brainchild

LESSON PLAN

Space

GRADE LEVEL: ELEMENTARY

brainchild.com | grades 3, 4, 5

i am OTHER NETFLIX ATOMIC ENTERTAINMENT

Space
Elementary Lesson Plan

OVERVIEW OF ACTIVITY

After viewing the Brainchild "Space" episode, students will consider the astronauts' experience of 16-18 sunrises a day at the International Space Station. They will explore our experience of sunrises on Earth by diving into a rotation and revolution movement activity.

DURATION

This collection of activities can be used as a 2 class period activity using all of the provided centers, or as a 1 class period activity if teacher chooses to isolate the forces.

STANDARDS ADDRESSED

Next Generation Science Standard

- **5-ESS1-2 -** Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

OUTLINE OF LESSON

- Teacher introduces topic.
- Whole class views the "Space" episode.
- Students participate in a movement activity, modeling the rotation and revolution of Earth.
- Students consider how and why sunrise and sunset are different on Earth and at the International Space Station.

ACTIVITY PROCEDURE

- Teacher explains to students that they will be watching a Brainchild episode on space. Students will be participating in an activity connected to a clip from the very end of the episode about sunrise and sunset.
- Whole class will view the "Space" episode.
- Teacher will distribute Student Activity Resource and have students break into standing groups of two or three, with a central focus on teacher. Teacher will choose the smallest student in the class to represent Earth and a larger student in the class to represent the sun. Hopefully this will help students remember that the Earth is much smaller than the sun in the future. A third member can be chosen to keep everyone in the group on task.

- With class gathered around, teacher will write the word "rotation" on the board and model a rotation with the Earth volunteer. Teacher should explain that anything spinning can be imagined spinning on an invisible line. This is called an axis of rotation (a spiraling football can serve as a good model of this concept). Students can discuss what they observe. Have partnerships or small groups choose the smallest team member to represent the Earth and model rotation. Teacher should call out different numbers of rotations to model, i.e., "Show me two rotations".

- Once it is clear that class grasps the concept of rotations, class gathers back to central part of room with model. Teacher now gives the sun volunteer the unshaded lamp or flashlight and turns out the lights. Teacher should explain that the unshaded bulb is more like the sun, while the flashlight makes a beam of light, unlike the sun, students should imagine that the sun is radiating light from all directions. Teacher will instruct the model Earth to display a slow rotation as class observes how the light of the sun changes on the Earth. Whole class should discuss what this means (the sunrise and set), and how often this happens (1 rotation per day). Small groups will go off and practice with teacher giving commands, i.e. "Show me one day/ three days/ two rotations."

- Students can complete the first part of the Student Activity Page, drawing a diagram of the Earth and sun indicating day and night.

- Students come back together once teacher feels students grasp this new concept and have completed the diagram.

- Teacher will pose the question, "How many of you have heard the phrase, 'the whole world doesn't revolve around you?'" Teacher will facilitate discussion around this question, pulling ideas of what "revolve" means, what words it's connected to ("revolution"), and what the various meanings of these words may be. Teacher will facilitate connection of what a revolution looks like using models of Earth and the sun. Teacher will have Earth model walk completely around the sun model.

- Small groups will go off to practice. Teacher will give commands, intermixing rotation and revolution. After a clear grasp has been made, teacher will explain that both of these are ALWAYS happening at the same time, one rotation every day and one revolution every year. Teacher can use Earth and sun volunteers to display this.

- As a final model, teacher can add the International Space Station model attached to a meter stick to demonstrate the orbit of ISS around the Earth. Then have Earth complete a rotation with sun shining. Students should be encouraged to consider how this would affect the sunrise and set for astronauts. This is a difficult concept that should only be touched upon lightly. The emphasis should be placed on rotation and revolution.

- Students can take the remaining time to complete the Student Activity Resource.

- Whole class can review findings.

FOLLOW-UP *(optional advanced work)*

The following prompt is found on the Student Activity Resource.

Today we explored rotations of the Earth and revolutions around the sun. We learned that the rotation of the Earth on its axis creates day and night, or the rise and set of the sun. A revolution of the Earth around the sun happens in one year. During the "Space" episode of Brainchild, you saw a clip of what the sunrise and sunset look like on the International Space Station. Use words and pictures to try and explain why it is so different from what we observe here on Earth.

MATERIALS LIST

- Student Activity Resource
- Low wattage lamp without shade
- Flashlights for student groups
- Small object attached to a meter stick with a string (representing International Space Station).