

Project 5.3.5 Planning Guide

Table 1. *Ideal Growing Conditions*

Plant Species	Radish
Factor	Ideal Conditions for Research Species
Light	6 - 8 hours
Carbon Dioxide	300 - 400 ppm / 12,000 - 15,000 ppm
Temperature	55 - 65 Germination / 55 - 85 Grow / 40 - 95 Soil
Water	45 inches of water for life cycle
Primary Nutrients	Nitrogen, Phosphorus, Potassium
Additional Information	Light Sandy Loam Soil

Table 2. *Experimental Design*

Factor being Tested:	Temperature
Possible Questions: What temperature is optimal for Radish growth?	
Prediction: The warmer the temperature the more favorable growth that will occur.	
Materials:	
<p>Materials per group of 3:</p> <ul style="list-style-type: none"> ● 1 Packet of Radish Seeds ● 9 Small Plastic Potting Containers ● Potting Soil ● 1 fluorescent lighting cart ● Access to floral cooler ● 1 Watering Can ● Chromebook ● Vernier temperature sensor ● 3 Room Thermometers 	<p>Per student:</p> <ul style="list-style-type: none"> ● Safety glasses ● Disposable gloves ● Computer with internet access and word processing software ● <i>Lab Report Template</i> ● <i>Lab Report Rubric</i> ● <i>Project 5.3.5 Evaluation Rubric</i> ● Pencil

- Additional materials available upon request
- Graduated Cylinder

Procedures:

1. Students will obtain all necessary lab supplies from their teacher.
2. Students will place potting soil into their pots, leaving a space of 1.5 inches from the top of the pot. (The soil has been tested to meet proper conditions for radish plants).
3. Create three evenly spaced holes in a triangle formation with the end of your pencil in the pot. (Holes should be approximately 1 inch deep)
4. Take 2 - 3 radish seeds and place them in the holes. Once you have placed seeds in all three holes gently cover the holes with soil in your pot. (Repeat steps 2 - 4 for all 9 pots)
5. Measure out 15 mL of water in a graduated cylinder and carefully pour into each pot, do for all nine pots.
6. Place 3 pots in the floral cooler with thermometer and fluorescent lighting cart. Turn lighting cart on over pots.
7. Place 3 pots in the window sill with thermometer.
8. Place 3 pots on the classroom countertop with thermometer.
9. Connect Go!Link to Chromebook and connect temperature sensor.
10. Change View to meter.
11. Place temperature sensor 1.5 inches into the center of the pot.
12. Once temperature stabilized, record soil temperature in Table 1.
13. Record the the air temperature in Table 1.
14. Repeat steps 9 - 13 for 28 days.
15. Find the average of both temperatures after 28 days.
16. Using a ruler measure the above soil growth of the plant, record those measurements in Table 2. The plant with the most growth will be considered the plant in optimal temperature for growth.

Date Table:

Table 1

Days	Soil Temperature	Air Temperature
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		
Day 8		
Day 9		
Day 10		
Day 11		
Day 12		
Day 13		
Day 14		
Day 15		
Day 16		
Day 17		
Day 18		
Day 19		
Day 20		
Day 21		
Day 22		
Day 23		
Day 24		
Day 25		
Day 26		

Day 27		
Day 28		
Averages:		

Table 2

Plan ts	Heig ht	Heig ht	Heig ht
Cool er (1-3)			
Win dow Sill (4-6)			
Cou ntert op (7-9)			

Teacher Approval: