

Doing Work

$$\text{Work} = \text{Force} \times \text{distance}$$

Object tested	Force (newtons)	distance (meters)	Work (joules)

1. Which object required the most force to lift?

2. Which object required the least force to lift?

3. Which object required the most work to lift?

4. Which object required the least work to lift?

Friction

$$\text{Work} = \text{Force} \times \text{distance}$$

1. Record your observations in the table below. For each surface tested, calculate the amount of work performed.

Surface tested	Force (newtons)	distance (meters)	Work (joules)
wooden board			
sandpaper			
waxed paper			

2. On which surface was the most amount of work done by moving the book? Why?

Pulleys

$$\text{Work} = \text{Force} \times \text{distance}$$

1. The distance between the floor and the desktop is _____ meters.
2. The force required to lift the book to the desktop was _____ newtons.
3. The distance the book moved was _____ meters.
4. The amount of work done was _____ joules.

5. The force required to lift the book using the pulley was _____ newtons.
6. The distance the book moved was _____ meters.
7. The amount of work done was _____ joules.

8. How does a pulley help you do work?

Moving Masses

1. Title

2. Statement of the Problem

3. Background Information

Acceleration: _____

Newton's second law of motion: _____

4. Hypothesis

5. Variables

Controlled Variables: _____

Independent Variable: _____

Dependent Variable: _____

Moving Masses

8. Data

Type of Ball	Mass of Ball	Acceleration of Ball

Other observations:

9. Data Analysis

Moving Masses

10. Conclusion

Have you proved or disproved your hypothesis? Explain.

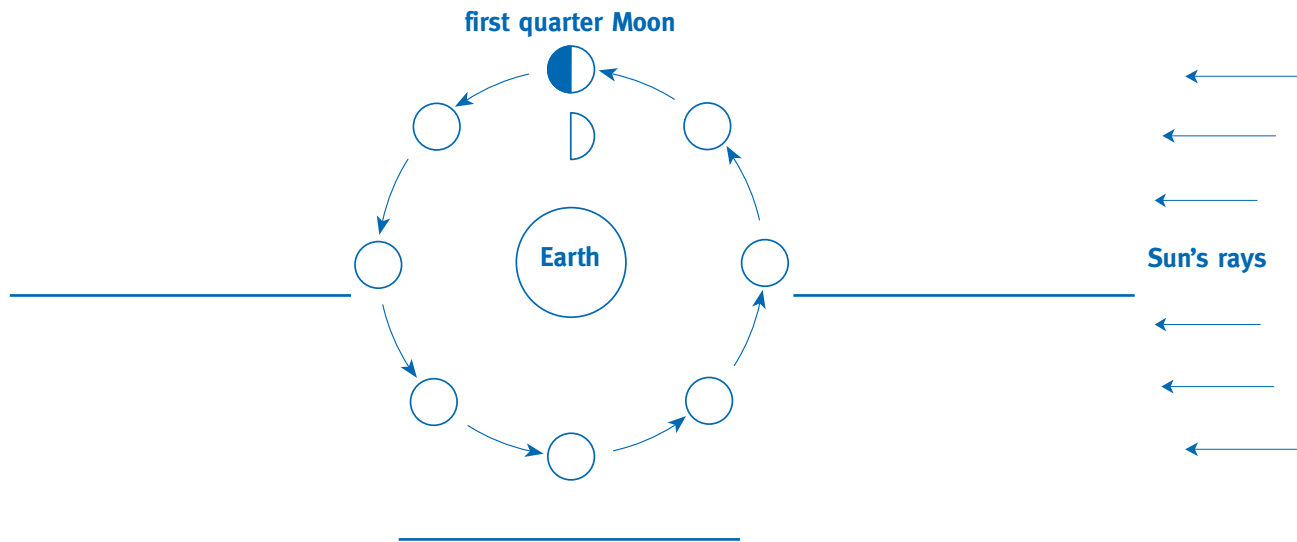
11. Recommendations

12. Acknowledgements

13. Bibliography

Modeling Moon Phases

1. Label the four major phases of the Moon. On the outer ring of Moons, shade the side of the Moon that is dark during each phase. Then, next to each Moon, draw the shape of the Moon as it appears from Earth. (The first quarter Moon is completed for you.)



2. Draw and label the actual illumination and the apparent shape of the two crescent phases of the Moon.
3. Draw and label the actual illumination and the apparent shape of the two gibbous phases of the Moon.

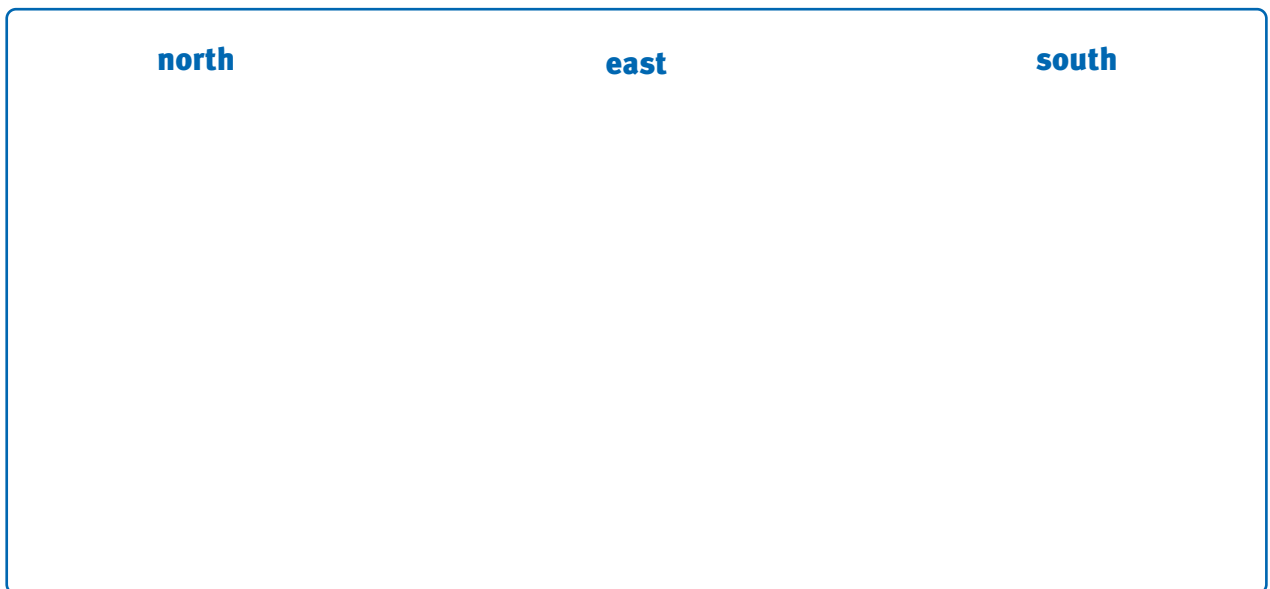
Solar Journal: Sunrise

1. Record the time of sunrise to the nearest minute each day. Do this for 2 weeks.

Day/Date	Time	Day/Date	Time
1		8	
2		9	
3		10	
4		11	
5		12	
6		13	
7		14	

2. Draw the eastern horizon. Make a dot at the location of sunrise each day.

north	east	south
--------------	-------------	--------------



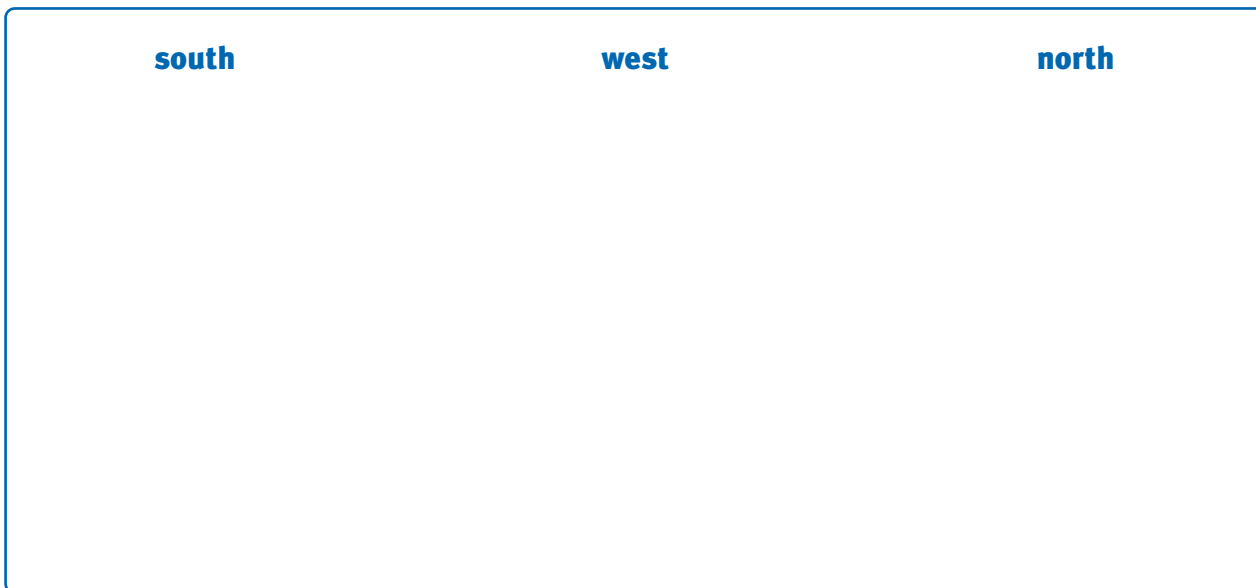
Solar Journal: Sunset

1. Record the time of sunset to the nearest minute each day. Do this for 2 weeks.

Day/Date	Time	Day/Date	Time
1		8	
2		9	
3		10	
4		11	
5		12	
6		13	
7		14	

2. Draw the western horizon. Make a dot at the location of sunset each day.

south	west	north
--------------	-------------	--------------



The Reason for Seasons

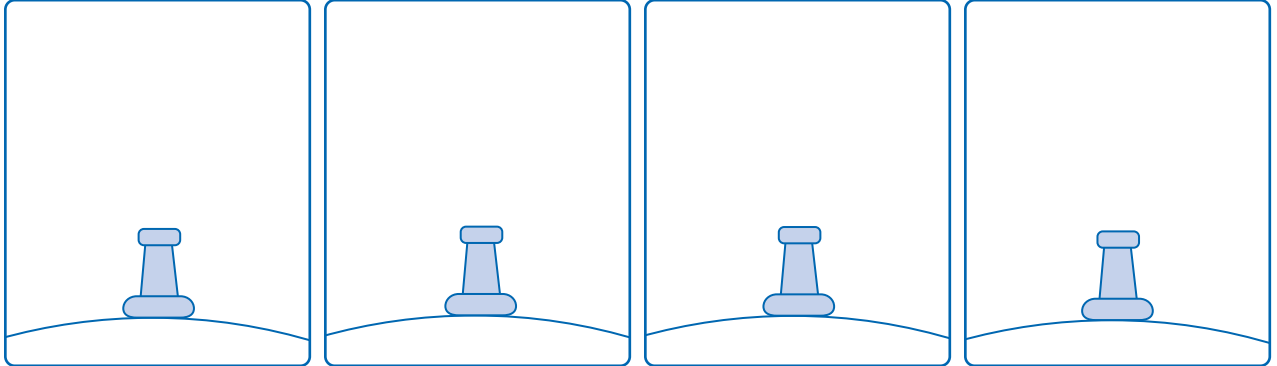
1. Draw the Sun where it would appear from the perspective of your push pin each season.

summer

autumn

winter

spring



2. Beside each season, write the distance the observer traveled on the globe during daylight and during night.

Season	Distance Traveled	
	Day	Night
summer		
autumn		
winter		
spring		

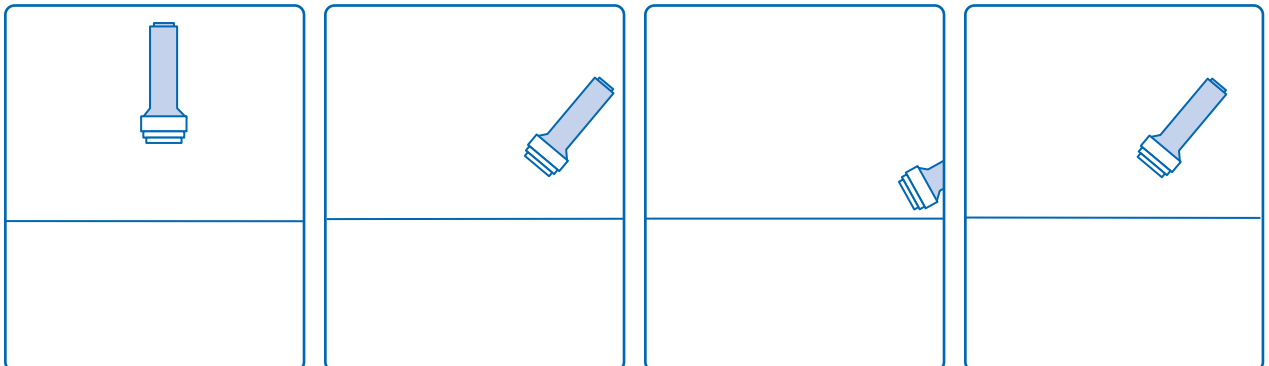
3. Draw the shape and size of the area lit by the penlight at the equinoxes and solstices.

summer solstice

autumnal equinox

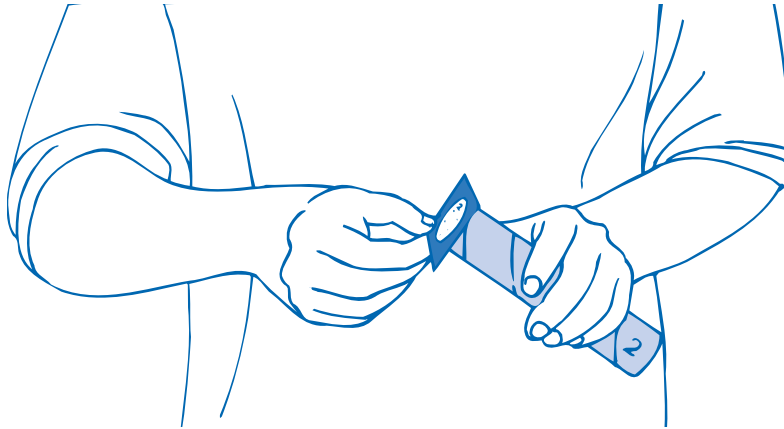
winter solstice

spring equinox

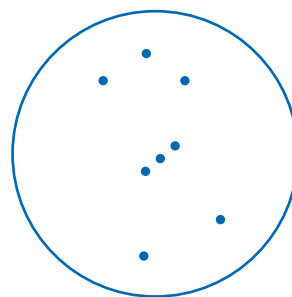
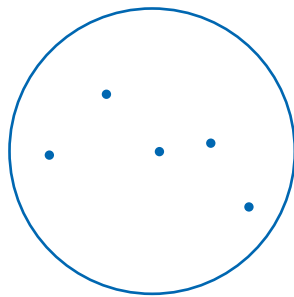
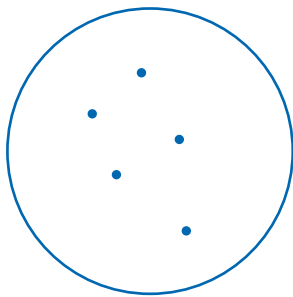
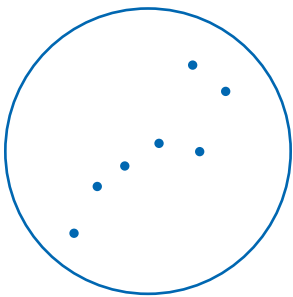


Constellations: Stories in the Sky

1. Make your constellation viewer: Use a pattern and a push pin to make a constellation. Glue the square of black paper over one end of the tube and let the glue dry. Locate the number on the pattern. Write this number on the tube.



2. Point your constellation tube toward a light source and look through the tube. Match the pattern you see with one of the patterns below. Write the tube number under the pattern that matches it. Then write the name of the constellation beside the number.



3. Swap viewers with a team whose viewer has a different number. View the constellation inside. Record the number and name of the constellation you see under its pattern above.
4. Swap viewers two more times until you have viewed all four constellations. Record the number and name of each constellation under its pattern above.

