAS

- **Geography**
  KL-024
- **Environmental impact**
  KL-028 KL-029 KE-050 KE-053 VL-009
- **Urbanization**
  KL-025 KE-051
- **Historical influences**
  KH-031 VH-010
- **Living in the global village**
  KL-026 KL-027 KP-044 KE-052 KE-054 VE-017

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GRADE 7 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 7 Specific Learning Outcomes

Grade 7 students study world geography and learn about environmental, social, and cultural factors that affect ways of life in today's world. They study three communities: an Indigenous community outside of Canada; a community in Africa, Asia, or Australasia; and one community from Europe or the Americas. Students focus on questions about culture, quality of life, international cooperation, and the responsibilities and rights of global citizenship.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

KNOWLEDGE AND UNDERSTANDING

REPORT CARD CATEGORIES

CITIZENSHIP

Citizenship education is fundamental to living in a democratic society. Students will develop an understanding of how their personal actions may have a global affect on the quality of life for people elsewhere in the world.

KC- 001 002 003 004 005

VC- 001 002 003 004

IDENTITY, CULTURE, AND COMMUNITY

Many factors influence identity and life in communities, including culture, language, history, and shared beliefs and values. Identity is subject to time and place. Through a study of the ways in which people live together and express themselves in communities, societies, and nations, students enhance their understanding of diverse perspectives and develop their competencies as social beings.

KI- 006 007 008 009 010 011 012 013 014

VI- 005 006 007

THE LAND: PLACES AND PEOPLE

Students, using geographic understanding and skills, explore how spatial and physical characteristics of the environment affect human life, cultures, and societies. They consider how connections to the land influence their identities and define their roles and responsibilities as civil stewards of the land, locally, nationally, and globally.

KL- 015 016 017 018 018F 019 020 021 022 023 024 025 026 027 028 029

VL- 008 009

HISTORICAL CONNECTIONS

An exploration of Canadian and world history enables students to acquire knowledge and appreciation of how historical events affect society. It also helps students appreciate history as an important way to understand contemporary life. Students learn to think historically as they explore people, events, ideas, and evidence of the past. As they reflect upon diverse perspectives, personal narratives, parallel accounts, and oral and social histories, students develop the historical understanding that provides a foundation for active democratic citizenship.

KH- 030 031

VH- 010

GLOBAL INTERDEPENDENCE

People, communities, societies, nations, and environments are interdependent. An exploration of this interdependence enhances students' global consciousness and helps them develop empathy with respect to human rights and quality of life.

KG- 032 033 034 035 036 037

VG- 011 012

POWER AND AUTHORITY

Students consider diverse global forms of governance and leadership, and inquire into issues of fairness and equity. This exploration helps students develop a sense of personal empowerment as active democratic citizens who can then resolve to find peaceful solutions to global issues.

KP- 038 039 040 041 042 043 044

VP- 013 014 015

ECONOMICS AND RESOURCES

The management and distribution of resources and wealth have a direct global impact on human societies and quality of life. Students build an understanding of sustainable development issues, and explore the effects of economic interdependence on individuals, communities, and nations. They examine economic factors that affect decision making, the use of resources, and the impact of changing technologies on ways of life around the world.

KE- 045 046 047 048 049 050 051 052 053 054

VE-016 017

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207 207A 208

- Select, organize, record, and represent information from a variety of sources and in various ways.
- Reference sources appropriately.
- Interpret primary and secondary information sources.
- Construct, select, and interpret maps that include a title, legend, compass rose, grid, scale, and latitude and longitude for specific purposes.
- Select and use appropriate tools and technologies to accomplish tasks.
- Use latitude and longitude to locate and describe places on maps and globes.
- Use traditional knowledge to read the land.
- Orient oneself by using observation, traditional knowledge, and a compass or other technologies.

Communicating

S- 400 401 402 403 404 405

- Listen actively and respectfully to others to understand their perspectives.
- Persuasively express differing viewpoints.
- Present information and ideas in a variety of ways.
- In discussions, elicit and clarify questions and ideas, and articulate beliefs and perspectives.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303 304 305 306 307 308 309 310 311

- Plan topics, goals, and methods for research.
- Evaluate advantages and disadvantages of solutions to a problem.
- Use research and evidence to draw conclusions.
- Evaluate personal assumptions based on new information and ideas.
- Distinguish fact from opinion and interpretation.
- Observe and analyze evidence for research.
- Assess the validity of sources.
- Compare differing viewpoints and diverse perspectives.
- Interpret information and ideas, and recognize that interpretations change with new information.
- Analyze prejudice, racism, stereotyping, or other forms of bias in information sources.

Being an Active Democratic Citizen

S- 100 101 102 103 104 105 106

- Collaborate with others to establish and carry out group goals.
- Resolve conflicts peacefully and fairly using a variety of strategies.
- Make decisions that reflect the principles of sustainable development, and that reflect fairness and equality toward others.
- Negotiate to build consensus and solve problems.
- Recognize bias and discrimination and propose solutions.
- Treat historically significant places and objects with respect.

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GRADE 7 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.

CURRICULUM Essentials

Grade 8

GRADE 8 MATHEMATICS at a glance

Grade 8 Mathematics at a Glance can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 8 Mathematics curriculum.

It is organized by **strands** and sorts learning outcomes into categories or **learning targets**. The learning targets can be used to connect learning by integrating strands, learning outcomes, and other subject areas.

This document can be used with the ***Glance Across the Grades*** document to plan clear and concise expectations for student learning by using big ideas (the why behind what we are learning).

Mathematical PROCESSES

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

- **[C] COMMUNICATION**
- **[CN] CONNECTIONS**
- **[ME] MENTAL MATHEMATICS AND ESTIMATION**
- **[PS] PROBLEM SOLVING**
- **[R] REASONING**
- **[T] TECHNOLOGY**
- **[V] VISUALIZATION**

NUMBER Strand

- **Representation of Whole Numbers and Operations with Whole Numbers**
  Perfect squares and square roots N.1
  Multiplication and division of integers N.7
- **Representation of Rational Numbers**
  Ratio and rate N.4
- **Operations with Rational Numbers**
  Approximate square roots N.2
  Percents N.3
  Problems involving rates, ratio, and proportional reasoning N.5
  Multiplication and division of fractions N.6
  Problems involving positive rational numbers N.8

PATTERNS AND RELATIONS Strand

Patterns
- **Patterning and Algebraic Thinking**
  Graphs and analysis PR.1

Variables and Equations
- **Algebraic Representations with Equations**
  Problems involving linear equations PR.2

SHAPE AND SPACE Strand

Measurement
- **Length**
  Problems involving Pythagorean theorem SS.1
- **Area**
  Problems involving surface area SS.3
- **Volume (Capacity)**
  Formulas SS.4

3-D Objects and 2-D Shapes
- **Identifying, Sorting, Comparing, and Constructing**
  Nets SS.2
  Different views SS.5

Transformations
- **Position and Motion**
  Tessellations SS.6

STATISTICS AND PROBABILITY Strand

Data Analysis
- **Collection, Organization, and Analysis of Data**
  Critique representations SP.1

Chance and Uncertainty
- **Probability**
  Problems involving probability SP.2

Substrands
- **Learning Targets**

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GRADE 8 MATHEMATICS

Curriculum Overview

NUMBER Strand

- **Representation of Whole Numbers and Operations with Whole Numbers**
  Demonstrate an understanding of perfect squares and square roots (limited to whole numbers). ➡ N.1

  Demonstrate an understanding of multiplication and division of integers. ■ N.7

- **Representation of Rational Numbers**
  Demonstrate an understanding of ratio and rate. ⬌ N.4

- **Operations with Rational Numbers**
  Determine the approximate square root of numbers that are not perfect squares (limited to whole numbers). ➡ N.2

  Demonstrate an understanding of percents greater or equal to 0%. ⬅ N.3

  Solve problems involving rates, ratios, and proportional reasoning. ➡ N.5

  Demonstrate an understanding of multiplying and dividing positive fractions and mixed numbers. ➡ N.6

  Solve problems involving positive rational numbers. ⬌ N.8

PATTERNS AND RELATIONS Strand

Patterns

- **Patterning and Algebraic Thinking**
  Graph and analyze two-variable linear relations. ➡ PR.1

Variables and Equations

- **Algebraic Representations with Equations**
  Model and solve problems involving linear equations in the form
  - $ax = b$
  - $\frac{x}{a} = b, a \neq 0$
  - $ax + b = c$

  ⬌

  - $\frac{x}{a} + b = c, a \neq 0$
  - $a(x + b) = c$

  ➡

  where a, b, and c are integers. PR.2

SHAPE AND SPACE Strand

Measurement

- **Length**
  Develop and apply the Pythagorean theorem to solve problems. ■ SS.1

- **Area**
  Determine the surface area of right rectangluar prisms, triangluar prisms, and cylinders to solve problems. ➡ SS.3

- **Volume (Capacity)**
  Develop and apply formulas for determining the volume of right prisms and cylinders. ➡ SS.4

3-D Objects and 2-D Shapes

- **Identifying, Sorting, Comparing, and Constructing**
  Draw and construct nets for 3-D objects. ➡ SS.2

  Draw and interpret top, front, and side views of 3-D objects composed of right rectangular prisms. ➡ SS.5

Transformations

- **Position and Motion**
  Demonstrate an understanding of tessellation by explaining the properties of tessellating shapes, and by creating and identifying tessellations. ■ SS.6

STATISTICS AND PROBABILITY Strand

Data Analysis

- **Collection, Organization, and Analysis of Data**
  Critique ways in which data are presented. ■ SP.1

Chance and Uncertainty

- **Probability**
  Solve problems involving the probability of independent events. ⬌ SP.2

- ■ Concept/learning outcomes are taught in this grade only and will be applied in future grades.
- ⬅ Concept/learning outcomes introduced in previous grade(s) are further taught in this grade and will be applied in future grades.
- ➡ Concept/learning outcomes are taught for the first time in this grade and will be taught in future grade(s).
- ⬌ Concept/learning outcomes introduced in previous grades are taught in this grade and will continue to be taught in future grades.

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING OF MATHEMATICAL CONCEPTS

The student demonstrates knowledge and understanding of grade-specific mathematical concepts and skills in each strand (number, patterns and relations, shape and space, statistics and probability).

MENTAL MATH AND ESTIMATION

The student uses math knowledge and number facts to calculate mentally or estimate within each strand (number, patterns and relations, shape and space, statistics and probability). Students apply mental math strategies with efficiency, accuracy, and flexibility. They are able to make reasonable estimates of values or quantities using benchmarks and referents.

PROBLEM SOLVING

The student applies knowledge, skill, or understanding to solve problems in each strand (number, patterns and relations, shape and space, statistics and probability). By learning to solve problems and by learning through problem solving, students connect mathematical ideas in new contexts. Students think logically, visualize, model, reason, and communicate and justify their solutions.

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GRADE 8 MATHEMATICS

Mathematical Processes

The seven interrelated **mathematical processes** are intended to permeate teaching and describe the critical aspects of learning, doing, and understanding mathematics. These processes allow students to engage in thinking about mathematics, and support the acquisition and the use of mathematical knowledge and foundational skills that develop conceptual understanding.

These processes are outlined in detail in *Kindergarten to Grade 8 Mathematics: Manitoba Curriculum Framework of Outcomes (2013)*.

COMMUNICATION (C)

Reading about, representing, viewing, writing about, listening to, and discussing mathematical ideas allows students to create links among their own language and ideas, the language and ideas of others, and the formal language and symbols of mathematics. Communication enables students to reflect upon, to validate, and to clarify their thinking. Expression of mathematical meaning and ideas can be accomplished orally or in written representations such as journals and learning logs.

CONNECTIONS (CN)

Mathematics becomes more meaningful when it is contextualized and linked to students' experiences across disciplines. Furthermore, mathematics should be viewed as an integrated whole, rather than as the study of separate strands or units. Within a particular topic, students should see the connections between concrete, pictorial, and symbolic modes of representation. When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant, and integrated.

MENTAL MATH AND ESTIMATION (ME)

Mental mathematics is a combination of strategies that enhances flexible thinking and number sense. Estimation is a strategy for determining approximate values or quantities, usually by referring to benchmarks or using referents, or for determining the reasonableness of calculated values. Estimation is often used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life. Strategies in mental mathematics and estimation enable students to calculate mentally without the use of external aids. In the process, they improve their computational fluency—developing efficiency, accuracy, and flexibility.

PROBLEM SOLVING (PS)

Students develop understanding of mathematical concepts and procedures when they apply their mathematical knowledge to solve problems in new ways and meaningful contexts. When students encounter new situations and respond to questions of the type *How would you . . . ?* or *How could you . . . ?*, the problem-solving approach is being modelled. Problems are often open-ended, so students may arrive at multiple solutions in different and creative ways. Rich problems allow students in the class to demonstrate their knowledge, skill, or understanding at a level appropriate to them. Learning through problem solving should be the focus of mathematics at all grade levels and should be embedded throughout all topics.

REASONING (R)

Mathematical reasoning involves generalizing from patterns, conjecturing, validating, and proving. Students need to develop confidence in their abilities to reason and to justify their mathematical thinking. Good reasoning is as important as finding correct answers. The thinking skills developed by a focus on reasoning can be used in life in a wide variety of contexts and disciplines.

TECHNOLOGY (T)

Technology contributes to and supports the learning of a wide range of mathematical concepts and can increase the focus on conceptual understanding by decreasing the time spent on repetitive procedures. It enables students to explore and create patterns, organize and display data, examine relationships, model situations, generate and test conjectures, solve problems, and reinforce the learning of basic facts. Technology can help to satisfy the curiosity of students and lead to rich mathematical discoveries at all grade levels. The use of technology can enhance, although it should not replace, conceptual understanding, procedural thinking, and problem solving.

VISUALIZATION (V)

Visual images and visual reasoning are important to a sense of number, space, and measurement. Visualization is fostered through the use of concrete materials, technology, and a variety of visual representations. Visualization can help students gain a concrete understanding of abstract concepts.

GRADE 8 SCIENCE at a glance

This ***Grade 8 Science at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used as a planning tool to preview the content of the Grade 8 Science curriculum.

It is organized by **clusters** and sorts learning outcomes into **big ideas**. The clusters are the context in which students develop knowledge and understanding of important ideas in science while actively engaging in science and technology practices, deepening their understanding of concepts as they experience how science is actually done.

This document can be used with the ***Grade 8 Science Curriculum Overview*** to plan clear and concise expectations for student learning. It can also be used to connect learning by making links to other subject areas.

Science PRACTICES CLUSTER 0 OUTCOMES

The **practices** of science and technological design support students in acquiring a better understanding of how scientific knowledge is produced and how solutions to practical problems are designed. Students engaging in scientific inquiry and design activities simultaneously use both knowledge and skills, which deepens their understanding of concepts and provides exposure to the many approaches that are used in science and technology.

These practices are outlined in detail in *Grades 5 to 8 Science: Manitoba Curriculum Framework of Outcomes*.

SCIENTIFIC INQUIRY

- Asking Questions and Making Predictions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Obtaining, Evaluating, and Communicating Information

DESIGN PROCESS

- Identifying and Defining Practical Problems
- Researching, Planning, and Choosing a Solution
- Constructing and/or Testing the Prototype or Consumer Product
- Evaluating and Optimizing the Solution

CELLS AND SYSTEMS

- **Cells as the basic unit of life**
  01 02 03 05 06 07 08
  8-0-9a
- **Cells, tissues, organs, and body systems**
  01 08 09 10 11 12 13 14
  15 16 19
- **Technological developments**
  01 04 06 17 18
  8-0-8b 8d 8e 8g 9b 9f

OPTICS

- **Light as a form of electromagnetic radiation**
  01 02 05 07 08 14
- **Properties of light**
  01 03 04 05 06 09 10 11
  12 13 14
  8-0-8d 8f

FLUIDS

- **Properties of fluids that determine their interactions with objects**
  01 02 03 04 05 06 08 11
  12 13 14
  8-0-8d 8f
- **Explaining properties of fluids using the particle theory of matter**
  01 07 09 10 11

WATER SYSTEMS

- **Water's unique properties**
  01 02 03 05
- **The global water cycle**
  01 05 06 07
- **Causes of ocean currents**
  01 03 04 05
- **Water's influence on shaping the land**
  01 07 08 09 10 11 12 13 19
- **Impacts of humans on the sustainability of water resources**
  01 14 15 16 17 18 19
  8-0-8g 9e

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GRADE 8 SCIENCE

Curriculum Overview

REPORT CARD CATEGORIES

KNOWLEDGE AND UNDERSTANDING

Cluster 1 CELLS AND SYSTEMS

- Cells are the basic units of living things and have specialized structures responsible for particular functions.

  01 02 03 05 06 07 08
  8-0-9a

- Specialized cells in multicellular organisms perform specialized functions. Groups of specialized cells form tissues, and different tissues are grouped together to form organs. Organ systems function interdependently to carry out essential processes (e.g., carry nutrients and oxygen to cells, carry waste products away from cells for excretion, protect against foreign agents).

  01 08 09 10 11 12 13 14 15 16 19

- Technological developments have led to a better understanding of cell structures and functions, as well as to medical advances related to disease treatment and prevention.

  01 04 06 17 18
  8-0-8b 8d 8e 8g 9b 9f

Cluster 2 OPTICS

- Visible light is an electromagnetic wave that can be detected by the human eye. It can be produced by incandescence and luminescence.

  01 02 05 07 08 14

- Light has characteristic properties (travels in a straight line, can be refracted when it passes from one material to another, can be reflected and absorbed) that produce a range of natural phenomena and can also be used for specific purposes.

  01 03 04 05 06 09 10 11 12 13 14
  8-0-8d 8f

Cluster 3 FLUIDS

- Fluids are substances that can flow and have specific properties (e.g., viscosity, density, compressibility) that determine how they interact with other substances and how they can be used in technological devices.

  01 02 03 04 05 06 08 11 12 13 14
  8-0-8d 8f

- Properties of fluids and the effects of changes in temperature, pressure, or volume on a fluid can be explained using the particle theory of matter.

  01 07 09 10 11

Cluster 4 WATER SYSTEMS

- Water's unique properties (e.g., heat capacity, transmission of sunlight, density, freezing point, ability to dissolve and transport materials) are central to Earth's dynamics. They affect weather patterns, climate, landforms, and life.

  01 02 03 05

- Water continually cycles between Earth and its atmosphere in what is known as the global water cycle. These changes of state and movements are driven by the Sun's energy and gravity.

  01 05 06 07

- Major ocean currents are generated by wind on the surface of the water, as well as by variations in the density of water caused by differences in temperature and salinity.

  01 03 04 05

- Water's movements on land cause weathering and erosion, which shape landscapes.

  01 07 08 09 10 11 12 13 19

- Water is essential for life on Earth and needs to be managed sustainably.

  01 14 15 16 17 18 19
  8-0-8g 9e

SCIENTIFIC INQUIRY

Asking Questions and Making Predictions
1a 3a 9c

- Ask testable questions that lead to investigations.
- Make a prediction or hypothesis that identifies a cause and effect relationship between the dependent and independent variables.

Planning and Carrying Out Investigations
1b 3b 3c 4a 4c 4d 4e 4f 5a 5c 5d 5e 5f 9c

- Create a plan to answer a specific question.
- Identify independent and dependent variables, as well variables that should be held constant to ensure a fair test.
- Select and safely use tools to observe and measure.
- Make observations that are relevant, and record observations and data using an appropriate format.

Analyzing and Interpreting Data
6a 6b 6c 6f 7a 7b 7c 7h 9c 9d

- Represent data using appropriate graphs, and interpret and evaluate these and other graphs.
- Interpret patterns and trends in data, and infer and explain relationships.
- Draw a conclusion based on evidence that explains the results of the investigation and supports or rejects the prediction or hypothesis.
- Evaluate the methods used to answer a question, and identify potential applications of investigation results.

Obtaining, Evaluating, and Communicating Information
2a 2b 2c 7f 7g 8a 8b 8d 9c

- Communicate results and conclusions in a variety of ways.
- Distinguish between science and technology, and describe how scientific knowledge and technologies have evolved over time.
- Access and review information from a variety of sources.

DESIGN PROCESS

Identifying and Defining Practical Problems
1c 3d 9c

- Identify and describe a practical problem that can be solved.
- Define the problem by developing criteria for measuring success based on function, aesthetics, and efficiency, and by identifying constraints such as available materials, environmental considerations, time, or cost.

Researching, Planning, and Choosing a Solution
1d 2a 3e 7d 9c

- Identify various ways to solve a practical problem, and select and justify one to implement.
- Create a plan for the chosen solution, which includes materials, safety considerations, labelled diagrams, and steps to follow.

Constructing and/or Testing the Prototype or Consumer Product
4b 4c 4d 4e 5b 5c 9c 9d

- Construct a prototype.
- Test the prototype or consumer product with respect to the criteria and the constraints.

Evaluating and Optimizing the Solution
6d 6e 6f 7d 7e 9c

- Identify and make improvements to a prototype with respect to the criteria, and explain the rationale for the changes.
- Evaluate the strength and weaknesses of a consumer product with respect to criteria.
- Propose and justify a solution to the initial problem.

GRADE 8 SCIENCE

Science Practices

Scientific Inquiry

ASKING QUESTIONS AND MAKING PREDICTIONS

Science inquiry begins with a child's sense of wonder about the world. Asking questions stimulates curiosity, promotes the development of ideas, promotes discussion, helps clarify concepts, and can lead to a deeper understanding of a concept. As students progress across the grades, their questions should become more relevant, focused, and sophisticated, which requires teaching effective questioning strategies and giving students opportunities to ask and refine their questions. Making predictions is also an important part of science inquiry. Using prior knowledge, observations, and reasoning, students develop ideas to predict possible answers to questions, rather than simply making random guesses.

PLANNING AND CARRYING OUT INVESTIGATIONS

Throughout their schooling, students are expected to plan and carry out, with appropriate levels of support, investigations in the field or laboratory, working collaboratively as well as individually; investigations gradually become more systematic and require clarifying what counts as data and identifying variables that could affect an investigation. The data and observations that are collected are used to test existing understandings, revise them, or develop new understandings.

ANALYZING AND INTERPRETING DATA

Student investigations produce data that must be displayed and analyzed in order to derive meaning. Because patterns and trends in data are not always obvious, a range of tools including tables, graphical representations, and visualizations are used to identify significant features and patterns in the data and to interpret the results of the investigation.

OBTAINING, EVALUATING, AND COMMUNICATING INFORMATION

Students engage with multiple sources to obtain information that is used to evaluate the merit and validity of their claims, methods, and investigation designs. They develop facility with communicating clearly and persuasively the method(s) used and the ideas generated. Critiquing and communicating ideas individually and in groups is a critical activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as orally, in writing, and through extended discussions.

For more information about scientific inquiry and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

Design Process

IDENTIFYING AND DEFINING PRACTICAL PROBLEMS

Technological problem solving involves identifying and defining problems that need to be solved. In order to define a problem, students identify the goals or criteria (what the solution needs to have) as well as constraints (limitations such as available tools and materials, time, dimensions, cost, environmental impact, etc.).

At the Middle Years level, a second facet of the design process is introduced to students. The evaluation of consumer products does not involve the construction of a model or prototype, but rather simulates the decision-making process of a consumer when purchasing a product.

RESEARCH, PLANNING, AND CHOOSING A SOLUTION

Research can be necessary to better understand a problem and to identify possible solutions or to make the best choice. Students conduct their own research and consider multiple possible solutions to a given problem. They can then choose the best solution by comparing each possible solution against the criteria and constraints that have been identified.

CONSTRUCTING AND/OR TESTING THE PROTOTYPE OR CONSUMER PRODUCT

Engineering uses models and simulations to analyze and test solutions to a problem. Students develop a plan to construct and/or test a prototype or consumer product against the criteria and constraints that were identified.

EVALUATING AND OPTIMIZING THE SOLUTION

Optimizing the design solution involves a process in which solutions are systematically tested and refined and the final design or decision is improved by trading off less important features for those that are more important.

For more information about the design process and student expectations across the grades, consult *Grades 5 to 8 Science: A Foundation for Implementation*.

GRADE 8 SOCIAL STUDIES at a glance

World History: Societies of the Past

This ***Grade 8 Social Studies at a Glance*** can be used in designing, planning, and assessing student learning for the year. It can be used to preview the content of the Grade 8 Social Studies curriculum.

It organizes the knowledge and values specific learning outcomes into thematic groups referred to as **clusters** or **essential ideas**. Together with the ***Grade 8 Social Studies Curriculum Overview: General Learning Outcomes with Grade 8 Specific Learning Outcomes***, this document can be used to plan student learning and to develop cross-curricular connections.

Social Studies SKILLS AND COMPETENCIES

Social studies involves the development of inquiry and research skills and methods, historical thinking, and geographic thinking. The skills and competencies learning outcomes are integrated throughout each cluster and are developed, refined, and applied across the grades. These skills and competencies are outlined in detail in the *Social Studies Foundation for Implementation* documents.

ACTIVE DEMOCRATIC CITIZENSHIP
MANAGING INFORMATION AND IDEAS
CRITICAL AND CREATIVE THINKING
COMMUNICATION

UNDERSTANDING SOCIETIES PAST AND PRESENT

- **What is a world view?**
  KI-005 KI-006 VI-004
- **Origins of human societies**
  KI-010 KI-011 KI-012
- **Societies and civilizations**
  KI-007 KI-008 KI-009 KL-022 VL-008
- **Knowing the past**
  KH-027 KH-028

EARLY SOCIETIES OF MESOPOTAMIA, EGYPT, OR THE INDUS VALLEY

- **Overview of early civilizations**
  KG-038 VH-009
- **Interaction with the natural environment**
  KL-023 KL-024 KE-054 VE-017
- **Living in an early society**
  KI-013 KH-029 KP-045
- **Communication and art in an early society**
  KI-014 KH-030 VH-010

ANCIENT SOCIETIES OF GREECE AND ROME

- **Overview of antiquity**
  KI-017 KG-039 VI-006
- **Culture of ancient Greece**
  KC-001 KI-015 KI-016 KH-031 VH-011
- **Democracy in ancient Greece**
  KC-002 KC-003 VC-001 VP-016
- **Roman Empire**
  KL-025 KH-031 KP-047 KP-048 KE-055
- **Legacy of ancient Greece and Rome**
  KH-032 KP-046 KE-056 VI-005

TRANSITION TO THE MODERN WORLD (CIRCA 500 TO 1400)

- **Overview of the Middle Ages**
  KH-033 KG-040 VG-015
- **Life in medieval Europe**
  KH-034 KH-035 KP-050 KP-052 KE-057
- **The rise of Islam and the Ottoman Empire**
  KI-018 KG-041 KP-049 KP-053
- **China and the Mongol Empire**
  KI-019 KP-051 VH-012
- **Legacy of the Middle Ages**
  KG-040 KG-042 KE-058 VG-014 VG-015

SHAPING THE MODERN WORLD (CIRCA 1400 TO 1850)

- **World overview (1400 to 1850)**
  KC-004 KG-043 VC-002 VC-003
- **Global exploration**
  KI-021 KL-026 KG-044 VH-013
- **Renaissance and Reformation**
  KI-020 KH-036 KH-037 VI-007
- **Industrial Revolution**
  KE-059 KE-060 KE-061 VE-018

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GRADE 8 SOCIAL STUDIES

Curriculum Overview: General Learning Outcomes with Grade 8 Specific Learning Outcomes

Grade 8 students explore world civilizations of the past up to the nineteenth century. They study early hunter-gatherer societies, ancient societies, and the influences that have shaped the modern world. They explore the interactions of cultures and consider the enduring influence of the past on the present.

In social studies, six general learning outcomes (GLOs) provide the broad conceptual structure from Kindergarten to Grade 12. Each general learning outcome is expressed as an **essential learning** for the grade level. Overarching all six GLOs is the core concept of Citizenship. The skills and competencies are interwoven throughout the clusters as shown below.

KNOWLEDGE AND UNDERSTANDING

REPORT CARD CATEGORIES

CITIZENSHIP

Students explore how the contributions of past societies shape our present day concepts of citizenship and democracy. A critical consideration of citizenship provides students with opportunities to explore political institutions as they have existed through time, as well as the origins, development, and enduring significance of the rule of law.

KC- 001 002 003 004

VC- 001 002 003

IDENTITY, CULTURE, AND COMMUNITY

A critical consideration of identity, culture, and community provides students with opportunities to explore the social and economic development of societies through time, as well as why some societies stay the same and others change over time. Students will broaden and deepen their knowledge and appreciation of the diverse and enduring qualities of art, architecture, ideas, literature, and science throughout time and place.

KI- 005 006 007 008 009 010 011 012 013 014 015 016 017 018 018F 019 020 021

VI- 004 005 006 007

THE LAND: PLACES AND PEOPLE

Students, using geographic understanding and skills, explore how spatial and physical characteristics of the environment have affected human life, cultures, and societies through time. Students explore the rise and fall of empires through world maps.

KL- 022 023 024 025 026

VL- 008

HISTORICAL CONNECTIONS

Students explore people, events, and ideas from diverse ancient societies that have had an enduring impact on our modern world. An important aspect of this process is the disciplined investigation and interpretation of history.

KH- 027 028 029 030 031 032 033 034 035 036 037

VH- 009 010 011 012 013

GLOBAL INTERDEPENDENCE

Students explore the characteristics of ancient communities, societies, and nations in diverse geographic regions of the world. They also explore the spread of ideas and technologies between societies through time and the interdependence of the environment on the economic conditions of their society. Students develop an appreciation of the importance of world history in understanding the contemporary world.

KG- 038 039 040 041 042 043 044

VG- 014 015

POWER AND AUTHORITY

Students critically examine diverse global forms of governance and leadership through time—both secular and theocratic. Through an exploration of various forms of power in history, students develop a sense of personal empowerment as active democratic citizens to resolve to find peaceful solutions to global issues.

KP- 045 046 047 048 049 050 051 052 053

VP- 016

ECONOMICS AND RESOURCES

Students build an understanding of the impact of advances in science and technology on societies both past and present, and explore the effects of economic interdependence on individuals, communities, and nations from ancient times to the present. Students explore concepts such as trade and the role it played in exchanging not only goods but enduring ideas through time and place.

KE- 054 055 056 057 058 059 060 061

VE- 017 018

RESEARCH AND COMMUNICATION

Managing Information and Ideas

S- 200 201 202 203 204 205 206 207 207A 208

- Select, organize, record, and represent information from a variety of sources and in various ways, including visual organizers.
- Reference sources appropriately.
- Interpret primary and secondary information sources.
- Construct, select, and interpret maps that include a title, legend, compass rose, grid, scale, and latitude and longitude for specific purposes.
- Select and use appropriate tools and technologies to accomplish tasks.
- Use latitude and longitude to locate and describe places on maps and globes.
- Use traditional knowledge to read the land.
- Orient oneself by using observation, traditional knowledge, and a compass or other technologies.

Communicating

S- 400 401 402 403 404 405

- Listen actively and respectfully to others to understand their perspectives.
- Persuasively express differing viewpoints.
- Present information and ideas in a variety of ways.
- In discussions, elicit and clarify questions and ideas, and articulate beliefs and perspectives.

CRITICAL THINKING AND CITIZENSHIP

Thinking Critically and Creatively

S- 300 301 302 303 304 305 306 307 308 309 310 311

- Plan topics, goals, and methods for historical research.
- Consider the context of events, accounts, ideas, and interpretations.
- Use research and evidence to draw conclusions.
- Evaluate personal assumptions based on new information and ideas.
- Distinguish fact from opinion and interpretation.
- Observe and analyze evidence for research.
- Assess the validity of sources.
- Compare differing accounts and diverse perspectives.
- Interpret information and ideas, and recognize that interpretations change with new information.
- Analyze prejudice, racism, stereotyping, or other forms of bias in information sources.

Being an Active Democratic Citizen

S- 100 101 102 103 104 105 106

- Collaborate with others to establish and carry out group goals.
- Resolve conflicts peacefully and fairly using a variety of strategies.
- Make decisions that reflect the principles of sustainable development, and that reflect fairness and equality toward others.
- Negotiate to build consensus and solve problems.
- Recognize bias and discrimination and propose solutions.
- Treat historically significant places and objects with respect.

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GRADE 8 SOCIAL STUDIES

Social Studies Skills and Competencies

ACTIVE DEMOCRATIC CITIZENSHIP

Citizenship skills enable students to develop good relations with others, to work in cooperative ways toward achieving common goals, and to collaborate with others for the well-being of their communities. These interpersonal skills focus on cooperating, resolving conflict, taking responsibility, accepting differences, building consensus, negotiating, making decisions collaboratively, and learning to deal with dissent and disagreement.

MANAGING INFORMATION AND IDEAS

Information-management skills enable students to access, select, organize, and record information and ideas, using a variety of sources, tools, and technologies. These skills include inquiry and research skills that enhance historical and geographical thinking.

CRITICAL AND CREATIVE THINKING

Critical and creative thinking skills enable students to make observations and decisions, to solve problems, and to devise forward-thinking strategies. These skills involve making connections among concepts and applying a variety of tools. Critical thinking involves the use of criteria and evidence to make reasoned judgments. These judgments include distinguishing fact from opinion and interpretation, evaluating information and ideas, identifying perspectives and bias, and considering the consequences of decisions and actions. Creative thinking emphasizes divergent thinking, the generation of ideas and possibilities, and the exploration of diverse approaches to questions.

COMMUNICATION

Communication skills enable students to interpret and express ideas clearly and purposefully, using a variety of media. These skills include the development of oral, visual, print, and media literacy, and the use of information and communication technologies for the exchange of information and ideas.