Fourth Grade Companion Document

4-Unit 4: Sun, Moon, and Earth

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Introduction to the K-7 Companion Document
An Instructional Framework

Overview

The Michigan K-7 Grade Level Content Expectations for Science establish what every student is expected to know and be able to do by the end of Grade Seven as mandated by the legislation in the State of Michigan. The Science Content Expectations Documents have raised the bar for our students, teachers and educational systems.

In an effort to support these standards and help our elementary and middle school teachers develop rigorous and relevant curricula to assist students in mastery, the Michigan Science Leadership Academy, in collaboration with the Michigan Mathematics and Science Center Network and the Michigan Science Teachers Association, worked in partnership with Michigan Department of Education to develop these companion documents. Our goal is for each student to master the science content expectations as outlined in each grade level of the K-7 Grade Level Content Expectations.

This instructional framework is an effort to clarify possible units within the K-7 Science Grade Level Content Expectations. The Instructional Framework provides descriptions of instructional activities that are appropriate for inquiry science in the classroom and meet the instructional goals. Included are brief descriptions of multiple activities that provide the learner with opportunities for exploration and observation, planning and conducting investigations, presenting findings and expanding thinking beyond the classroom.

These companion documents are an effort to clarify and support the K-7 Science Content Expectations. Each grade level has been organized into four teachable units- organized around the big ideas and conceptual themes in earth, life and physical science. . The document is similar in format to the Science Assessment and Item Specifications for the 2009 National Assessment for Education Progress (NAEP). The companion documents are intended to provide boundaries to the content expectations. These boundaries are presented as “notes to teachers”, not comprehensive descriptions of the full range of science content; they do not stand alone, but rather, work in conjunction with the content expectations. The boundaries use seven categories of parameters:

a. **Clarifications** refer to the restatement of the “key idea” or specific intent or elaboration of the content statements. They are not intended to denote a sense of content priority. The clarifications guide assessment.
b. **Vocabulary** refers to the vocabulary for use and application of the science topics and principles that appear in the content statements and expectations. The terms in this section along with those presented

within the standard, content statement and content expectation comprise the assessable vocabulary.

c. **Instruments, Measurements and Representations** refer to the instruments students are expected to use and the level of precision expected to measure, classify and interpret phenomena or measurement. This section contains assessable information.
d. **Inquiry Instructional Examples** presented to assist the student in becoming engaged in the study of science through their natural curiosity in the subject matter that is of high interest. Students explore and begin to form ideas and try to make sense of the world around them. Students are guided in the process of scientific inquiry through purposeful observations, investigations and demonstrating understanding through a variety of experiences. Students observe, classify, predict, measure and identify and control variables while doing “hands-on” activities.
e. **Assessment Examples** are presented to help clarify how the teacher can conduct formative assessments in the classroom to assess student progress and understanding
f. **Enrichment and Intervention** is instructional examples the stretch the thinking beyond the instructional examples and provides ideas for reinforcement of challenging concepts.
g. **Examples, Observations, Phenomena** are included as exemplars of different modes of instruction appropriate to the unit in which they are listed. These examples include reflection, a link to real world application, and elaboration beyond the classroom. These examples are intended for instructional guidance only and are not assessable.
h. **Curricular Connections and Integrations** are offered to assist the teacher and curriculum administrator in aligning the science curriculum with other areas of the school curriculum. Ideas are presented that will assist the classroom instructor in making appropriate connections of science with other aspects of the total curriculum.

This Instructional Framework is NOT a step-by-step instructional manual but a guide developed to help teachers and curriculum developers design their own lesson plans, select useful portions of text, and create assessments that are aligned with the grade level science curriculum for the State of Michigan. It is not intended to be a curriculum, but ideas and suggestions for generating and implementing high quality K-7 instruction and inquiry activities to assist the classroom teacher in implementing these science content expectations in the classroom.

Fourth Grade Unit 4:
Sun, Moon, and Earth

Content Statements and Expectations

4 – Unit 4: Sun, Moon, and Earth

Big Ideas (Key Concepts)

- The moon and the Earth move in a predictable pattern around the sun.
- The predictable patterns of the Earth and moon define a day, year, and moon phases.
- The sun appears to move in a predictable pattern across the sky.

Clarification of Content Expectations

Standard: Earth in Space and Time

Content Statement – E.ST.E.1

Characteristics of Objects in the Sky – Common objects in the sky have observable characteristics.

Content Expectations

E.ST.04.11 Identify the sun and moon as common objects in the sky.

Instructional Clarifications

1. Identify means to recognize the differences between the sun and moon and other objects in the sky.
2. The moon is the closest object to Earth, and while many other objects are larger, the moon appears prominent in the sky because it is so close to Earth.
3. The sun is the closest star to Earth, and while many other stars are larger, the sun appears prominent in the sky because it is so close to Earth.

Assessment Clarification

1. The moon is the closest object to Earth, and while many other objects are larger, the moon appears prominent in the sky because it is so close to Earth.
2. The sun is the closest star to Earth, and while many other stars are larger, the sun appears prominent in the sky because it is so close to Earth.

E.ST.04.12 Compare and contrast the characteristics of the sun, moon, and Earth, including relative distances and abilities to support life.

Instructional Clarifications

1. Compare and contrast means to note the similarities and differences of the sun, moon, and Earth.
2. The moon is the closest object in the sky to the Earth.
3. The sun is the closest star to the Earth.
4. The moon is a natural satellite of the Earth, and the Earth is a natural satellite of the sun.
5. The sun is capable of producing its own light, but the Earth and the moon reflect the sun's light.
6. The Earth is capable of supporting life, as we know it, because Earth has water, a breathable atmosphere, and light from the sun.
7. The moon is not capable of supporting life, as we know it, because it does not have breathable atmosphere.
8. The sun, moon, and Earth are nearly spherical.
9. Although the sun is much larger than the moon, they appear to be the same size because the sun is much farther away.
10. The Earth and moon are solid spheres and the sun is gaseous.
11. A common misconception is the sun and moon are the same size.
12. A common misconception is the sun is not a star.
13. A common misconception is the sun orbits the Earth.
14. A common misconception is the stars go away during the day, and the sun goes away at night.
15. A common misconception is the moon is not a satellite.
16. A common misconception is the moon can only be seen at night.
17. A common misconception is the moon has no gravity.
18. A common misconception is wind blows on the moon.

Assessment Clarifications

1. The moon is the closest object in the sky to the Earth.
2. The sun is the closest star to the Earth.
3. The moon is a natural satellite of the Earth and the Earth is a natural satellite of the sun.
4. The sun is capable of producing its own light, but the Earth and the moon reflect the sun's light.
5. The Earth is capable of supporting life, as we know it, because Earth has water, a breathable atmosphere, and light from the sun.
6. The moon is not capable of supporting life, as we know it, because it does not have breathable atmosphere.
7. The sun, moon, and Earth are spheres.
8. Although the sun is much larger than the moon, they appear to be the same size because the sun is much farther away.

Content Statement – E.ST.E.2

Patterns of Objects in the Sky – Common objects in the sky have observable characteristics and predictable patterns of movement.

Content Expectations

E.ST.04.21 Describe the orbit of the Earth around the sun as it defines a year.

Instructional Clarifications

1. Describe means to tell or depict in spoken or written words how the orbit of the Earth around the sun defines a year.
2. It takes the Earth approximately 365.25 days or one year to make a complete revolution around the sun. Leap year occurs every fourth year to accommodate the extra 0.25 day per year.
3. Revolution is the movement of one object on a path (orbit) around another object.
4. The path the Earth follows is called an orbit. The Earth follows the same imaginary path every year.

Assessment Clarification

1. It takes the Earth approximately 365 days or one year to make a complete revolution around the sun.
2. The path the Earth follows is called an orbit. The Earth follows the same imaginary path every year.

E.ST.04.22 Explain that the spin of the Earth creates day and night.

Instructional Clarifications

1. Explain is to clearly describe by means of illustrations (drawing), demonstrations, and/or verbally tell how the spin of the Earth creates day and night.
2. The Earth spins on its axis. It takes the Earth approximately 24 hours or one day to make one complete rotation.
3. Rotation is the turning of an object on its axis.
4. Axis is an imaginary line through the center of an object around which that object turns.
5. The side of the Earth facing the sun is experiencing daytime and the side not facing the sun is experiencing night.

Assessment Clarifications

1. The Earth spins on its axis. It takes the Earth approximately 24 hours or one day to make one complete rotation.
2. The side of the Earth facing the sun is experiencing daytime and the side not facing the sun is experiencing night.

E.ST.04.23 Describe the motion of the moon around the Earth.

Instructional Clarifications

1. Describe is to tell or depict in spoken or written words the path the moon travels around the Earth.
2. The moon travels on a path around the Earth called a revolution.
3. The moon rotates on its axis.
4. The moon takes approximately 28 days to both rotate and revolve thus causing the same side of the moon to always face the Earth.
5. A common misconception is the moon does not rotate on its axis as it revolves around the Earth.

Assessment Clarification

1. The moon travels on a path around the Earth called a revolution.

E.ST.04.24 Explain how the visible shape of the moon follows a predictable cycle, which takes approximately a month.

Instructional Clarifications

1. Explain is to clearly describe by means of illustrations (drawing), demonstrations, and/or verbally tell how the visible shape of the moon follows a predictable cycle that takes approximately a month.
2. The moon shines by reflecting light from the sun.
3. The observable shape of the moon changes from day to day in a cycle that lasts about a month. The different shapes of the moon are called phases.
4. No matter where the moon is in space, half is lighted and half is dark. As the moon revolves around the Earth, we see different amounts of the moon's lighted side. So, the moon seems to change shape.
5. The cycle of phases is new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, last quarter, and waning crescent. Note: Although the quarter moon looks like a "half moon," the word quarter refers to the moon being one fourth of its way through its cycle.
6. A common misconception is the moon gets bigger and smaller.
7. A common misconception is the phases of the moon are caused by shadows cast on its surface by other objects in the solar system.
8. A common misconception is the phases of the moon are caused by the shadow of the Earth on the moon.
9. A common misconception is the moon moving into the sun's shadow cause the phases of the moon.
10. A common misconception is clouds cause the phases of the moon.
11. A common misconception is the same side of the moon is always dark.

Assessment Clarifications

1. The moon is visible because it reflects light from the sun.
2. The moon seems to change shape from day to day in a cycle that lasts about a month.
3. The different shapes of the moon are called phases.

E.ST.04.25 Describe the apparent movement of the sun and moon across the sky through day/night and the seasons.

Instructional Clarifications

1. Describe is to tell or depict in spoken or written words the apparent movement of the sun and moon across the sky through day/night and the seasons.
2. The sun appears to move across the sky every day from the eastern part of the sky to the western part of the sky. The apparent motion of the sun across the sky is due to the Earth's rotation.
3. The path of the sun changes slowly with the seasons getting higher in the summer and lower in the winter.
4. The moon also appears to move across the sky from east to west on a daily basis due to the Earth's rotation, however the time of the rising and setting varies throughout its cycle.
5. A common misconception is the sun rises exactly due east and sets exactly due west every day.
6. A common misconception is the sun is directly overhead at 12:00 noon everyday.

Assessment Clarifications

1. The sun appears to move across the sky in the same way from east to west every day.
2. The path of the sun changes slowly with the seasons getting higher in the summer and lower in the winter.
3. When visible, the moon also moves across the sky from east to west on a daily basis.

Inquiry Process, Inquiry Analysis and Communication, Reflection and Social Implications

Inquiry Processes
S.IP.04.11 Make purposeful observations of the sun and the moon using the appropriate senses.
S.IP.04.12 Generate questions based on observations of the sun and the moon
S.IP.04.14 Manipulate simple tools that aid observation and data collection (ruler, thermometer).
S.IP.04.15 Make accurate measurements with appropriate units (centimeters, Celsius).
S.IP.04.16 Construct simple charts and graphs from data and observations of the movements of the sun and the moon.
Inquiry Analysis and Communication
S.IA.04.11 Summarize information from charts the Earth, sun, and moon
S.IA.04.12 Share ideas about the Earth, sun, and moon through purposeful conversation in collaborative groups.
S.IA.04.13 Communicate and present findings of observations and investigations.
S.IA.04.14 Develop research strategies and skills for information gathering about the sun and the moon.
Reflection and Social Implications
S.RS.04.11 Demonstrate understanding of the relationship of the Earth, sun, and moon through illustrations and models.
S.RS.04.14 Use samples as evidence to separate fact from opinion when classifying the Earth, sun, and moon.
S.RS.04.15 Use evidence when communicating about the Earth, sun, and moon.
S.RS.04.16 Identify technology used in everyday life when taking shadow readings of the sun's movement in the sky.
S.RS.04.18 Describe the effect the sun has on the balance of the natural world.
S.RS.04.19 Describe how people such as Ptolemy, Copernicus, Galileo, Hubble, and Hawking have contributed to science throughout history and across cultures.

Vocabulary

Critically Important – State Assessable	Instructionally Useful
Earth	seasonal change
sun	sun's position
moon	planet
star observe	relative position
reflect	solar system
ability to support life	compare
produce light	contrast
breathable atmosphere	approximately
revolution	
orbit	
rotation	
Earth's axis	
phases of the moon	
day	
night	
cycle	
seasons	
year	
natural satellite	
relative distance	
capable	
visible shape	
predictable cycle	
apparent movement	

Instruments, Measurements, Representations

temperature	thermometer	Celsius

Instructional Framework

The following Instructional Framework is an effort to clarify possible units within the K-7 Science Grade Level Content Expectations. The Instructional Framework provides descriptions of instructional activities that are appropriate for inquiry science in the classroom and meet instructional goals. Included are brief descriptions of multiple activities that provide the learner with opportunities for exploration and observation, planning and conducting investigations, presenting, findings, and expanding thinking beyond the classroom. The Instructional Framework is NOT a step-by-step instructional manual, but a guide intended to help teachers and curriculum developers design their own lesson plans, select useful and appropriate resources and create assessments that are aligned with the grade level science curriculum for the State of Michigan.

Instructional Examples

Characteristics of Objects in the Sky: E.ST.04.11, E.ST.04.12
Patterns of Objects in the Sky: E.ST.04.21, E.ST.04.22, E.ST.04.23, E.ST.04.24, E.ST.04.25

Objectives

- Make observations and describe the apparent movement of the sun and moon across the sky.
- Determine why there is day and night and a year.
- Observe the phases of the moon.

Engage and Explore

- Students are fascinated with the skies but often have misconceptions and a difficult time understanding the concept of size and distance. In the hallway, outside, or in the gym, a student stands and holds a baseball about 10 feet away from the class. Another student stands about 40 feet away and holds a basketball. Discuss the relative sizes of the balls and the distances between them. Students measure the relative sizes of the two balls by fully extending their arm and aligning their thumb between their eye and each ball. Note: the distances may need to be adjusted. Repeat the activity with the sun and a full moon. Each object will be about the size of your thumbnail. (E.ST.04.11, E.ST.04.12, S.IP.04.11, S.IP.04.14, S.IA.04.14, S.RS.04.11, S.RS.04.15)
- Students predict the sizes of the Earth and moon relative to the sun. Using play clay, the students create Earth and moon models based on an eight-inch diameter ball representing the sun. After comparing their models, discuss the sizes the clay balls should be relative to the eight-inch diameter ball. (The actual size of the Earth should be about the size of a peppercorn and the moon 1/4th of the Earth.) (E.ST.04.12, S.RS.04.11)

- Relative sizes and distances between the sun, moon, and Earth are shown outside. Use an eight-inch diameter ball to represent the sun, a peppercorn to represent the Earth, and a very small pinhead to represent the moon. It helps to attach the moon and Earth to cards so they don't get lost. Place the sun at one end of the playground. Use a yardstick and count out 26 lengths from the sun to the Earth. The moon is 2 ½ inches from the Earth. This model is accurate both in size and distance. Pluto would be another 974 yardstick lengths away. Have the students reflect on the fact that the moon is the farthest man has been in space. Other fun facts are 109 Earths lined up equal the diameter of the sun and a million Earths can fit into the sun. (E.ST.04.11, E.ST.04.12, S.IP.04.11, S.IA.04.14, S.RS.04.12, S.RS.04.15)
- Time needs to be spent outside making observations of the sun. On a sunny day put out a piece of chart paper with a stick standing up vertically in the center. Record the shadow the stick makes by tracing it. Repeat this every half hour for five hours. Allow the students time to measure the lengths of the shadows and have substantive conversation about the data they recorded. (E.ST.04.22, E.ST.04.25, S.IP.04.11, S.IP.04.14, S.IP.04.15, S.IP.04.11, S.IP.04.12, S.IP.04.14, S.RS.04.16)
- The sun produces heat and light that is reflected by the Earth and moon. Take the temperatures of two cups of cold water. Cover one with aluminum foil and leave the other uncovered. Put them in the sun for 15 minutes and take the temperatures again. The foil reflects the radiation while the water absorbs it. (E.ST.04.12, S.IP.04.14, S.IP.04.15, S.IP.04.14, S.RS.04.14, S.RS.04.16)
- The moon is more difficult to track but the students can create an observation chart and keep track of the shape of the moon for a month. (E.ST.04.23, E.ST.04.24, E.ST.04.25, S.IP.04.11, S.IP.04.12, S.IP.04.16, S.IP.04.11, S.IP.04.14, S.RS.04.11)
- Demonstrating the spinning of the Earth on its axis needs to be reinforced many times. Students put their index finger on top of their heads and spin counterclockwise showing the Earth's rotation on its axis. A flashlight shining at them can simulate the sun. When they are facing the "sun", it is day for them; and when they aren't facing the "sun", it is night for them. The moon also rotates on its axis, but it is very slow compared to the Earth. A helpful way for students to remember the concept of rotation and day and night is that the words "rotation", "day", and "axis" all have the letter "A". In pairs students can have substantive conversation about the words day and night. (E.ST.04.22, S.IP.04.14, S.RS.04.15)
- Demonstrating the Earth or moon traveling on an imaginary path also needs to be reinforced many times. Students walk around another object or use balls and flashlights to simulate revolution. A helpful way for students to remember revolution is that the words "revolution" and "orbit" have the letter "O" in them, and the letter O looks like an orbit. In pairs students can have substantive conversation about the definition of a year. (E.ST.04.21, S.IP.04.14, S.RS.04.15)

Explain and Define

- The difference between revolution and rotation can be clarified with many class discussions and demonstrations. The definitions for axis, orbit, day, night, and year are a natural fit while discussing rotation and revolution. Pictures should be made along with the definitions. Differences in sizes of the sun and moon and the phases of the moon also can be discussed. (E.ST.04.11, E.ST.04.21, E.ST.04.22, E.ST.04.23, E.ST.04.24, S.IP.04.12, S.IP.04.12)

Elaborate and Apply

- The Earth, sun, and moon can be compared and contrasted on a chart. While in cooperative groups, students use reference books to find various characteristics about the Earth, sun, and moon. (E.ST.04.12, S.IP.04.16, S.IP.04.11, S.RS.04.14)

	Size (diameter)	Distance from sun	Length for 1 rotation	Length for 1 revolution	Can support life	Fun facts
Sun		---	---	---		
Moon						
Earth						

- Students make a two or three-dimensional model of the Earth, sun, and moon. The model should show the rotations and revolutions of the Earth and moon, give the length of time it takes for these movements, and demonstrate day and night. (E.ST.04.11, E.ST.04.12, E.ST.04.21, E.ST.04.22, E.ST.04.23, S.IP.04.13, S.RS.04.11, S.RS.04.15)
- Using hands can easily recognize the different phases of the moon. The start of the moon cycle is the new moon when no moon is observed. By cupping the right hand into a backwards “C” shape, the moon phase that fits into the curve is the first quarter or the time when the moon appears to be getting bigger (waxing). When the left hand is cupped and the moon phase fits into the curve, it is the last quarter or time when the moon appears to be getting smaller (waning). A full moon is halfway through the cycle. Understanding what causes the phases is very difficult for fourth grade students and is not something they are required to learn.
- Show the phases using chocolate sandwich cookies. When they are carefully pulled apart, the frosting stays on one cookie and looks like a full moon. Using a toothpick, the frosting is scraped off to show the phases. The cookie without frosting looks like a new moon. Students can lay out the cookies, and then draw pictures of the phases of the moon while looking at the cookies and using their hands in the “C” shapes to help. (E.ST.04.24, S.IP.04.13, S.RS.04.11)
- A long-term project can be used to note how high the sun is in the sky through different seasons. At the start of each month, students measure the height of the sun at noon using fists. Students clench both hands into

fists, and put their arms out straight in front. Starting at the horizon, they continuously put one fist on top of the other until they get to the height of the sun. Count how many fists it takes. Each fist represents approximately 10 degrees. (Three fingers equal five degrees and the pinky finger is one degree if a fractional part is needed.) Record the data on a graph. Note: the time. *Warning: Do not look directly at the sun.* (E.ST.04.25, S.IP.04.16, S.IP.04.11, S.RS.04.11)

- To determine that the moon rises in the eastern part of the sky like the sun, the students need to make observations of the moon. If the moon is seen in the east, it is rising; and if it is seen in the west, it is setting. The time of day the moon is observed can be recorded on a chart. Unfortunately the moon does not always rise or set at approximately the same time like the sun does due to the fact that it's revolving around the Earth. It does, however, always rise in the east and set in the west. Fourth graders only need to know that it does rise in the east and set in the west. The best time to see the moonrise is during the full moon. (E.ST.04.25, S.IP.04.16, S.IP.04.11, S.RS.04.15)

Evaluate Student Understanding

Formative Assessment Examples

- Organize facts about the sun, moon, and Earth on a chart. (E.ST.04.11, E.ST.04.12)
- Draw diagrams and pictures to show understanding of the terms rotation, revolution, day, night, year, orbit, and phases of the moon. (E.ST.04.21, E.ST.04.22, E.ST.04.23, E.ST.04.24)
- Keep ongoing graphs and/or charts showing the data collected about the sun and the moon. (E.ST.04.24, E.ST.04.25)

Summative Assessment Examples

- Explain the difference between the words rotation and revolution. (E.ST.04.21, E.ST.04.22)
- Explain the difference between the time it take the Earth to rotate and revolve and the moon to rotate and revolve. (E.ST.04.21, E.ST.04.22, E.ST.04.23)
- Put pictures of phases of the moon in the correct order. (E.ST.04.24)
- Create a model of the Earth, sun, and moon that has labels showing: rotation and revolution of the Earth and moon, day and night, a year, and the relative sizes of the Earth, sun, and moon. (E.ST.04.21, E.ST.04.22, E.ST.04.23, E.ST.04.24)

Enrichment

- Research about craters on the moon and what causes them. Set up an investigation making craters by dropping clay balls into flour and observing the patterns and sizes of the craters. Try different heights to see if the size of the crater changes. A toothpick inserted into the clay ball makes it easier to drop the ball and remove it from the flour without disturbing the crater.
- Do research about the missions to the moon and what it was like for the astronauts. Students plan a make-believe mission to the moon. What would be the 10 most important items they would need to take and why?
- Research about possible missions to the sun.
- Take a field trip to a planetarium.
- Answer the question, “Why does it look like the American flag the astronauts planted is waving on the moon?” (Answer: there is a bar across the top to hold it out. Remember there is gravity on the moon and there is no atmosphere so no wind.)
- Research other moons around other planets.
- Contributions of scientists throughout history and across cultures have contributed significantly to current scientific thought. Knowledge about space is constantly changing. Scientists such as Ptolemy, Copernicus, Galileo, Steven Hawking, Neil deGrasse Tyson, Henrietta Leavitt, and Maria Mitchell can be studied.

Intervention

- Several times per day students get up and demonstrate rotation and revolution.
- Have students in groups of three-play act the sun, moon, and Earth. Repeat all the vocabulary words while acting them out.
- Use many flashlights and Styrofoam balls to demonstrate day and night and a year.
- Find examples of rotation and revolution in everyday life.
- Make a flipbook showing the phases of the moon.
- Use a calendar that shows the phases of the moon. Put up a phase once a week on the class calendar.
- In art class do a lesson on perspective and draw pictures with things in the foreground and things in the background.

Examples, Observations, and Phenomena (Real World Context)

Many misconceptions are found when observing objects in the sky. Our knowledge of space is constantly changing, however, our understanding of the phenomena discussed in this unit is and has been stable for a very long time. Scientists have understood the rotation of the Earth on its axis and the revolution of the Earth around the sun and moon around the Earth for centuries.

Discuss why pictures are drawn or models are made either incorrectly or are misleading. For example, the sun is always represented as a small object in a picture of the solar system simply because it isn't possible to draw its accurate size and distance relative to the Earth and moon. The paper would have to be the size of the classroom. If a model shows the correct relative sizes of the Sun, moon, and Earth, then the relative distances are often shown incorrectly or vice versa because the model has to be a useful size. The news sometimes has reporters giving incorrect information or updates on new findings by astronomers. Cartoon pictures or even pictures in textbooks can be incorrect or misleading. What was true 10 years ago may no longer be correct. Students need to be aware of misinformation and new information in their everyday lives.

NASA is once again planning a mission to the moon. Encourage students to visit the NASA website to view current information about space and simulations of the movement of the Earth and moon.

The sun is often in the news from solar power to causing skin cancer to solar flares disrupting computers.

Literacy Integration

Reading

R.CM.04.01 connect personal knowledge, experiences, and understanding of the world to themes and perspectives in text through oral and written responses.

R.CM.04.02 retell through concise summarization grade-level narrative and informational text.

R.CM.04.04 apply significant knowledge from grade-level science, social studies, and mathematics texts.

Examples of the trade books available for learning about the sun, moon, and Earth are:

Postcards From Pluto: A Tour of the Solar System by Loreen Leedy, 1996
The Moon by Seymour Simon, 2003
The Sun by Seymour Simon, 2003
Earth: Our Planet in Space by Seymour Simon, 2003
George's Secret Key to the Universe by Steven and Lucy Hawking, 2007

Writing

W.PR.04.01 set a purpose, consider audience, and replicate authors' styles and patterns when writing a narrative or informational piece.

- Using the same format as the book *Postcards from Pluto* and the chart that was made comparing and contrasting the Earth, sun, and moon, write postcards from the moon and the sun that include facts.

W.PR.04.02 apply a variety of pre-writing strategies for both narrative and informational writing (e.g., graphic organizers such as maps, webs, Venn diagrams) in order to generate, sequence, and structure ideas (e.g., plot, setting, conflicts/resolutions, definition/description, or chronological sequence).

W.PR.04.03 draft focused ideas using a variety of drafting techniques composing coherent and mechanically sound paragraphs when writing compositions.

Mathematics Integration

M.UN.04.01 measure using common tools and select appropriate units of measure.

M.PS.04.02 give answers to a reasonable degree of precision in the context of a given problem.

D.RE.04.01 construct tables and bar graphs from given data.