Characteristics of Living Things:

Analysis of Experimental Design, Results & Graphing Practice

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_

• Use the data and the paragraph to help you answer the questions that are next to each set of data

• Neatly create a graph in the space provided for each set of data. Be sure to provide a Legend, label the X and Y axis with appropriate units of measurement, title and use an appropriate type of graph that best represents the type of data being collected.

**Scenario 1.** Baby chickens, like all baby birds, require a constant source of food. As chicks grow, more energy is required for daily activities, and their food requirements increase. The following data table reports the average food eaten by a group of 10 chickens over a 5-day period.



**Baby Chicken Food**

 **Consumption**

|  |  |
| --- | --- |
| Day | Food Consumed (grams) |
| 0 | 0.0 |
| 1 | 1.0 |
| 2 | 3.2 |
| 3 | 6.5 |
| 4 | 10.6 |
| 5 | 15.4 |

***Questions***

1. Identify the independent and dependent variables.
	1. Independent =
	2. Dependent =
2. How much grain do you expect the chicks eat on day 6? (estimate)
3. How did you decide on your answer to question 2 (what factors did you consider)?
4. Describe the relationship between the two sets of data. Are the data directly related, inversely related, or is there no clear relationship?
5. Name 2 characteristics of living things that are being measured in this experiment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Scenario 2.** Elodea, a water plant commonly found in aquariums, gives off bubbles of oxygen when placed in bright light. Students in a biology class noted that if a light were placed at different distances from the plant in an aquarium, the rate of bubble production varied. The following data table shows the average results from several trials.

**Elodea Bubble Production**

|  |  |
| --- | --- |
| Distance from Light(cm) | Bubble Production Rate(bubbles/min) |
| 10 | 40 |
| 20 | 20 |
| 30 | 10 |
| 40 | 5 |
| 50 | 3 |

***Questions***

1. Identify the independent and dependent variables.
	1. Independent =
	2. Dependent =
2. Estimate the O2 production at 25 cm. \_\_\_\_\_\_\_\_\_\_
3. At 35 cm? \_\_\_\_\_\_\_\_\_\_
4. Describe the relationship between the two sets of data. Are the data directly related, inversely related, or is there no clear relationship?
5. Name 2 characteristics of living things that are being measured in this experiment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Scenario 3.** The data below summarizes the results of a scientific experiment on the effects of a growth hormone (gibberellic acid) on plant height. A 0.1 molar solution was used in all experiments.

Gibberellic Acid and Plant Height

|  |  |
| --- | --- |
| Gibberellic Acid (0.1 M)(mL) | Plant Height at1 Week (cm) |
| 20 | 18.5 |
| 30 | 20.7 |
| 40 | 45.2 |
| 50 | 62.3 |
| 60 | 10.6 |

***Questions***

1. Identify the independent and dependent variables.
	1. Independent =
	2. Dependent =
2. Estimate the plant height at 10 mL gibberellic acid. \_\_\_\_\_\_\_\_\_\_
3. Compared to the rest of the data, what is inconsistent about the plant height at 60 mL?
4. Explain why the plant height at 60mL might have turned out this way.
5. Name 2 characteristics of living things that are being measured in this experiment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Scenario 4.** A team of scientists wanted to test the effects of temperature on the germination rate of pinto beans. They placed three sets of 100 pinto bean seeds in temperature controlled chambers: Chamber A was set at 15 °C, chamber B at 20 °C, and chamber C at 25 °C. Their results are shown in Table 1 below:

Germination Rates of Pinto Beans

|  |  |  |  |
| --- | --- | --- | --- |
| Day | % Germination(15°C) | % Germination(20°C) | % Germination(25°C) |
| 0 | 0 | 0 | 0 |
| 2 | 2 | 10 | 10 |
| 4 | 10 | 30 | 50 |
| 6 | 20 | 40 | 80 |
| 8 | 20 | 60 | 90 |
| 10 | 35 | 70 | 90 |

***Questions***

1. Identify the independent and dependent variables.
	1. Independent =
	2. Dependent =
2. Compare and contrast the growth rate of pinto beans at the different temperatures.
3. Summarize the experimental results. (what trends do you see?)
4. Name 2 characteristics of living things that are being measured in this experiment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

