

Seasonal Changes

Teacher Facilitation Notes

In General . . .

- Project the slide deck in edit mode–do not show it as a slideshow.
- Hide the speaker notes before projecting. (View/Show Speaker Notes)
- Hide the toolbar. (Click on the up arrow at the right end of the tool bar.)
- Call on students to read the various content shown on slides.
- For each investigation, assemble the needed materials for each group and place in a central location for ease of distribution.
- Duplicate copies of the data sheets for each student.

Materials Needed Per Group:

Engage–The Four Seasons

Scissors

Tape

Glue

Elaborate:

Crayons or markers

Nail

Small ball of playdough

Metric rulers

Scissors

Hole punch

Sheet of construction paper

Other Materials

Student Recording Sheets

Pencils

Science Notebooks

The Four Seasons Folded Graphic Organizer Template, 1 per student

Earth's Orbit During the Year Template, 1 per student

White card stock, 2 piece per student OR Duplicated Circle Templates

Paper fastener, 1 per student

Quiz, 1 per student

Note:

Data for this lesson was found at:

<https://www.usclimatedata.com/climate/texas/united-states/3213> &

<https://sunrise-sunset.org/us/corpus-christi-tx/2022/12>

Curriculum Assistance:

[Core Knowledge](#)

[Project 0](#)

Seasonal Changes

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Engage: The Four Seasons

- Duplicate one copy of the folded graphic organizer for each student. Duplicate a copy of the orbit page for every 2 students. (Cut apart on the dotted line.)
- Brainstorm what the students know about the four seasons. Record their responses on the board or a piece of chart paper.
- Show the video. If possible, let students stand up and move to the music as they learn a song about the planets.
- Use the directions on the slides to have students model the different positions of the Earth at each season. Remind them to keep their right hand tilted and in the same position as the "Earth" orbits the "Sun".
- Discuss each season in the Northern Hemisphere as they reach that position:
 - Summer: "Earth's" axis is pointing at the "Sun"
 - Fall (or Autumn): "Earth's" axis is sideways to the "Sun"
 - Summer: "Earth's" axis is pointing away from the "Sun"
 - Summer: "Earth's" axis is sideways to the "Sun"
- Display the diagram of the Earth throughout its orbit around the Sun.
- Give each student the graphic organizer and the orbit pictures. Have them follow the directions on the slide to assemble their folded graphic organizer.
- Facilitate a class discussion, using the following questions, if desired:
 - What are the four seasons in the order in which they happen?
 - How is the Earth positioned when it is summer in the Northern hemisphere? Winter?
 - What did you notice about the seasons in the Northern Hemisphere compared to the seasons in the Southern Hemisphere?

Explore: Changing Seasons

- Read the introductory slide with the students. Brainstorm what they think about when they hear the term "winter". Remind students that they will be discussing the seasons as they occur in the Northern Hemisphere since that is where they live.
- Discuss where the Earth is in its orbit and around the sun and how it is tilted during winter in the Northern Hemisphere.
- Have students read about temperature and daylight hours during winter. Give them time to record the average high temperatures and the average hours of sunlight for the winter months on their data sheets.
- Continue in the same manner for the other three seasons. Point out differences between average temperature and average amount of sunlight as you go.

Seasonal Changes

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Explain: Analyzing Seasonal Data

- Discuss the first graph with the students. Call on volunteers to explain what the graph shows, being sure to read the titles on the x- and y-axis.
- Depending on student ability level, have them answer the questions on the data sheet independently or together as a class.
- Follow the same procedure with the table of daylight hours in Corpus Christi.
- Discuss as desired.

Elaborate: Signs of the Seasons

- If desired, prior to beginning this lesson, duplicate a copy of the two circle templates for each student. (If materials are limited, this can be done by pairs or trios of students.)
- Have students cut out the two circles or draw their own different-sized circles on card stock. (If students draw their own, have them use the rulers to add lines that cut the circle into four equal-sized pieces.)
- Point out the numbers on the large template: 1 represents winter through 4 for fall.
- Tell students that they are going to be doing a CSI* activity: color, symbol, and illustration. Ask students to think about a color that might most represent winter. Have them color the #1 section of the wheel that color. Do the same for the other three sections of the wheel.
- Assist students with punching holes in the middle of the large wheel and then the smaller wheel and the arrow.
- Brainstorm what symbols might represent each season. Call on volunteers to share their symbols and their reasoning behind choosing that symbol. Have students choose the symbols they think best represents each season and draw them on the small wheel (using the same numbers as before, e.g., 1 is winter.)
- Next, have students think about what images they might use to represent each season. Have them draw a small illustration under the symbols they chose for the seasons. Make sure they leave room to write a little bit about each season.
- In each section, have students write the names of the seasons and two things they learned about patterns of temperature and daylight hours.
- Have them complete the wheels as indicated on the slides.
- Let students share their wheels and details with the class. Discuss as desired.

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Evaluation

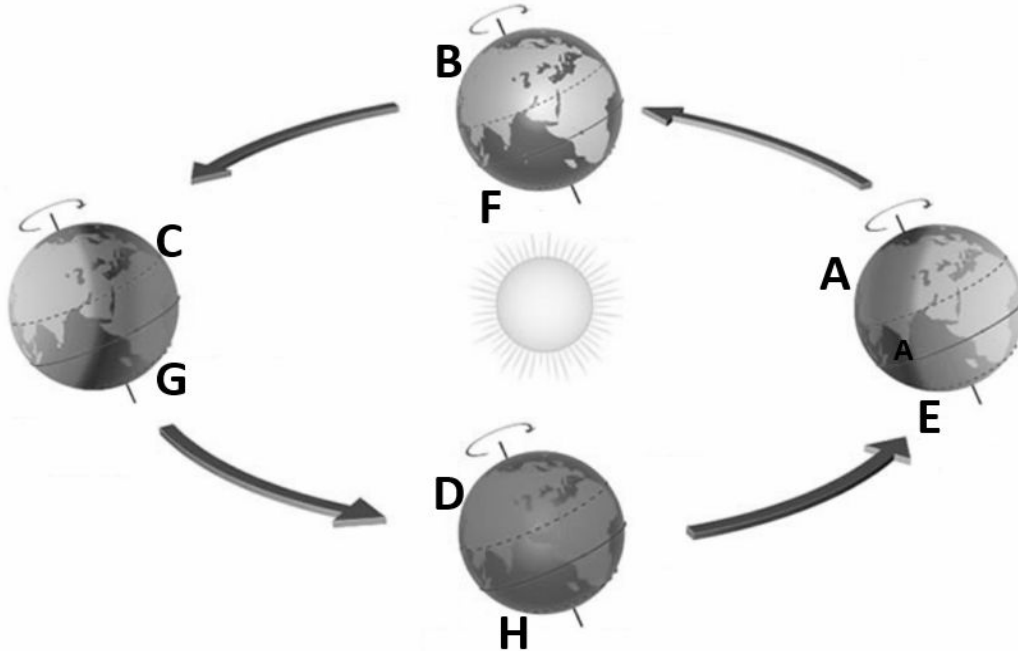
- Let students complete the quiz independently.
- Discuss evaluation activities as desired.

Seasonal Changes

Name: KEY

Evaluation, page 1

1. Study the diagram below.



Name each season in both hemispheres from the diagram above.

A. Summer

E. Winter

B. Fall

F. Spring

C. Winter

G. Summer

D. Spring

H. Fall

2. During which season in North America would you expect to experience more hours of daylight and less hours of darkness?

F Winter

G Spring

H Summer

J Winter

Seasonal Changes

Name: KEY

Evaluation, page 1

3. Which list shows the correct sequence of the seasons on the Earth?
- A Winter, Spring, Fall, Summer
 - B Spring, Fall, Summer, Winter
 - C Summer, Fall, Winter, Spring
 - D Fall, Winter, Spring, Summer
4. Why do we experience the changing season on Earth's surface? (Mark TWO answers.)
- F The Earth's distance from the sun
 - G The tilt of the Earth on its axis
 - H The orbit of the Earth around the Sun
 - J The rotation of the sun on its axis
5. Some fourth grade students collected data for the average daily high temperature for every month where they lived. Then they found the average for the the three months that make up each season. Their results are shown in the table below.

Season	Months	Average Daily High (°C)
Winter	December-February	18
Spring	March-May	26
Summer	June-August	34
Fall	September-November	27

Which two seasons are the most similar in terms of the average daily high temperatures?

- A Spring and Fall
- B Spring and Summer
- C Summer and Fall
- D Winter and Fall

Seasonal Changes

Engage: The Four Seasons, Folded Graphic Organizer Template

The Four Seasons

winter

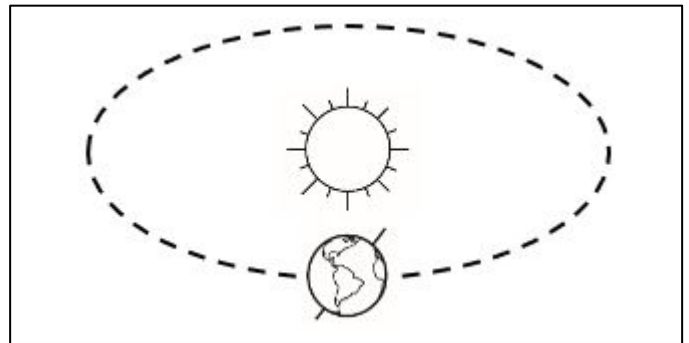
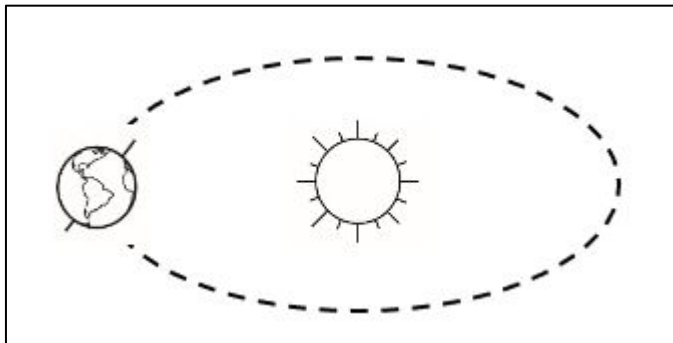
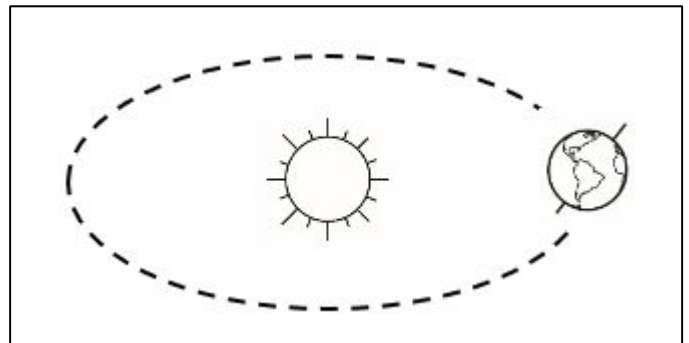
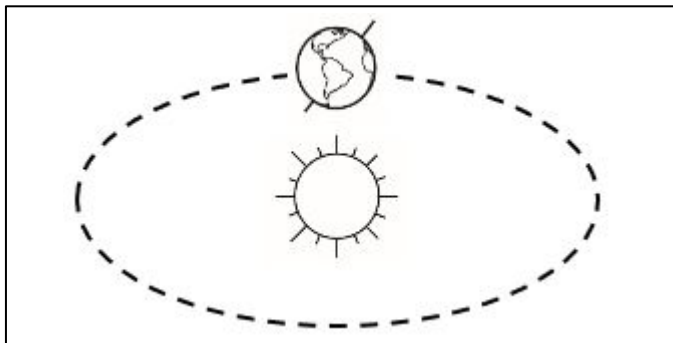
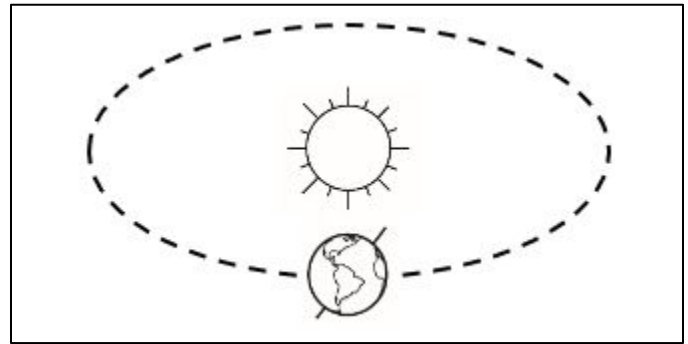
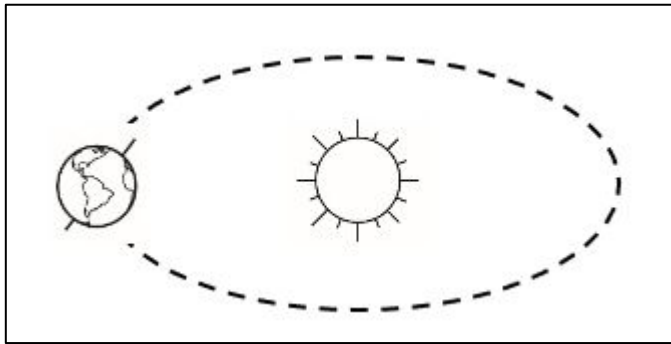
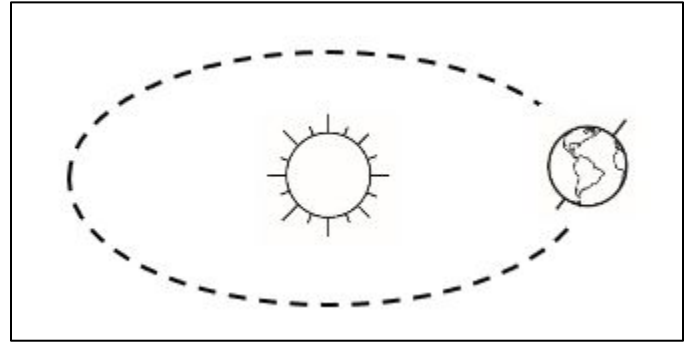
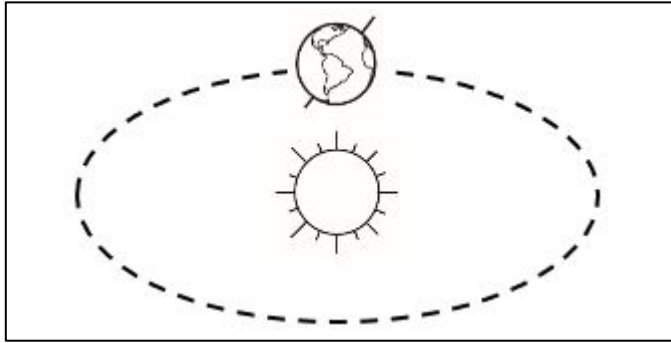
spring

summer

fall

Seasonal Changes

Engage: The Four Seasons, Earth Orbit Illustrations



Seasonal Changes

Name: _____

Explore: Changing Seasons

Average Seasonal High Temperatures for Three Texas Cities

	Winter	Spring	Summer	Fall
Dallas				
El Paso				
Houston				

Average Hours of Monthly Sunlight for Three Texas Cities

	Winter	Spring	Summer	Fall
Dallas				
El Paso				
Houston				

1. What do you notice about the average temperature in winter versus the average temperature for summer for Houston?
2. During which season does Dallas receive the least hours of sunlight? Why do you think this happens?
3. What is the difference between the average spring temperature and the average fall temperature in El Paso? Why do you think they are so similar?

Seasonal Changes

Name: _____

Explain: Analyzing Seasonal Data, Part 1

1. What are the months for each season of the year?

Spring _____

Summer _____

Fall _____

Winter _____

2. Which season has the lowest average low temperature? Why is this true? _____

3. In which two seasons are the average low temperatures almost the same? Why? _____

4. The last month of winter is February. What might you expect the average low temperature to be in March: 74°F, 62°F, or 43°F? Explain your reasoning.

Seasonal Changes

Name: _____

Explain: Analyzing Seasonal Data, Part 2

1. During which season are there the fewest number of daylight hours? What is your evidence? _____

2. There were 10 hours and 56 minutes of daylight on February 1. There were 11 hours and 38 minutes of daylight on March 1. About how many hours of daylight might you expect on March 14? Why? _____

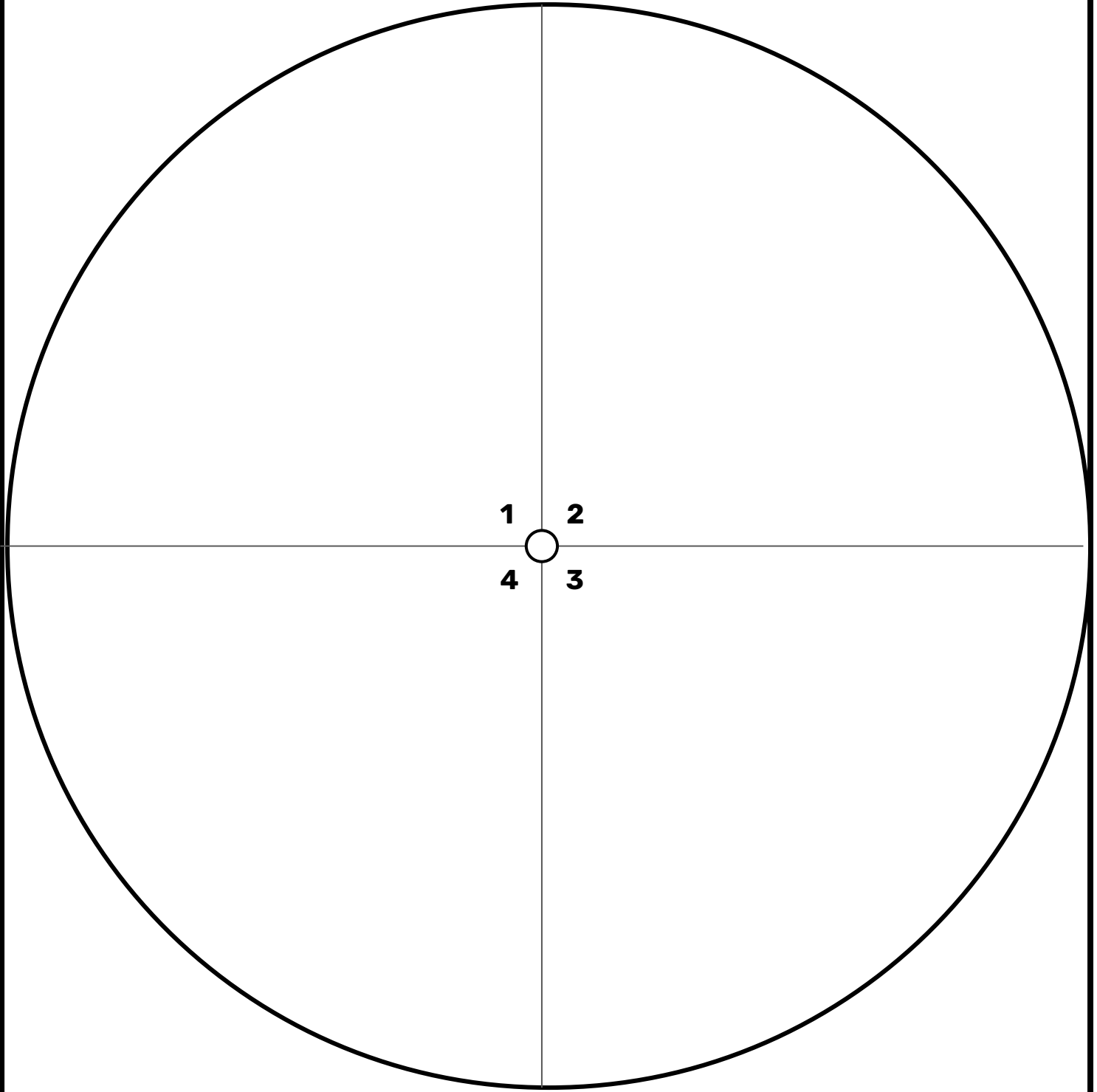
3. There is an average of 12 hours and 38 minutes of daylight each day during spring in Corpus Christi. Is this more or less than the average hours of daylight in winter? How do you know?

4. What prediction can you make about how the hours of daylight from September 2 to September 30 would change each day?

5. What prediction can you make about the number of daylight hours there would be 7 days before June 1?

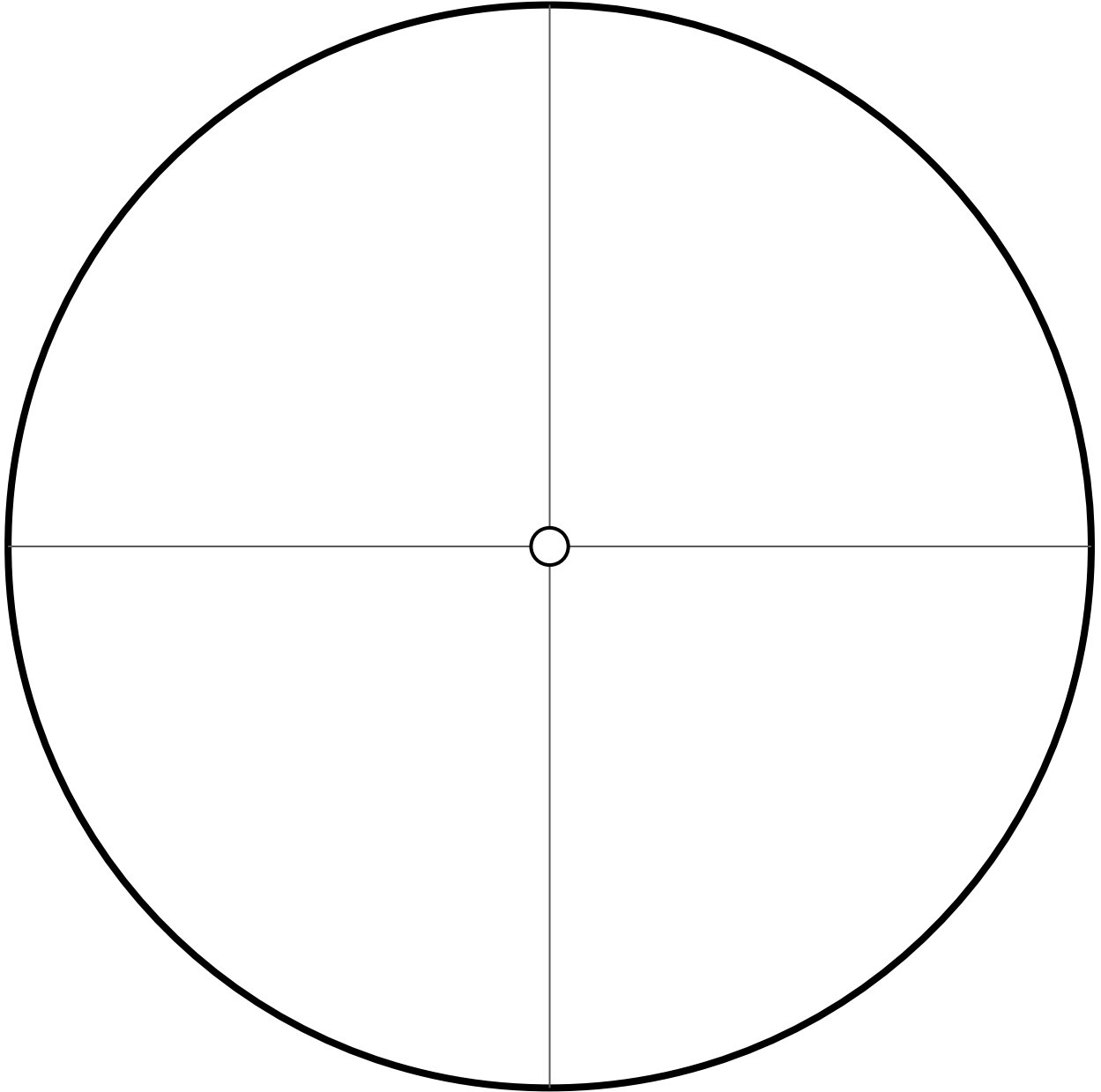
Seasonal Changes

Elaborate: Signs of the Seasons Large Circle Template



Seasonal Changes

Elaborate: Signs of the Seasons Small Circle Template

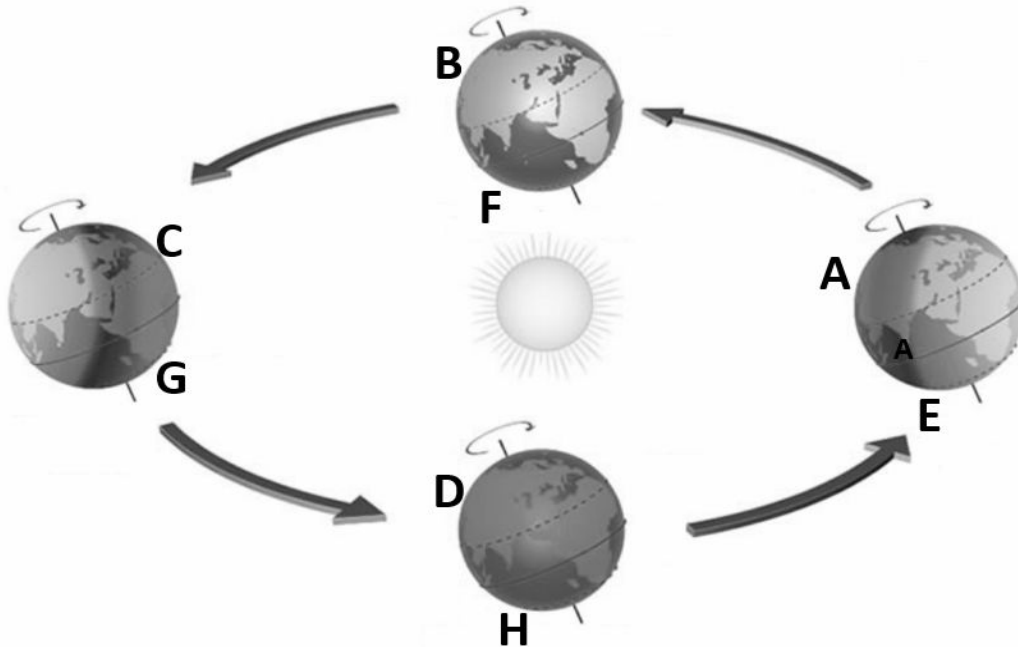


Seasonal Changes

Name: _____

Evaluation, page 1

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B. _____

F. _____

C. _____

G. _____

D. _____

H. _____

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H Summer

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Seasonal Changes

Name: _____

Evaluation, page 2

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