



Title: Creating a Sun Map for your Radishes!

Grade Level: 6-8

GPS/CC Standards:

- S6E1d. Explain the motion of objects in the day/night sky in terms of relative position.
- S6E2a. Demonstrate the phases of the moon by showing the alignment of the earth, moon, and sun.
- S6E2c. Relate the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.
- S6E6. Students will describe various sources of energy and with their uses and conservation.
 - Explain the role of the sun as the major source of energy and its relationship to wind and water energy.
 - Identify renewable and nonrenewable resources.

Materials Needed:

- Variety of seed packets
- Black, yellow, and green markers (1/group)
- White paper (4/group)

Time Needed: 45 minutes (throughout a day)

Goals:

Students will review the motion of the sun, earth, and moon in the day/night sky. Then, they will create a map of sun exposure for their garden by collecting data throughout one school day. Students will use the information they collect to plan their garden.

Objectives:

- Students should be able to explain and model the motion of objects in the day/night sky.
- Students should be able to identify the phases of the moon and demonstrate the corresponding alignment of the earth, moon, and sun.
- Students should be able to relate the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.
- Students should be able to collect data on the sun exposure in their garden and use that information to make decisions about their planting.



Outline:

- Engage – Model the Movement in the Solar System
- Explore – Create a Sun Map of your Garden
- Explain – Examine Seed Packets for Sun Requirements
- Extend – Planting by the Moon Phases
- Evaluate

Lesson Plan:

Engage (10 min):

Model the Movements in the Solar System

1. Sun – Choose one student to stand in the middle of the learning space to serve as the sun.
2. Earth's Revolutions – Choose another student to serve as the Earth and model the revolutions around the sun.
 - How long does it take the Earth to revolve around the sun?
3. Earth's Tilt – Have the same student carefully attempt to tilt in one specific direction while revolving around the sun.
 - How does the tilt of the Earth affect us? (Seasons)
 - Discuss what seasons are occurring at different times throughout the revolution around the sun (one year).
 - How does this affect our garden?
 - How would this affect people growing food in other parts of the world?
4. Earth's Rotations – Have that same student carefully attempt to model Earth's rotations.
 - How long does it take the Earth to revolve around the sun?
 - Discuss what time of day is occurring at different times throughout the rotation.
 - How does this affect our garden?
5. Moon – Choose another student to serve as the moon and carefully model revolutions around the Earth.
 - Discuss the moon phases that occur based on the alignment of the sun, earth, and moon.
 - How does this affect our garden?



Explore (30 min throughout the day):

Create a Sun Map of your Garden (example sun maps are provided)

1. Draw a map of your outdoor space (with sharpie on white paper).
 - *Individually* – Each student can create a map of their outdoor space at school.
 - *Small Group* – Small groups can work together to create a map of their outdoor space at school.
 - *Whole Group* – The teacher can create a map of the outdoor space at the school.
2. Make four copies of each map and label them as follows:
 - Morning
 - Noon
 - Afternoon
 - Final Sun Map
3. Visit outdoor space during each of the given times (morning, noon, afternoon) and color in the areas where you see shade.
4. Analyze and color-code your three maps to determine the sun exposure in different areas of the outdoor space.
 - Full Sun (Yellow) – Areas that were not colored in on any of your maps throughout the day.
 - Partial Sun (Green) – Areas that were sometimes colored in on your maps throughout the day.
 - Shade (Black) – Areas that were always colored in on your maps throughout the day.

Explain (5 min):

Explain that different plants need different amounts of sun daily and it is listed on the seed packets. Give students a chance to explore a variety of seed packets to determine how much sun they need. Allow students to discover that radishes need full sun (at least 6 hours each day) and allow students to determine where to plant radishes in their garden.

Extend (Optional):

Plant by the Moon Phases

It has been said that planting by the moon phases results in a larger, tastier harvest.

- Plant flowers or vegetables that bear crops above ground during the light, or waxing, of the moon.
- Plant flowering bulbs and vegetables that bear crops below ground (like radishes) during the dark, or waning, of the Moon.



Students can plant a bed of radishes while the moon is waxing and a bed of radishes while the moon is waning to determine if planting by moon is a reasonable strategy to grow a larger, tastier harvest. (Remember to discuss all of the other factors that could have contributed to altering the growth of each bed as well).

Evaluate:

Rubric

S6E1d.	Explains the motion of objects in the day/night sky.	___ / 30
S6E2a.	Demonstrates the phases of the moon by showing the alignment of the earth, moon, and sun.	___ / 30
S6E2c.	Relates the tilt of the earth to the distribution of sunlight throughout the year and its effect on climate.	___ / 40
TOTAL		___ / 100







