



Comprehensive Curriculum

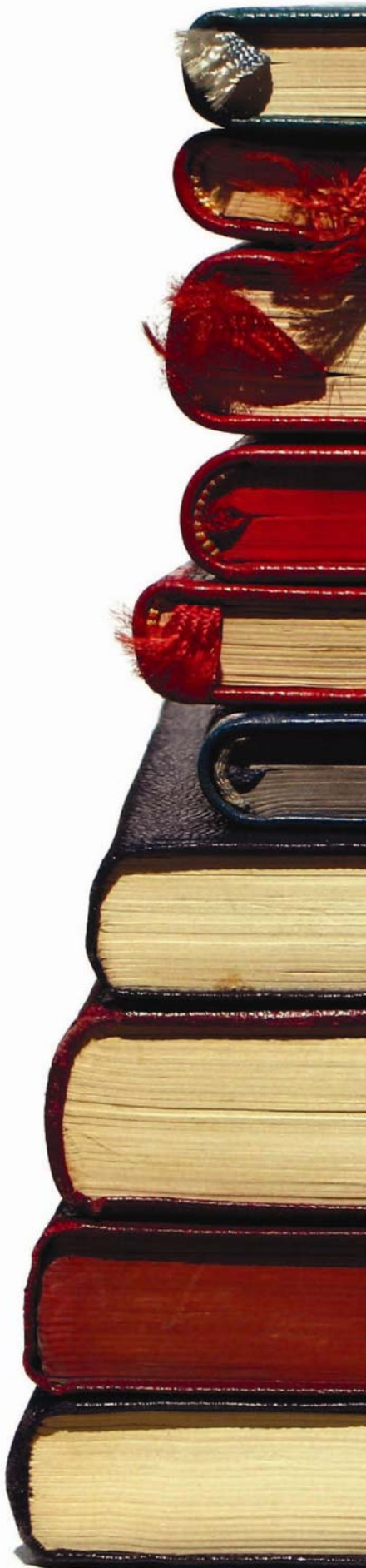
Revised 2008

Kindergarten Science



Louisiana Department of
EDUCATION

Paul G. Pastorek, State Superintendent of Education



**Kindergarten
Science**

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Louisiana Comprehensive Curriculum, Revised 2008 **Course Introduction**

The Louisiana Department of Education issued the *Comprehensive Curriculum* in 2005. The curriculum has been revised based on teacher feedback, an external review by a team of content experts from outside the state, and input from course writers. As in the first edition, the *Louisiana Comprehensive Curriculum*, revised 2008 is aligned with state content standards, as defined by Grade-Level Expectations (GLEs), and organized into coherent, time-bound units with sample activities and classroom assessments to guide teaching and learning. The order of the units ensures that all GLEs to be tested are addressed prior to the administration of *iLEAP* assessments.

District Implementation Guidelines

Local districts are responsible for implementation and monitoring of the *Louisiana Comprehensive Curriculum* and have been delegated the responsibility to decide if

- units are to be taught in the order presented
- substitutions of equivalent activities are allowed
- GLEs can be adequately addressed using fewer activities than presented
- permitted changes are to be made at the district, school, or teacher level

Districts have been requested to inform teachers of decisions made.

Implementation of Activities in the Classroom

Incorporation of activities into lesson plans is critical to the successful implementation of the Louisiana Comprehensive Curriculum. Lesson plans should be designed to introduce students to one or more of the activities, to provide background information and follow-up, and to prepare students for success in mastering the Grade-Level Expectations associated with the activities. Lesson plans should address individual needs of students and should include processes for re-teaching concepts or skills for students who need additional instruction. Appropriate accommodations must be made for students with disabilities.

New Features

Content Area Literacy Strategies are an integral part of approximately one-third of the activities. Strategy names are italicized. The link ([view literacy strategy descriptions](#)) opens a document containing detailed descriptions and examples of the literacy strategies. This document can also be accessed directly at <http://www.louisianaschools.net/1de/uploads/11056.doc>.

A *Materials List* is provided for each activity and *Blackline Masters (BLMs)* are provided to assist in the delivery of activities or to assess student learning. A separate Blackline Master document is provided for each course.

The *Access Guide to the Comprehensive Curriculum* is an online database of suggested strategies, accommodations, assistive technology, and assessment options that may provide greater access to the curriculum activities. The *Access Guide* will be piloted during the 2008-2009 school year in Grades 4 and 8, with other grades to be added over time. Click on the *Access Guide* icon found on the first page of each unit or by going directly to the url <http://mconn.doe.state.la.us/accessguide/default.aspx>.



**Kindergarten
Science
Unit 1: Describing Objects: Using the Five Senses**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit focuses on the use of the five senses to develop a heightened awareness of the world. Skill development is centered on observing, describing and classifying objects.

Student Understandings

Students use their senses to describe objects and identify common properties (red ball, red block, round clock, round wheel). Throughout the year, students develop more refined methods of observation, the ability to make more detailed descriptions and an increasing ability to differentiate among similar objects on the basis of one, and then multiple, characteristics. Describing objects involve making measurements of various properties and comparing them to other reference points (e.g., a color chart). Scientific observations using the five senses are encouraged during the year through simple exploration experiments.

Guiding Questions

1. Can students name the sense organ used for hearing?
2. Can students name common sounds that they hear?
3. Can students differentiate sounds? Can the students name some loud sounds?
Quiet sounds?
4. Can students name the sense organ they use for smell?
5. Can students name some good and bad smells they know?
6. Can students match pairs of smelly jars?
7. Can students name what sense organ they usually use for touching?
8. Can students name what sense organs are used for sight?
9. Can students name what senses they use to guess what is inside a box?
10. Can students name what sense organ they use for taste?
11. Can students name some foods that taste bad or good to them?
12. Can students identify “mystery foods” by taste?

Unit 1 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Science as Inquiry	
2.	Pose questions that can be answered by using student's own observations and scientific knowledge (SI-E-A1)
3.	Predict and anticipate possible outcomes (SI-E-A2)
4.	Use the five senses to describe observations (SI-E-A3)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
Physical Science	
9.	Identify and use appropriate safety procedures and equipment when conducting investigations (e.g., gloves, goggles, hair ties) (SI-E-A7)
10.	Recognize that a variety of tools can be used to examine objects at different degrees of magnification (e.g., hand lens, microscope) (SI-E-B3)
11.	Identify objects by using the senses (PS-E-A1)
13.	Sort objects based on their properties (e.g., size, weight, texture) (PS-E-A1)
19.	Demonstrate and identify sounds as <i>soft</i> or <i>loud</i> (PS-E-C1)
Life Science	
25.	Identify easily observable variations within types of plants and animals (e.g. features of classmates, varieties of trees, breeds of dogs) (LS-E-A4)

Safety Note: Activities in this unit will involve using the five senses to explore items. Allergic reactions to food or sensitivities to certain scents are an important concern with activities to be presented. For the health and safety of all students, parental input should be acquired before activities are taught. Teachers need to be aware of different allergic reactions for all students participating. If a student is identified as being allergic to certain items, then accommodations need to be made when planning activities. See Parental Response for Student Participation BLM.

Sample Activities**Activity 1: Safety Contract (GLEs: 7, 9)**

Materials: display board, writing media, chart paper

Using a modified *Student Questions for Purposeful Learning (SQPL)* strategy ([view literacy strategy descriptions](#)) the students will generate a list of safety procedures for science labs. This strategy uses a teacher-generated statement to cause students to wonder, challenge, or question. The statement does not have to be factually true as long as it causes students to think about safety procedures. The following statement or similar statement should be written on the board or on chart paper for student discussion:

Safety is only important when we are playing on the playground.

Have students respond to the statement. Record their responses on chart paper. Repeat the statement as needed to help generate responses. As students respond, record the comments on chart paper. Facilitate a discussion about each of the comments. Reinforce accurate comments and clarify inaccurate comments. Following the discussion, explain to students that the class will create a safety contract. Using the previous discussion, develop a chart on practicing safe science. Refer to this chart throughout the year.

Some examples of safety statements you might develop together are

- Listen to directions before beginning an experiment.
- Keep hand away from face when working.
- Demonstrate responsibility when using materials.

Explain to the students that different rules apply to different situations. Before every investigation or experiment, science safety requirements should be discussed. Add rules to chart as necessary. Students can then sign their name on the chart to show ownership.

Activity 2: Exploring Our Five Senses (GLEs: 4, 11)

Materials List: video clip, computer, television or projector for enhanced viewing, if available, container for students to explore, items for the container

Brainstorm the topic: The Five Senses. Generate ideas and experiences related to the topic. Following the discussion, view the video clip from Unitedstreaming entitled, *The Fabulous Five: Our Senses* or another appropriate video.

www.lpb.org/cyberchannel – This fee based resource is provided by LPB Cyberchannel. Check with your individual school district for availability.

Topic Understanding: Following the clip, explore the student's understanding of the video through a class discussion asking probing questions when necessary to generate discussions and clear up any misconceptions. Some sample questions that could be explored are

- What are the five senses?
- What parts of the body are used for each sense?
- What can the senses help humans do?
- How can we explore using each sense?

Alternative Activity: If the use of a video clip is not an option, there are other resources available that offer teaching information about the senses. The following Web sites are resources to help develop these concepts:

- The Senses: <http://faculty.washington.edu/chudler/chsense.html> - Teacher resources with additional links as well as activities to explore how we learn about the world around us: smell, taste, touch, see and hear.
- The Five Senses: <http://freda.auyeung.net/5senses/> - Teacher resource to explain background knowledge about how each sense works.

Prepare some type of container for students to explore using their five senses. Use a few readily available items to put in the container for discovery. The items to include in the container could be some type of food that is edible and able to accommodate all of the senses, fragrant candles, hand lotions that smell, a holiday noise maker, etc. Using the container, have students select an object and reflect on using each of the five senses to describe it. Have them answer these simple questions:

- How does it look?
- How does it smell?
- How does it feel?
- How does it taste?
- How does it sound?
- What is the item?

Provide each student a turn to answer at least one question about an item.

Activity 3: Sound Cans (GLEs: 4, 7, 9, 11, 19)

Materials List: film canisters or small plastic containers, common objects for sound canisters, tape, Softest to Loudest BLM, Mystery Canister Alphabet BLM, markers, pictures of items

**Safety Note: To better secure the lids on the canisters seal with strong tape. Discuss using tape as a safety precaution.*

Students will observe and compare common objects using their sense of hearing. Select objects from the classroom that will fit in film canisters or small plastic containers if canisters are unavailable. Suggested items include pencil erasers, paper clips, buttons, marbles, small pieces of chalk, small pieces of paper, push pins, toothpicks, pennies, sand, rice, dried beans, small pebbles, etc. Put two pieces in each canister and snap on lids. See *safety note* above.

Label the lid of each canister with a letter of the alphabet. Show the students how to shake the canisters. Explain that it is important to shake the canisters in the same way and at the same speed.

Divide students into small groups. Give each group a Softest to Loudest BLM sound graph and a set of canisters. **Be sure to caution students against opening the canisters.* Have the students shake their canisters and listen to the sounds. Ask students to compare the loudness of the sounds the canisters make. Instruct each group to order their canisters by placing them on the graph from softest to loudest. Have them then record their

findings on the chart by using the markers to write the letter of the canisters in the appropriate space on the chart. When each group has had a chance to order the canisters, invite students to share how they made their decisions. Observe how students listen to and compare sounds and how they explain what they did to put them in order.

Have the groups shake each canister and invite students to guess and record, through illustrations, what's inside using the Mystery Canister Alphabet Graph BLM.

Have students explain how they decided what was in the canister. Then open the canister and show what made the sound.

Using pictures of the objects in the sound cans, have students refer to their earlier-developed graphs to construct a large whole-class Softest to Loudest BLM of sounds from softest to loudest. Display the graph for further reference as students explore additional experiences using their five senses.

This learning experience should be placed in the discovery area, perhaps with different sound canisters for additional exploration.

Next, take a listening walk around school to search for different environmental sounds. Upon returning to class, compile a list of the various sounds heard on the walk. Examples of sounds heard could include children talking, birds singing, bells ringing, dogs barking, cars passing, insects buzzing, leaves rustling and wind blowing, clocks ticking, water running, etc.

The teacher should also note that people who exhibit difficulty hearing are hearing impaired and can sometimes get assistance with the use of hearing aids or other devices.

See these readily available resources to explore the sense of sound:

- **Book:**
 - Showers, Paul. *The Listening Walk*. HarperCollins Publishers.
- **Interactive Sound Websites:**
 - “Monkey Juggle” – Explores sound by clicking on the correct the banana.
<http://www.brainconnection.com/teasers/?main=sd/monkey>
 - “Phonic Segments HayLoft “-_Sound matching activity
http://www.professorgarfield.org/Phonemics/hay_loft/hay_loft.html
 - “Sound Match Game” - exploring sounds with pictures
<http://faculty.washington.edu/chudler/flash/sounds.html>

Activity 4: Smelly Jars (GLEs: 4, 7, 11, 13)

Materials List: common strong smelling substances, film canisters or small plastic containers with holes in lids, tape, cotton balls, Mystery Canister BLM, writing media, pictures of items in smelly jars, chart paper, writing media

Safety Note: Know and consider allergies to any substances by any student. Make sure the Parental Response for Student Participation BLM is on hand for all students participating. In the activity, demonstrate the wafting procedure to smell the odor and discuss safety precautions.

Students will observe and compare common objects, using the sense of smell. Punch small holes in the top of a film canister or small plastic containers if canisters are unavailable. To better seal the lids on the canisters, seal with strong tape. Select a variety of strong-smelling scents. Suggested scents include after-shave lotion, peppermint extract, almond extract, perfume, cinnamon, chocolate, vanilla extract, onion, coffee, vinegar, etc. Prepare pairs of matching smell bottles by dabbing cotton balls into small amounts of the selected scents and placing the cotton balls in the film canisters. See *safety note* above.

Have the students smell each canister, matching two canisters that smell the same. Have students explain how they decided what was in the canister.

Next, have the students smell each set and invite the children to guess the contents. Have the students illustrate their guesses using the Mystery Canister BLM.

Through whole group discussions, display pictures of objects in smelly jars to have students confirm their guesses. Note how children describe their process. Place this activity in the discovery area for additional exploration, perhaps with different scents. Bring in real life experiences by having children recall some good and bad smells they have experienced. Record their responses and post in the class for future reference.

Activity 5: Mystery Feely Boxes (GLEs: 4, 7, 11, 13)

Material List: assorted items to feel (2 of each), Mystery Feely Box (shoe box and scissors), Identifying Venn Diagram BLM, brainstorming chart paper, writing media

The teacher prepares a Mystery Feely Box. Using a shoe box, cut holes in two opposite sides large leaving enough room for students to insert their hands. Cut a third, larger hole in the back, large enough for a second student to put pieces of fabric or classroom objects into the box.

Students begin this activity with a discussion of how things feel. With assorted fabric and objects, students touch them and orally describe how they feel. The class will organize their thoughts formally by *brainstorming* ([view literacy strategy descriptions](#)) ways in

which items could be described. They will co-construct a graphic organizer using pictures or words to become familiar with vocabulary of describing words for different textures. Some examples of describing words might include *hard, soft, smooth, rough, bumpy, silky, shaggy, slippery, solid, holey, sticky, wet, dry, greasy, hot, cold*, etc.

The teacher puts a set of five fabrics or classroom objects in the Mystery Feely Box with an identical matching set of fabrics or classroom objects on the table. Have the students match the fabrics or objects in the mystery box to the items displayed on the table.

Ask students to explain how they were able to tell the fabrics or objects apart, encouraging the use of words identified earlier. In whole group, using the *graphic organizer* ([view literacy strategy descriptions](#)) strategy in the form of the Identifying Venn diagram BLM, have the student identify which fabrics or objects were easy, tricky or more difficult to tell apart.

Activity 6: Take a Closer Look (GLEs: 4, 7, 10, 11, 13, 25)

Material List: objects to explore, magnifying glasses, Alike and Different T Chart BLM, markers

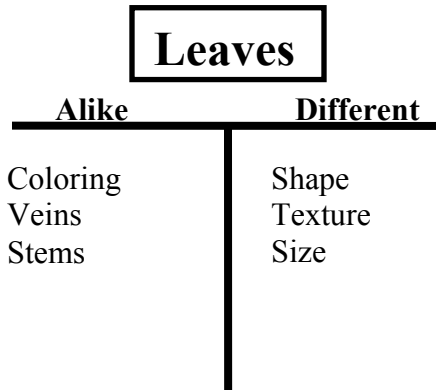
Safety Note: Remind students of safe and appropriate use of magnifying lenses.

The class then will take a “Closer Look” walk to observe and collect objects outside the building to include two different types of each object such as leaves, rocks, flowers, tree bark, shells, plants, stems, trees, grass, bugs, etc. to explore variations among species or varieties. On the walk, students observe objects as the teacher questions and prompts them to find two of the same object to compare and contrast.

Some guiding questions might include the following:

- How does it feel?
- How does it look?
- How does it smell?
- How are these alike?
- How are these different?

Upon returning, the class then sorts similar items and develops a class *graphic organizer* ([view literacy strategy descriptions](#)) using the Alike and Different T Chart BLM on how each set of items are alike and how they are different. Students explain what makes the objects look alike. Students observe details and attributes. Students then use magnifying lenses to examine items up close. One example that could be developed follows:



As students engage in these activities, the teacher makes notes of vocabulary terms used, concepts mastered, and high level questions that students asked.

The teacher should also note that people who exhibit difficulty seeing are visually impaired and can sometimes get assistance with the use of glasses or contact lenses.

Activity 7: Taste Test (GLEs: 2, 3, 4, 13)

Material List: tasting foods, spoons, plates, Taste Word Grid BLM, food pictures, food word cards, chart paper, writing media

Safety Note: Activities involving tasting should be well planned and supervised for safety, health, and optimum learning by all students. Care must be taken in this activity to warn students that they should NOT eat anything that an adult they trust has not approved. Emphasize that eating some familiar, as well as strange, things could make them very sick. Make sure the Parental Response for Student Participation BLM is on hand for all students participating.

Introduce this activity as a test for the students' noses (smelling) and tongues (tasting). Discuss how these two senses work closely together and how they are both compromised through illnesses such as allergies or having cold symptoms. Working in a small group, have several foods prepared in covered containers so the students do not recognize them. Use common salty, sweet, bitter, and sour foods; avoid apprehension or surprise by telling the students what foods to expect (unsweetened chocolate, pudding, cookies, pickles, lemons, popcorn, pretzels, crackers, etc.). Do not use nuts as some children are highly allergic to these foods. Students close their eyes to taste one food at a time that you put on his/her individual spoon. Once handed the spoon, students may smell, touch, and taste (eat) the food. After all the students have tasted the food, the students will discuss the food and proceed to predict the name of the food tasted. They will then discuss the food, using descriptive words that correspond to the taste. After they identify the food, create a *word grid* ([view literacy strategy descriptions](#)) using foods and their tastes. Write distinctive food tastes on the vertical dimension of a large word grid on a chart paper. Supply words along the horizontal dimension that are descriptive of tastes. With student participation, fill in the word grid by placing a \surd in the space corresponding

to the taste that the food possesses. Using new, clean, plastic spoons, repeat this process with the next foods. Students are encouraged to discuss the different tastes, textures, and smells and ways they identified one food from others. Students will then transfer this information to the Taste Word Grid BLM using simple words and pictures.

Example Word Grid:

Foods	Salty	Sweet	Bitter	Sour
Crackers	√			
Pudding		√		
Pretzels	√			
Chocolate			√	
Lemons				√
Popcorn	√			
Cookies		√		
Pickles				√

This word grid should be displayed in the room for future reference. Bring in real life experiences by having children recall some good and bad tastes they have experienced in the past. Record their responses and post in the class for reference. Students should be encouraged to explore additional foods throughout the year, using the vocabulary explored in describing food tastes. When doing this activity early in the year, using a few foods is best. Later in the year, after they are experienced with the investigative process, the students will be able to compare and describe items more fully. Teacher will record knowledge levels, vocabulary used, questions developed, and any misconceptions that arise, carefully correcting those when needed.

Activity 8: Coming To Our Senses (GLEs: 2, 3, 4, 7, 9)

Material List: unpopped popcorn, hot air popcorn popper, bowl, paper plates, chart paper, writing media

Safety Note: Remind students of safety when around hot appliances and foods. Supervision using hot appliances and food items is necessary at all times.

Ask students to recall items they can hear, see, smell, touch, and taste. Facilitate a brainstorm exercise for additional examples.

Using the modified *story chain* ([view literacy strategy descriptions](#)) the teacher will introduce statements to help develop an understanding of using the five senses in everyday life. Writing out the story provides students a reflection of their understanding. This is reinforced as students attempt to answer the statements. On a sheet of chart paper, record student responses to complete the story chain. Responses are open to class

discussion and could be revised based on student input. The students will orally build upon these statements:

- If I had unpopped popcorn, I would . . .
- When popcorn cooks, it sounds like . . .
- When popcorn cooks, it smells like . . .
- When popcorn cooks, it looks like . . .
- When touching cooked popcorn, it feels like . . .
- Popcorn tastes like . . .

Place this class-developed *story chain* in the reading corner to be explored by children throughout the year.

Lead a discussion about safety rules to follow around a popcorn popper or electrical appliances. Have students complete the statement about different scenarios while using appliances. Some example scenarios could include the following:

- If I were using an extension cord here and you got up . . .
- If the appliance started to smoke . . .
- If the appliance was hot . . .

The students then participate in popping popcorn, comparing and expanding the story chain developed earlier. The students are to discuss the sensory characteristics of popping popcorn as they participate in the actual act of viewing popcorn popping. Follow hot air popper manufacturer's instructions to pop the popcorn. Make sure students remain in their assigned area to ensure safety while completing this activity. Begin popping the popcorn. As the popcorn pops, use adjectives and terms to describe what is happening to expand the students ability to express the process for future discussions. After the popcorn pops, give each student about 1/4th cup on a paper plate and have them explore it through using their senses. Pose these simple questions to the students to include all five senses such as

- **Ears** –
 - Did you hear it while it was cooking?
 - How did it sound?
 - What body part did you hear it with?
- **Eyes** –
 - Can you see it?
 - How does it look?
 - What body part do you see with?
- **Touch** –
 - Can you touch it?
 - How does it feel?
 - What body part do you use to touch with?

- **Smell -**
 - Can you smell it?
 - How does it smell?
 - What body part do you use to smell with?

- **Taste -**
 - Can you taste it?
 - How does it taste?
 - What body part do you use to taste with?
 - Can you change its taste? How?

For additional resources on the five senses these materials could be explored:

- Aiki. (1989). *My Five Senses*. New York: Harper Collins Publishers.
- Thayer, Jan. *The Popcorn Dragon*. William Morrow and Company.
- “The Solution Site” - six science lessons integrating language and math which are entitled: [Overview: What Is It?](#), [Lesson 1: Susie Sees!](#), [Lesson 2: Harry Hears!](#), [Lesson 3: Sally Smells!](#), [Lesson 4: Tommy Tastes!](#), [Lesson 5: Freddie Feels!](#) - http://www.thesolutionsite.com/lpnew_bin/UI_Metadata/public/5104
- Unit K – “Five Senses” - graphic organizer, vocabulary terms, teacher background knowledge, lesson plan ideas
<http://www.sedl.org/scimath/pasopartners/pdfs/fivesenses.pdf> - Provides

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records, as well as student-generated products, may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes made by the teacher while circulating throughout the classroom and observing the students participating in unit activities
- A checklist that can be used quickly and efficiently by the teacher while circulating among the groups
- Student-generated work such as drawings, data collection charts, photographs of models, and experiment results
- Audiotapes, video tapes, or photos
- Picture graphs
- Venn diagrams

- Word Grids
- Student Recording Sheets

Activity-Specific Assessments

- Activity 3: As students shake the different sound cans, the teacher questions them and records their responses (knowledge, vocabulary and any connections they make to other sounds in the environment). The teacher asks the following questions and records individual student responses. All notes are dated and filed as part of the portfolio system.
 - Can you tell me about the sound (s) you hear?
 - Can you find two cans that sound the same? Tell me how you know.
 - Can you find two cans that sound different? Tell me how you know.
 - Can you guess what might be inside the sound can(s) making the sound? Explain your reasoning.(Answers may vary and any reasonable explanation should be accepted.)
- Activity 4: As students smell the different jars, the teacher questions them and records their responses noting knowledge, vocabulary, and any connections they make to other smells they know in the environment. The teacher asks the following questions and records individual student responses. All notes are dated and filed as part of the portfolio system.
 - Can you tell me about what you smell?
 - Can you find two jars that smell the same? Tell me how you know.
 - Can you find two cans that sound different? Tell me how you know.
 - Can you guess what might be inside the jar(s)? Explain your reasoning.(Answers may vary and any reasonable explanation should be accepted.)
- Activity 6: As students explore the different items using their sight, the teacher questions them and records their knowledge, vocabulary, and any connections they make to other items in the environment. The teacher asks the following questions and records student responses individually. All notes are dated and filed as part of the portfolio system.
 - Can you tell me about these items?
 - Can you find similar items? Tell me why you put these together.
 - Can you find differences among these items? Tell me what's different.
 - Where can you find other items like these that we collected?(Answers may vary and any reasonable explanation should be accepted.)
- Activity 7: As students taste the different foods on each spoon, the teacher questions them and records their knowledge, vocabulary and any connections they make to other tastes in the environment. The teacher asks the following questions and records student responses individually. All notes are dated and filed as part of the portfolio system.
 - Can you tell me about the flavor(s) you taste?

- Can you find a taste that is sweet? Tell me how you know.
 - Can you find a taste that is salty? Tell me how you know.
 - Can you find a taste that is sour? Tell me how you know.
 - Can you find a taste that is bitter? Tell me how you know.
 - Can you guess what food is in your spoon? Explain your reasoning.
- (Answers may vary and any reasonable explanation should be accepted.)

**Kindergarten
Science
Unit 2: Sorting and Constructing Patterns**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit develops the skill of recognizing patterns among objects and developing groups of objects based on observable characteristics. Sorting materials such as buttons, seeds, rocks, stamps, and leaves provides a variety of experiences in observing, sorting, and grouping objects based on color or texture or other observable characteristics.

Student Understandings

This unit expands the students' experiences in observing, sorting, and grouping objects. Students perform these tasks accurately and to explain why they placed objects in their set arrangements. Students discern inaccuracies in sorting or grouping and tell why an object doesn't belong or is misplaced.

Guiding Questions

1. Can students sort common objects accurately (first, by 1 attribute, then by 2 or 3 later in the school year)?
2. Can students tell about their sorting strategies and justify their choices?
3. Can students discern hard, soft, rough, smooth, small, large, heavy, light?
4. Can students decide if an object belongs in a particular group? Can students tell why they made the decision?
5. Can students determine how the objects in a group are alike?
6. Can students group, sort, and explain strategies with increasing skill and accuracy as they are given repeated experiences?
7. Can students construct simple ABAB patterns? Can students tell what comes next in an ABAB pattern?
8. Can the student explore and name patterns with increasing accuracy and difficulty as they are given repeated experiences?
9. Can students find and identify environmental patterns?

Unit 2 Grade-Level Expectations (GLEs)

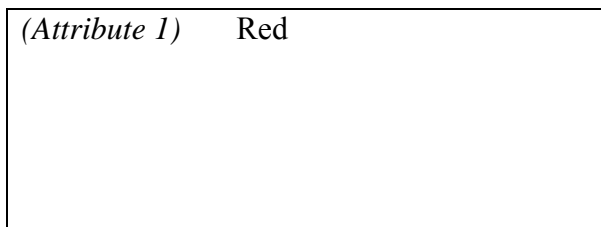
GLE #	GLE Text and Benchmarks
Science as Inquiry	
4.	Use the five senses to describe observations (SI-E-A3)
GLE #	GLE Text and Benchmarks
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
8.	Use a variety of appropriate formats to describe procedures and to express ideas about demonstrations or experiments (e.g., drawings, journals, reports, presentations, exhibitions, portfolios) (SI-E-A6)
Physical Science	
12.	Construct patterns by using color, size, and shape of objects (PS-E-A1)
13.	Sort objects based on their properties (e.g., size, weight, and texture) (PS-E-A1)

Sample Activities

Activity 1: Organized Grouping (GLEs: 4, 8, 13)

Materials List: variety of manipulatives, Student Recording Mat BLM, writing media, Sorting Rubric BLM

Provide a variety of small math manipulatives (found in the classroom) such as dinosaurs, bears, cubes, links, pattern blocks, beans, rocks, keys, tiles, pencils, and buttons. Students should work to sort the objects into groups based on similar attributes (e.g., color, type, size, shape). The teacher should circulate, asking guiding questions to encourage a variety of ways in which the objects can be sorted, such as Can you tell me how you sorted your objects? Can you show me a different way to sort your objects? Students should record their groups by drawing and coloring the sets using the Student Recording Mat BLM. Students will then share their results with classmates. Additional challenges could be made here to have classmates guess how and why they sorted groups the way they did. This extends their skills to identifying the attributes of each group. See one example below.



(Attribute 2) Blue

This activity should be built upon and extended throughout the year by analyzing and describing similarities and differences in properties of groups of items. Some additional items to explore might include styles of shoes, positions of furniture, items on the playground, items in the classroom, items in the cafeteria, numbers using curved or straight lines, letters using curved or straight lines, physical positions of items, word syllables, shades of colors, etc.

Have students explore grouping in more depth at the science center where student understanding will be explored using the Sorting Rubric BLM in the activity specific assessment section.

Activity 2: Sophisticated Sorting (4, 7, 13)

Materials List: chart for large word grid, writing media, sorting manipulatives

Word Grid Explanation:

Brainstorm different ways in which an item could be sorted. Display the manipulative to be sorted and allow time for the students to explore what they will be working with. Co-construct a *word grid* ([view literacy strategy descriptions](#)) to become familiar with the vocabulary of sorting criteria used to describe sorting groups. Use the actual item or draw illustrations on the vertical dimension of a large word grid on a chart paper. Supply words or pictures representing the words from the brainstorming activity along the horizontal dimension that describes specific sorting criteria. With student participation, fill in the word grid by placing a \surd in the space corresponding to the criteria the item possesses. Discuss the items in each column using math vocabulary such as more, less and equal then place the total amount on each using numbers or tally marks to represent the group.

Below are some examples that might be developed together using buttons:

Color: red, black, blue, brown, white, yellow, green, gold, silver, etc.

Type: 0 holes, 2 holes, 4 holes

Shape: round, square, heart, diamond, rectangle, etc.

Size: large, small, medium, etc.

Texture: smooth, rough, etc.

Buttons	Round	Square	Heart	Diamond	Rectangle
(button placement)	√				
		√			
	√				
				√	
					√
			√		
	√				
		√			
	√				
Totals:	4	2	1	1	1

This grid could be developed using any of the items in activity 1 to sort such as dinosaurs, bears, cubes, links, pattern blocks, beans, rocks, keys, tiles, etc. In addition to the above activity, together select an item to sort and brainstorm ways groups could be developed using a grid. The developed grids could be displayed in the class for further referencing to compare and contrast different sorted items.

See these readily available resources to explore patterns:

Sorting Books:

- *Sort it Out*. Newbridge Publishing. 1996.
- Reidy, Hanna. *All Sorts of Noises*. Picture Window Books, 2005. ISBN 1-4048-1064-1.
- Patilla, Peter. *Sorting*. Heinemann Library, 1999. ISBN 1-57572-969-5.
- Plunkrose, Henry. *Sorting*. Scholastic Library Publishing, 1995. ISBN 0-516-45458-7.
- Whitehouse, Patricia. *Sorting Foods*. Heinemann Library, 2002. ISBN 1-58810-747-7.

Teacher Resource Website:

- Math Steps – This site gives ideas in these areas for lesson development. “Identify Sort and Classify items”
<http://www.eduplace.com/math/mathsteps/k/>

Activity 3: Lively Leaves (GLEs: 4, 7, 13)

Materials List: leaf collection, chart for large word grid, writing media, color/word labels, crayons, 2 boxes with silted lids, word/picture labels

Have the students collect many different types of tree leaves from home and/or the school yard. Divide students into several small groups and give each group a variety of leaves. Assist the students in each group as they sort their leaves according to similar

characteristics. For example, students may sort their leaves by shape (round, skinny), by color (red, yellow), by texture (smooth, rough), or by size (large, small).

Lead a discussion focused on describing ways groups sorted leaves in groups above. Co-construct a *word grid* ([view literacy strategy descriptions](#)) using vocabulary discussed for sorting leaf groups. Place a leaf or draw illustrations on the vertical dimension of a large word grid on chart paper. Write words to describe the leaves on the horizontal dimension. With student participation, fill in the word grid by placing a √ in the space corresponding to the criteria the item possesses.

To sort by color, prepare a graph in advance. Label the graph “red,” “yellow,” “orange,” “brown,” and “green” using color/word labels. Encourage the students to sort their leaves by color. Students then place a √ on the graph for each corresponding color of leaf. Discuss the items in each column using math vocabulary such as *more*, *less* and *equal* then place the total amount on each using numbers or tally marks to represent the group.

Leaves	red	yellow	orange	brown	green
<i>Add samples</i>	√		√		
					√
		√		√	
	√	√	√		
Totals:	2	2	2	1	1

To sort by texture or size, provide two boxes with lids, with a slit cut in each lid. Label the boxes using picture/word labels with the words *large* on one box, *small* on the other, or use the words *smooth* or *rough*. The students will take turns selecting a leaf and deciding if the leaf is large or small, rough or smooth. Students will place the leaf in the appropriate box via the slit in the lid. Give students the opportunity to explain how they made their decisions about characteristics.

Activity 4: Touchy Feely (GLEs: 4, 8, 13)

Materials List: collection of textured items, sorting trays, recording paper, writing materials such as regular pencils, colored pencils, markers, and crayons

Display items with various textures such as a fabric scrap, a piece of aluminum foil, cardboard, sandpaper, a rock, a marble, a piece of burlap, an eraser, and a cotton ball. Students should use sorting trays to sort various items, noting those that are similar, putting them together into groups. Students will then record their sorted objects through item rubbings or illustrations and dictation to the teacher with words that describe how

the objects feel. Encourage students to find other ways to sort their objects. Have students explain how they chose the characteristics they used to sort their objects each time.

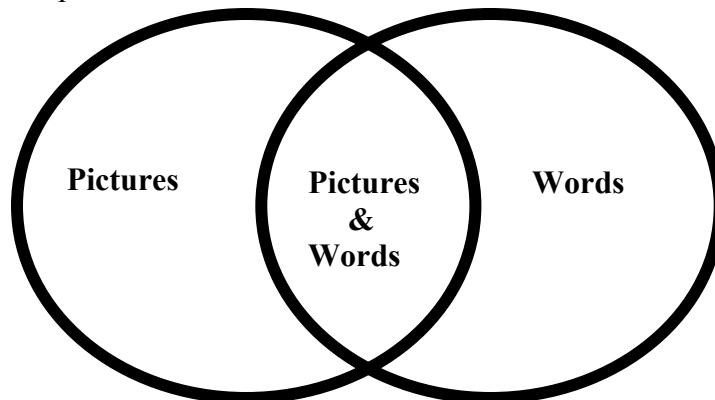
Activity 5: Seal of Approval (GLEs: 4, 7, 13)

Materials List: chart for large Venn diagram, writing media, diagram labels, used postage stamps, Venn Diagram Mat BLM, other sorting items

After exposure to several sorting activities, have the students collect used postage stamps from various envelopes for a few weeks. Lead a discussion on the visual properties of stamps the collection possesses. After this discussion, in whole group, using the *graphic organizer* ([view literacy strategy descriptions](#)), develop a Venn diagram using two attributes mentioned. Ask students to explain how they were able to tell the stamps apart, encouraging the use of descriptive words identified earlier in this unit.

Some attributes could include living, nonliving, animals, plants, pictures, writing, different themes, value, shapes, etc. To prepare the graph, draw two large overlapping circles on chart paper. Label each large circle with the attribute represented.

Venn diagram example:



Have the students point out where the stamps might be placed. Have the students offer ideas of what might be included in the part of the graph where the two circles overlap. This area includes stamps that incorporate both attributes. Using the Venn Diagram Mat BLM and a handful of stamps, model grouping. Direct the students to sort stamps by placing them on the appropriate section. After completion, have the students transfer their work to the class Venn diagram, completing one attribute at a time. Continue this process until all three groups are represented. Encourage the children to read the graph by counting the stamps in each group and discussing vocabulary terms to include words such as *more than*, *less than*, and *equal to*. This activity could be ongoing throughout the school year by having students explore other items such as keys, shoes, buttons, jar lids, shells, nursery rhyme comparisons, folk tale comparisons, book characters, book comparisons, food tastes, etc.

Activity 6: Producing Patterns (GLEs: 4, 8, 12, 13)

Materials List: manipulatives, paper strips, pattern labels, writing media, calendar, and calendar shapes

The student will use a variety of math manipulatives (cubes, beans, buttons, tiles, etc.) to explore and create patterns. Manipulative objects should vary by one attribute at first, then later by two or three (e.g., two different colors, sizes, shapes, texture). While creating simple patterns, students will call one type of object “A” and the other type of object “B”. The student will place or point to each object, read it aloud in simple patterns (e.g., red, blue, red, blue = A, B, A, B). Students begin recording their simple patterns on a long strip of paper by drawing with teacher-assisted labels. Later, they can draw and label by copying words or inventing spelling of the object attributes. Some students will be ready to create more difficult patterns such as AABBAABB or ABCABC. Encourage patterns regularly throughout the school year by introducing patterns with calendar number shapes, discussing the progression each day. Have the students predict and display which is next. Change the pattern each month, beginning with the simple AB pattern progressing to the more complex ABC pattern at the end of the year.

Activity 7: Patterns Around Us (GLE: 4, 7, 12)

Materials List: book, patterned objects, clip boards, Patterns All Around BLM, writing materials, camera (if available), magazines, bulletin board

The teacher will use an *opinionnaire* ([view literacy strategy descriptions](#)) to help establish interpretive reasoning and background knowledge about patterns. The students will hold their thumb up if they agree or down for disagreement in response to statements presented about patterns. Statements about patterns should be written in such a way as to elicit attitudes and feelings. These are a few sample statements that might be introduced:

1. Patterns are only used in math class.
2. Patterns are found in nature.
3. Only artist can make patterns.
4. Patterns can only be made with colors.

Allow time for information related to these statements to develop through discussions as students are questioned about their reasoning. Allow students the opportunity to defend the position taken on each statement. Emphasis is placed on students’ point of view and not correctness of the statements. The discussion should serve as a bridge for the following activity.

Introduce environmental patterns by reading a book containing pictures of the world around us. Together the students and the teacher brainstorm to develop a list of patterns in their natural environment. The class then will take a Pattern Walk to find objects in the school and outside the building. On the walk they will find and identify patterns.

Some examples of their findings should include animal fur patterns, building architecture, wall designs, sidewalk markings, landscaping, sign displays, drain covers, fences, playground equipment, etc. The students will use the Patterns All Around BLM sheet to record the patterns they find.

If a camera is available, assist students as they take pictures of each pattern identified on the walk. They will then explain and display their environmental patterns on a bulletin board. Students then search magazines and newspapers to locate patterns through pictures. The students identify and explain why they chose the picture. Encourage students to find other patterns as a home learning experience to search for patterns around their homes and bring in samples through illustrations or pictures. They then share and explain their patterns to the class, adding them to the bulletin board display.

See these readily available resources to explore patterns:

Pattern Books:

- Benton, Linda. *I See Patterns*. CA: Creative Teaching Press, Inc. 1995, ISBN 0-916119-97-1.
- Burton, Margie. *Looking for Patterns*. Benchmark Education Company, 1999, ISBN 1-58344-070-4.
- Burton, Margie. *Patterns All Around*. Benchmark Education Company, ISBN 1-892393-33-6.
- Ehlert, Lois. (1991). *Red Leaf, Yellow Leaf*. Harcourt Brace Jovanovich, Publishers.
- Gold, Kari Jenson. *Patterns Everywhere*. Newbridge Educational Publishing, 1996, ISBN 1-56784-306-9.
- Pluckrose, Henry. *Pattern*. Chicago: Childrens Press, 1995, ISBN 0-516-45455-2.
- Trumbauer, Lisa. *Nature's Patterns*. Newbridge Educational Publishing, 1998. ISBN 1-56784-979-2.
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Teacher Resource Website:

- Math Steps – This site gives ideas in these areas for lesson development. “Patterns” <http://www.eduplace.com/math/mathsteps/k/>

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes made by the teacher while circulating throughout the classroom and observing the students participating in unit activities
- A checklist which can be used quickly and efficiently by the teacher while circulating among the groups
- Student-generated work such as drawings, data collection charts, photographs of models, and experiment results
- Audiotapes, video tapes or photos
- Venn diagrams
- Word Grids
- Student Recording Sheets

Activity Specific Assessments

- Activity 1: The teacher will set up an assessment at the science center, having students work individually to sort objects by similar attributes (one attribute is minimal, two or more is above level). The teacher will use the Sorting Rubric BLM and note understanding of concept, level of skill, and ability to explain reasons for sorting.
- Activity 4: Students will work individually or in pairs to sort the texture samples into groups according to the way they feel. Categories should begin with 2 simple characteristics (hard, soft) and increase in difficulty (rough, smooth, bumpy, fuzzy). Upon sorting the texture samples, students will tell why they are grouping certain items together and why they are putting others in a different place. The teacher will note accuracy, skill, and ability to reason choices.
- Activity 5: The students will complete a class Venn diagram of stamps sorted and grouped based on observable characteristics. The teacher will evaluate the work for accuracy.

- Activity 6: The teacher will set up an assessment at the science center for students to work individually on pattern completion. The teacher will record student work including understanding of concept, ability to finish a simple ABAB pattern, and ability to read while pointing to each object with one to one correspondence. Patterns will be drawn on a picture card with extra space at the right for the student to extend the pattern. As the students complete 4-5 simple patterns, the teacher observes and records while questioning each student. Questions may include Why did you choose those colors/shapes? Could you make this pattern another way? Further anecdotal records may include descriptions of student accuracy, ability, understanding of concept, and higher level thinking.

**Kindergarten
Science
Unit 3: Exploring Living and Nonliving Things**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

The focus of this unit is on identifying living and nonliving objects. It will bring recognition to the differences and similarities among them. It is designed to introduce the concepts of the variations within plants and animals.

Student Understandings

Students determine major characteristics of living and nonliving things. Students relate the structure of living things by comparing the human body to the structure of a tree as well as to nonliving objects. Students become aware that there are many different variations among living things and all of them need food (energy), water, air, and shelter (habitat) to survive and grow.

Guiding Questions

1. Can students distinguish between a living thing and a nonliving thing?
2. Can students name some common things that are living? Can students name some common things that are nonliving?
3. Can students explain what living things need to survive?
4. Can students compare their needs to the needs of other living things?
5. Can students describe changes over the lifetime of a plant? Animal?
6. Can students compare the structure of the human body to the structure of a tree?
7. Can students compare the structure of the human body to nonliving objects?

Unit 3 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Science as Inquiry	
1.	Ask questions about objects and events in the environment (e.g., plants, rocks, storms) (SI-E-A1)
2.	Pose questions that can be answered by using students' own observations and scientific knowledge (SI-E-A1)
3.	Predict and anticipate possible outcomes (SI-E-A2)

GLE #	GLE Text and Benchmarks
5.	Measure and record length and temperature in both metric system and U.S. system units (SI-E-A4)
6.	Select and use developmentally appropriate equipment and tools and units of measurement to observe and collect data (SI-E-A4)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
8.	Use a variety of appropriate formats to describe procedures and to express ideas about demonstrations or experiments (e.g., drawings, journals, reports, presentations, exhibitions, portfolios) (SI-E-A6)
Understanding Scientific Inquiry	
10.	Recognize that a variety of tools can be used to examine objects at different degrees of magnification (e.g. hand lens, microscope) (SI-E-B3)
Physical Science	
11.	Identify objects by using the senses (PS-E-A1)
13.	Sort objects based on their properties (e.g. size, weight, texture) (PS-E-A1)
Life Science	
21.	Record observations on the growth of plant seeds (LS-E-A1)
22.	Classify objects in a variety of settings as <i>living (biotic)</i> or <i>nonliving (abiotic)</i> (LS-E-A2)
23.	Compare the human body at different stages of development. (LS-E-A3)
24.	Compare the human body with plants and animals (LS-E-A3)
25.	Identify easily observable variations within types of plants and animals (e.g. features of classmates, varieties of trees, breeds of dogs) (LS-E-A4)
29.	Match models of baby animals with their parents (LS-E-B3)

Safety Note: Activities in this unit will involve exploring living and nonliving organisms. For the safety of all students, make sure to stress proper handling of living organisms when starting the unit. Use the proper techniques and precautions depending upon the living animals used. . It is important to take what ever precautions the teacher deems necessary to not only be protective of the animals but of the students as well. Make sure to stress that the students do need to “respect” any thing that is living and to be gentle with all animals It is important not to select types of animals that would bite, scratch, be uncooperative, etc., as they conduct observations.

Sample Activities

Activity 1: Living or Nonliving (GLEs: 1, 2, 7, 11, 22)

Materials List: living vs. nonliving objects to compare, observation trays, T Chart BLM for whole class and individual work, writing media, Vocabulary Card 1 BLM, Vocabulary Card 2 BLM, glue, camera (optional), printer (optional), illustration paper, pictures, puppets or stuffed animals to use as props, red and blue stickers for each student, magazines, scissors, resealable plastic bags

Display one item of a living and nonliving object for students to observe. Examples of objects to explore could include living worms vs. gummy worms, living fish vs. plastic fish, living frog vs. toy frog, living butterfly vs. toy butterfly, living insect vs. toy insect, etc. In small groups, put the living and nonliving items on a tray and give students time to observe and explore both. Students should look closely and carefully at each item while comparing them. Students will answer the following teacher-led questions: How are they alike? How are they different? Are these things living? How do you know? Are these things not living? Why do you think so?

The teacher will develop a *graphic organizer* ([view literacy strategy descriptions](#)) to explore the terms *living* and *nonliving* through a large T Chart BLM, labeled Living and Nonliving. A real life picture of the items could be placed next to the text to assist nonreaders. As the students discuss characteristics of each, develop a list of their responses writing them on the corresponding sides. Below is an example developed using real worms and gummy worms.

Worms	
Living	Nonliving
Can move	Can't move alone
Has ridges	Has ridges
Slimy	Sticky
Cold	Does not need to eat
Needs water	Does not need water
Stinks	Smells good

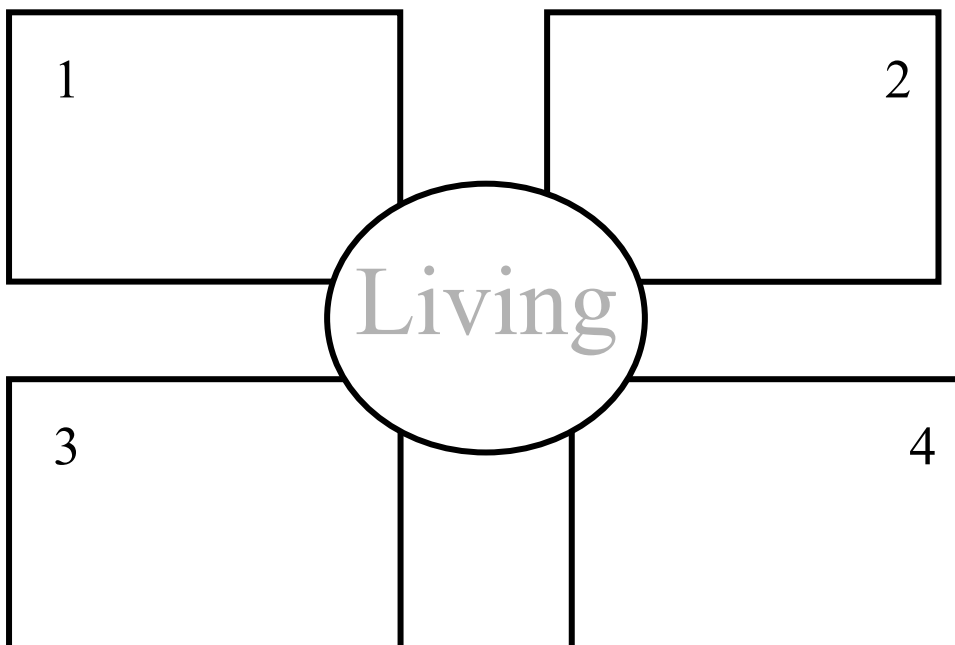
Topic Understanding: Be sure to lead students to the concept of basic needs of living creatures. Living things need energy from food, water, and shelter or habitat. Living things move about. Students should briefly discuss some nonliving things they know (pencil, ball, toy). The teacher should question students leading to the concept that nonliving things do NOT need the things living organisms do.

Allow time for students to ask questions about living and nonliving things to each other. Pictures, puppets, or stuffed animals could be used as props to help in the facilitation of a questioning and answering discussion between peers. Have students develop questions about living or nonliving things, and have them call on others students to answer them. Due to the students' limited abilities at this age, the teacher may need to help formulate statements presented by the students into appropriate questions to ask other students and help facilitate the discussion.

Students should then take a nature walk outdoors to look for living and nonliving things. Give each child one red and one blue sticker. Have the children identify items that are living things with red stickers and nonliving things with blue stickers. When all stickers are placed on living and nonliving items, have the students regroup for a brief class discussion on categories of objects. After the activity is complete, revisit the walk path to remove the stickers from the items identified. If a camera is available, assist students as they take pictures of each item identified on the walk.

After returning to the classroom, have students develop a title and label the chart such as "nature walk" or something similar. Students should print and display the pictures of items or illustrate things that they saw on the walk, placing them on either the living or nonliving side of a whole class T Chart modeled after the T Chart BLM. Students should share and explain their decisions on their placement of items. In small groups have students use magazines to cut out pictures of living organisms and nonliving objects. Monitor each group as they cut out pictures to check for understanding. The children should then use these pictures to develop an individual T Chart using the T Chart BLM of living and nonliving objects. This product will be used as an assessment. This could also be developed using different resources throughout the school year to include magazine exploration, class picture collections, field trips, etc. The title on the T Chart BLM should reflect their resources.

Have the students make a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) for the terms *living* and *nonliving*. Demonstrate the process as the students follow along completing the steps. On Vocabulary Card 1 BLM, have the students trace the targeted word "Living" in the middle of the card. Ask the students to provide a definition. Write the definition using illustrations or words in section 1 on the card. Next, ask the students to list characteristics of living things in section 2 on the card. This could be copied from the earlier developed T chart. Then, have the students search for pictures in magazines or on the Internet of real life living examples. If a camera is available, have the students take pictures then print living things in their real environment. Cut and glue these pictures on section 3 on the card. Finally, have the students draw a simple illustration of a living thing on section 4 on the card. After completing this first card, the students will repeat the same process with the targeted word "Nonliving" using Vocabulary Card 2 BLM.



Vocabulary cards are used to help students see the connections between words, examples of words, and the critical attributes associated with the word. The students should save these cards in resealable plastic bags, revisiting and adding to the collection with other important vocabulary terms presented throughout the year.

See these readily available resources to explore the concept of living and nonliving:

- Weidner, Kathleen, *What's Alive?* Harper Collins Publishers, 1995
- www.lpb.org/cyberchannel – This fee based resource is provided by Louisiana Public Broadcasting. Check with your individual school district for availability.
 - *Living and Nonliving Things* – This 12 minute segment shows the difference between living and nonliving things. It also explores the basic needs of living things.
- http://www.bbc.co.uk/schools/scienceclips/ages/5_6/ourselves.shtml - Living and nonliving game

Activity 2: Where Are Animals Found? (GLEs: 2, 7, 13, 25)

Materials List: video clip or book of animal classification, computer or television, Category Graph BLM, Blank Vocabulary Card BLM, writing media, pictures of various classifications of animals

The teacher will lead the students to *brainstorm* ([view literacy strategy descriptions](#)) the topic “What are animals?” Generate ideas and experiences related to the topic. Following the discussion, view the video clip from Louisiana Public Broadcasting’s

Cyberchannel entitled, *Animal Groups: Beginning Classification* - This 16 minute segment, shows how animals can be classified into different groups using common characteristics.

If the Louisiana Public Broadcasting’s Cyberchannel video clip is unavailable, a book or video on different classifications of animals could be read to the students as an alternative activity. Classifications that could be explored include *mammals, birds, fish, amphibians, reptiles, and insects.*

Topic Understanding: Following the presentation, explore the students’ understanding through a class discussion, asking probing questions, when necessary, to generate discussions and clear up any misconceptions. Some sample questions that could be explored are

- What are animals?
- Are all animals alike?
- How are they alike?
- Are all animals different?
- How are they different?
- Where do animals live?

Create a *graphic organizer* ([view literacy strategy descriptions](#)) to help organize animal groups using the Category Graph BLM and develop three animal categories relating to the previously presented material. One developed example follows:

(Category 1) birds	(Category 2) fish	(Category 3) insects
Red bird Stork Vulture Parrot Canary	Perch Bass Catfish Tarpon Flounder	Ladybug Ant Wasp Mosquito Grasshopper Butterfly

Drawing on prior knowledge, have the students give examples of or sort various pictures of these animals into their proper categories. Have them explain their choices as they categorize each. To get a sense of real life examples have students discuss places they’ve seen animals before. Clarify misconceptions with positive statements such as, insects are cool but some can be harmful to us if we bother them. When done, have students describe what these animals and people need to live. Point out the similarities of food, water, and especially, shelter or housing for all living animals.

Using the Blank Vocabulary Card BLM, have students develop modified *vocabulary cards* ([view literacy strategy descriptions](#)) for each animal category developed above. See Activity 1 for an example of how to develop vocabulary cards.

Activity 3: Me and a Tree (GLEs: 1, 2, 22, 24)

Materials List: playground access, real trees or tree pictures, book about living/nonliving things, nonliving objects, pictures, puppets or stuffed animals to use as props

Take a discovery walk out on campus to view trees or look at pictures in the classroom if there are no trees on campus. Lead the students in a discussion of how they are like trees. Ask How are you like a tree? How are you different from a tree? What can you do that a tree can not do? Compare roots to feet, arms to branches, fingers to leaves, body to trunk, and skin to bark. Guide students to understand that living things need food, air, and water. Read the book, *What's Alive?* by Kathleen Weidner or another similar story about living and nonliving things. Later, have students identify some nonliving things in the classroom and compare themselves to them. Some examples of nonliving objects might include chair, table, plate, crayon, spoon, glass, pencil, television, lamp, etc. Pose guiding questions to challenge student understanding as they explore using different objects. Sample examples of questions using a chair might include the following:

- How are you like a chair?
- How are you different from a chair?
- What can a chair do that you cannot do?
- What can you do that a chair cannot do?

Allow time for students to develop questions similar to these about other objects in the room to ask each other. The actual object should be displayed to help in the facilitation of a questioning and answering discussion between peers. Have students develop questions about the nonliving object and have them call on others students to answer them. The teacher will help formulate statements presented by the students into appropriate questions to ask other students and help facilitate the discussion.

Topic Understanding: Lead students to discover that nonliving things do not need food, air, or water.

This activity could be extended through an Arbor Day celebration by starting a corporate partnership with a local business to purchase and help your class with planting a tree on your school campus. Arbor Day is celebrated each year in Louisiana on the 3rd Friday in January. (see <http://www.arborday.org/arborday/arbordayDates.cfm>) This project would help promote the theme of getting people inspired with planting, nurturing, and celebrating trees. A school wide measurement project can be adopted by the entire student body in which the students could then observe and measure the growth of the tree throughout their school years. Measurements collected over time could be posted on a school bulletin board accessible to all. A comparison of the trees growth to student growth could also be explored within individual classes. Pictures of the tree could be

posted on the school website throughout the year, to view the changes it undergoes during different seasons.

See these readily available resources to explore the concepts of trees:

- Project Learning Tree - This site helps you learn how to think, not what to think, about the environment. <http://www.plt.org>
- Arbor Day Foundation - This site is the official site of the Arbor Day Foundation provides information about planting and caring for trees. www.arborday.org
- Project WILD Full Option Science System: *Trees* This site provides information about and sample materials from an interactive, interdisciplinary wildlife conservation and environmental education curriculum. <http://dnr.wi.gov/org/caer/ce/pltwild/plt.htm>





Activity 4: Investigating Seeds (GLEs: 2, 3, 6, 8, 10, 11, 13)

Materials List: seeds of various types of beans and peas, hand lenses, sorting trays, spoons, tweezers, pan balance scale, chart paper, writing media, Plant Development Rubric BLM

Conduct a discussion on seeds. Display seeds of various types of beans and peas, allowing time for comparisons and exploration using the senses. Tell the students that they may examine the seeds more closely, using hand lenses to see details. Encourage them to touch, smell, tap, and listen to sounds made with the different seeds. As a center type of activity, make trays and beans available for exploration, allowing students to work in pairs or individually. Ask the students to sort and classify the beans by shape, color, size, or kind. Limit the mixture of seeds to 4 or 5 different kinds. As they sort them, have each child explain the criteria used to sort the groups the way they did. Record responses as students make observations through seeing, feeling, hearing, and telling about the differences and similarities. To increase hand dexterity and incorporate fine motor skills, invite students to use small spoons or large tweezers for grasping and sorting. Of course, students may use their own fingers and hands if they choose.

Explore weight measurement by having students use a pan balance scale. Have them count 5 of the same kind of bean/peas on one side and 5 of different bean/peas on the other to compare weight. Develop a whole class Prediction/Observation chart where you would ask students to predict which will weigh more and why.

Example of a type of chart that could be used:

Predictions:	Observations:
 	 

↑	↓	↑	↓
↑	↓	↑	↓
↑	↓	↑	↓
↑	↓	↑	↓

Have the students come up to fill in the arrow on the chart or develop a similar chart using illustrations or simple wording to make predictions. At this time you may have to clear up the misconception that larger beans weigh more than smaller beans. Some smaller beans may be heavier than the larger beans depending on types compared. After time for exploration, have the students explain the results of weighing the beans. Allow time for them to make predictions, then conduct investigations on weight with different seeds and/or amounts.

If available in the community, invite a local garden club or senior citizen group to help generate a “Seed to Flower Garden” on campus, having students and community members work together to prepare, plant, and sustain a flowering garden for all to enjoy. This real life activity would facilitate a hands-on learning experience to gardening in which children could watch plants grow.

Refer to the activity specific assessment section to check for student understanding using some sections on the Plant Development Rubric BLM.

See these readily available resources to explore the concept of seeds and plants:

- kidsgardening.org helping young minds grow – A great web resource to include sections on home, teacher’s room, family room and a store.
www.kidsgardening.com
- See the Berger, Melvin. *An Apple A Day*. Newbridge Big Book
- Berger, Melvin. *Seeds Get Around*. Newbridge Big Book
- *Big Science, Plants We Eat*. (1991). Scholastic.
- Jordan, Helene M. *How a Seed Grows*.
- Krauss, Ruth. *The Carrot Seed*.
- Merrill, Claire and Swan, Susan. *A Seed Is a Promise*.

Activity 5: Growing Up, Up, Up (GLEs: 2, 3, 5, 6, 7, 21)

Materials List: lima beans, science learning logs, writing media, bowl, water, cotton balls, resealable sandwich bags, window display area or lamp, foam cups, markers, class planting container, soil, ruler, thin dowel rods, string, Home Growth Graph BLM, Growth Graph BLM, Plant Development Rubric BLM

Using science *learning logs* ([view literacy strategy descriptions](#)), have the students observe and describe a dry lima bean through illustrations. The teacher will use science *learning logs* as a means for students to illustrate the various stages of plant development as the growing process proceeds. Science learning logs could be developed by creating a book of blank pages bound and titled “My Science Learning Log” which could be used throughout the year for all assignments or it could be used and developed on an individual basis for each assignment. If the book style is selected, students could personalize their math log covers with their names, illustrations, and/or pictures from magazines to reflect their individuality. Explain that explorers, scientists, mathematicians, and scholars have always kept logs of their observations, thoughts, new understandings, predictions or hypotheses, and drawing conclusions or reflecting on what was done. In this way, they could record progress, test new ideas, and document what they learned. Similarly, with this activity, students will complete entries to record new understandings and reflect on what has been learned.

Next, each student places three beans into a cup of water. The teacher tells the students that the beans will soak in the water overnight. The students will predict what will happen to the bean after it soaks in water and record their predictions through an entry in the science *learning log*. Let the beans soak overnight. After soaking, the students should observe the seeds by holding and gently feeling the soaked beans. Students should check their predictions made earlier in their logs for accuracy. Students are to add to their science *learning log* an entry of what actually happened to the bean after soaking.

The students should then soak three cotton balls in the cup of water. Using a resealable plastic bag, have the students place one seed on one piece of cotton. Each student is to have three seeds and three cotton pieces per bag. Have the students display the bag in a warm place or sunny window to experience germination first hand. If a window is not available make sure that the seeds are displayed in a warm place away from drafts and cool places. A lamp could be used to help germination along because warmth is the key at this stage of development. Ask students to tell what they think will happen. Help students recall that seeds are living things and that a baby plant will grow from inside the seed. As the seeds begin to grow, have the students write daily entries in their *science learning logs* about their seeds. After about five to seven days, the seeds will have germinated and will be ready to transfer to soil for planting. Check seeds periodically and add additional moisture to prevent seeds from drying out.

Topic Understanding: Discuss how seeds contain food which allows a tiny plant to begin growing. As it then breaks out from the seed coat, the leaves begin to emerge capturing energy from the Sun or light source. The roots anchor the plant in the soil and allow the plant to take up water and minerals. The stem transports water and minerals from the roots to other plant parts. Because all of the plant components will be developed before soil planting, allow students time to observe their seedlings in their individual bags.

Using a foam cup and markers, have the children decorate their container for planting so each one is unique and identifiable. The children should plant two of their biggest

seedlings in soil. The children are allowed to bring them home for observations as a family home learning activity. They are to report their plant growth on a weekly basis using the Home Growth Graph BLM chart provided.

The others seedlings are to be planted in a class container for class observations and predictions. Students should participate in putting a twelve-inch dowel on each side of the container with several strings tied across at 2” intervals above the soil to support the plants as they begin to grow. As a class, choose one plant and make a class bar graph of plant growth. Encourage and assist students as they make their own bar graphs using the Growth Graph BLM. The students are able to compare the selected plant with the growth of others in the container. The teacher can provide food for thought using questions such as these:

- How tall is it?
- Is it taller or smaller than the other plants?
- How many plants are larger?
- How many plants are smaller?

Student should have an opportunity to measure the plant using a ruler. Have students tell about plant growth through science *learning log* entries. Have them predict how tall it will be in one week and have them decide if their predictions were accurate as time passes. At the end of this experience, the children will have a complete science *learning log* of plant development from the seed stage through plant maturity.

If time permits, allow more bags of seeds to germinate, restricting one of the basic necessities, i.e., water and warmth. Discuss this question: would depriving a seed of either one of these necessities effect germination? Another topic of interest could be explored by having bags placed at various places in the classroom and observing which ones germinate the fastest. Discuss this question: would placement in the classroom affect the germination? Discussions with students might spark other questions that could be explored with plant development. The possibilities are endless!

Refer to the activity specific assessment section to check for student understanding, using some sections on the Plant Development Rubric BLM.

See these readily available resources to explore the concept of plants:

- www.lpb.org/cyberchannel – This fee-based resource is provided by Louisiana Public Broadcasting. Check with your individual school district for availability
 - *Plants: A First Look* – This 19 minute segment shows what plants need for survival. It also explores the components of a plant to include the leaves, stems, roots, and the seed.

Activity 6: Who am I? (GLEs: 7, 23, 25, 29)

Materials List: student baby pictures, name labels, camera (optional), science learning logs, Growing Pictures BLM, What Can They Do? BLM, Kindergartners and Grown Ups BLM, writing media, magazines, scissors, parent and baby match up pictures

In a study of students, families, or community, discuss how people grow and learn more, move more, and do more as they get older. As a home assignment, have the students bring in baby pictures of themselves. Display these with name labels where all children can identify them easily. If a photo is not available for a student, take a picture if a camera is available or use a school picture to have them included in the display so they can feel a sense of ownership in this activity as well. Have the students tell a story using illustrations and inventive spelling as an entry in the science *learning log* ([view literacy strategy descriptions](#)) that describes when they were a baby. Lead a discussion on the needs of babies and how dependent they are on others for help.

After finishing these discussions, display Growing Pictures BLM of a baby, a toddler, a three year old, and five year old. Develop the What Can They Do? BLM chart by having the students *brainstorm* ([view literacy strategy descriptions](#)) things they know that the children can do at the corresponding ages. The teacher then writes the list, using few words and helping (rebus) pictures. Students can then develop an individual What Can They Do? BLM by selecting one item on each section to illustrate. Students can then participate in reading their selections to the class.

Next, ask students to think about growing up. Using the science *learning logs* have each student list and illustrate something that they CAN DO now that they COULD NOT do as a baby (walk, talk, eat hamburgers, use toilet).

Students then participate in a *brainstorming* activity to identify what grown ups can do that kindergarten children cannot. After a class discussion, have the students use a visual organizer entitled Kindergartners and Grown Ups BLM to list or illustrate unique abilities of each. Students can follow up by cutting out pictures from magazines to illustrate the actions identified putting them on their individual Kindergartners and Grown Ups BLM.

Using the above activities, lead the class to explore and discuss other animal stages. Have students match pictures of baby animals and people with pictures of their parents, focusing on changes as one grows. Discuss the proper term referring to specific animals and their baby names (Examples: goose/gosling, cow/calf, horse/colt, sheep/kid, pig/piglet, dog/puppy, cat/kitten, bat/pup, bear/cub, bird/chick, deer/fawn, dolphin/calf, fish/fry, goat/kid, lion/cub, shark/pup, etc.). Students should be questioned and asked to describe how the parents and babies are alike and how they are different to check for individual understandings.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes
- A checklist of skills and abilities
- Drawings of plants as they grow
- Sequence of growth chart pictures
- Data collection charts
- Audio tapes, videotapes, or photographs
- Teacher records of questions, answers, and connections made by students
- Science *learning log* entries
- Vocabulary Cards

Activity-Specific Assessments

- Activity 1: For this activity the student will complete a T Chart using the BLM for recording living and nonliving items using magazine pictures. The student should be able to sort these into the correct category. Ask the student to explain his/her choices. Record the responses considering skill, ability and reasoning level.
- Activity 4 and 5: Upon completing activity 4 and 5, students will be assessed using Plant Development Rubric BLM.
- Activity 6: Students should be able to identify different stages of development through the individual What Can I Do? BLM developed within this activity. Have the students explain their activities selected to the class and check their understanding to clear up any misconceptions that could arise. The responses documented on Kindergartners and Grown Ups BLM also gives an insight to the understanding of developmental stages. Probe students to find out why they chose the activities they did for the BLM activity. Responses should be recorded and included in their portfolio.

**Kindergarten
Science
Unit 4: Changes and Variations Among Living Things**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit develops knowledge of living things (plants and animals) as growing and changing over time and having distinct predictable life cycles. It will also introduce the concept of variations among living things.

Student Understandings

Students learn about growth and development of plants and animals that are found within life cycles. Students gain understanding in the process of life cycles. Students begin to see, know, and describe similarities and variations among organisms. Change over time (adaptation) in organisms might begin to surface in the minds of the more advanced students. Students recognize that there are variations in living things. Starting with well-known animals, students identify a large number of variations (e.g., in color, size, shape of body, shape of head). Moving to lesser-known objects, children begin to recognize and describe variations in flowers, behaviors, movement, etc., and begin to relate these to adaptations and use.

Guiding Questions

1. Can students explain how one's appearance changes as one grows from a baby to an adult?
2. Can students describe how animals change during their lives?
3. Can students describe how the life cycles of some animals are different?
4. Can students visually represent life cycle changes?
5. Can students describe how plants change through growth development?
6. Can students use linear measurement (rulers) to measure and record the height of a growing plant?
7. Can students recognize variations within the same type of animal?
8. Can students recognize variations within the same type of plant?
9. Can students describe similarities and differences between two given objects in nature?

Unit 4 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Science as Inquiry	
3.	Predict and anticipate possible outcomes (SI-E-A2)
4.	Use the five senses to describe observations (SI-E-A3)
5.	Measure and record length and temperature in both metric system and U.S. system units (SI-E-A4)
6.	Select and use developmentally appropriate equipment and tools and units of measurement to observe and collect data (SI-E-A4)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
9.	Identify and use appropriate safety procedures and equipment when conducting investigations (e.g., gloves, goggles, hair ties) (SI-E-A7)
10.	Recognize that a variety of tools can be used to examine objects at different degrees of magnification (e.g., hand lens, microscope) (SI-E-B3)
Physical Science	
13.	Match models of baby animals with their parents (LS-E-B3)
Life Science	
21	Record observations on the growth of plant seeds (LS-E-A1)
23.	Compare the human body at various stages of development (LS-E-A3)
25.	Identify easily observable variations within types of plants and animals (e.g., features of classmates, varieties of trees, breeds of dogs) (LS-E-A4)
28.	Observe life cycles and describe changes (e.g., humans, dogs, insects) (LS-E-B1)
29.	Match models of baby animals with their parents (LS-E-B3)

Sample Activities**Activity 1: Baby Animals and Their Parents (GLEs: 4, 29)**

Materials List: chart paper, writing media, available resources to explore (e.g., books, magazine pictures, videos, toys), Baby and Adult Cards BLM

Using a modified *Student Questions for Purposeful Learning (SQPL)* strategy ([view literacy strategy descriptions](#)) the students will generate a reaction to a statement. This strategy uses a teacher-generated statement to cause students to wonder, challenge, or question. The statement does not have to be factually true as long as it causes students to think about animals. The following statement or similar statement should be written on the board or on chart paper for student discussion:

Every baby animal looks just like their parent.

Have students respond to the statement. Record their responses on chart paper. Repeat the statement as needed to help generate responses. As students respond record the comments on chart paper. Facilitate a discussion about each of the comments. Reinforce accurate comments and clarify inaccurate comments. Following the discussion, explain to students that the class will explore animals and their babies in more depth.

Use available resources such as books, magazine pictures, videos, or small toy sets to explore baby animals and their parents. Have students match baby animals and their parents using correct names (e.g., sheep/lamb, dog/puppy, cow/calf, cat/kitten, bear/cub, duck/duckling, elephant/ calf, frog/tadpole, goat/ kid, goose/ gosling, horse/foal, lion/cub, pig/piglet, tiger/cub, whale/calf, zebra/foal).

Print Baby and Adult Cards BLM on cardstock then cut them apart to explore animals. Teachers may want to consider laminating cards if available. Display the cards and have students match pictures of the baby animals to their parents. As students work, the teacher will ask probing questions to include the following:

- Do all the animals look the same?
- How are they alike?
- How are they different?
- Why do you think some are smaller than others?
- Which animals do you think belong together?

Place a set of cards in the science center for further exploration as a center type activity. Refer to the activity specific assessment section to check for student understanding as they explore animals in more depth.

Activity 2: Guess Who? (GLEs: 4, 7, 23, 28)

Materials List: student baby pictures, camera if available, student pictures, teacher pictures, covered container, chart paper, writing media, (assessment materials: magazines, scissors, glue, assessment labels “Old” & “Young”)

Prior to the day’s activity, ask students to bring in photographs of them when they were babies. If camera is available, take pictures of students and have them developed to compare and contrast to their younger baby pictures. If a camera is not available, have them bring in a recent photo as well.

To encourage student participation, the teacher should display pictures of when he or she was a baby, a toddler, an elementary student, a junior high student, a high school student, a college student, and now. Generate a discussion with students on how the teacher has changed through the years. Compare the photos of each stage displayed. Co-construct a chart on the likenesses and differences in the photos at each stage of development with the most recent photo. How are the pictures alike? How are they different? Are there more noticeable changes in the earlier photos or the more recent photos? Students will be able to see the continuum of growth of someone they know. So both genders of

children can relate to changes from babies to adults. Try to secure pictures of someone from the opposite gender of the teacher. The pictures can be photocopied and placed in the science center for the children to sequence.

Using the baby pictures brought in from home, have the students try to figure out who is the baby in the picture. To do this, place all baby photos in a covered container. Have the students come up to select a picture, then have them guess who the baby is in the photo. After the baby is identified, discuss how the student has changed from the photo. Make sure to discuss criteria such as hair length, hair color, body size, eye color, strength, etc.

Have the students discuss some of the changes they see as a person goes from being an infant, to a child, to a teenager and then to adulthood. Refer to the activity specific assessment section to check for student understanding as they explore stages of development in more depth.

Activity 3: Life Cycle Changes (GLEs: 3, 7, 9, 10, 28)

Materials List: chart paper, writing media, mealworms, cut potatoes, clear plastic cups, permanent markers, $\frac{1}{4}$ cup measuring cup, oatmeal, brand meal or wheat germ, artificial light (optional), learning logs, writing media, hand lenses, rulers

Teacher should discuss health and safety issues and precautions with students for themselves as well as for the mealworms. Have students help construct a list of safety procedures when handling the mealworms. Mealworms are an excellent animal for classroom use to observe growth and changes in the life cycle. Mealworms can be purchased in pet stores or fishing supply stores. They are very inexpensive, readily available, and require minimum care.

To establish a sense of personal nurturing, provide each student with his/her own individual cup to house his/her mealworms in which to observe life cycle changes. Have children select names for the worms. Provide permanent markers to label cups with selected names for future identification. Have the students measure $\frac{1}{4}$ cup of oatmeal, brand meal, or wheat germ to put in the cup for the mealworms to nestle in. Have the students select two mealworms to observe as they undergo changes in their cups. Two are suggested, just in case one dies. The extra worms could be put into a larger container to see a community change together.

Their time of completion of the cycle stages will vary, which will provide observational comparisons for the students. To provide moisture for the mealworms, place a small slice of potato in each cup. This will have to be refreshed every four days or so to provide proper moisture for development.

The mealworm is the larval stage of a beetle. As it develops throughout several weeks, it will turn into the pupa stage and finally into the adult beetle stage. The time of cycle

changes will vary depending on the maturity of the mealworm, the time of the year, and the temperature of the environment it is kept. An artificial light could be used for warmth if the classroom is cool, but as the mealworms prefer the dark, they will bury under the meal. Students will enjoy hours of fun observing the mealworms' behavior and caring for them, as they become part of their classroom community.

The following Web sites are resources to help develop background information on life cycle changes of these animals:

- <http://www.lawrencehallofscience.org/foss/fossweb/teachers/materials/plantanimall/tenebrio beetles.html>
- <http://www.repticzone.com/caresheets/705.html>

Using science *learning logs* have the students observe and describe the life cycle and changes through illustrations. The teacher will use science *learning logs* ([view literacy strategy descriptions](#)) throughout the entire transformation process as a means for students to illustrate the various stages of the life cycle as the transformation occurs. Have students tell about the life cycle and predict what they think will happen through time as science *learning log* entries. Have students decide if their predictions were accurate as time passes. Hand lenses should be used to observe changes more closely. Have students answer the question, How did your mealworm change? Using the hand lenses for every observation, illustrate what is seen. Provide rulers to have students measure the length of the mealworm at each stage of development. After the cycle is complete, lead a discussion of their observations of the life cycle of mealworms and have students draw pictures of each stage of metamorphosis in their science *learning log*. At the end of this activity, the children will have a complete science *learning log* of the life cycle transformation through the stages.

Note: If a mealworm dies, it is a great time to discuss the completion of the life cycle.

Explain that different animals experience different stages of development and changes in their life cycle. Other animal life cycles should be discussed at this time. Alternative animals such as guppies, frogs, or butterflies could be substituted to observe life cycle changes if they are more readily available.

Refer to the activity specific assessment section to check for student understanding as they identify life cycle changes and development in more depth.

Safety tip: If animals are ordered from suppliers that are not native to the area, it is important that the animals be euthanized and not released into the environment. The release of different species can potentially threaten the native species of the area.. Consult the company for advice about the species ordered.

Activity 4: Tall, Tall Grass (GLEs: 3, 5, 6, 7, 21, 28)

Materials List: seeds or sugar cane sections, soil, planter, staking material, water, watering can, liquid water soluble fertilizer (optional), meter stick, height chart, chart paper, writing media, science learning log, furniture for measuring,

There are many types of plants that can be used for observing growth, but there are certain types of plants noted for rapid germination and development. These plants include different types of grasses. A few types that would be excellent for rapid development are pear millet, sweet sorghum, sorghum sudan, corn, and sugar cane. These plants grow best in early spring. These seeds or canes are readily available and could grow throughout the state. If there are any questions about these or other types of plants to grow, the local cooperative extension service agent can be contacted for assistance.

In a plot of soil or in a large container outdoors, prepare soil for planting. The plants suggested above grow rapidly UP with regular watering. Show the students how to plant the seeds or cane stems to make a new plant. Once they have planted them, discuss that they are grasses and grow very fast. Tell them that the plants may get taller than a teacher! Using a meter stick, discuss linear measurement of how long or tall the plants might grow. Have the students practice measuring chairs and other furniture in the room to explore the process of measuring. Be sure they know to start measuring at the floor with the lower numbers at the bottom. Have students measure each other using a meter stick then record their height. As the plants grow, compare their height with the height of the students in the class. As the plants develop, they may need staking due to their height and stability. On a classroom height chart, with teacher guidance and modeling, students will draw lines as tall as the plant upon measuring it throughout the growing process. This visual display will show plant growth over time and help students begin to record data.

Using science *learning logs* have the students observe and describe plant development through illustrations. The teacher will use science *learning logs* ([view literacy strategy descriptions](#)) as a means for students to illustrate the various stages of plant development as the growing process proceeds. Students should have an opportunity to measure the plant using a meter stick. Have students tell about plant growth through *science learning log* entries. Have them predict how tall it will be in one week and decide if their predictions were accurate as time passes. At the end of this experience, the children will have a complete science *learning log* of plant development from the seed or cutting stage to plant development. Have students report on what they observe focusing on using their senses:

- What do they see?
- How does it feel?
- Does it smell?
- How tall is it?

Use data collected as evidence to lead a discussion about how the plant changed and grew through observations entered in the science *learning logs*.

Make sure learning log entries reflect student understanding of major points to include the following:

- When a plant gets what it needs, it can grow and change.
- Plants begin from seeds or cuttings.
- Plants grow and develop by making stems, leaves, flowers, and seeds.
- Some things that affect plant development are water, sunlight, food, insects, etc.

If a liquid water soluble fertilizer is available, experimentation between two exact plants could be compared with growth development. Not only height can be compared between them but a comparison of a timeline as well. A comparison could be made to see if a plant receiving fertilizer will grow better than a plant not receiving fertilizer.

Refer to the activity-specific assessment section to check for student understanding as they explore plant growth and development in more depth.

Activity 5: Stuffed Animal Sorting (GLEs: 4, 13, 25)

Materials List: chart paper, writing media, optional- pictures of animals from the Baby and Adult Cards BLM, stuffed animals

Have the students observe a stuffed animal or a picture of an animal from the Baby and Adult Cards BLM. Students should be guided to recall the techniques used in the earlier units where they were forced to describe the likenesses and differences among items using their senses. Show the students a stuffed animal or picture of an animal that will be easy to describe using age appropriate vocabulary. While looking at the animal, have students identify words they can use to describe it. Using chart paper, make a list of the words identified. Guide students to formulate sentences that illustrate their understanding through a modified *GISTing* ([view literacy strategy descriptions](#)) activity. *GISTing* will help students summarize essential information while using a limited number of words in a gist sentence. Model *GISTing* by writing a sentence on the board to describe that picture in less than 15 words, but more than 3 words. For example, the students should develop a more interesting sentence than “It is pretty.” The sentence might read, The huge grey elephant is eating a pile of hay by the fence.” By limiting the total number of words students can use, this approach to summarizing forces them to think about only the most important information, which is the essence of comprehension.

Note: At this age, the students might have only limited ability to formulate sentences. In this case, instead of trying to decrease the number of words they will use, you want to increase the number of words they will use in each sentence. Have students refer to the chart of descriptive words developed earlier to formulate better and more descriptive sentences.

Together the students and teacher will co construct *GISTS* on chart paper using different animals or pictures to develop sentences that are very descriptive. Each *GIST* can be

illustrated and presented orally allowing the class to count the words as each sentence is developed.

The above activity will lead into the following stuffed animal exploration because it will force students to pay attention to tiny descriptive details of each animal. Have students bring in stuffed animals from home to explore observable variations among animals. Give ample time for students to observe obvious similarities and differences among the stuffed animal collection. Have students sort the collection of animals by type (e.g., bears, dogs, cats). Have students note that they are all models of animals, but they are different types of animals. Next, have the students explore the differences or variations among the groups sorted. Then divide students into groups to work with a given animal type. Have each group further sort using another attribute such as color, size, etc. Have students note that even though they have the same type of animals, the animals will have different characteristics. Have students resort their animals using other attributes that they choose. Have students discuss and share why they grouped the animals as they did. Through discussions and questioning, the students should begin to understand what is meant by variations within types of animals.

Activity 6: Animal Variations (GLEs: 4, 7, 13, 25)

Materials List: variety of animal pictures, word grid, chart paper, writing media

Survey the class to find out what types of experiences they have had with animals. Use this information to decide what type of animal to focus on when planning this activity. Because children learn best using real situations, they will better understand variations among animals if they have had first hand knowledge of the particular animal explored. Suggested animals include cats, birds, dogs, fish, frogs, turtles, etc.

After an animal of exploration is selected, collect a wide variety of pictures of that animal from magazines, books, and copy pictures. (Care should be taken to have the animal appear to be the same distance from the camera to enable realistic size comparisons.) Have students sort the pictures into groups with similar attributes. Have students describe their groupings and recall real life experiences with that animal.

Brainstorm ([view literacy strategy descriptions](#)) different ways in which an animal could be sorted. Discuss with students what *breed* means, and have students realize that variations are visible through color, size, skin covering type (long or short), etc. Allow time for the students to explore the pictures they will be working with. Co-construct a variation of a *word grid* ([view literacy strategy descriptions](#)) to become familiar with vocabulary of sorting criteria used to describe the breeds. Use the actual picture or draw illustrations on the vertical dimension of a large word grid on a chart paper. Supply words from the brainstorming activity along the horizontal dimension that describes specific sorting criteria. This criteria could be subdivided into smaller groups if necessary. [With student participation](#), fill in the word grid by placing a \surd in the space corresponding to the criteria the item possesses. Discuss the items in each column using

math vocabulary such as more, less and equal then place the total amount on each using numbers or tally marks to represent the group. Below is an example of a word grid developed for a dog.

Dog	Hair Color				Hair Length		Size of Animal	
	Dark	Light	Solid	Spotted	Long	Short	Big	Small
<i>(picture placement)</i>	√		√		√			√
		√	√			√		√
	√			√		√		√
		√		√		√	√	
	√		√		√			√
	√			√	√		√	
	√			√		√		√
Totals:	5	2	3	4	3	4	2	5

Students should understand that there are wide varieties in breeds and they should be able to list other examples of animal types (e.g., cats, cows, fish, birds, dogs) that display variations.

Activity 7: Tree Walk (GLEs: 4, 7, 10, 13, 25)

Materials List: trees and shrubs to observe, clipboards, drawing paper, writing media, collection basket, snippers for cutting plant samples, hand lenses, camera (optional), chart paper, variations booklet, rubbing media

Explore the school grounds by having the class take a walk around the campus, looking at the trees or shrubs. On the walk, the teacher will question and prompt the students to observe and find different types of trees and shrubs focusing on leaves, flowers, seeds, and stems or trunks.

- Are leaves needle type or flat type?
- Is the plant large or small?
- Does the tree or shrub have flowers?
- Are the seeds produced in cones, pod, or seed form?
- Is the transport system in the form of a stem or trunk?
- Is the transport system fleshy or covered with bark?

Students are provided clipboards and drawing paper to record the different types of trees or shrubs through illustrations. Samples of plant items should be collected and students could then use hand lenses to examine items up close. Pictures could be taken of plants examined and brought into the classroom for further discussion.

Upon returning to class, students will explain (using developmentally appropriate vocabulary) the variations they saw in the trees or shrubs. Samples, illustrations or pictures could be used to further explain variations among plants. Their discussions should focus on size, color, the tree trunks, leaves, needles, flowers, bark, etc. Using chart paper, record these variations for future reference throughout the school year. This could be repeated at various times during the school year to observe the seasonal changes of trees.

If time allows, students could use the materials collected to compose a book on variations among samples by using various natural materials comparing bark rubbings, leaf rubbings, flower rubbings, or illustrating simulations of these samples as well.

Activity 8: Say Cheeze! (GLEs: 3, 4, 7, 25)

Materials List: camera, photographs, chart paper, writing media, bar graph

Using a digital or instant print camera, take close up head shot photographs of students. Display these photos on the board and lead a discussion of the similarities and differences of the collection of photos. After the discussion, develop a class chart using criteria mentioned. The chart could include criteria of students' eye color, skin color, hair color, amount of missing teeth, shape of face, type of hair, hair length, etc. Have students sort photos using some of these criteria. Total the numbers in each group identified and develop a visual organizer in the form of a bar graph to facilitate better student understanding.

Begin a discussion on variations among humans. Students are then asked to engage in a modified version of *SPAWN writing* ([view literacy strategy descriptions](#)) to promote making predictions of variations among humans. *SPAWN writing* is an acronym that stands for five categories of writing prompts for content area learning. Using the W or "What If" category of prompts from SPAWN, students will respond to the following questions:

- What could the variation among humans be if everyone looked alike?
- What if everyone had the same eye color, hair type, hair color, face shape, hair length, skin color, etc.?
- How would we be different?
- Could we be different?

On a plain piece of paper, the students should illustrate a picture to answer the questions. The illustration should depict the prediction of how we would be different. Allow students to share their illustrated responses with the whole class. Follow up with a class discussion. With teacher guidance and through probing questions, have students conclude that humans can have variations other than just physical variations. Make a list on chart paper of as many variations in human beings that students can think of in addition to those discussed earlier. Some variations in humans that could be discussed

could include different races, culture, religious beliefs, personalities, personal strengths and weaknesses, ethnic groups, etc.

Refer to the activity specific assessment section to check for student understanding as they explore variations among humans through similarities and differences in more depth.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes made by the teacher
- A checklist which can be used quickly and efficiently by the teacher while circulating among the groups
- Student-generated work such as drawings, data collection charts, photographs of models, and experiment results
- Graphic representations (e.g., plant growth)
- Series of pictures (e.g., stages in the life cycle)
- Learning Logs

Activity-Specific Assessments

- Activity 1: Using the Baby and Adult Cards BLM, have students match baby animals with their parents as pairs. Ask the students to shuffle 6 or 8 pairs and place them down like the game of Concentration. Have pairs of students play the game, trying to match like animals. Ask the names of the animals, baby names (e.g., lamb, puppy, etc.). Ask probing questions to understand how much does each student know about babies and parents, names, relationships, needs, and parent care. Record responses.
- Activity 2: At a center time, have photographs of people at different stages of development. These may be cut from magazines or real photographs. Students will sort the cards into two categories, YOUNG and OLD. The student will explain his or her reasoning. Record the students' accuracy in sorting and placing

the age cards in proper category. Record vocabulary, understanding, and any questions or misconceptions the students may have.

- Activity 3: Students should be able to identify different stages of the life cycle illustrated through science learning log entries developed within this activity. Have the students explain how their entries developed. The entries documented give an insight to the understanding of the life cycle. Probe students to find out orally what they understand about the entire process and the changes the animals undergo. Responses should be recorded and included in their portfolio.
- Activity 4: After planting, begin to measure it (after it emerges) every few days using a meter stick at the base of the soil. Students should have prior instruction on how to use the meter stick, starting with the lowest number on the bottom. Record their knowledge, accuracy, questions, and skills throughout the growing process.
- Activity 8: Upon completing the similarities chart, the teacher will question each student about the data and record his/her ability and skill. Questions posed to the students should be specific to the chart developed together. The responses documented on the SPAWN writing activity also gives an insight to student understanding. The teacher looks for understanding of the concept and the student's ability to describe variations of similarities and differences among people with accuracy.

**Kindergarten
Science
Unit 5: Food Groups and Nutrition**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit provides instruction for learning where foods come from, how people prepare various foods for eating, and why food is important for life. Through activities and discussion, this unit will raise awareness of choosing healthy meals and snacks for the benefit of a healthier body and life style.

Student Understandings

Students can state why people and animals need food. . Students make healthy nutrition choices in activities on the food groups, food preparation, and explorations of a variety of fresh foods. Students identify food sources and cultural differences in foods that people eat. Students know that healthy lifestyles include eating right and being physically active.

Guiding Questions

1. Can students explain why it is important to eat a variety of foods?
2. Can students name the major food groups?
3. Can students list some healthy foods and tell why?
4. Can students list some unhealthy foods and tell why?
5. Can students tell that food is energy to help us grow and stay healthy?
6. Can students use simple words to describe foods?
7. Can students tell why it is important to wash hands and keep foods clean as they prepare them?
8. Can students identify physical activities that would help contribute to good health?

Unit 5 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Science as Inquiry	
2.	Pose questions that can be answered by using students' own observation and scientific knowledge. (SI-E-A1)
3.	Predict and anticipate possible outcomes. (SI-E-A2)
4.	Use the five senses to describe observations (SI-E-A3)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
8.	Use a variety of appropriate formats to describe procedures and to express ideas about demonstrations or experiments (e.g. drawings, journals, reports, presentations, exhibitions, portfolios) (SI-E-A6)
Physical Science	
11.	Identify objects using the senses. (PS-E-A1)
13.	Sort objects based on their properties. (size, weight, texture) (PS-E-A1)
Life Science	
26.	Classify various foods into the major groups (e.g., bread, meat, vegetable, fruit) (LS-E-A6)
27.	Determine which foods are superior for developing a healthy body (LS-E-A6)

Sample Activities

Safety Note: Activities in this unit will involve taste tests to explore items; therefore, for the health and safety of all students, parental input should be obtained before activities are taught. Teachers need to be aware of different allergic reactions for all students participating. If a student is identified to be allergic to certain items, then accommodations need to be made when planning activities. See Parental Response for Student Participation BLM included in Unit 1. Personal preferences as well as cultural and religious beliefs of all students must be considered and respected throughout every section of this unit.

Note: Before beginning this unit, make sure that you are aware of the state, parish and school guidelines for food in the classroom. This may influence your activities throughout the year.

Activity 1: Exploring the Food Pyramid (GLEs: 4, 7, 8, 13, 26, 27)

Materials List: video clip, computer, chart paper, writing media, KWL BLM, food pictures, Fruits Vocabulary Card BLM, Vegetables Vocabulary Card BLM, Grains Vocabulary Card BLM, Meat and Beans Vocabulary Card BLM, Milk Vocabulary Card BLM, Oils Vocabulary Card BLM, Exercise Vocabulary Card BLM, food magazines, newspaper circulars, scissors, glue, resealable plastic bags

Begin this unit by using a *graphic organizer* ([view literacy strategy descriptions](#)) in the form of the KWL BLM to develop an understanding of previous knowledge. The K in the chart will represent what they “Know about food.” The W in the chart represents what they “Wonder about food.” The teacher should use the W part of the chart that is developed to incorporate individual curiosities when teaching. The L part represents “What they learned.” Have the students brainstorm the topic *Food* to complete the K and W portion of the graphic organizer. Discuss and generate ideas and experiences related to the topic. The L portion of the chart will be developed at the conclusion of the unit when students discuss what they learned about nutrition.

Following the discussion, view the video clip from Louisiana Public Broadcasting’s Cyberchannel entitled *Food Smarts: My Pyramid for Kids* or another appropriate video. Note: This is a fee based resource; check with your individual school district for availability.

Topic Understanding: Following the video clip, explore the students’ understanding of the video through a class discussion asking probing questions, when necessary, to generate discussions and clear up any misconceptions. Some sample questions that could be explored are the following:

- What is the food pyramid?
- What types of foods are included on the pyramid?
- Are all snacks healthy?
- What are some healthy snacks?
- Is exercise important to health?
- What are some things we can do to stay healthy?

Alternative Activity: If the use of a video clip is not an option, there are other resources available that offer teaching information about the food pyramid. The following Web sites are resources to help develop these concepts:

- <http://www.mypyramid.gov/kids/index.html>
- <http://teammnutrition.usda.gov/kids-pyramid.html>

In a small or large group, discuss foods and the nutrients they give our bodies. Emphasize that different foods help our bodies in different ways. Discuss healthy foods (whole grains, bread, pasta, rice) in the starches group and point out that they give us energy. Discuss foods that are fresh and healthy such as fruits and vegetables, which should be

eaten each day. Emphasize that fruits and vegetables give us many vitamins and minerals to help us stay healthy. In the protein section, discuss meats, beans, and nuts as helping our muscles grow healthy. Proteins should be in our diets each day. In the milk section, these products provide calcium which helps to build strong bones and teeth to last a lifetime. Clearly state that students and adults (all people) should avoid eating a lot of fat, sugar, and salt (ice cream, candy, potato chips, etc.). Students should recall and discuss what foods are healthy and why. Emphasize the choices that students make affect their health now and when they are older.

Take a look at the school's weekly lunch menu. Students should point out what food groups are planned and how they help our bodies.

Have the students make a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) for the basic food groups to include meat group, milk group, fruit group, vegetable group, grain group, and the oils group. Demonstrate the process as the students follow along completing the steps. On their individual Fruits Vocabulary Cards BLM, have the students trace the targeted word "Fruits" in the middle of the card. Ask the students to help develop a group definition. Write the definition using illustrations or words in section 1 on the card. Next, ask the students for examples of fruits they are familiar eating. Display the list on the board and have the students transfer it to section 2 on the card. Then, have the students search for pictures in magazines, news circulars, or on the Internet of fruits. Cut and glue these pictures on section 3 on the card. Finally, have the students draw a simple illustration of their favorite fruit in section 4 on the card. After completing this first card the students will repeat the same process with the other targeted groups using the Vegetables Vocabulary Card BLM, Grains Vocabulary Card BLM, Meat and Beans Vocabulary Card BLM, Milk Vocabulary Card BLM, and Oils Vocabulary Card BLM.

Because exercise is an important component on the Food Pyramid, modify the process as necessary to develop a card using the Exercise Vocabulary Card BLM as well.

Vocabulary cards are used to help students see the connections between words, examples of words, and the critical attributes associated with the group. The students should save these cards in resealable plastic bags, revisiting and adding to the collection with other important vocabulary terms presented throughout the year.

Activity 2: Building the Pyramid (GLEs: 7, 11, 13, 26)

Materials List: Food Pyramid Poster BLM, Blank Food Pyramid BLM, variety of foods representing all components of the Food Pyramid, covered basket, food magazines, newspaper circulars, scissors, glue

Display an enlarged visual of the Food Pyramid Poster BLM and lead a discussion on the basic components it identifies. Provide students with pictures of a variety of different foods that could be classified on the Food Pyramid. These pictures could be found in

magazines or through a search on the computer as Internet images. Place the pictures in a basket with a top covering not to reveal the pictures to the students. Call students up individually to place their hand into the basket to reveal their mystery food selected. Have the student identify their food, and then identify the section of the Food Pyramid it belongs. Have students participate in placing assorted pictures of food onto the proper section on an enlarged version of the Blank Food Pyramid BLM. If needed, assist students with proper placement on the pyramid.

In small groups, have the students reconstruct the triangular food guide pyramid. Provide each student with the Blank Food Pyramid BLM. Have the students use magazines or news circulars to find food items to display on all sections of the pyramid. Assist students with proper food placement, if necessary.

See this interactive Food Group Sorting Game to explore foods as students test their knowledge of food groups:

http://funschool.kaboose.com/formula-fusion/games/game_food_groups.html

Activity 3: Fruits and Vegetables (GLEs: 4, 11, 13, 26)

Safety Note: Good hygiene rules (hand washing, no licking, no coughing or sneezing onto food) should be shared with the students and enforced by teachers during all food preparation activities.

Materials List: variety of fresh fruits and vegetables, sorting trays, chart paper, writing media; optional: fruits, preparation tools, gloves, water, bowls, reduced fat condensed milk or low fat yogurt, cups, spoons, invitations, guests

Provide students with a variety of fresh fruits and vegetables to explore (apples, pears, tomato, potato, celery, corn on the cob, green beans, carrot sticks, and bell pepper). Have the students describe the fruits and vegetables explored by using their senses. Ask probing questions to expand discussions to include:

- How does it smell?
- How does it feel?
- How does it look?
- How does it sound?
- How is it shaped?
- What is it?

Encourage students to sort them by different attributes. You may provide 2 or 3 large plastic trays or plates for sorting. Students should explain their reasons for sorting (e.g. color, texture, shape, and weight). Lead a discussion on “Why do we eat fruits and vegetables?” Make sure to stress the importance that eating plants as foods provide us with essential fiber, vitamins, and minerals necessary for survival. Create a visual organizer on chart paper with 2 categories to include a fruit and a vegetable category.

Lead a discussion on fruits and vegetables and have students identify and list or illustrate the foods putting them in the proper column.

Experiences with simple food preparation should be part of nutrition education. Have the students help plan and prepare a simple recipe. One example of a class recipe could include a simple fruit salad prepared by the students. Students discuss hand washing and why they must avoid licking, tasting, sneezing or coughing on the foods as they prepare them. Teacher will lead a discussion of healthy food preparation techniques to avoid spreading germs or diseases. Discuss safety procedures with equipment necessary to prepare the recipe. To help build a sense of community within the class, ask parents to supply one fruit of their choice to include in a class fruit salad. With assistance, the students prepare each fruit properly for consumption including washing the fruit. The fruits that need to be cut will be prepared by the teacher. After all fruits are prepared, they are then put together in a large bowl. Add one can of reduced fat condensed milk or yogurt to the community salad and stir until mixed. The fruit salad will be unique depending on the types of fruits the students supply. Discuss manners and proper serving etiquette with the students. Using cups and spoons, invite the students to help serve and enjoy the salad they helped to prepare.

This would be an excellent time to invite school helpers or administrators to meet your class and enjoy a treat. Simple invitations could be prepared and distributed by the class to those special friends.

Activity 4: Food from Animals (GLEs: 7, 8, 11, 26)

Materials List: chart paper, writing media, animal pictures, meat pictures

Brainstorm ([view literacy strategy descriptions](#)) the topic meat. Have students explore the following: What is it? Where does it come from? Together, ask students for foods that they think come from animals. Record these on a large chart by having students draw pictures or supply pictures of examples of familiar meats. Have students make predictions of what animals provide meat called beef, poultry, seafood, pork, etc. Record their predictions on chart paper.

Display pictures of different farm animals for children to view. Discuss how these animals give us food (e.g., milk- cow, eggs – chicken, ham – pig) and what the meat is called from various animals. Have students check their predictions from earlier in the lesson. Students should know that meats come from animals and that gives us protein for our muscles to grow strong and healthy. This is an excellent time to discuss dietary habits or preferences of other people and to present these differences in nonjudgmental ways. The teacher should introduce the word vegetarian and discuss why some people do not eat meat, fish, or poultry. The teacher should not to offend the meat eaters or vegetarians, in the class by pointing out that these animals are raised on farms to provide us food. Individual choices by people and families on whether or not to eat meat are okay, and we should avoid judgment.

Activity 5: What's for Lunch? (GLEs: 7, 8, 26)

Materials List: school lunch menu, chart paper, writing media, food labels, food group labels, food service employees, chart for favorite food graph, Unifix cubes™, Food Pyramid Poster BLM, optional – Blank Food Pyramid BLM

This activity will explore a lunch menu from the school cafeteria. Reviewing the lunch menu can be part of daily routine, weekly routine, or done occasionally. Students participate in teacher-led reading, writing and drawing of the day's menu. Cut out each illustrated and labeled food item listed on the menu. Upon finishing the menu, the teacher presents a chart with more than five items listed. Each is labeled with a main food group (e.g., grains, milk, meat and beans, fruits, vegetables, and oils/fats/salt). Have students make predictions of which foods go into the columns. Lead a discussion with students on the food groups and guide them in completing the chart by sorting the individual foods from the menu into the six food groups. Have students reflect on their initial predictions after the chart is completed. Students will participate in a discussion of how each different food gives the body nourishment in different ways (proteins build muscle, breads give energy, milk helps bones and teeth). Students should be aware of the variety in foods to meet different nutritional needs.

This activity may be repeated with the Blank Food Pyramid BLM as a chart instead of the six columns. The class may also visit the school cafeteria and interview the food service employees about food groups and meal planning. The cafeteria director may be available to discuss why individual foods are selected for each day's menu. Upon returning to the classroom students may compose a large thank you note for the visit to the cafeteria staff. The thank you note should include summary comments on what they learned about nutrition and the school cafeteria.

After eating lunch, reflect on the school menu to develop a favorite food graph. Create a chart to have children identify their favorite food on the school lunch menu for any given day. Have students vote on their favorite food of the day and have them say why they chose that food. Each time a child votes, have the child place a Unifix™ cube in the appropriate column. As students vote, the graph will grow to resemble a simplified version of a bar graph. After each child has had a turn to vote, add up the columns and identify through tally marks the total of each food item. Explore the graph by asking probing questions to help develop age appropriate vocabulary to include most, least, fewest, equal, etc. This should be done at different times of the school year to show different food preferences among students.

Have students explore food items in more depth at the science center where student understanding will be explored using the activity specific assessment section.

Activity 6: Try a New Food! (GLEs: 4, 7, 8, 27)

Materials List: foods to taste, plates, forks, toothpicks, napkins, Exploring New Foods BLM, writing media

Trying new foods is an activity that is best repeated throughout the year. Students may learn that tasting new foods is a part of growing up just like trying new activities, games, music, or places. Foods for tasting may include food groups, cultural foods and different forms of the same food (e.g., fresh apples, apple juice, applesauce, apple pie). Students need the opportunity to learn about foods from the various ethnic groups that may be represented in class. Invite parents or families to prepare food samples from family favorite recipes. Bringing these foods to the classroom will allow students to taste and learn about preparation and any cultural or family significance of a particular food (e.g., fry bread, won tons, fig cookies, potato pancakes, jambalaya, gumbo, tacos, burritos). Have students wash their hands properly. Display new foods in a simple, pleasing manner onto individual paper plates with a small fork, toothpick, and napkin for each child. Emphasize that students will try all foods and are not allowed to share foods from their plates with others.

The teacher may model trying a new food by tasting it in front of the students. Students should be encouraged to use their senses to see, smell, touch, and taste the new food. Students should never be forced to eat any food. Students who do not like the food are given permission to throw it away. Students who like it are encouraged to eat it and have another small sample if they want one. All students may participate in discussing the new food's color, smell, taste, and texture. The teacher may direct a discussion of this newly tasted food. Students are asked to identify which food group it belongs to and why. Have students talk about the nutritional value of the new food for building a healthy body.

Use Exploring New Foods BLM in an enlarged version to create a *graphic organizer* ([view literacy strategy descriptions](#)) in the form of a checklist using new foods tasted. Write like and dislike on the vertical dimension of the checklist on a chart paper. Supply student names along the horizontal dimension of the checklist. With student participation, fill in the checklist by placing a √ in the space corresponding to the students like or dislike of the food. Students are encouraged to discuss the different tastes, textures, smells and ways to describe the particular food tasted.

Example Graphic Organizer:

Do you like the new food?		
Food:	Taco	
Food Group:	1. Meat 2. Bread and Cereal 3. Milk	
Student:	Like	Dislike
Kailey		√
Kaleb	√	
Beth		√
Demi	√	
Patrick		√
Derick		√
Totals:	II	III

Upon completing a tasting survey, have the students tally the columns and discuss the results, using quantitative vocabulary such as *more than*, *less than*, *equal to*, etc. This chart should be displayed in the room for future reference. Students should be encouraged to explore additional foods throughout the year, using this checklist and vocabulary explored in describing food tastes.

Activity 7: Milk Changes (GLEs: 2, 3, 4, 7, 8, 27)

Teacher Note: For students with milk allergies, try a cool whip “shake” made with non-dairy liquids. Discuss food allergies as common among many people and that care must be taken to avoid those foods and get nourishment from other food sources.

Materials List: chart paper, writing media, milk product pictures, plates, spoons, milk products to taste, recipe ingredients which include milk, sugar, salt, gallon freezer plastic bags, quart freezer plastic bags, salt, ice, vanilla, measuring cups, measuring spoons, cups, spoons, cloth towels, science learning logs, related children’s literature (optional)

Discuss how certain animals such as cows and goats give us milk to make products that we eat. Ask students to list foods that they think come from these animals. Express how milk products provide calcium which helps to build strong bones and support teeth development to last a lifetime. Discuss that some foods come fortified with calcium such as cereals and juices, but they do not contain all of the other vitamins and minerals found in dairy products. Display pictures of different milk products. Ask children to brainstorm for different products not identified and record these on a large chart by having students draw and label pictures. Provide a taste test of different dairy products. Have students describe the products by using their senses. Using plates and spoons, invite the students to sample each and lead a discussion afterward on the likes and dislikes of each item tried. Some examples of products should include, different milks (regular, skim, chocolate, etc.), yogurts, ice creams, cheeses, puddings, etc.

Lead the class in a *brainstorming* exercise ([view literacy strategy descriptions](#)) to answer these questions:

- What would happen if the temperature of milk was lowered?
- Would milk change or remain the same?
- How would it look?
- How would it feel?
- Would it taste different?

Have the students make predictions as they explore possibilities. These questions serve as a bridge to lead into the activity below.

To become more familiar with milk and its possibilities of changing effects, have students make baggy ice cream as a cooperative partner activity. Have children partner up to work together to produce a finish product. In a gallon freezer plastic bag, fill about 1/2 with ice. To this add 4 to 6 tablespoons of salt. Have the pairs shake to mix the salt and ice together.

Next in a quart freezer plastic baggie combine 8 ounces of milk, 1 tablespoon of sugar, and 1/4 teaspoon of vanilla (or other flavoring). With teacher assistance, have the students seal the bag, getting rid of as much air as possible. Have the partners shake the bag until the sugar is dissolved and the flavoring is well mixed. Place the small bag inside the larger bag. Seal the large bag making sure to get rid of as much air as possible again. Have the partners work together, shaking the bag back and forth for about 5 minutes until the milk turns to ice cream. The bag gets very cold as it is shaken. Have several cloth towels at hand to assist those students that find it too cold to shake. With teacher assistance, have the group remove the small bag and wipe it down with a towel to make sure all the salt is removed. Have them explore the changes of what happened to the milk mixture. Have the partners spoon out the contents of the bag into two cups and so they can enjoy the finish product.

As the students enjoy the ice cream, have them discuss what actually happened. Have them compare their predictions made earlier to what they observed. Make sure to point out that the mixture of ice and salt lower the temperature of the milk and allows for the physical change from a liquid milk state to a more solid milk mixture. The salt/ice mixture demonstrates a more physical use of mixtures and solutions. The milk itself is a mixture while the sugar is actually dissolved in the milk.

Using a modified *RAFT writing* ([view literacy strategy descriptions](#)) have the students illustrate the changes milk goes through as it turns to ice cream to demonstrate their understanding of the process. This form of writing gives students the freedom to project themselves into unique roles and look at content from unique perspectives. From these roles and perspectives, *RAFT writing* has been used to explain process, describe a point of view, envision a potential job or assignment, or solve a problem. It's the kind of writing that when crafted appropriately should be creative and informative.

The students with teacher support will decorate their template, complete a short write up, and give an oral report on the following RAFT:

R- Role of the writer (the milk)

A- Audience or to whom or what the RAFT is being written (other students)

F- Form the writing will take (an oral report)

T- Topic or the subject focus of the writing (What happens to milk as it changes to Ice Cream?)

Students will use props collected or from the thematic center to act out the process of milk changing as students present their oral reports to the whole class. As students share their explanations with the class, check their accuracy and understanding of the process, clearing up any misconceptions that arise.

Again, discuss the nutritional benefits of milk and dairy products and have students tell ways that these foods help our bodies. Ask why it is important to drink milk every day or eat foods that are made with milk products. Encourage and discuss student ideas. Integrating children's literature such as *Make Mine Ice Cream* by Melvin Berger (non-fiction) or *No Moon, No Milk* by Chris Babcock (fiction) are excellent follow-up readings for this activity.

Activity 8: Healthy Snacking (GLEs: 2, 3, 13, 27)

Materials List: Food Pyramid Poster BLM, chart paper, writing media, packaged snacks with nutritional labeling, invited guests with healthy snacks, plates, napkins, spoons

Lead a discussion on the different foods students eat for snacks. Use chart paper to compile a list of snack foods discussed. Refer to an enlarged version of the Food Pyramid Poster BLM and discuss the "oils" group category with the students. Stress that many snack foods they eat fall into this category. Foods that contain large amounts of oil, sugar, and salt are said to be unhealthy.

Lead a discussion to have students make a prediction of Why they think we need healthy snacks? Develop a chart to record these responses. Lead the students to the understanding that healthy snacks provide us with energy to play, grow, and learn. Eating the right foods also keeps our body healthy and free from disease. Refer to the predictions made by the students earlier for correctness and clear up any misconceptions the students may have had. All healthy snacks have a place on the food pyramid in the wider sections. Provide a few healthy packaged snacks and introduce the nutritional labeling component provided on packaging. Stress that serving sizes and nutritional components are labeled to help inform us about products when purchasing. Have them bring a snack label from home to discuss in class. Because of their limited reading abilities, discuss with the students what is on each label. Use these labels to sort items into healthy and unhealthy snack categories. Focus on sugar, fat, and salt contents.

With the help of an adult, student selections and awareness can influence their future snacking decisions. This will make students more aware of what they are consuming. Invite parents, grandparents, community members, or another class in school to a meet-and-greet healthy snack party where they are asked to bring healthy snacks for the students to explore. Beforehand, provide them with a list of some examples of healthy snacks that include fresh vegetables, fruits, low-fat cheese, low-fat crackers, low-fat pudding, whole-grain products, etc. Local supermarkets or businesses may be willing to sponsor your efforts by donating food items to help develop healthier eating habits. After this activity, explore student understanding using the activity specific assessment.

See these readily available teacher resources that help provide background knowledge for and additional lessons for good health and nutrition:

- http://www.kidshealth.org/kid/stay_healthy/ Informative site with information on how to take care of your body, eat healthy, and stay fit.
- <http://www.thesolutionsite.com/search.shtml> Several informative lessons and black line masters to develop this concept. Perform a unit search for lessons at the K level including the key words healthy snacking.

Activity 9: Fitness (GLEs: 2, 7)

Materials List: chart paper, writing media, exercise tapes or DVDs, television or computer for viewing

The students will show agreement or disagreement with statements by holding their thumbs up or down in response to items on an *opinionnaire* ([view literacy strategy descriptions](#)). The students will be allowed opportunities to defend the position taken on each statement. The emphasis is on students' points of view not correctness during this introduction to the topic of food and health. Statements about food and health, as in the examples below, should be presented before exploring the topic further and should be written in such a way as to elicit attitudes and feelings.

What Are Your Opinions about food and health?

1. Foods help us grow.
2. Foods give us energy to work and play.
3. Food helps keep our bodies weak and unhealthy.
4. Our bodies use different foods for different needs.
5. Exercise is not important.

Each statement should be discussed after students take positions. The discussion should serve as a bridge for the following activity.

Eating right is only one component to healthy living. Healthy lifestyles include both eating right and being physically active. Discuss with students different types of exercises people participate in to facilitate good health. Exercises or activities such as aerobics, yoga, karate, gymnastics, football, baseball, biking, soccer, swimming, walking, jogging, running, dancing, etc. help promote good all-around health. It is recommended that all children get up to 60 minutes of physical activity every day. At various times throughout the school year, provide opportunities to introduce these exercises or activities at P.E. time. Tapes or DVDs checked out from the public library could provide background knowledge on different types and styles of exercises the children could participate in.

The teacher should also note that people or students that are physically impaired or restricted physically should consult with an adapted physical education teacher or physical therapists for guidance. It is their job to give suggestions of other appropriate exercises for them to participate in, depending on their physical condition.

Children participate in various activities to take up their time while at home. It is important for them to identify beneficial types of activities they can engage in to promote better health. Through brainstorming, have children make predictions about these questions:

- What activities would help contribute to better health?
- What activities would not help contribute to better health?

Lead a discussion on healthy and unhealthy activities. On chart paper, record examples of healthy activities and unhealthy activities for display in the class to reference throughout the year. Have students check predictions made earlier to the list developed by the class and clear up any misconceptions that students may have had. If children become aware of how to select better activities to participate in, they can in turn affect their overall health. After this activity, explore student understanding using the activity-specific assessment.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes
- A checklist of students understandings, abilities, and skills
- Student-generated work such as drawings, data collection charts, photographs of models, and experiment results
- Photographs of students preparing healthy foods
- Science Learning Logs

Activity-Specific Assessments

- Activity 2: Upon completion of the activity, students should be able to answer questions about the basic food groups found on the Food Guide Pyramid. Teachers may use the following checklist to question students:
 - Can students list and explain different types of foods groups?
 - Can students tell one or two ways that different foods benefit our bodies?
 - Can students tell which types of food we should eat more of? Less of? Why?
 - Do student responses indicate that they understand the concept? How well?

The responses documented on the Blank Food Pyramid BLM also give an insight to the understanding of food groups. Probe students to find out why they chose the foods they did for the BLM activity. Responses should be recorded and included in their portfolio.

- Activity 5: After exploration with the school lunch activity, the students should be able to identify foods to represent all food groups. As a center-based activity in the science center, have a variety of different foods or food pictures representing all groups from the Food Guide Pyramid. Students are to select one food from each group. Ask the student to explain their choices. Record the responses, considering skill, ability, and reasoning level. The teacher will record the information in the portfolio system.
- Activity 8: After completion of the activity, students should be able to identify both healthy and unhealthy snacks and make reference to the nutritional labeling on packaging. The student will demonstrate this by identifying two familiar healthy and unhealthy snacks. Ask each student to explain why they made their snack choices. Record the responses considering skill, ability, and explanation for their selection.

**Kindergarten
Science
Unit 6: Exploring Mixtures and Matter**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit is designed to build basic knowledge of mixtures and matter through a series of exploratory activities. These activities include making mixtures from commonly available dry and/or liquid materials and identifying mixtures in nature. Activities also include investigating water and its properties.

Student Understandings

Students explore mixing dry solids, wet liquids, and wet and dry materials together to form an understanding of mixtures. Students begin to recognize what materials are in commonly available mixtures. Students explore water in its solid and liquid state. They experience the evaporation process first hand. They also conduct simple investigations to explore common materials that will either sink or float in water.

Guiding Questions

1. Can students define and describe a solid mixture? Liquid mixture?
2. Can students describe what happens when they mix ___ with ___?
3. Can students describe what happens to solids in liquids?
4. Can students describe what happens to liquids in liquids?
5. Can students predict how mixtures may be separated?
(Filtering, taking apart piece by piece)
6. Can students predict how common materials interact with water?
7. Can students identify water in its solid and liquid form?

Unit 6 Grade-Level Expectations (GLEs)

GLE#	GLE Text and Benchmarks
Science as Inquiry	
2.	Pose questions that can be answered by using students' own observations and scientific knowledge (SI-E-A1)
3.	Predict and anticipate possible outcomes (SI-E-A2)

4.	Use the five senses to describe observations (SI-E-A3)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
9.	Identify and use appropriate safety procedures and equipment when conducting investigations (e.g., gloves, goggles, hair ties) (SI-E-A7)
10.	Recognize that a variety of tools can be used to examine objects at different degrees of magnification (e.g., hand lens, microscope) (SI-E-B3)
Physical Science	
15.	Create and separate mixtures (e.g., oil/water, rice/beans) (PS-E-A5)

Safety Note: Activities in this unit will involve experiments to explore items that are edible. Allergic reactions to food or sensitivities to certain scents are an important concern with activities to be presented. For the health and safety of all students, parental input should be acquired before activities are taught. Teachers need to be aware of different allergic reactions for all students participating. If a student is identified to be allergic to certain items, then accommodations need to be made when planning activities. See Parental Response for Student Participation BLM in Unit 1.

Sample Activities

Activity 1: Scientific Snacking (GLEs: 3, 4, 15)

Materials list: edible sorting mixture ingredients, Sorting Sheet BLM, resealable bags, ½ cup measuring cup

Safety Note: Activities involving tasting should be well planned and supervised for safety, health, and optimum learning by all students

Gather the ingredients for Scientific Snack Mix using at least five different items. Suggested ingredients are cereals, dried fruits, candies, chocolate candies without nuts, etc. Have students predict what will happen when all of the snack mix ingredients are combined. Pour all of the ingredients into a gallon-sized resealable plastic bag and seal it. Pass the bag around the group encouraging each child to help mix the ingredients by gently shaking the bag. Next, serve each student a half-cup of the mix on their Sorting Sheet BLM. Have the students sort their mixture by ingredients and then mix them back together. Students participate in discussion of what a mixture is. Have students brainstorm to identify other examples of mixtures that can be eaten. Be sure to discuss proper handling of laboratory ingredients with the students. After completion of the investigation, allow students to eat their mixture of ingredients.

Activity 2: Magnifying Mixtures (GLEs: 3, 4, 9, 10, 15)

Materials list: bowl, sugar, cinnamon, measuring spoons of $\frac{1}{2}$ teaspoon & 1 teaspoon, resealable bags, magnifying lenses, wooden craft sticks, butter or margarine, bread, paper plates, chart paper, writing media

Safety Note: Discuss safety precautions for use of magnifying lenses. Activities involving tasting should be well planned and supervised for safety, health, and optimum learning by all students. Discuss with students that not everything is safe to taste when conducting experiments. They are only to taste, feel, and smell substances when instructed to do so by the teacher.

At a small group time, fill a small bowl with sugar and a small bowl with cinnamon. Students then examine sugar and cinnamon by placing a tiny pinch of each in separate hands. Students predict what will happen when the two solids are mixed together. These predictions are recorded on chart paper. Using a snack-sized resealable plastic bag, have each student place $\frac{1}{2}$ teaspoonful of cinnamon and 1 teaspoon of sugar into the bag. Make sure the bags are sealed, then instruct students to shake the bag to mix the sugar and cinnamon. Students will then use plastic magnifying glasses to examine the contents through the bag. Students will discover that bits of cinnamon can be seen in with the sugar. Guided questions posed by the teacher will help students conclude that combining sugar and cinnamon created a mixture. Students participate in the discussion of the concept of a mixture. Students will revisit and discuss their earlier predictions, checking for accuracy to their experimental conclusions.

If time permits, allow students to use their individual bags of mixtures to make cinnamon bread. Give each student a paper plate, a slice of bread, softened butter or margarine, a wooden craft stick for spreading butter and their individual cinnamon sugar mixture for sprinkling. Using these items, have them assemble cinnamon bread to enjoy their unique mixtures.

Using the modified *story chain* ([view literacy strategy descriptions](#)), the teacher will introduce statements to help develop an understanding of mixing solids together. Writing out the story provides students a reflection of their understanding. This is reinforced as students attempt to answer the statements. On a sheet of chart paper, record student responses to complete the story chain. Responses are open to class discussion and could be revised based on student input. The students will build upon these statements:

- Cinnamon looks like . . .
- Cinnamon feels like . . .
- Cinnamon smells like . . .
- Cinnamon tastes like . . .
- Sugar looks like . . .
- Sugar feels like . . .
- Sugar smells like . . .
- Sugar tastes like . . .

- When mixed together they look like . . .
- When put on bread with butter it tastes like . . .

Place this class developed *story chain* in the reading corner to be explored by children throughout the year.

Activity 3: Shaking Up Mixtures (GLEs: 2, 3, 4, 7, 9)

Materials list: water, plastic bottles, tape, food coloring, vegetable oil, plastic droppers, writing paper, writing media

Safety Note: Be sure that all bottles are tightly closed and taped securely as they are not to be opened by students. Teacher may remind them of choking hazards of small objects.

Water and Food Coloring Experiment - Have the students observe water and a bottle of food coloring. Have students *brainstorm* ([view literacy strategy descriptions](#)) for likenesses and differences of each. Record responses on chart paper, allowing time to revisit throughout the activity and/or unit. Pose questions to facilitate the discussion. Ask the questions How are they alike? How are they different? Make sure they recognize that they are both liquid substances that flow but they are different in color.

Students are then asked to engage in *SPAWN writing* ([view literacy strategy descriptions](#)) to promote making predictions of what will happen when mixing these two liquids together. *SPAWN writing* is an acronym that stands for five categories of writing prompts for content area learning. Using the “W” or “What If” category of prompts from SPAWN, students will respond to the following question: “What will happen if we mix these two liquids together?” For example, What will happen to the clear substance? What will happen to the colored substance? Will they combine? Will they be able to be separated? On a plain piece of paper, the students will illustrate a picture to answer the question. The illustration will depict the prediction of mixing the liquids together. Allow students to share their illustrated responses with a partner or the whole class.

Have students observe as the teacher fills an empty (plastic) bottle with water. The teacher will add drops of food coloring as students observe the mixing and changing of the water. Students will refer to their *SPAWN illustrations* to confirm their predictions. The teacher will screw the cap on tightly and tape the joint. The teacher should explain that the bottle is not to be opened by students. Students should pass the bottle around and shake it. Students will respond to guided questions, discussing what happened when the two substances were mixed.

Before proceeding with this activity, the teacher will lead a discussion on safety issues when handling items for experimentation purposes. Some items that should be discussed could include the following:

- What to do if one of the caps are removed
- What to do if there are spills during the activity
- What to do if one of the bottles appears to have a crack in it

Have students develop responses to these or similar issues if these scenarios were to take place. The teacher will ask students probing questions to help facilitate discussions for accurate information in their responses.

Water and Oil Experiment - Have the students observe water and a bottle of vegetable oil. Using the plastic dropper, give each student a drop of water to feel in their hand. Next, give each student a drop of vegetable oil to feel in their hand. Have students brainstorm to identify the likenesses and differences of each.

Ask the questions How are they alike? How are they different? Make sure they identify that that they are both liquid substances that look, feel, and flow differently.

Students again explore the literacy strategy of *SPAWN writing* to predict what will happen when mixing these two liquids together. On plain piece of paper, the students will illustrate a picture to answer the question "What will happen if we mix these two liquids together?" For example, What will happen this time? What will happen to the water? What will happen to the oil? Will they combine? Will they be able to be separated? The illustration will depict the prediction of mixing these two liquids together.

Have students observe as the teacher fills the bottle by adding enough vegetable oil to fill it half way. The teacher should screw the cap and pass the bottle around as the students manipulate and shake the bottle. The teacher will question the students about what will happen when water is added to the oil. The teacher should lead a discussion as she begins pouring water into the bottle to fill it up. She should ask probing questions such as What is happening? Are these two liquids mixing? Why? Why not? The teacher will screw the cap on tightly and tape the joint. Students should pass the bottle around, shaking it as it goes. Students should respond to guiding questions, discussing what happened when the two substances were mixed.

The teacher discussion will lead students to the conclusion that some liquids cannot be mixed. (No matter how much you shake them, they will separate from one another when left alone.)

In conclusion the students participate in a discussion to compare and contrast what happens when food coloring is added to water and then what happens when water is added to oil. Place bottles (with tops secured) in the discovery area for further investigation. Additional bottles may be placed in the science center to demonstrate different degrees of mixtures to include both liquids and solids. Examples of other mixtures could include corn syrup, baby oil, water with glitter, paper clips, marbles, metallic confetti, small plastic toys, etc.

Activity 4: What Will It Do? (GLEs: 3, 4, 7, 15)

Materials list: water, pitcher, clear cups, items to investigate with water, timer, tablespoon, strong paper towels or coffee filters, colander, bowl, chart, word grid, writing media, What Will It Do? BLM

Allow time for students to explore items used in investigations to include water, sand, chalk, sugar, oil, jelly, baking soda, rocks, drink mix, coffee grounds, salt, toothpaste, etc. Ask students to make predictions: What would happen if water and sand is mixed together? What would happen if water and chalk is mixed together? Continue with all items.

Co-construct a modified *word grid* ([view literacy strategy descriptions](#)) to predict which items will dissolve and which items will remain separate within water. Draw illustrations of items to investigate on the vertical dimension of a large word grid on a chart paper. Supply the investigating questions along the horizontal dimension. With student participation, fill in the word grid with predictions of each item by placing a \checkmark in the space corresponding to the question, “Will the item dissolve in water?” Using the What Will It Do? BLM, have students record the predictions made on the co-constructed grid.

Investigations begin by filling clear cups with water. Add 1 tablespoon of each item to investigate to a water filled cup. Stir and ask students to describe what happens to each. Record their description on chart paper. Leave the mixtures alone for five minutes to allow time for some items to dissolve. Stir again. Ask What happens now? Again, record their time lapsed description of each on chart paper. Students then compare their descriptions of each with their previous predictions discussed before investigations began.

Next, strain mixtures by pouring the mixtures through strong paper towels or coffee filters lining a colander over a bowl. Students should observe the mixtures and filters then discuss their observations. Through brainstorming, students will participate in developing characteristics of a mixture. Students should be guided to realize that some solids mix with liquids to dissolve, where others remain separate within the liquid.

After investigations, fill in the word grid with the conclusions of investigations for each item by placing a \checkmark in the space answering the question, “Did it dissolve in water?” Total the amount of checks on each question, using numbers or tally marks to represent the group. Have the students record the unfilled portion of the What Will It Do? BLM, using the co-constructed grid containing the investigation conclusions.

At center time, allow children opportunities for water exploration and investigations of different solids with proper supervision.

Activity 5: Water Comes and Goes (GLEs: 2, 3, 4, 7)

Materials list: chart paper, writing media, computer, video clip or other appropriate material, large ice cubes, clear cups, small paint brushes, cement surface, Ice Cube BLM, Painted Water BLM

A viewing of the video clip from the Louisiana Public Broadcasting's Cyberchannel entitled, *Water: A First Look*. This is a fee-based resource; check with your individual school district for availability. Use this clip or other appropriate material on water to participate in a modified *DR-TA* or directed reading-thinking activity ([view literacy strategy descriptions](#)). This is an instructional approach that invites students to answer the questions and then check these answers during and after viewing or reading.

Brainstorm the topic "Water." Generate ideas and experiences related to the topic. Some questions to explore should include the following:

- Where is water found on Earth?
- What are the three states of water?
- Who needs water to live?
- How can we help conserve water?

To develop background knowledge of water and its properties, have students make predictions and record their answers on chart paper for further reference.

After questions are answered, have students view the video clip or other appropriate material on water and its properties. *DR-TA* provides a frame for self-monitoring because the viewer/reader(s) pause throughout the clip or reading to ask questions. Allow the students to check and revise the answers when necessary. It may be necessary to generate discussions about these questions to check for student understandings to clear up any misconceptions they might have.

Alternative Activity: If the use of a video clip is not an option, other resources could be explored to help build background knowledge that offer teaching information about water. Some suggestions include the following:

- *Local Parish Adopted Science Series*
- *I Am Water* by Jean Marzollo – K level reading literature
- *The Magic School Bus at Waterworks* by Joanna Cole – informative text

Have students conduct an investigation as an experiment, to experience the phases of water first hand. Students will predict, observe, and draw conclusions with the solid state of water and the process of evaporation.

Using the Ice Cube BLM, have students complete the prediction section by illustrating the answer to the question, "What will happen to an ice cube in a cup?" Next, conduct an experiment of changing the ice from a solid to a liquid. Give each student a clear cup with a large ice cube to experience what will happen. Allow time for observing the

melting process. Have students discuss what they observed during their investigation. Ask the student to tell you about the ice. Did it remain the same? Did it melt? What did it look like? Does it feel the same? What does it feel like? Using the Ice Cube BLM, have students complete the conclusion section by illustrating the answer to the same question after experimentation.

Next, have the students use the same cup of water to experience evaporation. Using the Painted Water BLM, have students complete the prediction section by illustrating the answer to the question, “What will happen to water when painted on cement?” Next, conduct an experiment of changing the state of water from a liquid to a gas outside. Give each student their cup of water and a small paint brush. Have students paint designs on a sidewalk or cement surface designated by the teacher. Allow time for the evaporation process to take place. Have students discuss what they observed during their investigation. Ask the student to tell you about the water. Did it remain the same? What did you see happen? Where is the water? Using the Painted Water BLM, have students complete the conclusion section by illustrating the answer to the same question after experimentation.

Topic Understanding: Water can be observed in a solid state, a liquid state, and in the process of evaporating. Water can change to from a liquid to solid or a solid to a liquid.

If time permits, expand investigations to include changing temperature during experimentation, noting the effects on the investigations. Some questions that may spark additional investigations could include the following: If the experiment is conducted inside or outside, does it make a difference? Does the sun play a part in the investigation? Does painting cement in the sun or shade make a difference? Does heat speed up or slow down the processes? etc.

Activity 6: Float or Sink? (GLEs: 2, 3, 4, 7)

Materials list: various small objects to test, trays, labels, writing media, water, large tub, foil, paper for summarizing experiment, Float or Sink BLM

Display various small objects such as clay, foil, wood, cork, rocks, blocks, various coins, pencils, crayons, cotton balls, sponges, toys, toothpicks, etc. that will sink or float to conduct simple investigations. Introduce and discuss vocabulary for investigations such as plan, investigate, observe, and sort. Lead a discussion on sinking and floating. Label two trays with word cards or illustrations of sinking and floating to be used with experimentation. Have students participate in a simple experiment by having them select an item they would like to test. Using a tub of water, have the students’ place the item in the water to investigate and observe what happens. Have students discuss what they observed during their investigation. Ask the student to tell you about the object. Does it float? Does it sink? Is weight a factor? Is the shape of the item a factor? Have the children remove their item from the tub, then place the item in the correct tray labeled “sink” or “float.”

After all students had a chance to participate, have students use the Float or Sink BLM to record class results of their findings through illustrations on items that float and sink

If time permits, have the students discuss what they could do to make the items on the float tray sink. Test some of these theories using the tub of water. Did their theories work? Why or Why not? If not, how could the theory be adjusted to have it sink? You may have to test through experimentation again.

Have students also explore with foil and water. Instead of just putting the objects in the water, have the children use foil to make boats and see how many small objects they can put in their boat until it sinks. Allow students to discuss what is happening during their investigations.

Observe how children plan, conduct their investigation, and explain their results of what happened. Have them summarize on paper what they learned about objects that sink and objects that float through an illustration at the conclusion of experimentation.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes made by the teacher while circulating throughout the classroom and observing the students participating in unit activities
- A checklist which can be used quickly and efficiently by the teacher while circulating among the groups
- Student-generated work such as illustrations, data collection charts, and experiment results
- Audiotapes, videotapes, or photographs
- Word Grid
- Story Chains

Activity-Specific Assessments

- Activity 2: The teacher will set up an assessment at a science table for students to work individually. The teacher will observe and record student work as they mixing the two materials. Students are asked to draw a simple flow chart and explain the events and results of the activity. Through open-ended questions, the teacher will ask the following questions and record each student's answers:
 - What happened when we mixed the two materials?
 - What changes did you see? Feel? Taste?
 - Can you think of two other materials that would make a mixture?

- Activity 3: The teacher will set up an assessment at a science table for students to work individually. The teacher will observe and record student work as they make predictions, create mixtures, and orally tell about the events and changes. Students will draw the process on a long strip of paper labeling the steps and the changes that take place. The teacher should observe and record knowledge of the concept, accuracy of prediction, and ability to describe the process.

- Activity 4: The teacher will set up an assessment at a science table for students to work individually. Using guided questions, the teacher will have students predict which solids will dissolve in water and which ones will not dissolve. The teacher will evaluate the work, noting understanding of concept, vocabulary used, and accuracy of predictions. Note student's ability to justify his/her answers reasonably and logically.

**Kindergarten
Science
Unit 7: Motion, Speed, Direction and Attraction**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

Activities provide experiences with outside forces and examine how they may influence motion, speed, direction, and attraction. The unit is also designed to allow experiences that develop an understanding of directions and use directional vocabulary.

Student Understandings

The students describe and predict the motion, speed, and direction of an object. Students explain and predict how outside forces may influence the motion of objects. Students gain beginning concepts of magnetism as they begin to identify objects that are magnetic and non-magnetic.

Guiding Questions

1. Can student accurately describe simple directions and placement of objects (on, under, behind, away, towards)?
2. Can students describe how objects move on ramps or slides?
3. Can students describe some different ways that objects move?
4. Can students describe what happens when they push objects? Can the student describe what happens when they pull objects?
5. Can students describe objects that roll when they push them?
6. Can students describe objects that slide when they push or pull them?
7. Can students identify whether objects are attracted by a magnet or not?
8. Can students compare and contrast the speed of objects?

Unit 7 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Science as Inquiry	
2.	Pose questions that can be answered by using student's own observations and scientific knowledge (SI-E-A1)
3.	Predict and anticipate possible outcomes (SI-E-A2)
4.	Use the five senses to describe observations (SI-E-A3)

GLE #	GLE Text and Benchmarks
5.	Measure and record length and temperature in both metric system and U.S. system units (SI-E-A4)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
9.	Identify and use appropriate safety procedures and equipment when conducting investigations (e.g., gloves, goggles, hair ties) (SI-E-A7)
Physical Science	
14.	Determine whether objects are magnetic or nonmagnetic (PS-E-A1)
16.	Follow directions using vocabulary such as <i>front/back</i> , <i>above/below</i> , <i>right/left</i> , and <i>next to</i> (PS-E-B1)
17.	Trace the motion of an object, such as a ball or toy car, as it rolls (PS-E-B3)
18.	Sequence the relative order of the speed of various objects (e.g., snails, turtles, tricycles, bicycles, cars, airplanes) (PS-E-B3)
Life Science	
22	Classify objects in a variety of settings as <i>living (biotic)</i> or <i>nonliving (abiotic)</i> (LS-E-A2)

Sample Activities

Activity 1: Where, Oh Where? (GLEs: 4, 16)

Materials List: stuffed animals or manipulatives, hula hoop, large different colored buttons, chart paper, writing media, assessment materials: table, small box, small objects, Positional Checklist BLM

Give each student a stuffed animal or manipulative such as a dog, cat, teddy bear, dinosaur, frog, etc. to explore positional or directional concepts. Tell students you are going to instruct them to put their animals in specific places using positional words. Instruct students to place the animals in the proper location according to verbal directions given. Some examples of positional or directional concepts to explore could be the following:

- on / over / under
- in / out
- inside/ outside
- front / back
- beside / behind / in front
- top / middle / bottom
- up / down
- high / low
- on / off
- above / below
- right / left

- first / last

Observe students for correctness and misconceptions of the positions.

After students have practiced positional or directional words with animals, have them use these practiced positions to describe objects. Place a hula hoop on the floor and toss large different colored buttons in and around a hula hoop. Call upon students to describe the positions of the buttons. Record their answers on chart paper as they identify the button positions. Instruct students not to use the same position twice to encourage more positional terms. Explore the possibilities that there could be more than one positional concept to describe each button position. For example, the red button could be on the side, next to, or even to the right of the hula hoop. Be prepared to discuss endless possibilities with students. Repeat this activity until every child has a turn.

Positional and directional terms should be incorporated throughout daily routines, such as lining up for outdoor activities and music and movement activities, etc. Students should regularly be able to give simple directions to the other students and then reverse the roles. Following simple directions is important for each student.

Have students explore positional and directional concepts in more depth at the science center where student understanding will be explored using the activity-specific assessment section.

Activity 2: Ups and Downs (GLEs: 2, 3, 4, 5, 9, 17, 18)

Materials List: boxes, cubes, beanbags, blocks, planks, medium and small balls, various size and weighted trucks and cars, ramp materials, cardboard cylinders (paper towel, toilet paper rolls, carpet rolls, etc.), ruler, writing media, chalk, freezer tape, meter stick, recording paper, writing media, pieces of carpet, pictures of inclines

Teacher Note: Discuss safety precautions as needed with materials that are used and manipulated for exploration.

Gather common, readily available materials such as boxes, cardboard tubes, cubes, beanbags, blocks, planks, balls, toy cars, etc. in various sizes and weights for exploration. Using everyday items for investigations might spark students to continue their explorations at home. Allow ample unstructured exploration time for students to discover the action and reaction of how things work through rolling, pushing, pulling, tilting, balancing, dropping, and sliding objects so they begin to develop natural interests. As students explore, encourage them to verbalize their thoughts and ideas. Facilitate the students through guiding their investigations toward the discoveries in the content of the movement of objects. As students explore, the teacher assesses student knowledge, experiences, interests, and misconceptions that they may have. Use this knowledge acquired to scaffold questions guiding their discoveries. Some examples of guiding questions might be as follows:

- How do objects move?

- What makes things move?
- What would happen if the ramp was higher?
- What would happen if the ramp was lower?
- Can you make the object move slower? How?
- Can you make the object move faster? How?
- Can the surface of a ramp change what happens? How?

After free exploration, students will begin more controlled experimentations. Have students experiment with several objects moving down a ramp. As activities progress use appropriate descriptive vocabulary such as *ramp, incline, speed, push, pull, distance, direction, friction, roll, spin*, etc. Before they begin, have students make predictions of which object will go the farthest. Using chart paper, record their predictions. As students test objects, have them trace the path of the object with chalk. At the end of the path, have the students place a piece of freezer tape in the ending position of the object. Using a meter stick, assist students as they measure and record the actual distance the objects travel. Write the actual distance next to their predictions made earlier. Facilitate a discussion as students check their prediction chart with the data recorded and have them compare and contrast the results among objects. Students should be able to do this activity on a wooden or tiled floor, first. Then students repeat the ramp trials on a carpet. Students will discuss the difference that a floor surface makes on moving and rolling objects. Next have students experiment with changing the height of the ramps. Again, students will discuss results as objects are tested. Objects can be sequenced according to speed at which they traveled. Teacher-directed questions will assist students in the discovery of basic principles in motion.

- wood floor—faster
- carpet—slower
- high ramp—faster
- low ramp—slower

Students will then create tunnels from empty toilet paper or paper towel rolls, gift wrap rolls, carpet rolls, etc. Instruct students to roll the balls down the ramps and through the tunnels to change directions. Encourage students to describe the relative position of the balls using appropriate vocabulary to include words like *right, left, down, up, in, and out*. Next, students will discuss the speed of the balls when the ramps are raised or lowered. Have students trace and measure how far the ball moves on the flat floor for each trial. After the trial is complete, have students sequence the balls from the shortest distance rolled to the farthest distance rolled. Lead a discussion to have students explain which ball rolled the shortest and which the farthest and why they think this happened. The teacher will observe to check for understanding and clear up any misconceptions that arise.

Facilitate a *brainstorming* ([view literacy strategy descriptions](#)) activity to have students identify different inclines they are familiar with in their experiences. Provide real life pictures of different inclines to include bridges, roads, parking garage ramps, slides, stairs, handicapped access areas, etc. so students unfamiliar with these examples can

better relate. Extend this activity beyond the classroom by having students identify and visit areas on campus to test objects on inclines.

Periodically throughout the school year, students should have the opportunity to work with balls, ramps, tunnels, and other small toys that roll in the Block/Building or discovery area for further explorations.

Activity 3: Magnetic Attraction (GLEs: 3, 7, 14)

Materials List: selection of different magnets to include bar, ring, rod, and horseshoe, various objects to explore attraction with, video clip or alternative activity, computer, Mystery Bag with small common items to test-1 per group, additional Mystery Bag with common items to test-1 per student for assessment, Mystery Bag BLM - 2 copies per student (one for initial activity; one for assessment), crayons, writing media, Home Magnet Sheet BLM, chart paper

Teacher Note: Safety is a consideration when exploring with magnets. Items such as computer discs, televisions, watches, gift cards, credit cards, video tapes, and telephones can be ruined if they come in contact with a magnet. Students should be instructed not to experiment with these items using magnets.

Allow ample unstructured exploration time for students to discover the action and reaction of magnets with various objects, being sure to provide different types of magnets including the bar, ring, rod, and horseshoe types. As students explore, the teacher should assess students' knowledge, experiences, interests, and misconceptions that they may have. Use this knowledge acquired to scaffold questions guiding their discoveries. Some examples of guiding questions might be

- What happens when the magnet touches the object?
- Does everything stick to a magnet?
- What does the magnet do?
- Does one part of the magnet seem to work better than another part?
- What happens when two magnets touch?
- What happens when you use the other end of the magnets?

Introduce and encourage students to describe magnet actions using appropriate vocabulary such as *attract*, *repel*, *push*, *pull*, *magnetic field*, *north pole*, *south pole*, etc.

Following the discussion, view the video clip from Louisiana Public Broadcasting's Cyberchannel entitled *Magnets: A First Look*, or another appropriate video. Note: This is a fee-based resource; check with your individual school district for availability.

Topic Understanding: Following the video clip, explore the students' understanding of the video through a class discussion asking probing questions, when necessary, to generate discussions and clear-up any misconceptions.

If the video clip is unavailable, there are other appropriate websites and books that offer valuable information to help build background knowledge about magnetism.

- Brandley, Franklyn M. and Eleanor K. Vaughan. *Mickey's Magnet*.
- <http://www.coolmagnetman.com/magindex.htm> - Website on magnetism and experiments with magnets
- http://www.ckcolorado.org/units/Kindergarten/K_TeachingMagnetsKindergarten.pdf - Lesson plans on teaching about magnets in kindergarten

Using a Mystery Bag of about ten small common items, the students will experiment with the field of magnetism in small groups. Some examples of items to include in the Mystery Bag could be a washer, sock, block, marble, ring, eraser, can, paper clip, coin, screw, bolt, button, jack, nail, bolt, rubber band, bead, bread tie, cork, pencil, crayon, etc. Using the Mystery Bag BLM, each student will illustrate the item selected from the Mystery Bag, then they make a prediction about whether it is attracted to a magnet or not by coloring the corresponding face. They will color the smiley face for attracting or the frowning face for not attracting. The students should then experiment with the item to classify it according to whether or not it is attracted to a magnet. They should record these findings as well. After all items are tested they should discuss the accuracy of their predictions to their findings observed.

Lead a discussion of the everyday uses of magnets in their world. Have students answer the questions:

- Where do you see magnets?
- What do they do?

As a home learning assignment using the Home Magnet Sheet BLM, have students and their family search for items in their home that contain magnets and record it on the sheet for the next lesson. Allow time for students to discuss their individual discoveries with their classmates. Using the items identified in this discussion, the teacher should create a list of magnets found in their home as well as magnets that help with everyday tasks. Some examples that could be mentioned are can openers, refrigerator magnets, cabinet fasteners, screw driver tips, clips, etc. Some extensions of magnets that help us in everyday life such as computer discs, televisions, gift cards, credit cards, video tapes, telephones, etc. can be identified as well.

Have students explore magnetism in more depth at the science center where student understanding will be judged in developing an individual Mystery Bag BLM to test items for magnetic attraction using the activity-specific assessment.

Activity 4: Speed Comparison (GLEs: 4, 18, 22)

Materials List: manual wind-up toys, battery operated toys, chart paper, writing media, camera (optional), developed pictures, photographs of living and non living objects, assessment materials: pictures or objects to make speed comparisons

The students will show agreement or disagreement with statements by holding their thumb up or down in response to items on an *opinionnaire* ([view literacy strategy descriptions](#)). The students will be allowed opportunities to defend the position taken on each statement. The emphasis is on students' points of view, not correctness, during this introduction to the topic of the speed of things. Statements about speed, as in the examples below, should be presented before exploring the topic further and should be written in such a way as to elicit attitudes and feelings.

What Are Your Opinions about speed?

1. All living and nonliving objects move.
2. Everything moves at the same speed.
3. We can make things move faster.
4. We can make things move slower.

Each statement should be discussed after students take positions. The discussion should serve as a bridge for the following activity.

Ask students to bring items from home such as small manual, wind-up, or battery-operated toys that can be used to explore the concept of speed. After showing students the toys, ask them to make predictions as to which items they think will go fast and which items will go slowly. Have them rank items from the ones that move the slowest to the ones that move the fastest. Record their predictions on chart paper. Let students race the toys. If items need to be pushed manually, make sure to use the same force or intensity to race all objects. If this is done, then race outcomes will have validity with speed comparisons. Have students develop a chart by sequencing the toys from the ones that move the slowest to those that move the fastest. Discuss with the students why they placed the toys in a certain order. Check the sequence with the predictions made earlier. Lead a discussion as to what factors can influence speed to change the race outcomes with the focus being the basic principals of motion discussed in Activity 2.

Together the students and the teacher *brainstorm* ([view literacy strategy descriptions](#)) to develop a list of objects in their natural environment that can move. Create a list of objects that move (by self propulsion) and a list of objects that can be moved (with help). The class then will take a walk on campus to find and identify objects in the school and outside the building that can move or be moved. Some examples of their findings should include cars, trucks, various toys, tables or carts on wheels, people, animals, etc. As items are selected, have students identify if the object is living or non living and how do they know? If a camera is available, assist students as they take pictures of each object identified on the walk. Using these pictures and other photographs of various living and nonliving objects that can move, have students work in small groups to discuss their experiences and understandings of the different objects.

Have students investigate speed comparisons in more depth at the science center where student understanding will be explored, using the activity-specific assessment section.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes made by the teacher while circulating throughout the classroom and observing the students participating in unit activities
- A checklist which can be used quickly and effectively by the teacher while circulating among the groups
- Student-generated work such as drawings, data collection charts, photographs of models, and experiment results
- Photos

Activity-Specific Assessments

- Activity 1: The teacher uses the Positional Checklist BLM to note each student's accuracy in placing an object as directed in relationship to a box on the table. The teacher directs the student to put a small object in the desired position. The teacher dates and records student learning using a + or – indicating student response.
- Activity 3: After completion of the activity, students will be given a variety of different mystery objects and students should be able to predict if each will be attracted by the magnet or not. Using the Mystery Bag BLM the students draws his predictions on the chart. After predicting and marking his/her prediction, the student tests each object and record the true results by coloring the corresponding face. They will color the smiley face for attracting or the frowning face for not attracting. Each student explains his/her choices and errors showing evidence of reasonable, scientific thinking. Teacher dates, observes and records student learning
- Activity 4: Upon completion of this activity, students will be able to order or rank items for speed comparisons. This could be done using appropriate pictures or items available for such as toys, forms of transportation, people of various ages, animals, etc. The teacher checks for reasonable accuracy and notes student's ability to verbally justify his/her answer. Once dated and recorded, this information is put in the student portfolios.

**Kindergarten
Science
Unit 8: Earth and Sky**

Time Frame: The Content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit introduces the concept of Earth as a planet. Activities bring in the use of a globe as a small model of Earth and maps as flat pictures of places on Earth. This unit introduces the major features of maps and globes such as land areas, oceans, mountains, deserts, islands, lakes, and rivers. It develops an understanding that change is a naturally occurring event. Activities are designed to help students to begin to develop an understanding that natural forces and human actions can change the Earth and these changes can be cyclical and predictable (e.g., day/night, weather, seasons). The unit will also demonstrate that the location and movements of certain large objects (Moon, Sun) in the sky are predictable. It also brings an awareness to the importance of the Earth's natural resources.

Student Understandings

Students recognize that Earth is made up of land and water. Students know that mountains, hills, plains, and islands are different types of land. Students recognize that water is found in lakes, rivers, streams, swamps and oceans. Students begin to recognize the sky as air and space above Earth. Students learn the main objects in the day and in the night sky. Students learn that because of the Earth's rotation, change is often a naturally occurring event that sometimes happens in cycles which are predictable (sunrise, sunset). Students learn that change depends on some factors (seasonal changes depend on where you live on Earth). Students make observations about Earth and sky at home and at school. Students also identify some natural forces and human actions that can change landforms. Students also identify the Earth's natural resources and provide examples to reduce, reuse, and recycle materials they use daily. Students learn about, consider, and compare their observations with accepted values in the related fields of study.

Guiding Questions

1. Can students describe the land around the school?
2. Can students list what makes up the Earth's land?
3. Can students list places where we find water?
4. Can students identify what they see in the sky during the day?
5. Can students identify what they see in the sky at night?
6. Can students name the four seasons?

7. Can students describe what the weather is like today?
8. Can students tell how the weather today is different from the weather yesterday?
9. Can students tell why there is day and night?

Unit 8 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Science as Inquiry	
1.	Ask questions about objects and events in the environment (e.g., plants, rocks, storms) (SI-E-A1)
2.	Pose questions that can be answered by using student’s own observations and scientific knowledge (SI-E-A1)
3.	Predict and anticipate possible outcomes (SI-E-A2)
4.	Use the five senses to describe observations (SI-E-A3)
5.	Measure and record length and temperature in both metric system and U.S. system units (SI-E-A4)
6.	Select and use developmentally appropriate equipment and tools and units of measurement to observe and collect data (SI-E-A4)
7.	Express data in a variety of ways by constructing illustrations, graphs, charts, tables, concept maps, and oral and written explanations as appropriate (SI-E-A5) (SI-E-B4)
8.	Use a variety of appropriate formats to describe procedures and to express ideas about demonstrations or experiments (e.g., drawings, journals, reports, presentations, exhibitions, portfolios) (SI-E-A6)
10.	Recognize that a variety of tools can be used to examine objects at different degrees of magnification (e.g., hand lens, microscope) (SI-E-B3)
Physical Science	
20.	Identify objects that give off heat, such as people, animals, and the Sun (PS-E-C3)
Earth and Space Science	
30.	Distinguish between areas of Earth covered by land and water (ESS-E-A2)
31.	Identify the patterns in information recorded on a weather calendar (ESS-E-A4)
32.	Discuss and differentiate objects seen in the day and/or night sky (e.g., clouds, Sun, stars, Moon) (ESS-E-B1)

Sample Activities

Activity 1: Planet Earth (GLEs: **8, 30**)

Materials List: writing media, chart paper, 3-D globe, paper plates, blue paint or crayons, Flat Globe BLM, enlarged prepared Earth replica for demo, scissors, glue, landform and water form pictures or computer images

Using a modified *Student Questions for Purposeful Learning (SQPL)* strategy ([view literacy strategy descriptions](#)) the students will generate a reaction to a statement. This strategy uses a teacher-generated statement to cause students to wonder, challenge, or question. The statement does not have to be factually true as long as it causes students to think about the Earth's surface. The following statement or similar statement should be written on the board or on chart paper for student discussion.

There is an equal amount of water and land on Earth

Have students respond to the statement. Repeat the statement as needed to help generate responses. As students respond, record the comments on chart paper. Facilitate a discussion about each of the comments. Reinforce accurate comments and clarify inaccurate comments. Following the discussion, explain to students that the class will explore the make-up of the Earth's surface in more depth.

Display the globe and have students participate in a *brainstorming* ([view literacy strategy descriptions](#)) activity to see what they already know about Earth. Using chart paper, record major concepts about Earth, identified through the discussion.

Using the globe, have the students identify the different features on the globe to include land and water. Lead a discussion to include some important concepts about the planet Earth. Some of the concepts that should be discussed include the following:

- Earth is round like a sphere.
- There is water on Earth.
- There is more water than land.
- There is ice around the poles of the Earth.
- There is land on the Earth.
- There is less land than water on the Earth.

To reinforce some of these concepts have the students develop a model of Earth. Using a paper plate, have each student paint or color the entire plate blue to represent the water on Earth. If using paint, allow time for it to dry. Next, using the Flat Globe BLM, have the students color the land areas green. When finished, have the students cut out the land areas on the Flat Globe BLM, placing it onto the plate in the correct places. Have a large model on hand to assist students in placing the land accurately on their globe. Through a discussion after completion, have students identify areas representing land and water.

After this concept is established, have students discuss the types of landforms found in their immediate environment. Expand identifying landforms to include things they might have seen during vacations, pictures in magazines, television programs, computer images, etc. Discussions should include *mountains, hills, plains, and islands*. Provide pictures from magazines or computer sites at hand to give a visual representation to facilitate the topic of discussion.

Repeat the activity above, but ask students to discuss different water forms found on Earth. Places water is found should include *bayous, lakes, rivers, oceans, and swamps*.

If time permits, have students describe activities enjoyed in their area, using the local land and water forms. Some examples might include swimming, skiing, fishing, golfing, riding bikes, walking, hunting, etc. Record their examples through illustrations and words on chart paper for classroom display.

Activity 2: The Sky From Day to Night (GLEs: 4, 7, 32)

Materials List: Daytime BLM, Night Time BLM, writing media, magazines, scissors, glue, chart paper

To help students become more aware of the sky and concepts of day and night, have students conduct an observation both at school in the daytime and at home for the night time as an experiment, to experience the changes in the sky first hand. Using the Daytime BLM and Night Time BLM have the students create a pictorial representation to what is seen in the sky in the daytime and what is seen in the sky at nighttime. Suggested pictures of objects that may be seen in the sky at night and during the day include the Sun, Moon, stars, different types of clouds, rainbow, etc. Allow time for the students to share their drawings with their classmates. Through a class discussion, compare and contrast the characteristics between day and night.

In small groups, direct students to look through magazines for pictures of objects or things they see in the day and in the night (e.g., Sun, Moon, car with headlights on, mail carrier on sidewalk, streetlights, children in a park, etc.). Students should then cut out these pictures and glue them on appropriate charts one labeled Daytime and one labeled Night Time. Students will then share their pictures of objects on charts with other students through a class discussion. The teacher will lead a discussion on how the appearance of the sky changes during the day and how people's activities change along with it.

Enhance lesson development with these readily available teacher resources:

Web based sites:

- <http://www.thesolutionsite.com/> - Several informative lessons and black line masters to develop this concept. Perform a unit search for lessons at the K level including the key word Sky.

- <http://www.kizclub.com/storytime/skystory/sky1.html> - Interactive story on things seen in the daytime and at night.

Books:

- Asch, Frank. (2000). *The Sun is My Favorite Star*. Scholastic.
- de Paola, Tomie. (1975). *The Cloud Book*. New York: Holiday House.
- James, Felix. (2001). *The Night Sky*. National Geographic.
- Rockwell, Anne. (1999). *Our Stars*. Scholastic.

Activity 3: The World Goes Round (GLEs: 3, 4, 20, 32)

Materials List: book about the sky, chart paper, writing media, flashlight, dark room

Safety Note: Remind students of the safe and appropriate use of a flashlight. Make them aware that it is never to be pointed in the face of a student.

Using a book selected from the school or local library, have students participate in a viewing, a reading, and a discussion on a book about the sky. Students can then use the knowledge from the book presented on the sky to participate in a modified *DR-TA* or *directed reading-thinking activity* ([view literacy strategy descriptions](#)). This is an instructional approach that invites students to make predictions and then check their predictions during and after viewing or reading.

Lead a discussion on the topic “The Sky.” Generate ideas and experiences related to this topic. Some questions to explore for predictions should include

- What is found in the sky?
- Why do we have day and night?
- Is the Moon out during the day?
- Is the Sun out during the night?
- Why can’t we see stars every night?
- Do we see the Sun everyday? Do you think that the Sun is in the sky on days that we are not able to see it?
- Do we see any changes in the Moon?
- What makes the sky different in the daytime and in the night time?

To develop background knowledge of the sky and its components, have students make predictions and record their answers on chart paper for further reference.

After predictions are made, have students listen to appropriate literature or other appropriate material available on the sky and its components that will address the earlier questions of prediction. *DR-TA* provides a frame for self-monitoring because the viewer/reader(s) pause throughout the reading to ask questions. Allow the students to check and revise the predictions when necessary. It may be necessary to generate discussions about these questions to check for student understandings to clear up any misconceptions they might have.

The topic of understanding should include the following:

- The Sun is a star (large burning ball of gases).
- The Sun gives off light and heat.
- The Sun provides daylight.
- The Earth turns or rotates and when our side of Earth is away from the Sun, it is night for us.
- The Moon has phases that changes in shape..
- Clouds are found in the Earth's atmosphere.
- Rainbows are formed in the Earth's atmosphere.

Provide a visual demonstration along with a guided discussion of the changes that happen between night and day. The students will begin to realize that the Sun is always shining. Have one student (the Sun) stand still and shine a flashlight towards a second student (Earth). Turn off the lights and darken the classroom as much as possible. Have the student who represents Earth stand with their back to the flashlight. Explain that it is night for this person because they are facing away from the Sun. Have the student turn slowly counterclockwise until the light is shining on them. Explain that it is now daytime for this student because they are facing the Sun. Have the students continue to rotate until it is night again. Explain that it takes Earth one day to complete a turn. Students are to recognize that day follows night and night follows day. They should also be aware that the stars are always in the sky but can only be seen at night because in the day the Sun is to bright for us to see them.

Enhance lesson development with these readily available teacher resources:

Web based sites:

- <http://www.wildwildweather.com/clouds.htm> - this site discusses every aspect of clouds and includes a gallery of weather pictures
- <http://eo.ucar.edu/rainbows> - this site discusses every aspect of a rainbow

Books:

- Arvetis, Chris, and Carole Palmer. (1984). *What Makes Day and Night?* Field Publications.
- Williams, Rozanne Lanczak. (1994). *The Four Seasons*. Creative Teaching Press.

Activity 4: The Weather Calendar (GLEs: 1, 3, 4, 5, 7, 8, 31)

Materials List: KWL BLM, writing media, video clip, computer, chart paper, Sunny Vocabulary Card BLM, Cloudy Vocabulary Card BLM, Rainy Vocabulary Card BLM, Windy Vocabulary Card BLM, Snowy Vocabulary Card BLM, Weather Pictures BLM, Reduced Weather Pictures BLM, chart-size weather graph, student weather graphs, local newspaper or Internet weather based site, rain gauge, thermometer, wind gauge, chart for recording instrument calculations, assessment: blank calendar, black yellow and gray crayons, books and web based sites to build background knowledge

Begin this activity by using a *graphic organizer* ([view literacy strategy descriptions](#)) in the form of the KWL BLM to develop an understanding of previous knowledge. The K in the chart will represent what students “Know about weather.” The W in the chart represents what they “Wonder about weather.” The teacher should use the W part of the chart developed to incorporate individual curiosities when teaching. The L part represents “What they learned.” Have the students explore the topic “Weather” to complete the K and W portion of the graphic organizer. Discuss and generate ideas and experiences related to the topic. The L portion of the chart will be developed at the conclusion of the activity when students discuss what they learned about weather.

Following the discussion, view the video clip from Louisiana Public Broadcasting’s Cyberchannel (<http://www.lpb.org/education/cyberchannel.cfm>) entitled, *Weather: A First Look* or another appropriate video. Note: This is a fee-based resource; check with your individual school district for availability. Teachers will need to login for viewing.

Topic Understanding: Following the video clip, explore the student’s understanding of the video through a class discussion asking probing questions, when necessary, to generate discussions and clear-up any misconceptions. Some sample questions that could be explored are

- Is weather always the same?
- Does the Sun affect the weather around us?
- Can you name the Seasons?
- Do we dress differently for each season?
- Where does the rain come from?
- Can we measure rain?
- How can we measure wind?
- Can we predict how the weather will be?
- What is a cloud?
- What is a rainbow?
- How can we measure temperature?
- What is a meteorologist?

These are two additional videos available from LPB’s Cyberchannel that offer teaching information about weather as well:

Weather: Changes and Measurement – Explores the vocabulary terms used to describe weather. It also explains the tools used to measure weather changes.

Investigating Weather – This program touches on basic types of weather and explores the role of the Sun in weather patterns. It also touches on actual weather experiences using video clips from actual storms.

The following Web sites are additional resources to help develop these concepts:

- <http://www.fossweb.com/modulesK-2/AirandWeather/activities/whatstheweather.html> - interactive activity that explores dressing appropriately for different types of weather.
- <http://www.alfy.com/games/playgame.aspx?gameID=331&gameName=Let's%20Make%20Weather> – This game explores the different seasons and the temperatures and environmental changes that take place at those times of the year.

Have the students make a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) for basic weather terms to include *sunny*, *cloudy*, *rainy*, *windy*, and *snowy*. Demonstrate the process as the students follow along completing the steps. On their individual Sunny Vocabulary Card BLM, have the students trace the targeted word “sunny” in the middle of the card. Ask the students to help develop a group definition and record this on the board or on chart paper. Write the definition using illustrations or words in section 1 on the card. Next, ask the students for examples of things they enjoy doing in the Sun. Display the list with illustrations on the board and have the students transfer one of them to section 2 on the card. Then, have the students search for pictures in magazines, newspapers or Internet images of the Sun. Cut and glue these pictures on section 3 on the card. Finally, have the students draw a simple illustration of their favorite thing to do in the Sun in section 4 on the card. After completing this first card the students will repeat the same process with other weather conditions using the Cloudy Vocabulary Card BLM, Rainy Vocabulary Card BLM, Windy Vocabulary Card BLM, and Snowy Vocabulary Card BLM.

Through daily morning activities, develop a weather graph using the Weather Pictures BLM provided. Allow students time to observe weather conditions daily and then have them report what the weather is like using the pictures provided. Record their findings on the chart. Display the weather graph on a board for daily input and reflection. Provide individual copies of the Reduced Weather Pictures BLM for students to develop an individual graph and have them record their findings as well. After reporting on the day’s weather for about a month, have the students total up each column and record their findings using tally marks or numerals. See example below using Weather Picture BLM in place of the area of shaded blocks:

Weather Graph														Totals :
Sunny														8
Rainy														3
Cloudy														9
Windy														2
Snowy														0
Hot														2
Warm														16
Cold														2
Icy														0

Continue discussing weather by having students predict what the weather will be the following day. After they make a prediction, use a local newspaper, or Internet weather based site to check a meteorologist's prediction for the next day's weather as well. Have the students check both of these predictions with the actual weather the following morning.

After a complete weather graph is developed, next introduce weather tools that are used to measure weather conditions. Introduce the rain gauge, the thermometer and the wind gauge. Demonstrate how the instruments are used and how the measurements are read from the specific instruments. Have students measure, read, and record calculations from each instrument ongoing at appropriate times throughout the school year. This could be done once a day, once a week, or once a month, depending on the specific weather conditions in the area.

Have students explore weather in more depth at the science center, where student understanding will be explored in developing a weather calendar using the activity specific assessment section of this unit.

Enhance lesson development and build background knowledge with some of these readily available teacher resources:

Web based sites:

- <http://www.enchantedlearning.com/rhymes/topics/weather.shtml> - Explores different Rebus Rhymes Mentioning Weather
- <http://www.nationalgeographic.com/xpeditions> - Several informative lessons to build background knowledge of weather
- <http://www.nationalgeographic.com/xpeditions/lessons/04/gk2/weathercards.pdf> - Weather cards
- <http://www.sciencenetlinks.com/lessons.cfm?BenchmarkID=4&DocID=155> - Several informative lessons and black line masters to develop this concept.
- <http://www.thesolutionsite.com/> - Several informative lessons and black line masters to develop this concept.
- Louisiana Public Broadcasting's Cyberchannel entitled *Magical Mother Nature: The Four Seasons* – This video segment will show weather changes that occur each season and how these changes affect their lives and community.

Books:

- Allen, Marjorie N., and Shelley Rotner. *Changes*. Macmillan/McGraw Hill.
- Barrett, Judi, *Cloudy with a Chance of Meatballs*. Atheneum Books for Young Readers
- Chanko, Pamela, and Daniel Moreton. (1998). *Weather*. Scholastic.
- Rogers, Paul. *What Will the Weather Be Like Today?* Houghton Mifflin

Activity 5: Land Changes (GLEs: 1, 2, 3, 4, 5, 6, 7, 10)

Materials List: trays, sandy soil, cups, water, science learning logs, writing media, hand lenses, chart paper, water puddle, ruler or meter stick, recording paper, book: *Louie the Buoy: A Hurricane Story*

In this activity, students will conduct an experiment on how soil changes. In small groups or centers, provide a tray, a mound of about two cups of sandy soil, and a cup of water to students. Using science *learning logs* ([view literacy strategy descriptions](#)) have the students predict through illustrations what they think will happen to the soil as water is poured out onto the mound.

Next, have the students conduct the experiment by slowly pouring the water onto the mound of soil. Have students explore and observe what happens as water is poured and settles. Allow hand lenses for closer observation. Students should check their predictions made earlier in their logs for accuracy. Students are to add another page to their science *learning log* entry of what actually happened to the soil as the water is poured onto the mound and settles, using illustrations and simple wording.

Topic of Understanding: Discuss how water is able to move through the soil because there are small spaces between the soil that allows the water to flow through. Water can carve paths or move soil. Soil can be moved from one place to another.

Earth's soil can be moved through various ways. Have students *brainstorm* ([view literacy strategy descriptions](#)) ideas of how the Earth's soil moves. Record their responses using illustrations or words on chart paper.

Topic of Understanding: Natural forces and human actions can change land on the Earth. Soil can be moved through wind, water, plants, by humans, etc. Some change is rapid (storms and construction) and some is very slow (erosion).

If time allows, have students use a real life situation in their immediate environment to observe how water affects the Earth on a daily basis. Have student identify a dry water puddle hole on campus to observe throughout the remainder of the school year. Using a ruler or meter stick, have students record the height and depth of the hole. As time and nature takes its course, revisit the area after several rain storms to re-measure the hole and record their findings. Have students compare the measurements with previous recordings. Using this simple progressive observation, have students reflect on what happens to land and water over time.

Enhance lesson development with weather books as listening literature to explore natural forces. An example of an informational book that explores the hurricane for this age level is, *Louie the Buoy: A Hurricane Story* by Allain C. Andry, III.

Activity 6: Reduce, Reuse and Recycle (GLEs: 1, 2, 3)

Materials List: video clip, computer, optional books, articles or web based sites, writing media, chart paper, guest speaker, recycled materials from home, web based sites to enhance lesson

To build background knowledge about the Earth and its natural resources, present information in the form of a video clip to heighten students awareness. There are several informative video clips available from Louisiana Public Broadcasting's Cyberchannel:

- *Taking Care of Our Earth* - Teaches us about our natural resources and why it is important to conserve them.
- *Learning About Natural Resources* – Discusses the importance of natural resources and how we should use them in our daily lives.
- *The Blue Dragon: What a Waste!* – Discusses how people can damage the environment as well as putting animals in danger.

Note: This is a fee-based resource; check with your individual school district for availability.

Topic Understanding: Following the video clip, explore the students' understanding of the video through a class discussion asking probing questions, when necessary, to generate discussions and clear up any misconceptions. This is some information that could be explored and discussed:

- Water, land and air are Earth's natural resources,
- Both plants and animals use and need Earth's natural resources for survival.
- The consumption of natural resources should be reduced, recycled, and reused.
- People have an effect on animal and plant survival.
- Identify ways to reduce, recycle, and reuse natural resources.
- If natural resources are mistreated or misused, then plants and animals can become endangered.

Alternative Activity: If the use of a video clip is not an option, books, current news articles, or web-based sites could be explored that offer teaching information about the Earth's natural resources and ecology as well.

Help students better understand the role of trash in the community begin a discussion by having students reply to a modified *SPAWN* ([view literacy strategy descriptions](#)) prompt written on the board. *SPAWN* is an acronym that stands for five categories of writing options (Special Powers, Problem Solving, Alternative Viewpoints, What if? and Next). These categories can create numerous thought-provoking and meaningful prompts related to any topic. The teacher begins by targeting the kind of thinking students should be exhibiting. Next, the teacher selects a category of *SPAWN* that best accommodates the

kind of thinking about the content students should exhibit. The teacher presents the *SPAWN* prompt to the students by writing it on the board. *SPAWN* writing should be a tool students can use to reflect on their developing disciplinary knowledge and critical thinking.

On the board, write the following W or What If? *SPAWN* prompt:

What if there was no place to put our trash?

Give students time to respond to the prompt and share their predictions about what would happen. As students give their predictions, write them on the board or chart paper. Use these responses to introduce to the students the idea that getting rid of garbage in an improper way affects our land, water, and air.

If available in the community, invite a representative from the local sanitation or recycling service to discuss problems created by solid waste. Have the guest address the predictions made earlier through the *SPAWN* prompt for accuracy, possible problems, and real-life connections. Discuss possible ways to help alleviate these problems through reducing, recycling, and reusing materials.

To help build a sense of community within the class, ask parents to recycle materials from home that could be reused, such as left-over construction paper, wrapping paper, foam sheets, cardboard tubes, catalogs, newspapers, old comic books, clear plastic soda bottles, bottle caps, paper bags, baby food jars, sand paper scraps, old cookie sheets, old socks milk cartons, boxes and lids, wallpaper scraps, yarn, ribbon, string scraps, clean old sponges, various-size plastic containers, aluminum foil scraps, corks, old file folders, old assorted pasta, old uniform shirts, etc. Materials found in nature that could be collected and used include leaves of various sizes and colors, sea shells, pebbles, pine cones, nuts, sand, dried beans, wood shavings, egg shells, dried flowers, etc.

As the materials are collected, have the students *brainstorm* ([view literacy strategy descriptions](#)) ways that the items could be used. Record their ideas on chart paper for potential projects. Ideas could be generated from books or simple Internet searches. Have these items available for students' use for various creative art projects throughout the year.

Have students explore the concept of recycling and reusing materials in more depth at the science center where student understanding will be evaluated using the activity-specific assessment.

Enhance lesson development with these readily available web based sites as teacher resources:

- <http://www.earthdaybags.org/powerpoint.htm> - A PowerPoint presentation designed to introduce students to recycle grocery bags.

- <http://www.sciencenetlinks.com/lessons.cfm?DocID=17> – Site to help students identify, recycle materials and develop a use for them.
- <http://www.thesolutionsite.com/> - Several informative lessons and black line masters to develop this concept. Perform a unit search for lessons at the K level including the key words *Reduce*, *Reuse*, and *Recycle*.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Anecdotal notes made by the teacher while circulating throughout the classroom and observing the students participating in unit activities
- A checklist which can be used quickly and efficiently by the teacher while circulating among the groups
- Student-generated work such as drawings, data collection charts, photographs of models, and experiment results
- Visual representations (e.g., student “globes,” weather graph, sky observations, etc.)
- Learning Logs

Activity-Specific Assessments

- Activity 2: Students should be able to identify different objects seen in the sky during the day and during the night. This will be demonstrated by their pictorial representations using the Daytime BLM and the Night Time BLM developed within this activity. Have the students explain their selection of pictures to include in the Daytime and Night time class chart. Their responses give an insight to the understanding of their concepts about day and night. The teacher should observe for accuracy, having students explain their choices. Responses should be recorded and included in their portfolio.
- Activity 4: Students should be able to identify and explain the different weather information collected through the individual weather graph developed within this activity. Their level of understanding about the different types of weather will be

demonstrated through their completed Vocabulary Cards. As they proceed in completing the cards, ask probing questions to students to find out why they selected the activities and pictures they did. Check their understanding throughout this activity to clear up any misconceptions that could arise. At the conclusion of this activity, the students should be able to record the weather through observation of the sky each day. Using a blank monthly calendar, have students color in a rainy (black), sunny (yellow) or cloudy (gray) square to reflect weather patterns. Students should be able to record accurately, on a daily basis, the weather they observe. This activity is ongoing for a month with school days completed. The teacher questions the students about their data and records answers, looking for accuracy, skill, and ability to justify the answers.

- Activity 5: Students should be able to explain what happened during the experiment of pouring water onto the soil. Their understanding will be assessed through their illustrations using the science learning log entries developed within this activity. Have the students give an oral explanation of their entries developed. Probe students to find out what they understood about the entire process and the changes to the soil as water is poured onto it. The teacher should observe for understanding of the concept and explanation of their reasoning. They should also be able to identify one thing that could change the Earth's soil through nature or human actions. Responses should be recorded and included in their portfolio.
- Activity 6: After completion of the activity, students should be able to identify one of the Earth's natural resources. Have the students explain why they think it is important to reduce, recycle, or reuse materials. In the science center, have students explore their recycled materials brought in from home, and ask each student to orally explain one way they we can recycle or reuse one of the items available. Record their selection and responses, considering skill, ability, and explanation for their selection.