

RESOURCE LIBRARY  
ACTIVITY : 1 HR

## The Sun, Earth, and Cardinal Directions

Students record the position of the sun in the morning and afternoon and make connections to the directions east and west. They practice moving north, south, east, and west and use cardinal directions to read a map.

### GRADES

Pre-K, K, 1

### SUBJECTS

*Earth Science, Geography*

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## OVERVIEW

Students record the position of the sun in the morning and afternoon and make connections to the directions east and west. They practice moving north, south, east, and west and use cardinal directions to read a map.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/sun-earth-and-cardinal-directions/>

## DIRECTIONS

### 1. Prepare materials for the activity.

Cut out 10 large yellow paper suns from construction paper. On white construction paper, write in large letters north, south, east, and west. Put the words east and west on the east and west walls of the classroom. You can download a [compass](#) app on a smartphone or tablet to ensure correct placement of these.

## **2. Find east and west by observing the sun in the morning and afternoon.**

Tell students that they are going to observe where the sun is each morning and afternoon for five days. Take students outside first thing in the morning and at the end of the school day and have them observe where the sun is in the sky. While outside in the morning, as students identify the location of the sun, tell them that we call that direction east. Go into the classroom and have a student write the date and time of day on a sun cutout and put it next to where the word “east” is located.

Avoid saying that the sun is moving. It will probably appear to students that the sun is moving, not the Earth, but it is not age appropriate for students to try to conceptualize the movement of the Earth on its axis or around the sun yet. The goal is to have students understand that east is a certain direction and the sun always rises in the east in the morning.

Observe the sun again at end of the school day and ask students if it is in the same location as earlier in the morning. Identify that direction as west and have a student put the date and time of day on a sun cutout and place it next to the “west” sign.

## **3. Look for a pattern in the sun’s location in the morning and afternoon.**

Track the sun's location in this way for five days and then ask students if they have noticed a pattern. Together write a sentence that explains what they have observed and what they would expect to see in the future.

## **4. Observe north and south, and label the classroom walls.**

Next, ground students’ learning about north and south in the physical world with one or more of these ideas. Add the north and south labels to the classroom walls:

- Use a compass, or a compass app on a smartphone or tablet, to show north and south and reinforce east and west. Have students line up the E and W on the compass with east and west labeled on the wall. Ask them to point toward the N, and explain that this direction is north.

- In areas where there is snow, teach north and south by observing where snow melts faster: the south side of buildings (in the northern hemisphere).
- North and south can also be observed with wind patterns. Track the weather using the provided Weather Channel website, and look for opportunities to take the students outside when north or south winds are blowing.

## 5. Practice using cardinal directions.

Practice the directions in the room by having students face north first, then turn at right angles and point, naming the directions “north, south, east, and west” several times. You can help them remember N, S, E, and W by using a phrase such as “Never Eat Sour Watermelon,” or have them create a phrase they like.

Have students use cardinal directions to talk about movement also. Play Simon Says and have them take steps in different directions.

As a final game of practice, send a volunteer to the hall and hide an item so the class sees the hiding place. Have the volunteer come back in the room, and have students one at a time guide the volunteer to the hidden item, with phrases such as “walk 5 steps to the north,” “walk three steps to the south,” and so on.

## 6. Have students apply their understanding to a map.

Discuss with students why we use special words to tell directions. Elicit from students that they help us to explain to one another where things are. Direction words also help us to read maps.

Give each student the handout Map of Joe’s Farm. Have them orient their maps by placing them on their desks so that north, south, east, and west on the map match the directions labeled on the wall.

Discuss together where things are on the map of the farm. Ask: *Is the pig pen closest to the north, south, east on the map?* (east) *One pig got away. On which side of the farm is that pig?* (west) Have students write 3-4 sentences describing directions that animals and people might move on the farm. As needed, provide examples such as:

The cow walks \_\_\_\_\_ to get to the barn. (west)

The children walk \_\_\_\_\_ to the chickens. (south)

The pig walks \_\_\_\_\_ to go to the pig pen. (east)

The garden is \_\_\_\_\_ of the pigs. (north)

The \_\_\_\_\_ lives on the north side of the farm. (cow)

Have students continue to practice the directions of N, S, E, W by having them pass their papers in to the north, south, east, or west. You can also have them line up on the north side of the room, the west side of the room, and so on.

## Tip

Be safe when looking in the direction of the sun, and make sure that students do not stare at the sun. Have them quickly point in the direction of the sun, and then move their arms down from the direction of the sun to where the sky meets land. That direction should be east.

## Tip

Instead of placing cutout suns on the wall next to “east” and “west,” have students build a model of the outside area of their school. Label it with N, S, E, W and then each day place a sun in the morning and afternoon as noted above. You can use an image of the wind for north and south.

## Modification

Observing the movement of light from classroom windows is another way to look for east and west.

## Informal Assessment

Check students’ sentences with the Map of Joe’s Farm for understanding and comprehension.

## Extending the Learning

- Have students watch the sun over a matter of months and note the change in its location as the days shorten and lengthen.

- Play a “Where in the classroom?” game using a stuffed animal. Move the familiar animal to a different spot in the room each day. Have students write the location of the animal using cardinal directions. Over time this could be expanded to other locations in the school or playground where N, S, E, and W are labeled.
- Show students the variety of ways that maps show the cardinal directions. On local, state, or country maps, look for the compass rose or the north arrow. Help students determine which way north, south, east and west are on those maps. Place the maps flat on a surface to reinforce the true directions.

## OBJECTIVES

# Subjects & Disciplines

Earth Science

Geography

# Learning Objectives

Students will:

- describe the pattern of the location of the sun each morning and afternoon and connect this to the directions east and west
- name the cardinal directions and point toward north, south, east, and west using signs in their classroom
- use north, south, east, and west when describing locations of items on a map

# Teaching Approach

- Learning-for-use

# Teaching Methods

- Discussions
- Modeling
- Visual instruction

# Skills Summary

This activity targets the following skills:

- 21st Century Student Outcomes
  - Learning and Innovation Skills
    - Communication and Collaboration
- Geographic Skills
  - Acquiring Geographic Information
- Science and Engineering Practices
  - Obtaining, evaluating, and communicating information
  - Planning and carrying out investigations

## National Standards, Principles, and Practices

### NATIONAL COUNCIL FOR SOCIAL STUDIES CURRICULUM STANDARDS

- Theme 9:

Global Connections

### NATIONAL GEOGRAPHY STANDARDS

- Standard 1:

How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

### NATIONAL SCIENCE EDUCATION STANDARDS

- (K-4) Standard A-1:

Abilities necessary to do scientific inquiry

- (K-4) Standard D-3:

Changes in earth and sky

### COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

- Reading Standards for Informational Text K-5:

Key Ideas and Details, RI.1.1

- Reading Standards for Informational Text K-5:

Key Ideas and Details, RI.2.1

## Preparation

## What You'll Need

### MATERIALS YOU PROVIDE

- Markers
- Compass or compass app (optional)
- Yellow and white construction paper
- Removable tape or glue
- Safety scissors

### REQUIRED TECHNOLOGY

- Internet Access: Required
- Tech Setup: 1 computer per classroom, Mobile data device (smartphone or tablet), Projector

### PHYSICAL SPACE

- Classroom
- School playground

### OTHER NOTES

Ideally, this activity will take place over 5 consecutive days to allow students to make their observations and identify patterns.

## BACKGROUND & VOCABULARY

# Background Information

North, east, south, and west are the four cardinal directions, often marked by the initials N, E, S, and W. East and west are at right angles to north and south. East is in the clockwise direction of rotation from north. West is directly opposite east. The sun's position in the sky

can be used to determine east and west if the general time of day is known. In the morning, the sun rises roughly in the east and tracks upwards. In the evening it sets roughly in the west.

The concepts of cardinal directions and Earth-sun relationships may be challenging for students, so this activity is designed to help students connect the abstract terms of north, south, east, and west with their known world.

## Prior Knowledge

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## Recommended Prior Activities

- [Explore Cardinal Directions](#)

## Vocabulary

<b>Term</b>	<b>Part of Speech</b>	<b>Definition</b>
<b>cardinal direction</b>	<i>noun</i>	one of the four main points of a compass: north, east, south, west.
<b>compass</b>	<i>noun</i>	instrument used to tell direction.
<b>map</b>	<i>noun</i>	symbolic representation of selected characteristics of a place, usually drawn on a flat surface.
<b>map skills</b>	<i>noun</i>	skills for reading and interpreting maps, from learning basic map conventions to analyzing and comprehending maps to address higher-order goals.

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### For Further Exploration

#### Books

- [Leedy, Loreen. \*Mapping Penny's World\*. New York: Square Fish, 2000.](#)

#### Interactives

- Maps 101: Uncle Sam's Farm



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