

STARS AND CONSTELLATIONS

EXPLORING THE SOLAR SYSTEM

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Stars and Constellations

Exploring the Solar System

Skill Level

Beginner (5th Grade)

Educational Standards Supported

5.ESS1.1-7

Learner Outcomes

The learner will be able to:

- Explain the cause-and-effect relationship between the positions of the sun, Earth, moon and resulting eclipses, position of constellations and appearance of the moon
- Use tools to describe how stars and constellations appear to move from the Earth's perspective throughout the seasons

Tag(s)

4-H Science

Time Needed

30-60 minutes (adaptable depending on the time allotted)

Materials Needed

- Worksheet
- Pencil
- Pipe Cleaners
- Beads (Magic beads or star beads are fun)
- Computer to access websites
- Slides:
https://np1.nearpod.com/sharePresentation.php?code=ede2c42464acf4e0686f54099985c43e-1&oc=user-created&utm_source=link
- Constellation Cards:
<https://www.123homeschool4me.com/constellation-flashcards/>
- Modeling this (5-7):
<https://www.bbsd.org/packets/weeksix/science6.pdf>

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Introduction to Content

Students will learn about space, specifically focusing on constellations and stars. The lesson is designed to pick activities based on your time limit.

Introduction to Methodology

Students will use their computers to access websites and participate in an interactive lesson on Nearpod. A hands-on component is also offered.

Terminology/Vocab

Stars – A ball of hot, explosive gas that makes its own light and heat

Constellations – A group of stars that form a recognizable shape like the Big Dipper

Leap Year- A year with one additional day added. We have leap years every four years because one orbit of the Earth around the sun is 365.25 days. Our normal calendar has 365 days, so every four years we have a leap year which adds an extra day

Earth's orbit- An orbit is the path an object follows as it moves around another one. Earth moves in a circle around the sun once every 365.25 days. We call that path Earth's orbit

Earth's rotation - The action of the Earth turning or spinning around its center. This occurs every 24 hours

Teacher Talk

If there is time, cut out the constellation cards and laminate them before the session.



Setting the Stage/Opening Question

Open the Nearpod slides:

(https://np1.nearpod.com/sharePresentation.php?code=ede2c42464acf4e0686f54099985c43e-1&oc=user-created&utm_source=link) and explore the galaxy while you wait for the students to log on.

Ask, “What do you think we will learn about today?”

Experience

Go through the slides of Nearpod and a few videos so the students have background knowledge.

Activity 1: Pipe cleaner constellation (Should take 10 minutes)

Pair the students or let three students work together but no more. If there is time, cut out the cards and laminate them before the session and have them make constellations with pipe cleaners and stars and answer part 1 of the worksheet.

If there is less time, shorten set up time by giving them their specific constellation, beads and pipe cleaner(s). If there is even less time, modify the worksheet and just have them draw their constellations.

Activity 2: Finding Constellations (Should take 10 minutes - 15 minutes)

In part 2, youth will have the opportunity to explore their local constellations. In the Nearpod, Livingston, Tennessee, was utilized. We recommend using your county seat, as it is a place everyone knows. However, to make your own county seat the highlight, visit <https://www.timeanddate.com/astronomy/night/> Type in your county seat’s zip code. You can then copy that zip code from the URL bar to use and answer the questions.

Activity 3: Human Constellations

Have the students form a circle/oval. They are stars that make up a constellation. In the center, one youth is the sun. Between the sun and the stars is the Earth. This student should be comfortable answering questions. Have the students move through the “seasons” as they orbit. They will stop. They have to name the constellations they see, aka the student’s names. We then guide them through the questions.

Activity 4: Time to climb (Should take 10 minutes)

Constellations are one of the last standards met in a school year. This lesson is great between February and April. Our time to climb overviews constellations as well as other concepts they should know by the time they finish their pace unit.

Strategies to Increase Student Engagement

- Ask students, “Do you go out at night and look at the stars?” or “Where is the best place to stargaze?”
- Encourage youth who might get overwhelmed. Astronauts and scientists always have more questions than answers.

Share

Ask the students to pair and share one thing they learned in the activity.

Process

Ask someone to explain what a constellation is and whether or not they can see them with their bare eyes.

Generalize

Ask how this information can be used going forward.

Apply

Ask how this information can be used in their lives and ask for examples. Give the youth opportunities to talk about where the constellations are and how to identify them in the night sky.

References

- Nearpod Presentation:
https://np1.nearpod.com/sharePresentation.php?code=ede2c42464acf4e0686f54099985c43e-1&oc=user-created&utm_source=link
- 123 Homeschool 4 Me - Constellation Cards:
<https://www.123homeschool4me.com/constellation-flashcards/>
- Lesson 2 - Analyzing an Earth-Sun Model to Explain the Stars Seen in the Sky:
<https://www.bbsd.org/packets/weeksix/science6.pdf>

Notes

Supplemental Information

Educational Standards Met

5.ESS1: Earth's Place in the Universe

- 1) Explain that differences in the apparent brightness of the sun compared to other stars are due to their relative distances from the Earth.
- 2) Research and explain the position of the Earth and the solar system within the Milky Way galaxy and compare the size and shape of the Milky Way to other galaxies in the universe.
- 3) Use data to categorize different bodies in our solar system including moons, asteroids, comets and meteoroids according to their physical properties and motion.
- 4) Explain the cause-and-effect relationship between the positions of the sun, Earth and moon and resulting eclipses, position of constellations and appearance of the moon.
- 5) Relate the tilt of the Earth's axis, as it revolves around the sun, to the varying intensities of sunlight at different latitudes. Evaluate how this causes changes in day-lengths and seasons.
- 6) Use tools to describe how stars and constellations appear to move from the Earth's perspective throughout the seasons.
- 7) Use evidence from the presence and location of fossils to determine the order in which rock strata were formed.

TIPPS *Life Skills*

5th Grade-

Head Thinking

Hands Doing



Stars and Constellations Worksheet



Part 1

1. Which pipe cleaner constellation were you given? *Write down the name.*

2. Draw your constellation.

3. *Using your chrome book, in a new tab, search for the answer:* Which hemisphere is your constellation located?

4. *Using your chrome book, in a new tab, search for the answer:* What is the name of the brightest star in your constellation? *Go back to question 2 and circle it.*

5. *Using your chrome book, in a new tab, search for the answer:* Is your constellation known by another name? If so, write it down.

Close the tab you use to search for the information about your constellation.
Return to the Nearpod tab and wait for the rest of your instructions.

Using Nearpod, we will visit this website: <https://www.timeanddate.com/astronomy/night/@4637626> to see what constellations are visible in the night sky from your area.



6. Pick out one of the constellations that is easy to draw. Click on the constellation. If you click on the constellation, when you change the date and time, you will be able to see where your constellation is. You may have to close out the planets multiple times.

6c. Using the white box in the top left corner, write down the altitude and direction your constellation is located in. *This is where you would point a telescope to see this constellation at the specific date and time.*

7. On the bottom of your screen enter the dates and times listed below one at a time. Draw your constellation for each of these “seasons.” You must use the same constellation every time to observe the change.

8. What did you observe during this activity? _____



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