Grades 9 to 12 Interactive Digital Media

Manitoba Technical-Vocational Curriculum Framework of Outcomes

Manitoba

Grades 9 to 12
Interactive Digital Media

Manitoba Technical-Vocational Curriculum
Framework of Outcomes

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This resource is available on the Manitoba Education and Training website at <www.edu.gov.mb.ca/k12/cur/teched/sy_tech_program.html>.

Available in alternate formats upon request.

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Technical-Vocational Education Media Overview

In 2013, Manitoba Education released the document *Technical-Vocational Education Overview* to provide the philosophical and pedagogical underpinnings for curriculum development and the teaching of courses in the Senior Years Technology Education Program. This overview presents educators with the vision and goals of technical-vocational education (TVE) in Manitoba.

Topics include the following:

- curriculum revitalization and renewal
- curriculum framework and implementation
- articulation of programming
- assessment and reporting
- safety
- employability/essential skills and career development
- sustainable development

The TVE curriculum includes Grades 9 to 12 courses in a variety of areas, including interactive digital media.

Interactive Digital Media Overview

Introduction

Grades 9 to 12 Interactive Digital Media: Manitoba Technical-Vocational Curriculum Framework of Outcomes identifies the goals, general learning outcomes (GLOs), and specific learning outcomes (SLOs) for nine interactive digital media courses. This framework is intended for use in all Manitoba schools teaching interactive digital media as part of the Senior Years Technology Education Program.

Curriculum Description

The high school interactive digital media program provides students with the opportunity to learn the knowledge, skills and attitudes required to develop and produce interactive digital media projects, such as apps, games, websites, virtual worlds, and cross-platform media.

Students will gain knowledge and skills in digital design, asset creation, coding, and project management. Using a project-based approach, they will combine technology and artistic skills to create authentic interactive digital media applications.

Students will be exposed to the professional aspects of making a living in interactive digital media, learning all aspects of the profession, including the entrepreneurial skills to pursue self-employment.

Graduates of the program will be equipped with the knowledge, skills, and attitudes needed to find entry-level employment in the industry. Careers include the following:

- customer support
- quality assurance manager
- web designer
- web developer
- web manager
- social media manager
- advertising and marketing specialist
- app developer
- game developer
- asset developer
- animator
- beta / alpha tester
- computer programmer
- digital artist
- cinematographer

Graduates will also have the opportunity to continue their education in post-secondary institutions.

Delivery of the Interactive Digital Media Subject Area

To receive a Senior Years Technical Education diploma, a student must complete at least eight departmentally developed courses from an approved technical-vocational cluster, together with 16 compulsory credits and six optional credits.

The grade level in which the courses are offered are a local, school-based decision, but it is highly recommended that the sequencing of credits align with the following schedule.

Cross-curricular learning outcomes from subjects including, but not limited to, English Language Arts, Mathematics, and Science are to be integrated into the authentic activities of the course.

Outcomes dealing with the following topics are also integrated into most courses:

- health and safety
- sustainability
- ethical and legal standards
- employability skills
- the IT industry
- evolution, technological progression, and emerging trends

In the TVE curriculum, the emphasis is on applied activities. For instructional purposes, the sequence of learning outcomes and the outcomes can vary based on the activities within the course. Teachers are advised to select the activities best suited to teach the learning outcomes, based on a variety of factors, including access to resources or regional needs.

The curriculum is not sequential. In other words, learning outcomes might be taught in an order different from how they appear in the document. In light of rapid changes in technology, teachers are encouraged to update their activities in order to meet the needs of students.

Interactive Digital Media Goals, General Learning Outcomes (GLOs), and Specific Learning Outcomes (SLOs)

Grades 9 to 12 Interactive Digital Media: Manitoba Technical-Vocational Curriculum Framework of Outcomes identifies specific learning outcomes (SLOs) for use in all Manitoba schools teaching Grades 9 to 12 Interactive Digital Media as part of the Senior Years Technology Education Program. SLO statements define what students are expected to achieve by the end of a course.

It is essential for students to learn and demonstrate safety practices and employability skills; therefore, some SLOs related to health and safety, as well as to employability skills are repeated in several courses.

Please note that SLOs are not identified for the goals and GLOs that are not addressed in a given course.

Goal 1: Describe and apply appropriate **health and safety** practices.

- **GLO 1.1:** Describe and apply appropriate **health and safety** practices.

Goal 2: Demonstrate the identification, selection, use, and maintenance of **software, hardware, supplies,** and **equipment**.

- **GLO 2.1:** Demonstrate the identification, selection, and use of **software**.
- **GLO 2.2:** Demonstrate the identification, selection, use, and maintenance of **hardware**.
- **GLO 2.3:** Demonstrate the identification, selection, use, and maintenance of **supplies and equipment**.

Goal 3: Incorporate **project management** processes throughout the development cycle.

- **GLO 3.1: Document** the development process.
- **GLO 3.2: Collaborate** with peers, teachers, and clients.
- **GLO 3.3: Assess** the project development process.
- **GLO 3.4:** Incorporate **quality assurance** processes.
- **GLO 3.5: Manage** projects.

Goal 4: Conceptualize projects.

- **GLO 4.1:** Discuss and incorporate interactive digital media development **theory**.
- **GLO 4.2:** Explore and research **project ideas, audience, clients, and project requirements**.
- **GLO 4.3:** Assess, analyze, and select project **concept**.

Goal 5: Plan projects.

- **GLO 5.1: Determine scope, timeline, and milestones**.
- **GLO 5.2:** Develop **linear** and **non-linear stories, plans, and flowcharts**.

Goal 6: Develop projects.

- **GLO 6.1:** Develop and test **prototypes**.
- **GLO 6.2:** Create and incorporate **assets**.
- **GLO 6.3:** Use **code** to solve problems.
- **GLO 6.4:** Evaluate and incorporate **security features**.

Goal 7: Publish, release or present, and assess projects.

GLO 7.1: Publish, release or present, and assess projects.

Goal 8: Describe and demonstrate the transferable **cross-curricular** knowledge and skills relevant to the interactive digital media industry.

GLO 8.1: Read, interpret, and communicate information.

GLO 8.2: Apply the knowledge and skills from **other subject areas** (mathematics, science, art, business education) relevant to interactive digital media design.

Goal 9: Demonstrate awareness of **sustainability** as it pertains to interactive digital media development.

GLO 9.1: Describe the interactive digital media design industry's **sustainability practices** and impact on the environment.

GLO 9.2: Describe the impact of **human sustainability** on the well-being of those employed in interactive digital media design and the users of their services.

GLO 9.3: Describe **sustainabile business practices** within the interactive digital media design industry.

Goal 10: Demonstrate awareness of the **ethical and legal standards** as they pertain to interactive digital media design.

GLO 10.1: Demonstrate awareness of the **ethical and legal standards** as they pertain to interactive digital media design.

Goal 11: Demonstrate **employability skills**.

GLO 11.1: Demonstrate **fundamental employability skills**.

GLO 11.2: Demonstrate awareness of **cultural proficiency** and its importance in the workplace.

GLO 11.3: Demonstrate understanding of the **business operation** of an interactive digital media design organization.

GLO 11.4: Demonstrate **critical thinking skills**.

Goal 12: Demonstrate understanding of the **interactive digital media industry**.

GLO 12.1: Demonstrate understanding of the **scope** of the interactive digital media industry.

GLO 12.2: Demonstrate understanding of the **educational and career opportunities,** as well as **industry and professional associations**.

GLO 12.3: Demonstrate understanding of **working conditions** in interactive digital media.

Goal 13: Demonstrate awareness of the **evolution, technological progression, and emerging trends** in interactive digital media.

GLO 13.1: Describe the **history**, **technological progression**, and **emerging trends** in interactive digital media.

Course Descriptions

Course titles, descriptions, and codes for the nine interactive digital media courses follow. For an explanation of the codes, refer to the *Subject Table Handbook: Technology Education: Student Records System and Professional School Personnel System* (Manitoba Education and Training).

9093 Exploration of Interactive Digital Media

15S/15E/15M
10S/10E/10M

This optional course is designed for students to explore interactive digital media. Students will learn the basic steps in creating digital assets and in coding.

9094 Introduction to Interactive Digital Media

20S/20E/20M

This course is designed for students interested in interactive digital media. They will learn to conceptualize, plan, develop, and publish an interactive digital media project. Projects involve an introduction to asset development and coding.

9095 Interactive Digital Media Design

30S/30E/30M

In this course, students will learn about the design principles required to complete an interactive digital media project, integrating artistic and technical theory and skills.

9096 Interactive Digital Asset Creation

30S/30E/30M

This course focuses on the creation of original assets to support interactive digital media projects by using a variety of software. Examples of assets include vector images, rasterized images, 2-D animations, 3-D models, sound effects, and rigging.

9097 Coding for Interactive Digital Media

30S/30E/30M

This course focuses on the creation of interactive components of projects by using basic coding. Students will learn programming theory, and how to incorporate it into interactive digital media projects.

9098 Advanced Interactive Digital Asset Creation

40S/40E/40M

This course builds on the skills and knowledge learned in 9096 Interactive Digital Asset Creation. Students will learn the skills related to creating advanced features of dynamic asset creation, and to applying code to assets.

9099 Advanced Coding for Interactive Digital Media

40S/40E/40M

This course builds on the skills and knowledge learned in 9097 Coding for Interactive Digital Media. Students will learn to code in more than one language, focusing on advanced programming theory and techniques.

9100 Project Management for Interactive Digital Media — 40S/40E/40M

In this course, students will collaborate with others as they apply the knowledge and skills learned in previous courses in order to create, manage, and release an authentic interactive digital media project.

9101 Futures in Interactive Digital Media — 40S/40E/40M

In this course, students will synthesize and apply skills and knowledge learned in previous courses to create their own portfolio site to prepare them for either self-employment, entry-level employment, or post-secondary opportunities in interactive digital media.

Curriculum Implementation Dates

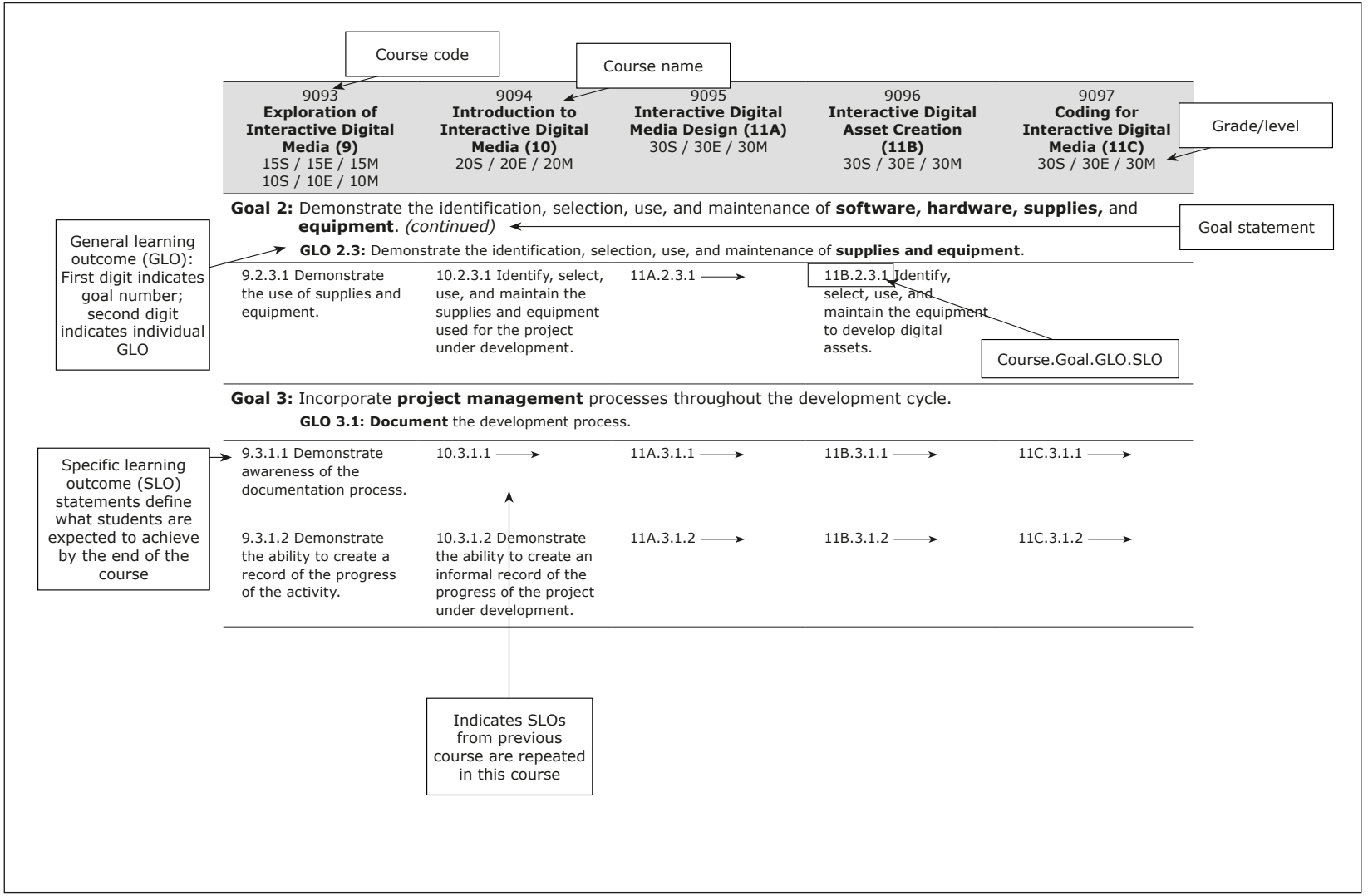
During **voluntary implementation**, teachers have the option of teaching the entire new draft curriculum as soon as Manitoba Education and Training releases it on the *Technology Education* website. They also have the option of teaching the courses from the previous curriculum. Teachers who implement courses before system-wide implementation need to ensure that students who are already taking courses from the previous curriculum achieve all SLOs with a minimum of redundancy.

Voluntary implementation of all interactive digital media courses began in the fall of 2015 and will continue until their respective system-wide implementation dates.

Date	System-Wide Implementation
Fall 2016	Grade 9 (optional)
Fall 2017	Grade 10
Fall 2018	Grade 11
Fall 2019	Grade 12

Under **system-wide implementation**, all teachers in Manitoba teach the new curriculum and use the new course codes. Teachers will no longer be able to use the previous course codes. Course codes are found in the *Subject Table Handbook: Technology Education*.

Guide to Reading the Interactive Digital Media Goals and Learning Outcomes



Grades 9 to 11 Interactive Digital Media

General and Specific Learning Outcomes by Goal

Grades 9 to 11 Interactive Digital Media
General and Specific Learning Outcomes by Goal

9093 **Exploration of Interactive Digital Media (9)** 15S / 15E / 15M 10S / 10E / 10M	9094 **Introduction to Interactive Digital Media (10)** 20S / 20E / 20M	9095 **Interactive Digital Media Design (11A)** 30S / 30E / 30M	9096 **Interactive Digital Asset Creation (11B)** 30S / 30E / 30M	9097 **Coding for Interactive Digital Media (11C)** 30S / 30E / 30M
Goal 1: Describe and apply appropriate **health and safety** practices.				
GLO 1.1: Describe and apply appropriate **health and safety** practices.				
9.1.1.1 Describe and practice online safety.	10.1.1.1 →	11A.1.1.1 →	11B.1.1.1 →	11C.1.1.1 →
9.1.1.2 Demonstrate the ability to maintain a safe and organized workspace.	10.1.1.2 →	11A.1.1.2 →	11B.1.1.2 →	11C.1.1.2 →
9.1.1.3 Demonstrate the ability to keep cables safe and uncluttered.	10.1.1.3 →	11A.1.1.3 →	11B.1.1.3 →	11C.1.1.3 →
9.1.1.4 Describe ergonomically appropriate procedures to avoid injury.	10.1.1.4 →	11A.1.1.4 →	11B.1.1.4 →	11C.1.1.4 →
	10.1.1.5 Demonstrate awareness of health and safety issues related to lighting and glare, including monitors.	11A.1.1.5 →	11B.1.1.5 →	11C.1.1.5 →

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Goal 2: Demonstrate the identification, selection, use, and maintenance of **software, hardware, supplies,** and **equipment**.				
GLO 2.1: Demonstrate the identification, selection, and use of **software**.				
9.2.1.1 Demonstrate the identification, selection, and use of software.	10.2.1.1 Evaluate and select the most appropriate software for a specific project.	11A.2.1.1 Evaluate and select the most appropriate software for a specific project (i.e., WYSIWYG editor, CMS, game engine, code editor, graphic software).	11B.2.1.1 →	11C.2.1.1 →
	10.2.1.2 Demonstrate the use of software to complete stages of a project.	11A.2.1.2 Demonstrate the use of graphics software for a specific project.	11B.2.1.2 Demonstrate the use of software to develop digital assets.	11C.2.1.2 Demonstrate the use of software to develop interactive digital media.
GLO 2.2: Demonstrate the identification, selection, use, and maintenance of **hardware**.				
9.2.2.1 Demonstrate the ability to organize files and folders.	10.2.2.1 →	11A.2.2.1 →	11B.2.2.1 →	11C.2.2.1 →
9.2.2.2 Demonstrate the use of hardware for the project under development.	10.2.2.2 →	11A.2.2.2 →	11B.2.2.2 Demonstrate the ability to maintain backups of files. 11B.2.2.3 Identify, select, use, and maintain hardware to develop digital assets.	11C.2.2.2 →

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Goal 2: Demonstrate the identification, selection, use, and maintenance of **software, hardware, supplies,** and **equipment**. *(continued)*				
GLO 2.3: Demonstrate the identification, selection, use, and maintenance of **supplies and equipment**.				
9.2.3.1 Demonstrate the use of supplies and equipment.	10.2.3.1 Identify, select, use, and maintain the supplies and equipment used for the project under development.	11A.2.3.1 →	11B.2.3.1 Identify, select, use, and maintain the equipment to develop digital assets.	
Goal 3: Incorporate **project management** processes throughout the development cycle.				
GLO 3.1: Document the development process.				
9.3.1.1 Demonstrate awareness of the documentation process.	10.3.1.1 →	11A.3.1.1 →	11B.3.1.1 →	11C.3.1.1 →
9.3.1.2 Demonstrate the ability to create a record of the progress of the activity.	10.3.1.2 Demonstrate the ability to create an informal record of the progress of the project under development.	11A.3.1.2 →	11B.3.1.2 →	11C.3.1.2 →

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Goal 3: Incorporate **project management** processes throughout the development cycle. *(continued)*				
GLO 3.2: Collaborate with peers, teachers, and clients.				
	10.3.2.1 Demonstrate the ability to collaborate with peers and teachers. 10.3.2.2 Use communication tools to collaborate with peers and teachers.	11A.3.2.1 Provide, request, and incorporate feedback from peers, teachers, and/or clients.	11B.3.2.1 →	11C.3.2.1 →
GLO 3.3: Assess the project development process.				
	10.3.3.1 Demonstrate awareness of the project development process.	11A.3.3.1 Participate in the project development process.	11B.3.3.1 →	11C.3.3.1 →

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Goal 3: Incorporate **project management** processes throughout the development cycle. *(continued)* **GLO 3.4:** Incorporate **quality assurance** processes.				
9.3.4.1 Demonstrate awareness of quality assurance.	10.3.4.1 Discuss the importance of quality control. 10.3.4.2 Perform quality control on a project.	11A.3.4.1 Demonstrate the ability to perform quality control on a project.	11B.3.4.1 Demonstrate the ability to perform quality control on the asset.	11C.3.4.1 Demonstrate the ability to perform quality control on coding.

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Goal 4: Conceptualize projects.				
GLO 4.1: Discuss and incorporate interactive digital media development **theory**.				
9.4.1.1 Discuss the theory behind the project under development (i.e., colour theory, branding, game theory, programming concepts).	10.4.1.1 ⟶	11A.4.1.1 ⟶	11B.4.1.1 ⟶	11C.4.1.1 ⟶
GLO 4.2: Explore and research **project ideas, audience, clients, and project requirements**.				
9.4.2.1 Demonstrate research skills.	10.4.2.1 ⟶	11A.4.2.1 ⟶	11B.4.2.1 ⟶	11C.4.2.1 ⟶
9.4.2.2 Brainstorm ideas related to the clients' needs.	10.4.2.2 ⟶	11A.4.2.2 Collect and document the characteristics of the audience for the project under development.		11C.4.2.2 Demonstrate understanding of audience when developing interface.
	10.4.2.3 Identify and describe the audience for the project under development.	11A.4.2.3 Develop concepts of the elements for the project under development.		11C.4.2.3 Demonstrate understanding of different platforms.
	10.4.2.4 Discuss different platforms.			11C.4.2.4 Demonstrate the ability to identify programming requirements.
	10.4.2.5 Discuss and gather requirements.			

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Goal 4: Conceptualize projects. *(continued)* **GLO 4.3:** Assess, analyze, and select project **concept**.				
9.4.3.1 Demonstrate the ability to brainstorm project concept.	10.4.3.1 Demonstrate awareness of project concepts. 10.4.3.2 Determine project concept.	11A.4.3.1 Select concept based on project criteria.	11B.4.3.1 Assess and select assets based on project criteria.	11C.4.3.1 Select interface concepts based on project criteria.
Goal 5: Plan projects. **GLO 5.1:** Determine **scope, timeline,** and **milestones**.				
9.5.1.1 Demonstrate the ability to set and meet goals for the project under development. 9.5.1.2 Demonstrate the ability to determine steps for the project under development.	10.5.1.1 Demonstrate the ability to determine scope, timeline, and milestones of the project under development.	11A.5.1.1 →	11B.5.1.1 →	11C.5.1.1 →

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Goal 5: Plan projects. *(continued)* **GLO 5.2:** Develop **linear** and **non-linear stories, plans, and flowcharts**.				
9.5.2.1 Develop an entry-level project plan.	10.5.2.1 Develop workflow.	11A.5.2.1 Develop pre-production plan.	11B.5.2.1 Develop storyboards and mock-ups.	11C.5.2.1 Create program flowchart.
	10.5.2.2 Ensure that the stories and plans reflect characteristics of the audience.		11B.5.2.2 Develop concept designs for assets (i.e., stage, character designs, storyboards, score compositions, etc).	11C.5.2.2 Create pseudo code.
	10.5.2.3 Develop concept designs for assets (i.e., stage, character designs, storyboards, score compositions, wireframes) for the project under development.			11C.5.2.3 Use iterative refinement in program development.

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Goal 6: Develop projects.				
GLO 6.1: Develop and test **prototypes**.				
	10.6.1.1 Demonstrate awareness of the use of prototypes and early models in the development process.	11A.6.1.1 Develop draft prototype (i.e., level screens, wire frames, comps).		11C.6.1.1 Develop draft prototype (i.e., level screens, wire frames, comps).
		11A.6.1.2 Test the draft prototype of the project under development.		11C.6.1.2 Test the draft prototype of the project under development.
GLO 6.2: Create and incorporate **assets**.				
9.6.2.1 Create vector and rasterized assets.	10.6.2.1 →	11A.6.2.1 →	11B.6.2.1 →	11C.6.2.1 Demonstrate understanding of how databases are used in projects under development.
	10.6.2.2 Demonstrate awareness of databases and their use in interactive digital media.	11A.6.2.2 Demonstrate understanding of how databases are used in projects under development.	11B.6.2.2 Create a library of assets (i.e., databases, animated 2D assets, animated 3D assets, rigged objects, animated characters, videos, motion graphics).	
	10.6.2.3 Create assets (i.e., sound effects, animated assets, graphics).			

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Goal 6: Develop projects. *(continued)* **GLO 6.3:** Use **code** to solve problems.				
9.6.3.1 Demonstrate awareness of coding.	10.6.3.1 Identify the most appropriate code for the project under development (i.e., HTML, CSS, JavaScript).	11A.6.3.1 Use the most appropriate code for the project under development (i.e., HTML, CSS, JavaScript).	11B.6.3.1 Discuss the use of code in asset development (i.e., actionscript, expressions, HTML5).	11C.6.3.1 Demonstrate understanding of variables.
	10.6.3.2 Use code for the project under development (i.e., HTML, CSS, JavaScript).			11C.6.3.2 Demonstrate understanding of data types.
	10.6.3.3 Complete an entry-level project.			11C.6.3.3 Demonstrate knowledge of keywords.
				11C.6.3.4 Demonstrate understanding of syntax.
				11C.6.3.5 Document code using comments.
				11C.6.3.6 Follow current programming conventions (i.e., naming, commenting, layout).
				11C.6.3.7 Use operators.
				11C.6.3.8 Use pre-existing objects.
				11C.6.3.9 Use pre-existing functions and methods.

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Goal 6: Develop projects. *(continued)* **GLO 6.3:** Use **code** to solve problems. *(continued)*				
				11C.6.3.10 Use branching or selection structures. 11C.6.3.11 Use looping or repetition structures. 11C.6.3.12 Create and use programmer-defined functions. 11C.6.3.13 Create functions or procedures to respond to events. 11C.6.3.14 Use a variety of debugging techniques to find and correct programming errors. 11C.6.3.15 Test code by using a variety of user inputs.

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Goal 6.4: Develop projects. *(continued)* **GLO 6.4:** Evaluate and incorporate **security features**.				
9.6.4.1 Demonstrate understanding of online identity, including usernames and passwords.	10.6.4.1 →	11A.6.4.1 Discuss potential security vulnerabilities and threats.	11B.6.4.1 Discuss potential security threats related to the theft and unauthorized use of assets.	11C.6.4.1 Discuss awareness of security concerns in code.
9.6.4.2 Discuss the need for strong passwords.	10.6.4.2 →	11A.6.4.2 Incorporate pre-existing security features.		
9.6.4.3 Use strong passwords and other security features.	10.6.4.3 →			
	10.6.4.4 Demonstrate awareness of security features.			

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Goal 7: Publish, release or present, and assess projects.				
GLO 7.1: Publish, release or present, and assess projects.				
9.7.1.1 Demonstrate the ability to publish activities.	10.7.1.1 Publish project to one or more platforms (i.e., various browsers and/or various devices).	11A.7.1.1 Publish project to one or more platforms (i.e., various browsers and/or various devices).	11B.7.1.1 Publish asset to more than one file format, suitable to the project under development.	11C.7.1.1 Publish project to one or more platforms (i.e., various browsers and/or various devices).
	10.7.1.2 Demonstrate the ability to present projects.	11A.7.1.2 →	11B.7.1.2 →	11C.7.1.2 →
	10.7.1.3 Demonstrate the ability to assess completed project.	11A.7.1.3 →	11B.7.1.3 →	11C.7.1.3 →

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Goal 8: Describe and demonstrate the transferable **cross-curricular** knowledge and skills relevant to the interactive digital media industry. **GLO 8.1: Read, interpret, and communicate** information.				
	10.8.1.1 Demonstrate awareness of communication platforms commonly used in the interactive the digital media industry.	11A.8.1.1 Discuss the differences between writing for the web versus writing for text. 11A.8.1.2 Utilize communication platforms commonly used in the interactive digital media industry.	11B.8.1.1 Incorporate story, plot, and character development into asset development.	11C.8.1.1 Use resources to solve problems.

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Goal 8: Describe and demonstrate the transferable **cross-curricular** knowledge and skills relevant to the interactive digital media industry. *(continued)* **GLO 8.2:** Apply the knowledge and skills from **other subject areas** (mathematics, science, art, business education) relevant to interactive digital media design.				
			11B.8.2.1 Utilize ratios, fractions, percentages, and scale.	11C.8.2.1 Utilize formulas.
			11B.8.2.2 Incorporate design theory and colour theory into asset development.	11C.8.2.2 Utilize mathematical order of operations.
				11C.8.2.3 Demonstrate understanding of data types.
				11C.8.2.4 Utilize Boolean logic.
				11C.8.2.5 Utilize modulus division.
				11C.8.2.6 Demonstrate awareness of binary and hexadecimal numbers.

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Goal 9: Demonstrate awareness of **sustainability** as it pertains to interactive digital media development.

GLO 9.1: Describe the interactive digital media design industry's **sustainability practices** and impact on the environment.

9.9.1.1 Discuss the lifespan of electronic devices, and its impact on electronic waste.	10.9.1.1 ⟶	11A.9.1.1 ⟶	11B.9.1.1 ⟶	11C.9.1.1 ⟶

GLO 9.2: Describe the impact of **human sustainability** on the well-being of those employed in interactive digital media design and the users of their services.

9.9.2.1 Describe human sustainability.	10.9.2.1 ⟶	11A.9.2.1 Discuss concerns related to hyper-connectivity.		
	10.9.2.2 Discuss the impact of interactive digital media on society.	11A.9.2.2 Discuss the pros and cons of interactive digital media.		

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Goal 10: Demonstrate awareness of the **ethical and legal standards** as they pertain to interactive digital media design.				
GLO 10.1: Demonstrate awareness of the ethical and legal standards as they pertain to interactive digital media design.				
9.10.1.1 Demonstrate awareness of copyright and the ownership of intellectual material.	10.10.1.1 →	11A.10.1.1 Discuss the consequences of unethical behaviour.	11B.10.1.1 Demonstrate understanding of, and comply with copyright legislation as it pertains to digital assets.	11C.10.1.1 Demonstrate understanding of, and comply with copyright legislation as it pertains to code.
9.10.1.2 Demonstrate awareness of the concept of digital citizenship.	10.10.1.2 Discuss ethical considerations in the interactive digital media design industry.	11A.10.1.2 Discuss the importance of reading terms and user agreements.	11B.10.1.2 Demonstrate understanding of, and comply with, licensing agreements.	
9.10.1.3 Compare and contrast storing media on a local drive versus storing media on a cloud drive.	10.10.1.3 Practice digital citizenship.			

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Goal 11: Demonstrate **employability skills**.				
GLO 11.1: Demonstrate **fundamental employability skills**.				
9.11.1.1 Demonstrate regular and punctual attendance.	10.11.1.1 →	11A.11.1.1 →	11B.11.1.1 →	11C.11.1.1 →
9.11.1.2 Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.	10.11.1.2 →	11A.11.1.2 →	11B.11.1.2 →	11C.11.1.2 →
9.11.1.3 Demonstrate accountability by taking responsibility for their actions.	10.11.1.3 →	11A.11.1.3 →	11B.11.1.3 →	11C.11.1.3 →
9.11.1.4 Demonstrate adaptability, initiative, and effort.	10.11.1.4 →	11A.11.1.4 →	11B.11.1.4 →	11C.11.1.4 →
9.11.1.5 Demonstrate teamwork skills.	10.11.1.5 →	11A.11.1.5 →	11B.11.1.5 →	11C.11.1.5 →
9.11.1.6 Demonstrate the ability to stay on task and effectively use time in class and work environments.	10.11.1.6 →	11A.11.1.6 →	11B.11.1.6 →	11C.11.1.6 →

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Goal 11: Demonstrate **employability skills**. *(continued)*				
GLO 11.1: Demonstrate **fundamental employability skills**. *(continued)*				
9.11.1.7 Demonstrate the responsible use of technology.	10.11.1.7 ⟶	11A.11.1.7 ⟶	11B.11.1.7 ⟶	11C.11.1.7 ⟶
9.11.1.8 Provide and accept constructive feedback.	10.11.1.8 ⟶	11A.11.1.8 ⟶	11B.11.1.8 ⟶	11C.11.1.8 ⟶
GLO 11.2: Demonstrate awareness of **cultural proficiency**, and its importance in the workplace.				
	10.11.2.1 Define and discuss the meaning of culture. 10.11.2.2 Discuss the importance of culture in the workplace. 10.11.2.3 Discuss the sensitive nature of certain images, names, and themes to various cultures around the planet.	11A.11.2.1 Discuss potentially sensitive or offensive assets.	11B.11.2.1 Discuss potentially sensitive or offensive assets.	
GLO 11.3: Demonstrate understanding of the **business operation** of an interactive digital media design organization.				
		11A.11.3.1 Discuss the requirements for companies to generate profits in order to continue operating.		

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Goal 11: Demonstrate **employability skills**. *(continued)* **GLO 11.4:** Demonstrate **critical thinking skills**.				
	10.11.4.1 Discuss the need for critical thinking. 10.11.4.2 Discuss the need for problem solving skills.	11A.11.4.1 Demonstrate critical thinking skills when designing the project under development.	11B.11.4.1 Demonstrate critical thinking skills when solving problems.	11C.11.4.1 ⟶
Goal 12: Demonstrate understanding of the **interactive digital media industry**. **GLO 12.1:** Demonstrate understanding of the **scope** of the interactive digital media industry.				
	10.12.1.1 Demonstrate understanding of the scope of the interactive digital media industry.	11A.12.1.1 Discuss the place of interactive digital media in the Canadian economy.	11B.12.1.1 Discuss the place of asset creation in the Canadian economy.	11C.12.1.1 Discuss the place of coding in the Canadian economy.

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Goal 12: Demonstrate understanding of the **interactive digital media industry**. *(continued)*				
GLO 12.2: Demonstrate understanding of the **educational and career opportunities,** as well as **industry and professional associations**.				
9.12.2.1 Develop an online portfolio.	10.12.2.1 ⟶	11A.12.2.1 ⟶	11B.12.2.1 ⟶	11C.12.2.1 ⟶
	10.12.2.2 Demonstrate understanding of the scope of careers in interactive digital media.	11A.12.2.2 Discuss career opportunities in digital media design.	11B.12.2.2 Discuss career opportunities in asset development.	11C.12.2.2 Discuss career opportunities in coding.
	10.12.2.3 Demonstrate awareness of marketing (i.e., meta tags, SEO, pagination, micro-blogging, linking, branding).	11A.12.2.3 Demonstrate understanding of marketing (i.e., meta tags, SEO, pagination, micro-blogging, linking, branding).	11B.12.2.3 ⟶	
GLO 12.3: Demonstrate understanding of **working conditions** in interactive digital media.				
	10.12.3.1 Discuss the working conditions related to different occupations in interactive digital media.	11A.12.3.1 ⟶	11B.12.3.1 ⟶	11C.12.3.1 ⟶

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Goal 13: Demonstrate awareness of the **evolution, technological progression, and emerging trends** in interactive digital media.				
GLO 13.1: Describe the **history, technological progression**, and **emerging trends** in interactive digital media.				
9.13.1.1 Discuss the history, technological progression, and emerging trends in interactive digital media.	10.13.1.1 →	11A.13.1.1 →	11B.13.1.1 →	11C.13.1.1 →

Grade 12 Interactive Digital Media

General and Specific Learning Outcomes by Goal

Grade 12 Interactive Digital Media
General and Specific Learning Outcomes by Goal

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Goal 1: Describe and apply appropriate **health and safety** practices.			
GLO 1.1: Describe and apply appropriate **health and safety** practices.			
12A.1.1.1 Describe and practice online safety.	12B.1.1.1 →	12C.1.1.1 →	12D.1.1.1 →
12A.1.1.2 Demonstrate the ability to maintain a safe and organized workspace.	12B.1.1.2 →	12C.1.1.2 Promote a safe and organized workspace among all team members.	12D.1.1.2 Maintain a safe and organized workspace.
12A.1.1.3 Demonstrate the ability to keep cables safe and uncluttered.	12B.1.1.3 →	12C.1.1.3 →	12D.1.1.3 →
12A.1.1.4 Demonstrate awareness of health and safety issues related to lighting and glare, including monitors.	12B.1.1.4 →	12C.1.1.4 →	12D.1.1.4 →
12A.1.1.5 Discuss risk factors and treatments related to carpal tunnel syndrome.	12B.1.1.5 →	12C.1.1.5 →	12D.1.1.5 →

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Goal 2: Demonstrate the identification, selection, use, and maintenance of **software, hardware, supplies**, and **equipment**.			
GLO 2.1: Demonstrate the identification, selection, and use of **software**.			
12A.2.1.1 Evaluate and select the most appropriate software for a specific project (i.e., WYSIWYG editor, CMS, game engine, code editor, graphic software, DBMS).	12B.2.1.1 →	12C.2.1.1 →	12D.2.1.1 →
12A.2.1.2 Select and use software to develop digital assets.	12B.2.1.2 Demonstrate competence in using at least two programming languages. 12B.2.1.3 From at least 2 choices, select the most appropriate programming language for the project under development.	12C.2.1.2 Select and use software to develop a project.	12D.2.1.2 Select and use software to develop a career portfolio.
GLO 2.2: Demonstrate the identification, selection, use, and maintenance of **hardware**.			
12A.2.2.1 Identify, select, use, and maintain hardware to develop digital assets.			

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Goal 2: Demonstrate the identification, selection, use, and maintenance of **software, hardware, supplies**, and **equipment**. *(continued)*			
GLO 2.3: Demonstrate the identification, selection, use, and maintenance of **supplies and equipment**.			
12A.2.3.1 Identify, select, use, and maintain the supplies and equipment to develop digital assets.			
Goal 3: Incorporate **project management** processes throughout the development cycle.			
GLO 3.1: Document the development process.			
12A.3.1.1 Develop a formal documentation process for the project under development.		12C.3.1.1 Initiate and implement a formal documentation process for the project under development.	
GLO 3.2: Collaborate with peers, teachers, and clients.			
12A.3.2.1 Provide, request, and incorporate feedback from peers, teachers, and clients (i.e., student groups, sports teams, local business or industry).	12B.3.2.1 →	12C.3.2.1 →	12D.3.2.1 →
	12B.3.2.2 Collaborate with others on a project.	12C.3.2.2 Collaborate with others on the project under development.	12D.3.2.2 Collaborate with peers, teachers, and clients at a level required in a workplace.
		12C.3.2.3 Participate in kick-off meetings, client meetings, and regular status meetings for the project under development.	

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Goal 3: Incorporate **project management** processes throughout the development cycle. *(continued)*			
GLO 3.3: Assess the project development process.			
12A.3.3.1 Review and evaluate the project development process.		12C.3.3.1 Review and evaluate the project development process.	12D.3.3.1 →
		12C.3.3.2 Reflect and perform self-assessment.	12D.3.3.2 →
GLO 3.4: Incorporate **quality assurance** processes.			
12A.3.4.1 Perform quality control on the assets (i.e., data redundancy, web safe, graphic design, optimization, uniformity).	12B.3.4.1 Design comprehensive testing scenarios.	12C.3.4.1 Determine and manage the quality assurance process.	
	12B.3.4.2 Demonstrate the ability to assess code for bugs and level of robustness.		
	12B.3.4.3 Demonstrate the ability to validate data.		

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Goal 3: Incorporate **project management** processes throughout the development cycle. *(continued)* **GLO 3.5: Manage** projects.			
		12C.3.5.1 Develop and implement procedures to manage the project under development. 12C.3.5.2 Determine and assign the various roles and tasks for the project under development. 12C.3.5.3 Clarify roles and responsibilities of team members throughout the project. 12C.3.5.4 Review project milestones. 12C.3.5.5 Promote communication among team members, teachers, clients, etc. 12C.3.5.6 Organize, schedule, and host kick-off meetings, client meetings, and regular status meetings for the project under development. 12C.3.5.7 Manage relationships with stakeholders. 12C.3.5.8 Demonstrate the ability to manage and address change. 12C.3.5.9 Identify and manage risks for the project under development.	12D.3.5.1 Manage the development of a career portfolio.

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Goal 3: Incorporate **project management** processes throughout the development cycle. *(continued)* **GLO 3.5: Manage** projects. *(continued)*			
		12C.3.5.10 Track and report on the progress of the project under development. 12C.3.5.11 Ensure project completion to specifications and quality standards. 12C.3.5.12 Demonstrate the ability to manage project release. 12C.3.5.13 Demonstrate the ability to conduct a project review.	
Goal 4: Conceptualize projects. **GLO 4.1:** Discuss and incorporate interactive digital media development **theory**.			
12A.4.1.1 Discuss the theory behind the project under development (i.e., colour theory, branding, game theory, programming concepts, business rules, data modelling, indexing, ERDs, normalization).	12B.4.1.1 →	12C.4.1.1 →	

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Goal 4: Conceptualize projects. *(continued)*			
GLO 4.2: Explore and research **project ideas, audience, clients, and project requirements**.			
12A.4.2.1 Demonstrate research skills.	12B.4.2.1 →	12C.4.2.1 →	
12A.4.2.2 Demonstrate the ability to develop strategies to collect data.	12B.4.2.2 →	12C.4.2.2 →	
12A.4.2.3 Demonstrate the ability to gather project requirements.	12B.4.2.3 →	12C.4.2.3 →	
GLO 4.3: Assess, analyze, and select project **concept**.			
12A.4.3.1 Using the project criteria, assess and select the most appropriate assets.		12C.4.3.1 Demonstrate the ability to establish project goals.	
Goal 5: Plan projects.			
GLO 5.1: Determine **scope, timeline**, and **milestones**.			
12A.5.1.1 Determine scope, timeline, and milestones of the project under development.		12C.5.1.1 Determine scope, timeline, and milestones of the project under development.	12D.5.1.1 Plan the development of their career portfolio project.

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Goal 5: Plan projects. *(continued)* **GLO 5.2:** Develop **linear** and **non-linear stories, plans,** and **flowcharts**.			
12A.5.2.1 Develop storyboards and mock-ups.	12B.5.2.1 Demonstrate the ability to create program flowchart.		
12A.5.2.2 Develop concept designs for assets (i.e., stage, character designs, storyboards, score compositions, 3D models, sprite sheet, data models, etc).	12B.5.2.2 Demonstrate the ability to create pseudo code.		
	12B.5.2.3 Demonstrate the ability to use iterative refinement in program development.		
Goal 6: Develop projects. **GLO 6.1:** Develop and test **prototypes**.			
		12C.6.1.1 Develop draft prototype (i.e., level screens, wire frames, comps). 12C.6.1.2 Test the draft prototype of the project under development.	12D.6.1.1 Develop and test their career portfolio.

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Goal 6: Develop projects. *(continued)*			
GLO 6.2: Create and incorporate **assets**.			
12A.6.2.1 Create a library of assets (i.e., databases, animated 2D assets, animated 3D assets, rigged objects, animated characters, videos, motion graphics, foley art, scores, special effects, digital paintings) to be used in a project under development.		12C.6.2.1 Create a library of assets (i.e., databases, animated 2D assets, animated 3D assets, rigged objects, animated characters, videos, motion graphics, foley art, scores, special effects, digital paintings) to be used in a project under development.	12D.6.2.1 Create a library of assets (i.e., databases, animated 2D assets, animated 3D assets, rigged objects, animated characters, videos, motion graphics, foley art, scores, special effects, digital paintings) to be used in a career portfolio.
GLO 6.3: Use **code** to solve problems.			
12A.6.3.1 Use code in asset development (i.e., actionscript, expressions, XML, SQL) for the project under development.	12B.6.3.1 Demonstrate understanding of variables. 12B.6.3.2 Demonstrate understanding of data types. 12B.6.3.3 Demonstrate understanding of syntax. 12B.6.3.4 Demonstrate the ability to document code using comments.	12C.6.3.1 Use code for the project under development (i.e., client website, app, game).	12D.6.3.1 ⟶

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Goal 6: Develop projects. *(continued)* **GLO 6.3:** Use **code** to solve problems. *(continued)*			
	12B.6.3.5 Demonstrate the ability to follow current programming conventions (i.e., naming, commenting, layout). 12B.6.3.6 Demonstrate the ability to use operators. 12B.6.3.7 Demonstrate the ability to use pre-existing objects. 12B.6.3.8 Demonstrate the ability to use pre-existing functions and methods. 12B.6.3.9 Demonstrate the ability to use branching or selection structures. 12B.6.3.10 Demonstrate the ability to use looping or repetition structures. 12B.6.3.11 Create and use programmer-defined functions. 12B.6.3.12 Create functions or procedures to respond to events. 12B.6.3.13 Demonstrate the ability to use a variety of debugging techniques to find and correct programming errors.		

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Goal 6: Develop projects. *(continued)* **GLO 6.3:** Use **code** to solve problems. *(continued)*			
	12B.6.3.14 Test code by using a variety of user inputs. 12B.6.3.15 Demonstrate the ability to use arrays. 12B.6.3.16 Harvest data from external sources (i.e., files, databases). 12B.6.3.17 Send data to external storage. 12B.6.3.18 Implement efficient modular programming techniques. 12B.6.3.19 Demonstrate the ability to use parameters and arguments to pass information. 12B.6.3.20 Demonstrate understanding of Object Oriented Programming (OOP). 12B.6.3.21 Demonstrate the ability to distinguish between an object and an instance of an object. 12B.6.3.22 Demonstrate the ability to create programmer-defined objects.		

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Goal 6: Develop projects. *(continued)*			
GLO 6.3: Use **code** to solve problems. *(continued)*			
	12B.6.3.23 Demonstrate the ability to create methods for instances of objects to communicate with each other. 12B.6.3.24 Demonstrate the ability to connect to a pre-existing database.		
GLO 6.4: Evaluate and incorporate **security features**.			
12A.6.4.1 Discuss potential security threats related to the theft and unauthorized use of assets. 12A.6.4.2 Create security features for assets (i.e., watermarking, copyrighting images, database security).	12B.6.4.1 Demonstrate the ability to incorporate current security procedures.	12C.6.4.1 Create security features for the project under development.	

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Goal 7: Publish, release or present, and assess projects.			
GLO 7.1: Publish, **release or present, and assess** projects.			
12A.7.1.1 Publish asset to file format suitable for project under development.		12C.7.1.1 Publish project to file format suitable for project under development.	
12A.7.1.2 Demonstrate the ability to present project.		12C.7.1.2 Demonstrate the ability to present project.	
12A.7.1.3 Demonstrate the ability to assess completed projects.		12C.7.1.3 Demonstrate the ability to implement project turnover to client.	
Goal 8: Describe and demonstrate the transferable **cross-curricular** knowledge and skills relevant to the interactive digital media industry.			
GLO 8.1: Read, interpret, **and communicate** information.			
12A.8.1.1 Incorporate story, plot, character development, and/or business requirements into asset development.		12C.8.1.1 Demonstrate the ability to develop project training resources for client.	
		12C.8.1.2 Demonstrate the ability to read, interpret, and communicate information to stakeholders.	

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Goal 9: Demonstrate awareness of **sustainability** as it pertains to interactive digital media development.			
GLO 9.1: Describe the interactive digital media design industry's **sustainability practices** and impact on the environment.			
12A.9.1.1 Discuss the lifespan of electronic devices, and its impact on electronic waste.	12B.9.1.1 ⟶	12C.9.1.1 ⟶	12D.9.1.1 ⟶
GLO 9.2: Describe the impact of **human sustainability** on the well-being of those employed in interactive digital media design and the users of their services.			
12A.9.2.1 Discuss concerns related to hyper-connectivity.			12D.9.2.1 Demonstrate awareness of the stresses related to staying current with new technologies.
GLO 9.3: Describe **sustainable business practices** within the interactive digital media design industry.			
12A.9.3.1 Define and discuss the concept of sustainable business practices.	12B.9.3.1 Demonstrate awareness of the need for businesses to create networks in order to promote their business.	12C.9.3.1 Discuss the types of business practices that promote the long-term viability of businesses such as those found in interactive digital media design.	12D.9.3.1 Discuss the types of business practices that promote the long-term viability of businesses such as those found in interactive digital media design.
12A.9.3.2 Demonstrate awareness of the purpose of marketing, and the need to keep it current.	12B.9.3.2 Demonstrate awareness of the need for entrepreneurs to keep their technology current.	12C.9.3.2 Demonstrate awareness of the ways that entrepreneurs can promote their business.	12D.9.3.2 Demonstrate how entrepreneurs can use their portfolios in order to develop a customer base.

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Goal 10: Demonstrate awareness of the **ethical and legal standards** as they pertain to interactive digital media design.			
GLO 10.1: Demonstrate awareness of the **ethical and legal standards** as they pertain to interactive digital media design.			
12A.10.1.1 Demonstrate understanding of, and comply with, licensing agreements.		12C.10.1.1 Ensure compliance with legal and professional obligations for the project under development.	
12A.10.1.2 Demonstrate understanding of, and comply with, copyright legislation as it pertains to digital assets.			
12A.10.1.3 Discuss the importance of reading terms and user agreements.			

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Goal 11: Demonstrate **employability skills**.			
GLO 11.1: Demonstrate **fundamental employability skills**.			
12A.11.1.1 Demonstrate regular and punctual attendance.	12B.11.1.1 →	12C.11.1.1 →	12D.11.1.1 →
12A.11.1.2 Demonstrate the ability to communicate respectfully and effectively with teachers, supervisors, co-workers, and students.	12B.11.1.2 →	12C.11.1.2 →	12D.11.1.2 →
12A.11.1.3 Demonstrate accountability by taking responsibility for their actions.	12B.11.1.3 →	12C.11.1.3 →	12C.11.1.3 →
12A.11.1.4 Demonstrate adaptability, initiative, and effort.	12B.11.1.4 →	12C.11.1.4 →	12D.11.1.4 →
12A.11.1.5 Demonstrate teamwork skills.	12B.11.1.5 →	12C.11.1.5 →	12D.11.1.5 →
12A.11.1.6 Demonstrate the ability to stay on task and effectively use time in class and work environments.	12B.11.1.6 →	12C.11.1.6 →	12D.11.1.6 →
12A.11.1.7 Demonstrate the responsible use of technology.	12B.11.1.7 →	12C.11.1.7 →	12D.11.1.7 →

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Goal 11: Demonstrate **employability skills**. *(continued)*			
GLO 11.2: Demonstrate awareness of **cultural proficiency**, and its importance in the workplace.			
12A.11.2.1 Discuss potentially sensitive or offensive images. 12A.11.2.2 Consider culture when creating or using assets (i.e., colours, symbols, gestures, imagery).			
GLO 11.3: Demonstrate understanding of the **business operation** of an interactive digital media design organization.			
			12D.11.3.1 Demonstrate the knowledge and skills required to start, organize, and maintain a business.
GLO 11.4: Demonstrate **critical thinking skills**.			
12A.11.4.1 Demonstrate critical thinking skills when solving problems.	12B.11.4.1 →	12C.11.4.1 →	12D.11.4.1 Demonstrate the critical thinking skills required to start, organize, and maintain a business.

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Goal 12: Demonstrate understanding of the **interactive digital media industry**.			
GLO 12.1: Demonstrate understanding of the **scope of the industry**.			
12A.12.1.1 Demonstrate understanding of scope of asset creation.			12D.12.1.1 Demonstrate the ability to research the scope of the local industry.
GLO 12.2: Demonstrate understanding of the **educational and career opportunities**, as well as **industry and professional associations**.			
12A.12.2.1 Discuss career and educational opportunities in asset creation.			12D.12.2.1 Collect and organize evidence of skills to create a portfolio to be used for gaining employment in the IT industry.
12A.12.2.2 Demonstrate awareness of professional associations and communities in asset creation.			12D.12.2.2 Develop a resume to be used for gaining employment in the IT industry.
			12D.12.2.3 Demonstrate how to use portfolios in order to develop a customer base.
		12C.12.2.1 Demonstrate the use of online marketing strategies (i.e., social media, SEO, viral marketing, crowd sourcing) to promote project under development.	12D.12.2.4 Demonstrate the use of online marketing strategies (i.e., social media, SEO, viral marketing, crowd sourcing) to promote self-employment opportunities.

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Goal 12: Demonstrate understanding of the **interactive digital media industry**. *(continued)* **GLO 12.3:** Demonstrate understanding of **working conditions** in interactive digital media.			
12A.12.3.1 Discuss the working conditions related to different occupations in interactive digital media.			
Goal 13: Demonstrate awareness of the **evolution, technological progression, and emerging trends** in interactive digital media. **GLO 13.1:** Describe the **history**, **technological progression**, and **emerging trends** in interactive digital media.			
12A.13.1.1 Discuss the history, technological progression, and emerging trends in asset creation.			12D.13.1.1 Demonstrate understanding of emerging trends in social media, and how these can be used to generate income from interactive digital media.

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