

## Does Distance Away from the Sun Affect Seasons?

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Period: \_\_\_\_\_ Page: \_\_\_\_\_

Question: Does Earth's distance away from the Sun affect the seasons on Earth?

Description: You will be using a football field as a model of the Earth's orbit around the Sun. You have Earth's distances away from the Sun for each month of the year. It's your goal to calculate how far you need to draw your Earth away from the Sun (on the 50 yard line) in centimeters.

Procedure:

1. Calculate the scale model distance for Earth's distance away from the Sun.  
To calculate scale model distance, take the actual distance away from the Sun and divide it by 20 million. Round to the nearest hundredth (Example:  $5.365 = 5.37$ )

$$\text{Distance Away from the Sun} \div 20,000,000 = \text{Scale Model Distance}$$

2. Using the metric side of a ruler, measure out your calculated scale model distances from the Sun along the dashed line. Measure to the nearest millimeter (small mark between each centimeter)
3. Place a dot for the calculated scale model distance away from the Sun for each month.
4. Place a circle around dot on the dashed line to represent the Earth. Connect the Earth locations using a curved line.

Month	Distance Away from the Sun	Scale Model Distance
January	147,000,000 km	
February	147,200,000 km	
March	148,100,000 km	
April	149,600,000 km	
May	151,000,000 km	
June	151,700,000 km	
July	152,000,000 km	
August	151,800,000 km	
September	150,900,000 km	
October	149,700,000 km	
November	148,200,000 km	
December	147,100,000 km	

1. Looking at both Earth's actual distance and the scale model distances away from the Sun, which month of the year is Earth closest to the Sun? What season is the northern hemisphere in during this month?
2. When is Earth farthest away from the Sun? What season is the northern hemisphere in during this month?
3. Based on this information from the previous two questions, does Earth distance away from the Sun cause seasons? Why or why not?

