Solar Tracker Name:_____

6th Grade – Design Task Assessment Date:_____

Directions: For each of the questions below, choose the BEST answer.

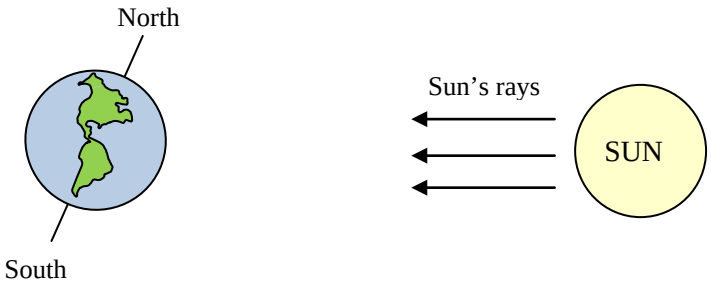
1. During which season would you expect to have the most hours of daylight?

   A. Winter
   B. Spring
   C. Summer
   D. Autumn

2. Maria and her classmates are going on a fieldtrip. On the day of their fieldtrip, at which of the times below will the Sun be highest?

   A. 7 a.m.
   B. 9 a.m.
   C. Noon
   D. 4 p.m.

3. The Earth, shown below, is orbiting the Sun. What season is it in the *Southern Hemisphere*?



   A. Summer
   B. Spring
   C. Autumn
   D. Winter

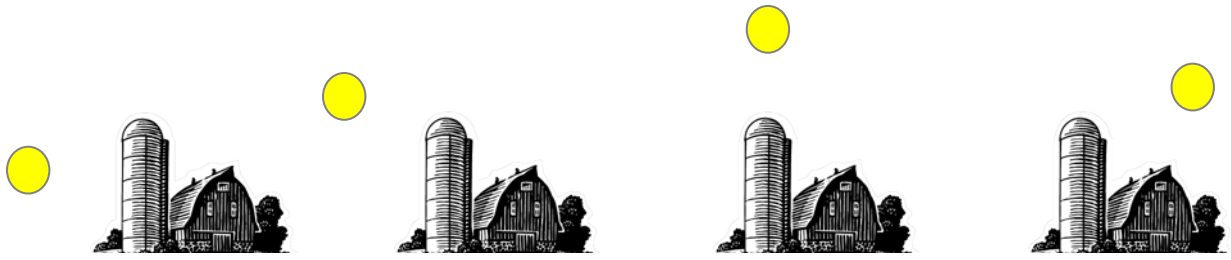
4. The Sun's path is highest in the sky during _____.

A. Spring
B. Summer
C. Autumn
D. Winter

5. In January it is winter in Indiana (Northern Hemisphere) but summer in South Africa (Southern Hemisphere). Which **best** explains why it is summer in South Africa?

A. Earth is at its closest point to the Sun.
B. Earth rotates once every 24 hours.
C. Neither hemisphere is tilted towards the Sun.
D. The southern hemisphere is tilted towards the Sun.

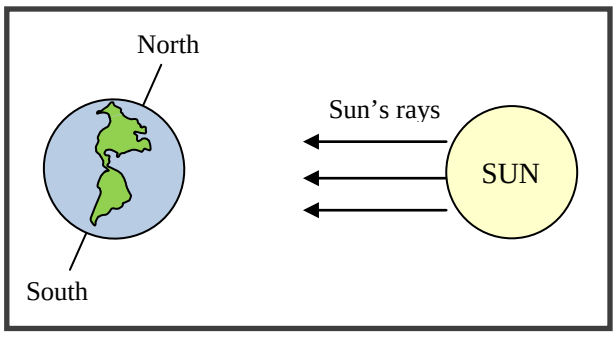
6. Which picture below shows when sunlight is most direct?



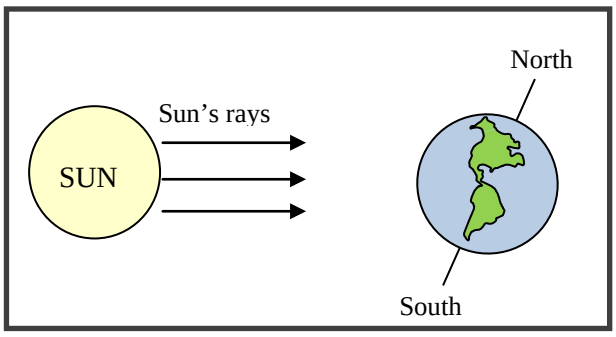
A. B. C. D.

7. For the Northern Hemisphere, how does the sunlight shown in Season 1 compare to the sunlight shown in Season 2?

Season 1



Season 2



A. Sunlight in Season 1 is more direct.
B. Sunlight in Season 2 is more direct.
C. There is no difference.
D. It is not possible to tell.

8. Robert needs to measure an angle. Which tool should he use?

A. Scissors
B. Graduated cylinder
C. Protractor
D. Spring scale

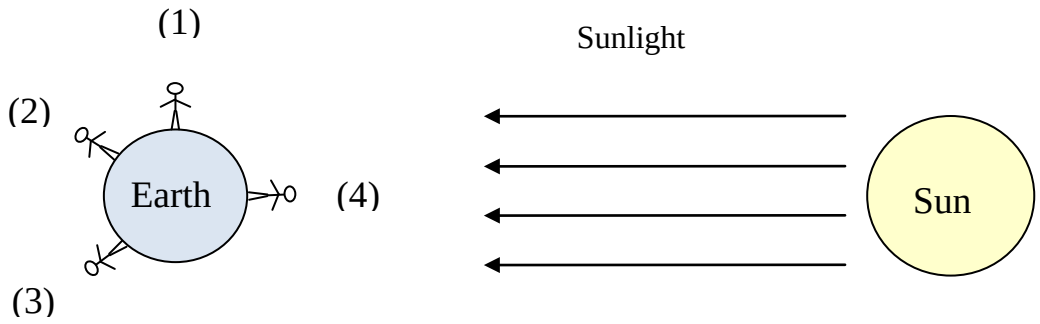
9. Which units will Robert record after he has measured the angle?

A. Centimeters
B. Liters
C. Feet
D. Degrees

10. A satellite orbiting Earth is always adjusting its solar panels to face the Sun in order to collect as much solar energy as possible. Which of the following features is most important to the solar panel design?

A. Volume of the satellite.
B. Ability to adjust the speed of the satellite.
C. Color of the satellite.
D. Ability to tilt the satellite's solar panels.

11. A figure is shown standing on the Earth in different places. At which position will the figure receive the most direct sunlight?



A. 1
B. 2
C. 3
D. 4

Use the following information to answer questions 12-13.

A housing construction company, Green Homes, wants to offer houses for sale that have "green" energy sources. Green Homes believes that potential homeowners will be interested in buying houses with solar panels. Green Homes hires Solar Panels Inc. to design a solar panel that will help provide energy by converting solar energy into electricity.

12. Who is the client?

A. Green Homes
B. Solar Panel Inc.
C. Homeowners
D. An energy company

13. What is the *best* description of the design problem?

A. Construct a solar panel to match the house colors.
B. Cool a house with a solar panel.
C. Provide electricity using a solar panel.
D. Help warm a house with a solar panel.

14. A team of scientists and engineers want to send a robotic vehicle to explore the planet Mars. The design problem identified by the team is to design a solar-powered vehicle that must be able to travel over sand and rocks and not get stuck. The *best* step for the team to take now is to:

A. build a prototype of the robotic vehicle and send it to Mars for its first test.
B. brainstorm ways the robotic vehicle can be made to float.
C. build a prototype and test it to make sure it works before starting to document the design process.
D. brainstorm all the different ways the robotic vehicle can be designed to move over sand and rocks.