

4TH GRADE SCIENCE CHOICE BOARD

Choose one of the activities to complete for 3-5 extra credit points added to your final third quarter grade!

Standards: ESS1.1 Generate and support a claim with evidence that over long periods of time, erosion and deposition have changed landscapes and created new landforms; ESS1.2 Explain how the orbit of the Earth and sun cause observable patterns; PS4.2 Describe how the colors of available light sources and the bending of light waves determine what we see.

Estimated completion time: 45 minutes

Option 1: Technology: Earth's Landforms and Features

Through Clever, log on to Discovery Education. Click on the "classroom" button across top. There is a video and assessment assigned to each class. (Similar to Mastery Connect)

<https://cleversso.discoveryeducation.com/learn/player/3edd693f-f30a-40bb-8e7c-c861e0487351>

Materials: computer, tablet

Option 2: Writing: "The Milky Way Galaxy"

Read the article, "The Milky Way Galaxy," and answer the short answer question. Don't forget to use evidence from the text! Use complete sentences.

Materials: computer or print out of article, pencil

Option 3: Project: "Simple Light Refraction"

All you need is a glass of water, a sticky note, and a black marker to complete the project. On a sheet of paper, define refraction and explain what you are seeing. You can include pictures of you doing the project when you turn it in!

Fill a glass halfway with water.

Instructions:

2. Draw two arrows pointing in the same direction, It helps to line up the arrows so that the glass is in front of the post-it, one arrow is above the water line and one below.
3. Stick the sticky note on a wall or on the back of the book.
4. Move the water glass back and forth. Watch the bottom arrow change directions. Yay, refraction!

Materials: glass of water, sticky note, black marker, paper, pencil

Option 4: Reading for Understanding: "The Ever Changing Sky"

Read the ReadWorks article, "The Ever Changing Sky," and answer the questions

Materials: computer or print out of article, pencil

The Ever-Changing Sky

by Megan McGibney



Look up at the sky on a clear day. You will see the sun. It is bright and shiny, warming much of what its light touches. Look up at the sky again at night. You may see the stars. They are also bright and shiny, glimmering in the dark sky. You may also see the moon. It looks bright and shiny, reflecting light from the sun. People have always looked up at the sky with wonder. Some have even studied the sun, moon, and stars. These people, called astronomers, have learned that those objects in the sky do not stay in the same place all the time.

The earth revolves around the sun and also rotates on its axis, which is an imaginary line that runs from the North Pole to the South Pole, through the earth's center. It takes just under 24 hours for the earth to complete one rotation on its axis - a day, that's right! And guess how long it takes the earth to revolve around the sun? A little over 365 days. That's a year, with an

extra quarter of a day.

Let's take a closer look at the moon. The earth does not revolve around the moon. Instead, the moon revolves around the earth. It takes the moon about four weeks to complete a revolution around the earth. The portion of the moon we, here on Earth, see changes over this period of about four weeks as the moon's position around the earth changes. The moonlight we see at night is the moon's reflection of sunlight onto Earth. The different ways the moon appears to us are known as the moon's phases. The moon's phases depend on the moon's position in relation to the earth and the sun.

The four-week period starts and ends with the new moon. The new moon cannot be seen because the side of the moon lit by the sun is facing away from the earth. This is because the moon is nearly between the sun and the earth at this time. After that comes the first quarter moon, which is when we see half of the side of the moon lit by the sun. Then comes the full moon, when we can see the entire side of the moon lit up by the sun. This is because the earth is nearly lined up between the sun and the moon, and the sunlit part of the moon is facing the earth. One of the last phases is called the last quarter moon. This is when we see the other half of the lit side of the moon.

Sometimes the way the sun, moon, and earth are positioned causes an event known as an eclipse. There are two types of eclipses. A lunar eclipse happens when the earth passes between the moon and the sun and when the earth blocks the moon from the sun. The earth's shadow may block the entire moon or just part of the moon from view. A solar eclipse happens when the moon passes directly between the earth and the sun. A solar eclipse can block part of the sun or the entire sun from the earth's view.

Because of the regular orbit of the moon around the earth and the regular orbit of the earth around the sun, astronomers can predict when an eclipse will happen even many years into the future.

Name: _____ Date: _____

1. What does the earth revolve around?

- A. the moon
- B. the sun
- C. the stars
- D. meteors

2. What does the author describe in the passage?

- A. how long it takes the sun to revolve around the earth
- B. when the next solar eclipse will occur
- C. how long it takes the earth to revolve around the sun
- D. the movement of other planets in our solar system

3. The phases of the moon are caused by the moon's orbit around the earth. Which details from the text support this conclusion?

- A. It takes 24 hours for the earth to complete one rotation on its axis.
- B. A lunar eclipse occurs when the earth passes between the moon and the sun and the earth blocks the moon from the sun.
- C. The direction the sunlit side of the moon facing the earth changes as the moon revolves around the earth.
- D. The moon changes from a new moon to a half moon to a full moon.

4. What blocks the sun during a solar eclipse?

- A. the moon
- B. the earth
- C. the earth's shadow
- D. a nearby meteor

5. What is this passage mostly about?

- A. solar and lunar eclipses
- B. the solar calendar
- C. phases of the moon
- D. the movement of the earth and the moon

6. Read the following sentences: "It takes just under 24 hours for the earth to complete one rotation on its axis - a day, **that's right!** And guess how long it takes the earth to revolve around the sun?"

Why does the author say "**that's right!**"?

- A. because the author thinks the reader has made the connection between the rotation of the earth around its axis and the length of a day
- B. because the author was talking to someone while writing the passage
- C. because the author wants to reassure the reader
- D. because the author is waiting for an answer from the reader

7. Choose the answer that best completes the sentence below.

The moon goes through different phases in a month, _____ full moon, half moon, and new moon.

- A. but
- B. including
- C. first
- D. as a result

8. When does a full moon occur?

9. Why can astronomers predict eclipses?

10. Give two examples of how the sky is ever-changing.

The Milky Way Galaxy

This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.



Photo Credit: NASA

Milky Way as seen from Earth

The Milky Way is a huge collection of stars, dust, and gas. It's called a spiral galaxy because if you could view it from the top, it would look like a spinning pinwheel. The Sun is located on one of the spiral arms, about 25,000 light-years away from the center of the galaxy. Even if you could travel at the speed of light (186,000 miles per second), it would take you about 25,000 years to reach the middle of the Milky Way.

The Milky Way gets its name from a Greek myth about the goddess Hera who sprayed milk across the sky. In other parts of the world, our galaxy goes by other names. In China it's called the "Silver River," and in the Kalahari Desert in Southern Africa, it's called the "Backbone of Night."

If you could see our galaxy from the side, it would look like a huge, thin disk with a slight bump in the center. This flat shape is caused by the galaxy spinning around. Everything in our spinning galaxy would fly off into space if it weren't for the force of gravity.



Photo Credit: NASA/JPL

Milky Way as seen from the side

The Milky Way gets its name from a



Photo Credit: NASA/JPL

Milky Way as seen from below

Without a telescope, we can see about 6,000 stars from Earth. That may seem like a lot of stars, but it's actually only a small part of the whole. If you think of the entire galaxy as a giant pizza, all the stars you can see from Earth fall within about one pepperoni on that pizza. In fact, for every star you can see, there are more than 20 million you cannot see. Most of the stars are too faint, too far away, or blocked by clouds of cosmic dust.

Name: _____ **Date:** _____

1. What is the Milky Way a huge collection of?

2. Why can't people on Earth see the entire Milky Way?

Support your answer with evidence from the text and images.

3. What is the main idea of this text?

4. The author compares the Milky Way to a number of different objects or things. For instance, the author compares it to a spinning pinwheel. What is one other thing the author compares the Milky Way to?

Support your answer with evidence from the text.

5. Why might the author have compared the Milky Way to objects or things that may be more familiar to readers?
