

# **Kids into Discovering Science Experimental Log**

Student\_\_\_\_\_

Teacher\_\_\_\_\_



# Lesson 1: California Habitats

Date\_\_\_\_\_

1. What would your team name the habitat in each photograph? Give each one a very descriptive name based on what your team sees. Be creative!

Habitat Photo #1

Name\_\_\_\_\_

Habitat Photo #2

Name\_\_\_\_\_

Habitat Photo #3

Name\_\_\_\_\_

2. Look closely at the three photos. What is different about the habitats shown in the photos? What is the same about the habitats?

Possible answers: different types or heights of plants (more trees or grasses or flowers), different colored flowers, some have hills, different weather. Two have trees and two have flowers, and they all look like they are in California.

3. Now let's give the soils names!

Soil Photo #1

Name\_\_\_\_\_

Soil Photo #2

Name\_\_\_\_\_

Soil Photo #3

Name\_\_\_\_\_

4. How do you think the three soils are similar? How are they different?

Possible answers: all brownish or reddish, but different colors, particle sizes, moisture levels, obvious layers, rocks.

# Lesson 1: California Habitats

Date\_\_\_\_\_

5. Follow along with the class discussion. Fill in the answers to the questions below:

a. What is different about the habitats?

b. What is different about the plants in the habitats?

c. What do you think causes the differences that you see in these habitats?

Possible answers: weather/climate, animals, people, soils, topography (hills and mountains), geology, time, location.

d. What is different about the soils? How can you describe them?

e. What do you think causes the differences in the soils?

Possible answers: climate, topography, age, parent material (kind of rocks that the soil was made from), organic matter (parts of plants and animals and other living things).

f. Which soils do you think match the three habitat types? Why?

(1 to 1, 2 to 2, 3 to 3)

## Lesson 2: You Are The Scientist!

Date\_\_\_\_\_

1. What do you observe about your soil samples? How are they the same?  
How are they different?

Possible answers: color, texture, particle size, moisture, presence of rocks or small animals, presence of dead plants.

2. What is the hypothesis for our experiment? (What do you predict will happen in this experiment? Be specific!) Why do you think this will happen?

Possible hypotheses:

I think plants will grow taller in the sandy loam soil because.....(more moisture, more nutrients, fewer rocks, etc.)

I think plants will grow taller in the serpentine soil because.....

I think the plants will grow to the same height in both soil types.

# Lesson 3: Scoring Emergence

Date \_\_\_\_\_

Use this space to record any observations you made about the seedlings. You can use a combination of words and pictures to record your observations!

Soil Type #1: \_\_\_\_\_

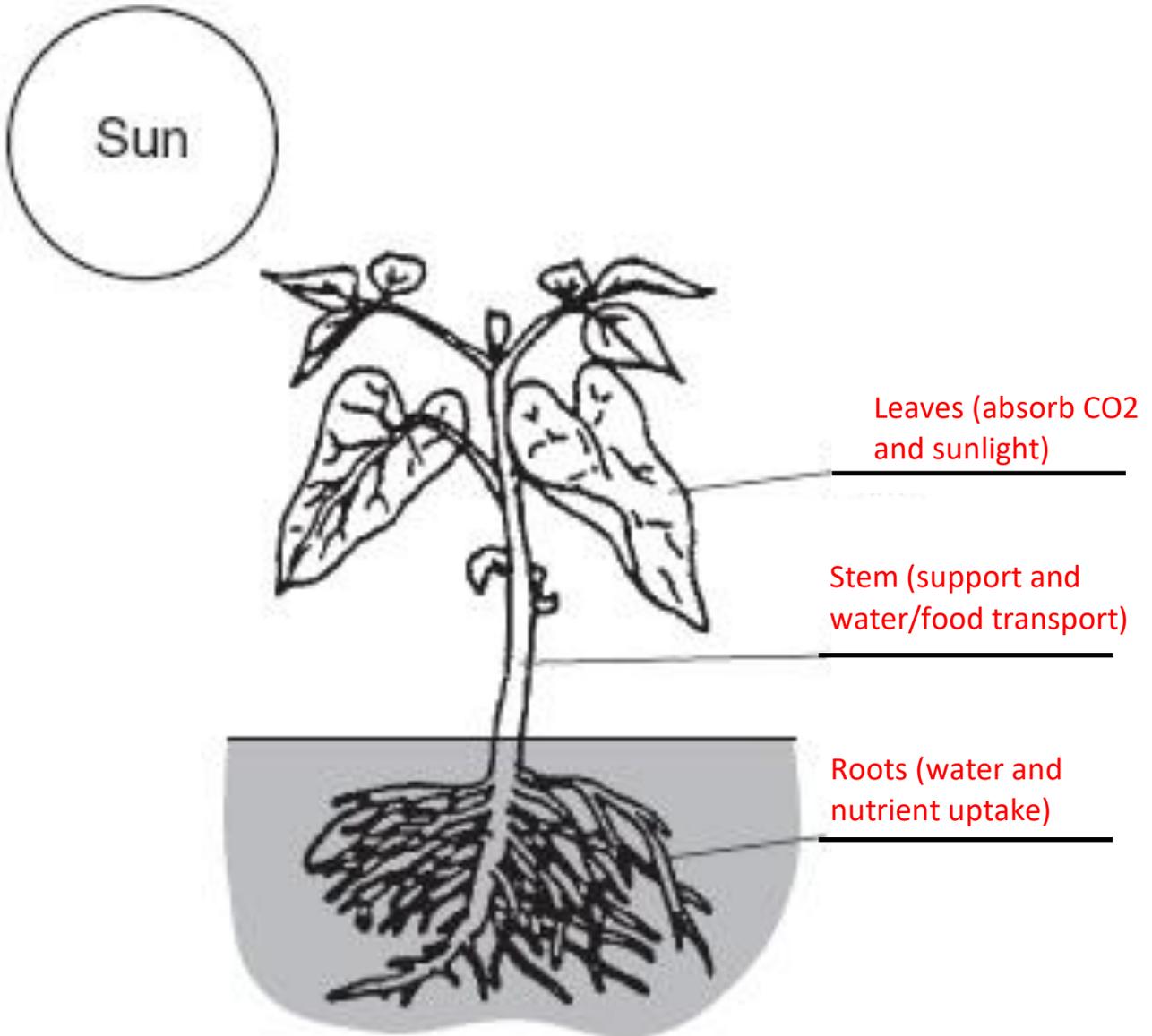
Soil Type #2: \_\_\_\_\_

Possible observations: more emergents in one soil, bigger emergents in one soil, presence of mold, dead plants, etc.

# Lesson 4: What Do Plants Need To Grow?

Date \_\_\_\_\_

Label the plant parts in the diagram:



# Lesson 4: What Do Plants Need To Grow?

Date\_\_\_\_\_

1. What do plants get from the sun and what plant parts do they use?

Energy / heat, primarily leaves.

2. What do plants get from the air and what plant parts do they use?

Carbon dioxide, primarily leaves.

3. What do plants get from the soil and what plant parts do they use?

Water and nutrients, roots.

4. What else do plants need and where do they get it?

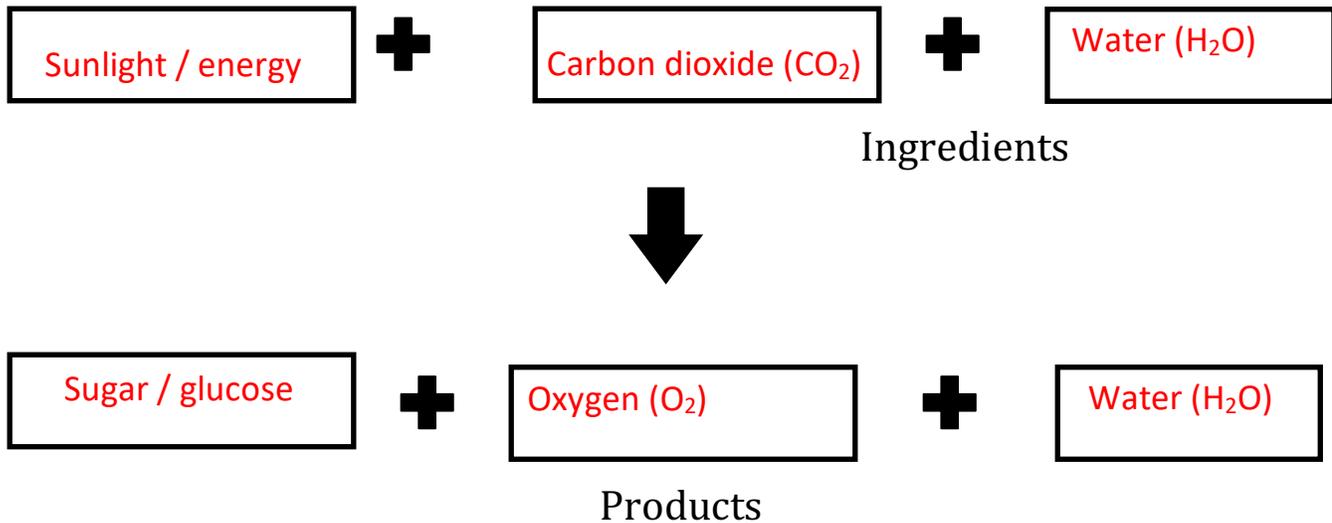
Possible answers: support (stem), protection from predators/pests (epidermis/bark/toxins), some nutrients absorbed from air.

# Lesson 4: What Do Plants Need To Grow?

Date \_\_\_\_\_

1.

## Photosynthesis



## 2. What is photosynthesis and why is it important?

Photosynthesis is the process by which plants make their own food using carbon dioxide, sunlight, and water. Photosynthesis is how plants grow, making the materials that make up the body of plants, and that we in turn use for food, clothing, buildings, paper, energy, and more. Photosynthesis also produces oxygen that we and other animals breathe as a byproduct.

## Lesson 4: What Do Plants Need To Grow?

Date\_\_\_\_\_

3. Use this space to describe your method for measuring plant height. Provide as much detail as possible, so that someone else could read your description and do exactly what you did.

Hold the ruler straight and hold the plant against the ruler. Push the ruler into the soil so that the 0 cm marker is at the soil level. Read the line where the top of the stem (not leaves) comes to on the ruler to the nearest .1 cm value. If the plant is taller than the ruler or meter stick, mark where the top of the ruler comes, lift the ruler and measure from that point to the top, then add this value to the length of the ruler. Record the value, with units, before moving on to another measurement.

4. Did all the seedlings emerge on the same day? Can you describe the pattern of emergence?

5. Did one pot have more seedlings emerge than the others? If so, what do you think caused the difference?

Possible answers: different soil types, higher quality seeds, different moisture levels, chance.

## **Lesson 4: What Do Plants Need To Grow?**

Date\_\_\_\_\_

6. Do all the seedlings look the same? If not, how are they different?

7. Did any of the first 3 emergents die? If so, how should we deal with them?

8. Do you have any support for your hypothesis?



# Lesson 5: Evaluating Success

Date\_\_\_\_\_

## Plant growth comparison datasheet

*Observe a set of bean plants from another team! Please respect the other team's work by being very gentle with the plants in the pot.*

What is the name of the team whose potted plants you are borrowing today?

\_\_\_\_\_

1. Look at the plant height data that you wrote down earlier today for your team's bean plants. Record those measurements for each plant in the column labeled "Height of our team's plant". Make sure that each measurement is written down in the correct place.

2. *Very gently* measure the height of each bean plant in the other team's serpentine pot. Write down those measurements below in the column labeled "Height of **other team's** plant"). Then, do the same for plants in the other team's loam pot.

<b>Serpentine soil:</b>	Height of <b>our team's</b> plant	Height of <b>other team's</b> plant
Pink toothpick		
Blue toothpick		
Yellow toothpick		
<b>Loam soil:</b>	Height of <b>our team's</b> plant	Height of <b>other team's</b> plant
Pink toothpick		
Blue toothpick		
Yellow toothpick		



# Lesson 6: Seeds and Seedlings in Action

Date\_\_\_\_\_

1. Use adjectives to describe the DRY SEEDS in the table below:

Color	Size	Shape

2. Now, describe what you observe about SOAKED SEED

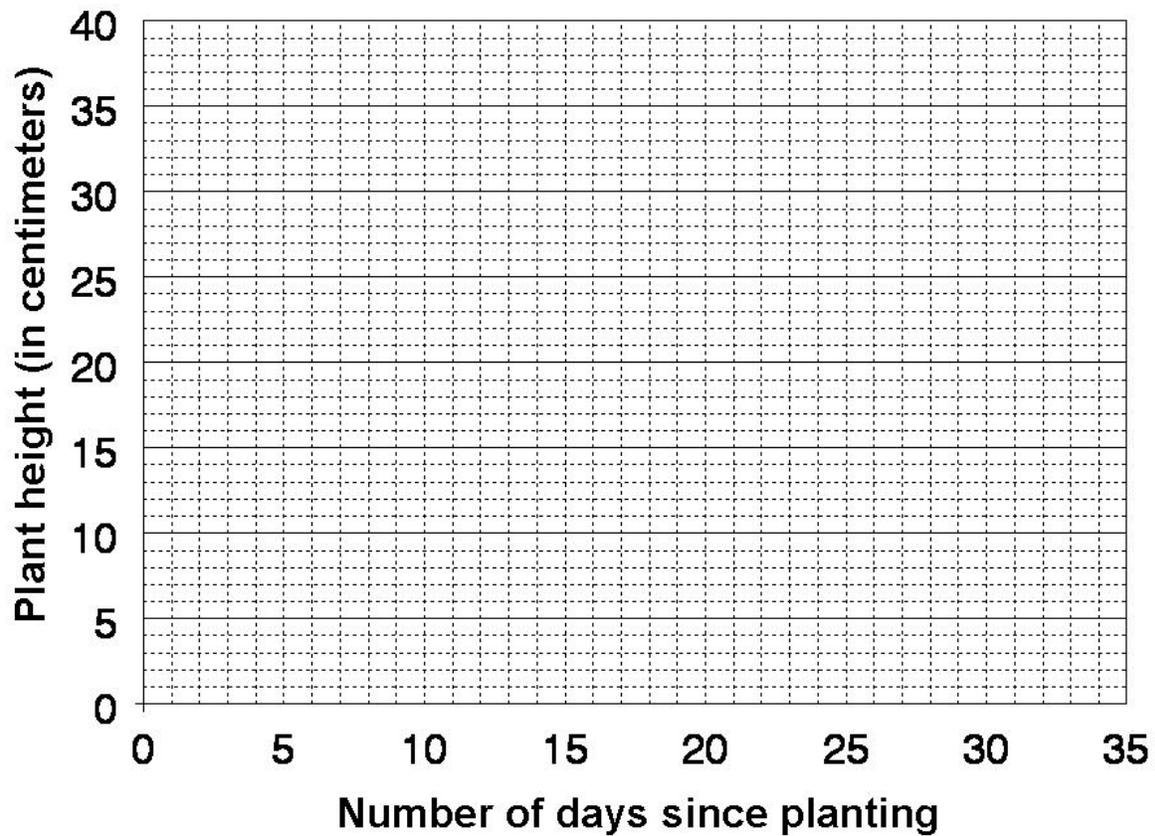
3. Describe the SPROUTS

# Lesson 7: Visualizing Plant Growth With Graphs

Date \_\_\_\_\_

Use this graph paper to follow along with the graphing lesson. You will use the graph paper at the back of the log to graph your own plant data next!

Team: \_\_\_\_\_ Soil Treatment: \_\_\_\_\_ Teacher: \_\_\_\_\_



# Lesson 8: Which Group is Taller, On Average?

Date \_\_\_\_\_

1. For the **whole class**, how big was the difference between the tallest and the shortest plant grown on each soil type? To find out, fill in the table below.

	Loam soil	Serpentine soil
Height of the tallest plant on this soil type (in centimeters)		
Height of the shortest plant on this soil type (in centimeters)		
Subtract the minimum height from the maximum height (this is the height range)		

2. Fill in the table below to calculate the most recent average heights you measured (in centimeters!) for **your** serpentine and loam bean plants.

	Loam soil	Serpentine soil
Height of pink bean plant		
Height of blue bean plant		
Height of yellow bean plant		
Total height (add up the height measurements above)		
Number of plants measured		
Calculate the average height on this soil type*		

Use the space below and on the next page (page 19) to show how you calculated each average:

# Lesson 8: Which Group is Taller, On Average?

Date \_\_\_\_\_

3. Working with your teachers, fill in the following chart with the **whole-class average** bean height data for each soil type and each measurement day.

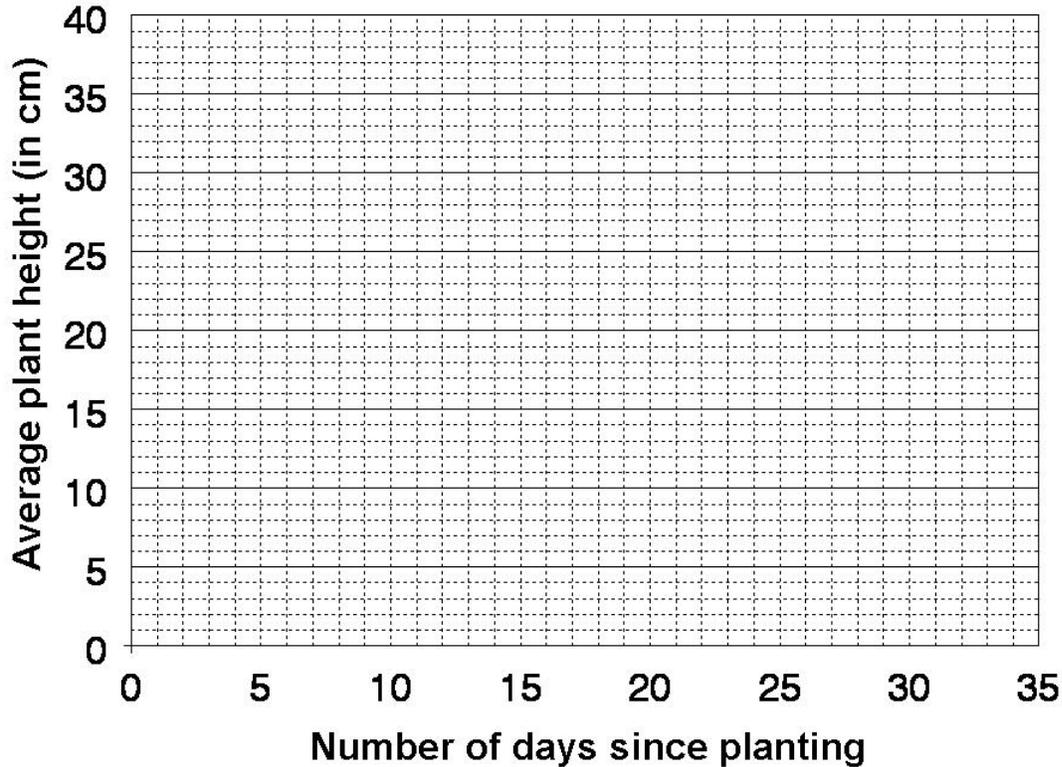
Measurement Day Number (Days after seeds were planted)	Average height on loam soil (in centimeters)	Average height on serpentine soil (in centimeters)
0		

# Lesson 8: Which Group is Taller, On Average?

Date \_\_\_\_\_

4. Following the examples shown by your teachers, plot the average bean plant heights for the **whole class**. Plot the serpentine and loam treatment averages for each day you all measured your bean plants. IN PENCIL, show the means for the serpentine treatment as filled-in circles (●), and those for the loam treatment as an X mark (X). Draw lines connecting the averages for each treatment to show how an “average” bean plant grew on each soil type.

Symbols: ● = serpentine treatment      x = loam treatment



# Lesson 9: Experiment Summary

Date\_\_\_\_\_

1. Summarize your bean height results in 1 sentence. What was the overall effect of soil type on bean height?
2. Did your results support your hypothesis? How?
3. Use this space to make observations about how the heights of **your** bean plants differed from the heights of the **other team's** bean plants.
4. Write a 3-4 sentence conclusion that you will share with the rest of your class.

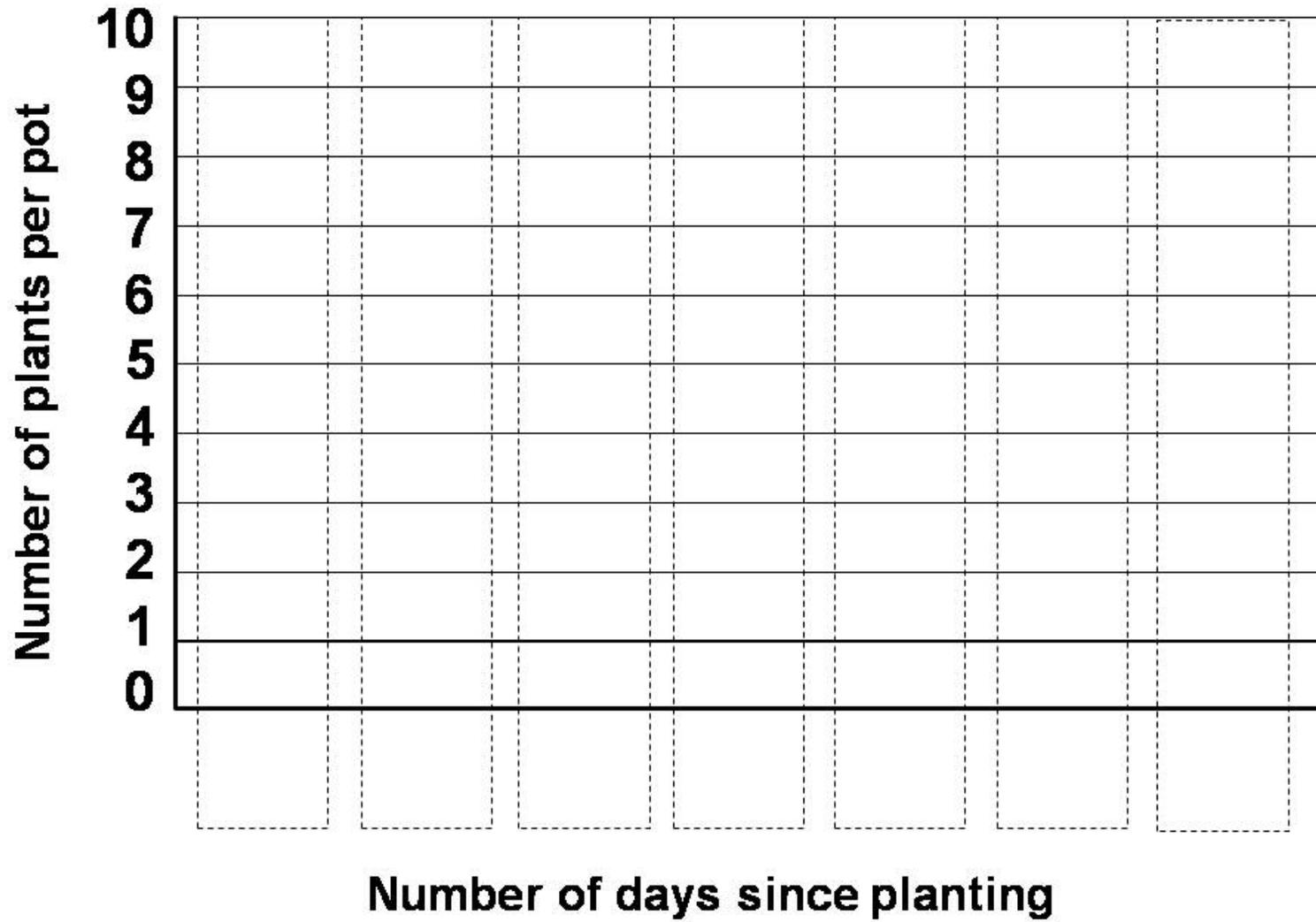
# Plant Emergence Datasheet

Date	Days since planting	Number of plants		Observations
		Serpentine	Loam	

# Plant Emergence Chart #1

PLANT NAME =

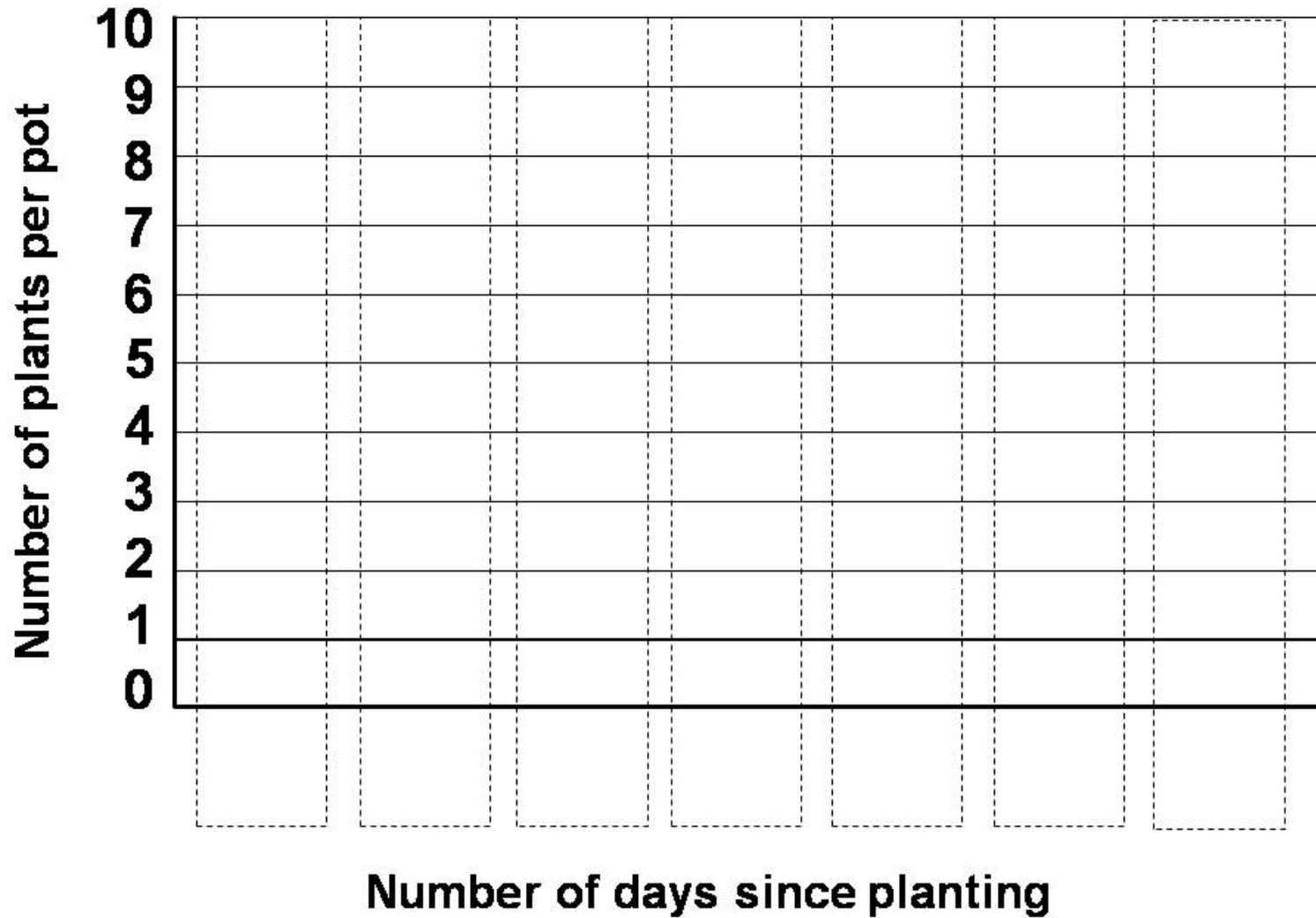
SOIL =



# Plant Emergence Chart #2

PLANT NAME =

SOIL =

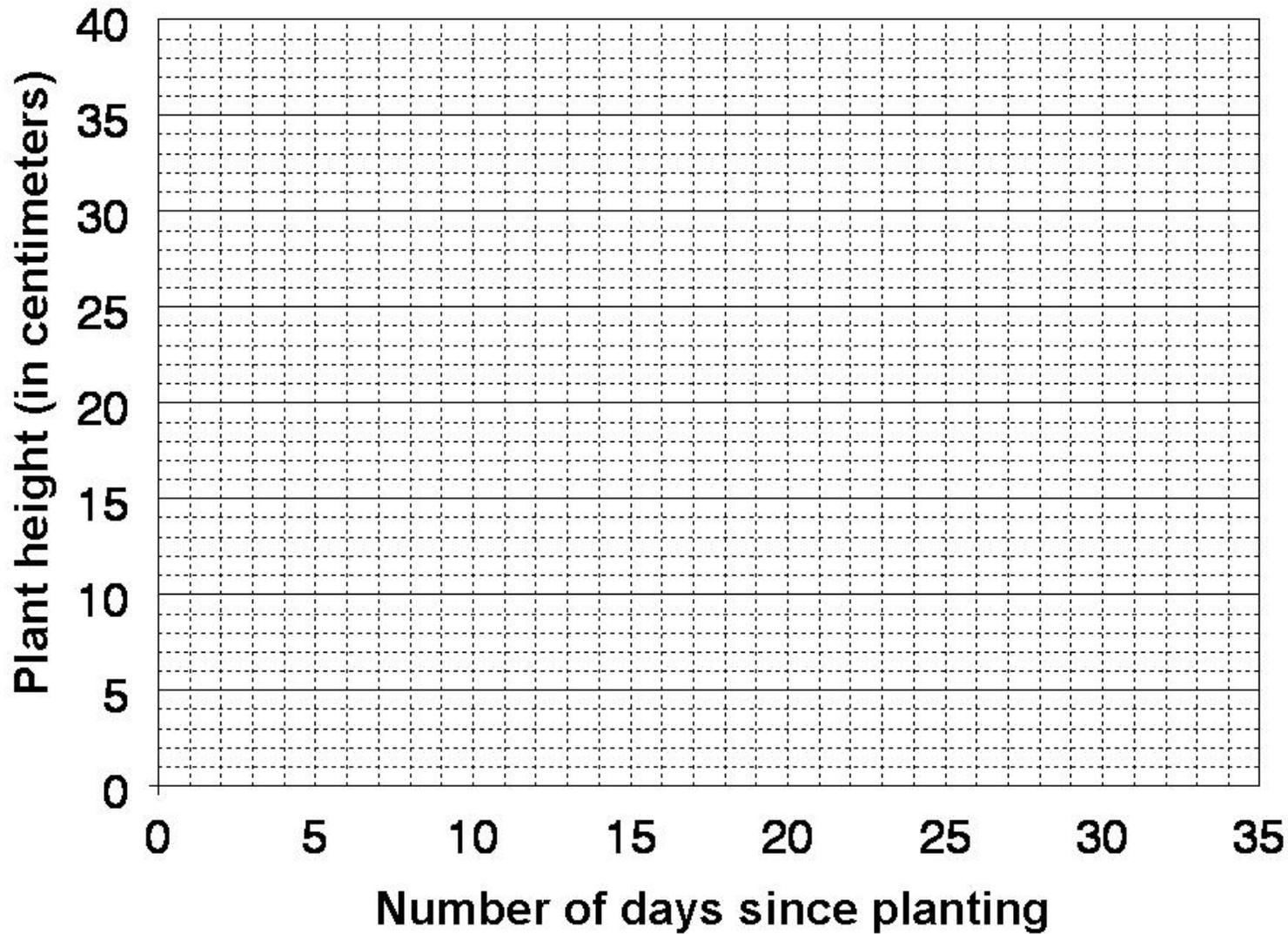


## Plant Growth Datasheet

Date	Days since planting	Height			Other Observations
		Marker Color	Serpentine	Loam	
		Pink			
		Blue			
		Yellow			
		Pink			
		Blue			
		Yellow			
		Pink			
		Blue			
		Yellow			
		Pink			
		Blue			
		Yellow			

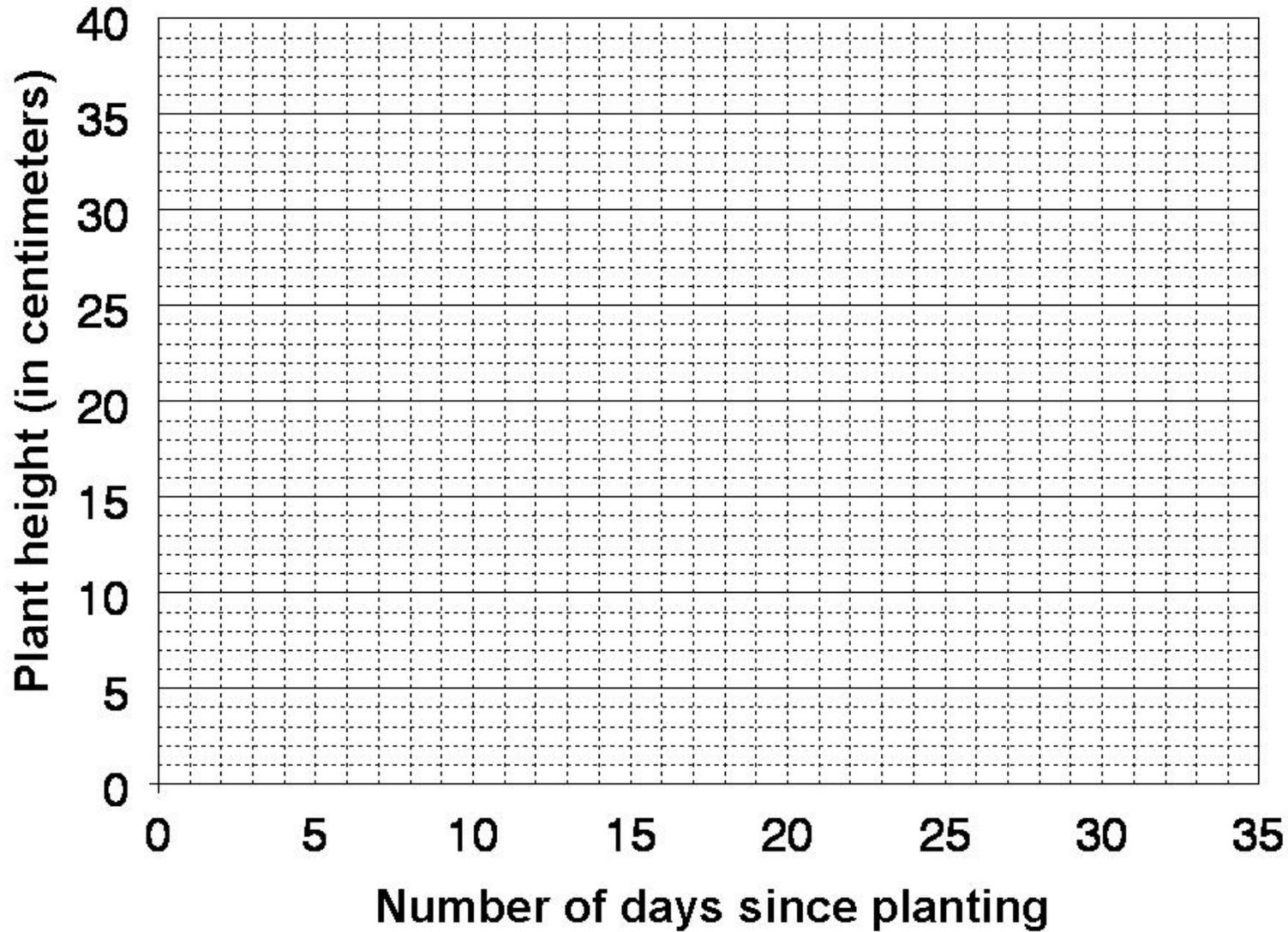
### Plant Growth Graph #1

Student \_\_\_\_\_ Soil Treatment: \_\_\_\_\_ Teacher: \_\_\_\_\_



## Plant Growth Graph #2

Student \_\_\_\_\_ Soil Treatment: \_\_\_\_\_ Teacher: \_\_\_\_\_



# **Sense of Place Journal**

**Use this space to make observations, draw pictures, and write about your sense of place**

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