

Reason for the Seasons

All of us experience the seasons every year! But can we explain why the Earth has different seasons? This lesson will allow each person to “actively” model the Earth throughout the four major seasons we experience here in the Southwest. As you proceed with the activity, keep the focusing question in mind.



? What is the reason that the Southwest experiences summer in June, July, and August **?**

MATERIALS

- 1 helium yellow balloon (for entire class)
- 1 star to represent Polaris
- 1 popsicle stick with “E” & 1 with “W” (one set for each student)
- 1 map of the United States and masking tape (one for each student)

PROCEDURE

1. Place the balloon representing the Sun in the center of a large indoor space. All students will model being the Earth as it rotates and revolves around the Sun.
2. Give each student a map and tape to attach the map to the front of his/her shirt. Give each student one popsicle stick with an “E” for east and one with a “W” for west.
3. Ask participants to discuss the following questions with a partner.
 - a. If your head is the North Pole and your feet the South Pole, in which hand does the East and West go? Have students convince their partner that they are correct.
 - b. Model rotating the way the Earth rotates everyday. Be ready to describe the direction of rotation. Does direction matter?
 - c. What time event do we associate with the Earth’s rotation?
4. Have students move in a circle around the Sun. What time event do we associate with this motion?
5. Now, have all students tilt their bodies, or the north pole, toward Polaris, the North Star. While in this position, students will represent the Earth at different positions in its orbit around the Sun.
 - a. Pick out one student that represents summer in the Northern Hemisphere.
 - Ask students which hemisphere is pointing directly at the Sun (Northern Hemisphere).
 - What season does this represent for any countries in the Northern Hemisphere? (Summer)

- On June 21, the Sun is shining directly on the Tropic of Cancer and the Northern Hemisphere experiences its longest day. This season is called the Summer Solstice.
 - If the Northern Hemisphere is experiencing summer, what season would the Southern Hemisphere be experiencing? (Winter)
 - At this position in its orbit, the Earth is actually farther away from the Sun (94.5 million miles or 152 million kilometers) than at Colorado's winter.
- b. Pick out one student that represents winter in the Northern Hemisphere.
- Which hemisphere is pointing directly toward the Sun? (Southern Hemisphere)
 - Does Colorado still have daylight? Why?
 - If the Southern Hemisphere is experiencing summer, which season is Colorado experiencing?
 - On December 21, the Sun is shining directly on the Tropic of Capricorn and the Northern Hemisphere experiences its shortest day. This season is called the Winter Solstice.
- c. Pick out one student that represents fall (positioned between summer in the Northern Hemisphere and winter in the Northern Hemisphere).
- At which position on the Earth does the Sun shine directly over? (Equator)
 - This position occurs on September 23 and is called the Autumnal Equinox.
- d. Finally, pick out one student that represents spring (positioned between winter in the Northern Hemisphere and summer in the Northern Hemisphere).
- Where on the Earth is the Sun shining directly? (Equator)
 - This position occurs on March 21 and is called the Vernal Equinox.
6. Answer the analysis questions in your science notebook.

ANALYSIS QUESTIONS

1. Explain why the Sun "appears" to rise in the East and set in the West.
2. How much of the Earth can be lit by the Sun on any given day? Why aren't all the days in the Southwest the same length?
3. What is the rotation of Earth called? How long does one rotation last?
4. What is the revolution of Earth called? How long does one revolution last?
5. Explain what causes a skier or snowboarder at Vail, Colorado to get sunburned when the air temperature is 24°F.
6. During the summer, the Earth is farthest from the Sun. Explain why the Southwest is experiencing summer.

CONCLUSION

Use what you learned in this lesson to write a conclusion to the focusing question.

E E W W

E E W W

E E W W

E E W W

E E W W

Name _____

Date _____

USA: Physical

