

Grade 1 Science

Grade 1

Cluster 1: Characteristics and Needs of Living Things

Overview

Students in Grade 1 are interested in a wide variety of living things found in their local environments as well as in those from afar. In this cluster, a study of living things provides opportunities for students to discover the many different forms life takes. Students observe similarities and differences among living things and develop an understanding of their general characteristics. As a result, students become aware that all living things, including themselves, have needs. They discover that living things can often have similar needs, but that particular needs may be unique to individual living things. While the emphasis is on shared characteristics and needs among living things, diversity is also recognized, including the variations that make each human unique.

PRESCRIBED LEARNING OUTCOMES

SUGGESTIONS FOR INSTRUCTION

Students will...

1-1-01 Use appropriate vocabulary related to their investigations of characteristics and needs of living things.

Include: characteristic, human, animal, plant, living things, needs, as well as descriptive words relating to life processes.

GLO: C6, D1

➤ Introduce, explain, use, and reinforce vocabulary throughout the cluster.

1-1-02 Identify major parts of the human body and describe their functions.

Examples: arms and legs for movement...

GLO: D1, E2

➤ **Human Body Parts**

Brainstorm a list of external body parts of human beings. Have students indicate the function of each body part.

Example:	Body Part	Function
	eyes	seeing
	2 legs	moving
	2 arms	carrying things

1-0-4f. Work in cooperative partnerships and groups. (ELA 5.2.1) GLO: C7

Teachers can use this opportunity to include and use words and phrases for body parts from a variety of languages such as Native languages (*Native Studies: Early Years (K-4)* p. 35).

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TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

This cluster focusses on the characteristics and needs of living things. Students should not undertake any extensive classifying of things as living and/or non-living. This could result in confusing complications around things that were “once living”; or may be considered as “living” by different cultures.

This cluster has strong links with *Native Studies: Early Years (K-4), Grade 1, Unit One*. Refer to this document for further instructional suggestions.

It is important that children be familiar with their own external body parts before beginning the comparison with other animals.

Teachers will need to show sensitivity to differently-abled and special-needs students.

Observation: “Show Me”

Work with small groups. Give the following instructions:

We are going to play a game called “Show Me.” I am going to give you a clue about one part of your body. I want you to point to that part on your body.

- This body part lets you see.
- This body part lets you touch or grab things.
- This body part lets you hear.
- This body part lets you eat, speak, and smile.
- This body part covers your whole body.
- This body part lets you walk.

Make a note of those students who are unsure or unable to identify the body part with its function.

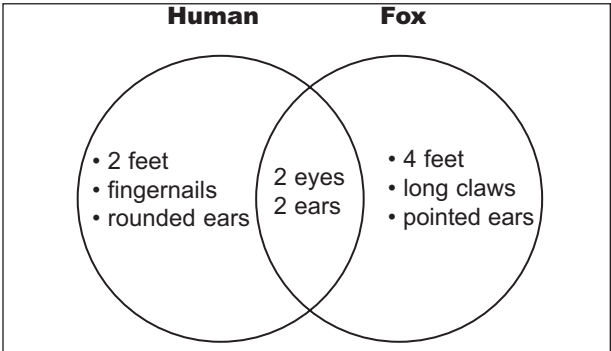
PRESCRIBED LEARNING OUTCOMES
<i>Students will...</i>

SUGGESTIONS FOR INSTRUCTION

- **Body Tracing**
 Have students work with partners to trace each other’s body outlines. Have them add body parts to the drawings that were not originally traced (e.g., ears, nose, mouth, fingers, hair, eyes, fingernails). Post the tracings and use a Gallery Walk (Brownlie and Close, 1992) to facilitate sharing. (*Gallery Walk* is outlined in *ELA, Strategies*, pp. 202-203.) Discuss the tracings, using the following questions for reflection:
 - What body parts did you trace?
 - What body parts did you not trace?
 - What can you add to your traced body to make it more like you really are?
 - What parts does everyone have?
- **Animal Observation**
 Provide a large picture of an animal for the whole class to study or provide copies of an animal picture for each student. Have students observe the animal closely to identify and discuss its body parts.
- **Animal Observation and Drawing**
 Have students draw an animal they have observed and have them label external body parts using cut-and-paste labels.

<p>1-1-03 Identify and describe common characteristics of humans and other animals they have observed. <i>Examples: number of limbs, eyes, ears, skin...</i> GLO: D1, E1</p> <p>1-1-04 Identify and appreciate variations that make each human unique. <i>Examples: eye colour, hair colour, body type...</i> GLO: C5, E1</p>

- **Animal/Human Comparison**
 Have students observe pictures of other animals and discuss the similarities between the external body parts of animals and humans. Use a Venn diagram to show the comparisons.



<p>1-0-5e. Record observations using drawings and tally charts. (ELA 4.1.2., 4.2.5; Math SP-II.1.1) GLO: C2, C6</p> <p>1-0-6c. Place materials and objects in a sequence or in groups using a single, given attribute or a single, self-determined attribute. (Math SP-IV.2.1) GLO: C2, C3, C5</p>
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- **Math Centre**
 Have students collect data related to human variations (e.g., eye colour, hair colour, etc.) Have them, with guidance, represent their data on a concrete object graph or pictograph.

TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

Children will benefit from observing a live animal, such as a classroom pet. See Appendix C for safety considerations related to pets in the classroom.

It is important to tell the children that when scientists make drawings, they try to make them look the same as the real animal, e.g., same colour and markings.

Paper and Pencil Task: Body Tracing

To assess knowledge of major body parts, have students draw a picture of themselves and attach the correct labels.

Draw a picture of yourself. Cut out the words below. Use them to label your picture.

leg	ear	arm	eye	skin
mouth	hand	nose	foot	

1. Drawing includes

- | | | | |
|-------------------------------|--------------------------------|-------------------------------|--|
| <input type="checkbox"/> legs | <input type="checkbox"/> mouth | <input type="checkbox"/> eyes | <input type="checkbox"/> other (fingers, eyebrows, toes, etc.) |
| <input type="checkbox"/> arms | <input type="checkbox"/> skin | <input type="checkbox"/> ears | |
| <input type="checkbox"/> feet | <input type="checkbox"/> hands | <input type="checkbox"/> nose | |

2. Correct labels are attached for

- | | | | |
|-------------------------------|--------------------------------|-------------------------------|--------------------------------|
| <input type="checkbox"/> leg | <input type="checkbox"/> mouth | <input type="checkbox"/> eye | <input type="checkbox"/> other |
| <input type="checkbox"/> arm | <input type="checkbox"/> skin | <input type="checkbox"/> ear | |
| <input type="checkbox"/> foot | <input type="checkbox"/> hand | <input type="checkbox"/> nose | |

PRESCRIBED LEARNING OUTCOMES

SUGGESTIONS FOR INSTRUCTION

Students will...

1-1-05 Recognize that plants, as living things, come in different forms.
Examples: grass, trees, shrubs...
GLO: D1, E1

1-0-4g. Verbalize questions and ideas during classroom learning experiences.
GLO: C6
1-0-6c. Place materials and objects in a sequence or in groups using a single, given attribute or a single, self-determined attribute. (Math SP-IV.2.1)
GLO: C2, C3, C5

1-1-06 Observe and identify similarities in life processes between themselves and other living things.
Examples: they eat, sleep, grow, and breathe, and so do other living things...
GLO: D1, E1

1-1-07 Recognize that plants, animals, and humans, as living things, have particular needs.
Examples: plants need sunlight and water...
GLO: D1

1-0-1a. Ask questions that lead to explorations of living things, objects, and events in the immediate environment. (ELA 3.1.2, 3.1.3)
GLO: A1, C2, C5

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➤ **Observing the Environment**
Take students on a walk to observe the plants in their neighbourhood. Provide each student with a collection bag and ask students to collect a variety of leaf samples. Limit the number of samples. Discuss and model respect for plants as living things (link to 1-1-14). After returning to the class, discuss the following questions:

- How many different kinds of plants did you observe?
- How can you group the different plants you found? (Encourage general categories such as grasses, trees, and shrubs.)

➤ **Sort and Classify Leaves**
Have students sort and classify the leaves that were collected; examples include: rounded leaves, pointed leaves, leaves with veins, smooth leaves, fragrant leaves. Encourage students to use smell and feel, as well as sight (link to Cluster 2: The Senses).
Extension: As a class, make an ABC Big Book of Plants. (A is for apple tree, B is for buttercup...)

➤ **Pet Observations**
Have students observe a live animal over the course of a week. Have them take turns being responsible for changing the water, feeding, and cleaning up after the pet. Emphasize respect for living things (link to 1-1-14 **Pet Rules!**). Use a class log book in which students record their observations and their care of the animal. Provide opportunities for students to observe the pet at different times of the day in order to allow them to observe the pet active, asleep, as well as eating and drinking.
Using a Sharing Circle, discuss observations of the pet, utilizing the following questions for reflection:

- What types of activities did the pet do during the day?
- How did you feel when you had the responsibility for caring for the pet?

(See Sharing Circle in *ELA, Strategies*, p. 106).

➤ **How Are We Like Our Pets?**
Use the Think, Pair, Share strategy (McTighe and Lyman, 1992) to have students discuss the similarities between a pet and themselves. Record responses using words and pictures.
Extension: If students have observed a mammal, have them observe another animal such as a fish, bird, reptile, insect or amphibian (see Think-Pair-Share/Think-Pair-Square in *ELA, Strategies*, pp. 15-16).

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TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

Students will benefit from seeing and handling plants of varying kinds and sizes, including both indoor and outdoor plants. Emphasize the variety in plants.

Caution: Check for plant allergies prior to bringing plants into the classroom. Many common house plants are poisonous if ingested, so select plants carefully.

Science Journal Entry: Leaves

Have students write or draw about the leaves that they collected and sorted.

Observing Leaves

I learned that leaves. . .

Expect some reference to shape (rounded, pointed); texture (smooth, soft, rough); smell; and structure (veins, no veins).

Students may say that leaves are living things, leaves come from different plants, etc.

Caution: Be sure to check for allergies before bringing a pet to the classroom.

If it is not possible to observe the activities of an animal in the classroom, students can observe their own pets or livestock at home. As an alternative, use books, videos, or multimedia resources.

PRESCRIBED LEARNING OUTCOMES

SUGGESTIONS FOR INSTRUCTION

Students will...

➤ **The Trip**

As a class, discuss what a family would need to take with them for a two-week stay at a cabin that is only accessible by boat. Tell the students that there is no electricity, running water, gas, or oil at the cabin. Everything they need has to be carried in with them. The students should brainstorm to decide what the family will take with them and provide reasons for choosing each item.

This activity is a variation of the Trapline Activity in *Native Studies: Early Years (K-4)* p. 41 and can be modified to suit local situations.

➤ **Plant Investigation: How Does It Grow?**

As the focus shifts from animals to plants, encourage students to ask questions about what plants need to survive. Keep a list of questions visible, and brainstorm ways to find answers to the questions. The following investigation can help students find some of the answers.

Use three plants of the same type and size. Measure the height of the three plants and record the information on an observation sheet. Put the first plant inside a box to block the sunlight but continue to water it once a week. Put the second plant in the sun but do not add water. Place the third plant in the sunlight and water it once a week. Keep a record of how the plants are doing as you focus on the learning outcomes that comprise this cluster. Observe the plants once a week and record observations in words and pictures. At the end of several weeks, review the observations and have students record in their science journals what they learned.

1-1-08 Describe what is needed to care for a pet, a farm animal, or an indoor plant.

Examples: provide fresh water for their hamster daily, feed and bed calves regularly...

GLO: B4, B5

➤ **“How to” Illustrations**

Have students work with partners to identify the basic needs and the care required for pets, indoor plants, and humans. Have students cut and paste or draw pictures as well as write words and phrases to illustrate the basic needs and care required for these living things.

1-0-7d. Connect new experiences and information with prior knowledge.

(ELA 1.2.1)

GLO: A2

TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

A discussion about the differences between needs and wants should emerge from this learning experience. It is important for students to be able to identify the basic things they need to survive and how, in this respect, they are no different from any other living thing.

It is not easy for students to recognize the life processes and needs of plants. The suggestions given are meant to highlight a plant's need for water and light. A more detailed study of plants occurs in Grade 3.

Have students use Blackline Master 1: Scientific Inquiry Recording Sheet: Grades 1 and 2.

Performance Assessment: "How to" Illustrations

Say to students: Imagine that you are getting a dog for a pet. What do you need for your dog? How will you care for your dog? Explain, using pictures and words.

Scoring Rubric

Note: Explanations may include pictures and/or words.

- 4 solid understanding of the needs of living things; four basic needs (food, water, air, and shelter) identified; clear and complete explanation
- 3 good understanding of the needs of living things; three basic needs identified; clear explanation
- 2 basic understanding of the needs of living things; two basic needs identified; explanation may or may not be clear
- 1 limited understanding of the needs of living things; one basic need identified; explanation unclear or incomplete

PRESCRIBED LEARNING OUTCOMES
<i>Students will...</i>
<p>1-1-09 Compare ways in which humans and other animals meet their needs. <i>Examples: senses, locomotion, tools...</i> GLO: C2, D1, E1</p> <p>1-1-10 Describe how humans and other living things depend on their environment to meet their needs. <i>Examples: the environment provides humans and other living things with food...</i> GLO: D2, E2</p>
<p>1-0-2a. Access information using a variety of sources. <i>Examples: picture and concept books, people, excursions, camps, CD-ROMs...</i> (ELA 3.2.2, Math SP-II.1.1, TFS 2.1.1) GLO: C6</p> <p>1-0-6c. Place materials and objects in a sequence or in groups using a single, given attribute or a single, self-determined attribute. (Math SP-IV.2.1) GLO: C2, C3, C5</p> <p>1-0-9b. Willingly observe, question, and explore. GLO: C5</p>
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SUGGESTIONS FOR INSTRUCTION

➤ **Picture Sort**

Have students work with a partner to sort a variety of animal pictures according to specified categories. Include categories such as how animals move, the foods animals eat, how animals get their food, and where animals live. Have students discuss their picture sort and observe how others sorted their pictures.

➤ **Science Centre Matching Game**

Animals move in different ways within their habitats in order to capture food or to escape from their enemies. Set up a matching game at the Science Centre in which students match the feet or footprints of different animals with the actual animal. Be sure to include webbed feet, split hooves, talons, and claws. Discuss student findings using the following questions for reflection:

- Where might these animals live?
- Which animals would be the best swimmers? Why?
- Which feet might be good for climbing? Why?
- How do an animal’s feet help it to survive in its environment?

➤ **Investigation — Meeting Needs**

Have students work with partners to answer questions and identify ways in which humans and other animals meet their needs through their environments. Encourage students to record what they already know about the topic before they read or view texts, videos, or CD-ROMs to get additional information.

Questions to guide the investigation could include the following:

- Which senses do animals use to meet their needs?
- How do animals move to obtain their food?

Example: How Senses Are Used to Meet Needs

<u>Animal</u>	<u>What I Know</u>	<u>What I Found out</u>
rabbit	uses eyes to look for food	uses smell
hawk	uses ears to listen for food	uses sight
bat	uses ears to listen for food	uses hearing and echolocation

➤ **Ten Key Questions**

Give one student a picture of an animal. Have the other students ask questions that can be answered with yes or no about how the animal meets its needs.

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TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

Student Interviews: Meeting Needs

For this assessment activity gather the following materials:

- a picture of a person
- a picture of a mammal
- a picture of a different animal (bird, fish, etc.)

Ask individual students the following questions. Record their responses. Note any misconceptions they may have.

1. What are the basic needs of all living things?
 food water air shelter
2. How does a person meet his/her needs? (Use the picture of the person.)
How does the person get food? water? air? shelter?
3. How does this animal meet its needs? (Use the picture of the mammal.)
How does it get food? water? air? shelter?
4. How does this animal meet its needs? (Use the picture of a different animal.)
How does it get food? water? air? shelter?
5. How do senses help animals and humans meet their needs?

PRESCRIBED LEARNING OUTCOMES

SUGGESTIONS FOR INSTRUCTION

Students will...

➤ **Humans in the Environment**

“Physical needs are universal. Native people met and continue to meet these physical survival needs in a variety of ways. The Elders play an important role in providing understanding about survival” (see *Native Studies: Early Years (K-4)*).

Have students research and share traditional stories that illustrate the interdependence between Native cultures and the environment. Invite a storyteller to visit the class, or view First Nations’ art objects and images that show this interdependency.

➤ **Our Community**

Have students identify how people in their community depend on the environment. Have students discuss where they get their food.

1-1-11 Design a representation of an environment that meets the needs of a Manitoba animal.
Examples: a model, a diagram
GLO: C3, D1

➤ **Designing an Environment**

Set the context by saying to the class: “We have discovered that every animal in Manitoba has basic needs that include air, food, and water as well as shelter from the weather in order to survive. Today we are going to design a three-dimensional environment for a Manitoba animal that meets that animal’s needs.” The following is one approach to designing an environment that could be taken with students.

- 1-0-1c.** Recognize a practical problem in a given context. GLO: C3
- 1-0-3a.** Brainstorm, with the class, possible solutions to a practical problem, and reach consensus on a solution to implement. (ELA 1.1.3, 3.1.3) GLO: C3, C7
- 1-0-3b.** Create, with the class, a plan to solve a problem or meet a need. Include: identify simple steps to follow. (ELA 1.2.3) GLO: C3, C7
- 1-0-3c.** Develop, as a class, limited criteria to evaluate an object or device based on its function. GLO: C3, C7
- 1-0-3d.** Identify materials to be used, and explain their choices. GLO: C2, C3, C4
- 1-0-4b.** Construct an object or device to solve a problem or meet a need. GLO: C3
- 1-0-4d.** Identify and make improvements to an object or device with respect to pre-determined criteria. GLO: C3
- 1-0-7b.** Propose a solution to the initial problem. GLO: C3
- 1-0-7c.** Identify new problems that arise. GLO: C3

- ❶ Brainstorm and chart different Manitoba animals.
- ❷ As a class, develop criteria for evaluating the final product such as
 - provides for the basic needs of food, water, shelter
 - looks visually appealing
 - uses the materials provided
- ❸ As a class, discuss the general plan for completing this project.
- ❹ Working in cooperative groups, have each group choose an animal and begin their research using a variety of information sources such as library books, CD-ROMs, Internet...
- ❺ Have students draw a simple plan for their environment.
- ❻ Have students construct their environment based on the plans they drew.
- ❼ Have students use the criteria identified to evaluate their finished product and suggest improvements.

Have students use Blackline Master 3: Design Process Recording Sheet: Grades 1 and 2.

TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

Depending on the type of community, different environments as sources for food can be highlighted, e.g., farming, fishing, and hunting locales. Students in urban locales can discuss the role of the supermarket in providing a link between the farmer and the shopper.

The materials made available to students can help define the parameters of this learning experience. Part of the criteria could be the use of a specific set or quantity of materials. This can make classroom management of materials easier and limit decisions that students are required to make. For some students at this level, an unlimited choice of materials is overwhelming.

Teachers may have students do all of the planning for the environmental dioramas or models at school and then have students do their construction at home. Upon completion, the projects could be presented to the class.

The criteria for evaluating the final design product must be developed with the students. The science-related criteria (e.g., meeting all of the animal's basic needs) will be provided by the teacher, but the majority of the other criteria should be identified by the students.

Observation Checklist: Designing an Environment

During the process of designing a representation of an environment look for evidence of the following:
















- takes part in brainstorming solutions
- helps to create a plan
- helps to develop criteria
- uses a variety of resources to gather information
- constructs the representation
- tests the representation with the criteria established
- explains the design to the class

Group Assessment: Designing an Environment

Create a list of questions with icons, such as the ones below. Have each student assess her/his group's work. (Teachers may choose to read these items to students)

How did we work as a group?

Colour the face that shows how you feel.

- | | | | |
|---|---|---|---|
| We worked cooperatively. |  |  |  |
| We shared materials and ideas. |  |  |  |
| Everyone did his/her share of the work. |  |  |  |
| We took turns. |  |  |  |
| We listened to each other. |  |  |  |

PRESCRIBED LEARNING OUTCOMES	SUGGESTIONS FOR INSTRUCTION
<p><i>Students will...</i></p>	
<p>1-1-12 Identify hobbies and jobs that require knowledge of the needs of living things.</p> <p><i>Examples: gardeners, nurses, zookeepers...</i></p> <p>GLO: B4, B5</p>	<p>➤ Field Trip</p> <p>Take students on field trips to places such as a market garden, a veterinary clinic, a hospital, or a zoo. Have students look for examples of how people in that environment use their knowledge of the needs of living things to care for the plants, animals, or people in their charge (see Field Trips, <i>ELA, Grade 1</i>, p. 166).</p>
<p>1-0-2a. Access information using a variety of sources. <i>Examples: picture and concept books, people, excursions, camps, CD-ROMs...</i> (ELA 3.2.2, Math SP-II.1.1, TFS 2.1.1) GLO: C6</p>	<p>➤ Guest Presenter</p> <p>Invite students’ parents to talk about jobs or hobbies related to living things. Parents are a valuable resource and most parents are willing to share their knowledge with students.</p>
<p>1-1-13 Develop, implement, and evaluate personal and group action plans that contribute to a healthy environment for themselves and for other living things.</p> <p><i>Examples: wash hands before eating, reduce amount of waste produced by the class...</i></p> <p>GLO: B3, B5, C4, C7</p>	<p>➤ What Can I Do? Individual Weekly Planner</p> <p>As a class, brainstorm actions that students can do individually, each day, throughout the coming week to help themselves and other living things stay healthy. Record their actions on a daily plan using words and/or pictures. Plans could include the following ideas:</p> <ul style="list-style-type: none"> • not littering when travelling to and from school (or taking one day to pick up the litter they encounter) • selecting healthy snacks • bringing a lunch packaged in reusable materials
<p>1-0-3a. Brainstorm, with the class, possible solutions to a practical problem, and reach consensus on a solution to implement. (ELA 1.1.3, 3.1.3) GLO: C3, C7</p> <p>1-0-3b. Create, with the class, a plan to solve a problem or meet a need. Include: identify simple steps to follow. (ELA 1.2.3) GLO: C3, C7</p> <p>1-0-9a. Willingly consider other people’s views. GLO: C5, C7</p>	<p>➤ What Can We Do? Class Project</p> <p>As a class, develop and implement a project that would help students and other living things stay healthy (link to 1.12: Guest Presenter for a health perspective). Projects could include the following ideas:</p> <ul style="list-style-type: none"> • reducing the amount of classroom waste produced • cleaning up a local playground, park, or other area of the community
<p>1-1-14 Show respect for living things in their immediate environment.</p> <p><i>Examples: handling the class gerbil with care...</i></p> <p>GLO: B5</p>	<p>➤ Pet Rules!</p> <p>Develop, with the class, a set of rules for handling the classroom or school pet. Discuss the importance of each rule (link to 1.06: Pet Observations). Have students make posters to illustrate the rules. Post the rules near the pet.</p>

TEACHER NOTES	SUGGESTIONS FOR ASSESSMENT
<p>Note: parents refers to parents or guardians.</p>	
<p>Students at this level may not be familiar with the effects of their actions on the environment, themselves, and on other living things. It is important to limit the scope of the action plans to things that are within the realm of possibility for them.</p>	
<p>This attitudinal outcome can be addressed throughout this cluster with teachers modelling respectful behaviour towards living things and expecting this of students.</p>	

PRESCRIBED LEARNING OUTCOMES

Students will...

1-1-15 Recognize that some information they receive about living things is not scientific in nature.
Examples: movie animals talking, Jack’s beanstalk growing to the sky...
 GLO: A1, C5, C8

1-0-2b. Recognize when information answers the questions asked.
 (ELA 3.2.3, 3.2.5)
 GLO: C6, C8

1-0-7d. Connect new experiences and information with prior knowledge.
 (ELA 1.2.1)
 GLO: A2

1-0-7e. Describe, in a variety of ways, what was done and what was observed.
Examples: concrete materials, drawings, oral language...
 (ELA 4.1.2, 4.1.3) GLO: C6

SUGGESTIONS FOR INSTRUCTION

➤ **Fact or Fiction**

Read some traditional folk tales such as *The Three Little Pigs*, *Little Red Riding Hood*, or *Jack and the Beanstalk*. Have students list information from the story they believe is not factual, based on their experiences and knowledge of living things. For any areas they are unsure of, students should check the information in a non-fiction resource.

Example: *The Three Little Pigs:*

- Pigs do not build homes.
- Pigs cannot talk.
- Wolves cannot talk.
- Pigs do not cook supper.

➤ **Partner Reading**

Have partners read other fictional stories about living things and make lists of things in the stories that are science facts. Use a Sharing Circle to have students share science facts they have discovered and explain how these may have added to the story.

TEACHER NOTES

SUGGESTIONS FOR ASSESSMENT

It is important for students to begin developing the ability to discern fact from fiction. This should not lessen their enjoyment of fictional literature, movies, etc., but should ensure that misconceptions are avoided whenever possible.

NOTES