

Names _____ Period _____ Date _____

Germinating Peas – Experimental Design

FORMING A QUESTION AND A HYPOTHESIS

Question:

Hypothesis:

Why do you believe your hypothesis is true?

- **Scientific Concepts or Personal Experiences:**

Predictions

1. If oxygen is increasing, what process is occurring? (photosynthesis or respiration)

- _____

2. If oxygen is decreasing, what process is occurring?

- _____

3. If carbon dioxide is increasing, what process is occurring?

- _____

4. If carbon dioxide is decreasing, what process is occurring?

- _____

5. Summary

| Process | Oxygen Level | Carbon Dioxide Level |
|----------------|--------------|----------------------|
| Photosynthesis | | |
| Respiration | | |

DESIGNING AN INVESTIGATION

General Plan:

- Identify **constants** (factors that will be kept the same). List at least 3.

- Identify **variables** (factors that will be changed on purpose and may change as a result).
 - Independent variable:
 - Dependent variables (2):

Germinating Pea Lab

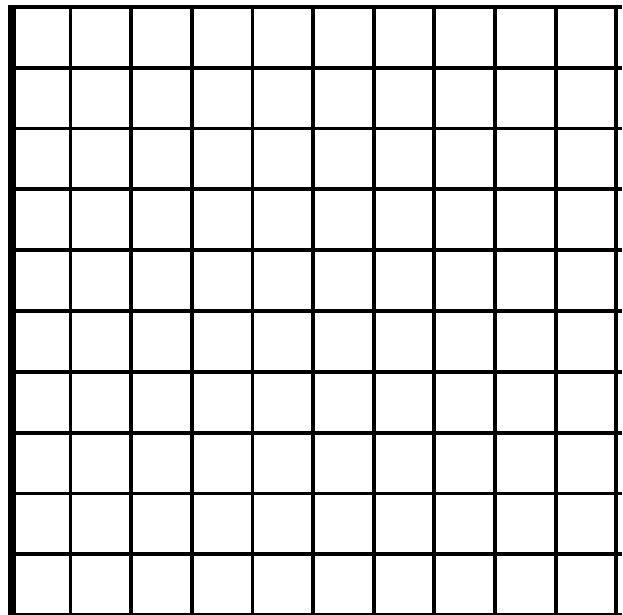
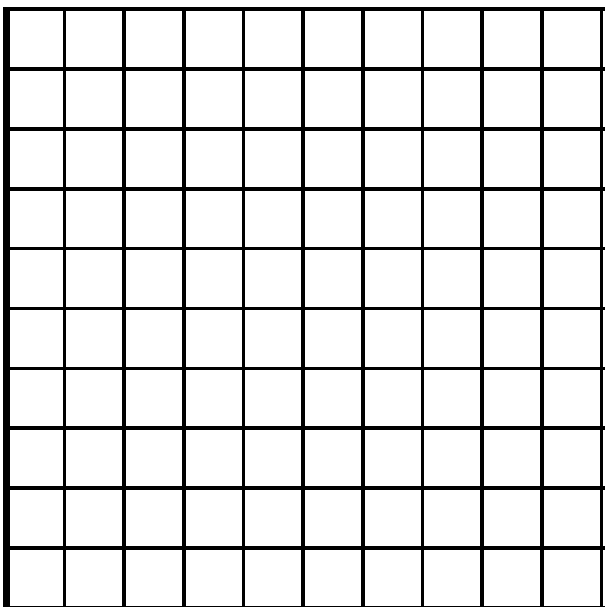
- For our **control groups**, we will test whether oxygen and carbon dioxide levels change in chambers filled with blue beads and non-germinating (dormant) peas. Explain why it is important to show that oxygen and carbon dioxide levels do not change in these chambers. What would it mean if the levels of these gases *did* change?

COLLECTING AND PRESENTING DATA

Data Tables (including independent variable, dependent variable results, and statistics/analysis):

Graph:

- Label the **axes** with the **IV** and **DV** and **units** in the correct places.
- Axis scales are increasing and evenly spaced.



Germinating Pea Lab

ANALYZING AND INTERPRETING RESULTS

Conclusion (including claim, evidence, and reasoning):

Use the framework below.

| | |
|---|---|
| Claim (Answer your original scientific question.) | |
| Evidence (Summarize what your data shows.) | Reasoning (<i>Explain</i> what your data means.) |

Peas are made mostly of **starch** (stored food). They perform **digestion** of starch using an enzyme to make individual **glucose** molecules. Glucose is provided to the growing plant inside the seed, which undergoes **cell respiration**. This produces the **ATP** needed for the initial **germination** of the plant, as well as **carbon dioxide**.

Complete the concept map below to create a model of the phenomena described above using the ALL the bold terms from the paragraph above.

