Biology Summer Assignment: 2021-2022.

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. Prepare a graph of the data points along with a best-fit curve (regression analysis trendline).

Baby Chicken Food Consumption

Day	Average Food Consumed (g)
1	1.0
2	3.2
3	6.5
4	10.6
5	15.4

Questions

1. Identify the independent and dependent variables.
2. How much grain will the chicks eat on day 6?
3. On day 7?
4. Both questions 2 and 3 have you *extrapolating* data from the set of points using a trendline. What is a danger of doing this?

Type answers for Problem Set 1 here

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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. Prepare a graph from the data. Create two trendlines—one linear and one logarithmic.

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Elodea Bubble Production

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

*They forgot to record data at this distance!

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Questions

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1. Identify the independent and dependent variables.
2. Optional question- Use the R^2 values to decide which trendline best fits the relationship that exists. Which did you choose and why?
3. Estimate the O_2 production at 25 cm.
4. At 40 cm?
5. Questions 2 and 3 have you *interpolating* the data from the set of points. Can you do this if using a bar graph?

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2. OPTIONAL. DO NOT HAVE TO WORK ON IT IF YOU DON'T WANT.

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Type answers for Problem Set 2 here:

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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. Graph the data below—include a trend line for the given data.

Gibberellic Acid and Plant Height

Gibberellic Acid (0.1 M) (mL)	Plant Height at 1 Week (cm)
20	8.5
30	23.8
40	45.2
50	15.7
60	91.3

Questions

1. Identify the independent and dependent variables.
2. Explain why the plant height at 50 mL is not consistent with the rest of the data. What evidence can you use from the regression analysis to make this point?
3. Plot a second series that does not include the plant height at 50 mL of gibberellic acid and make a second trendline. How does this new analysis differ from the previous one?

Type answers for Problem Set 3 here:

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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 the table below. Plot the data including trend lines for each.

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.
2. Summarize the experimental results.

Type answers for Problem Set 4 here:

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5. A number of Colonie High freshmen were working on their Making Connections lab and they collected data from over 100 students regarding their pulse rate at rest. The results are shown in the table below:

Resting Pulse Range (beats/min)	Number of Students
≤50	8
51-60	18
61-70	41
71-80	52
81-90	20
≥90	11

1. Summarize the significance of the 'curve' (pattern) shown by the graph.
2. Why would a line graph be inappropriate for this set of data?

Type answers for Problem Set 5 here:

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Find a Biology Research Scientist or a Field Biologist in our area or out of state, or on the internet, whose work fascinates you and write an article about their research. Include a picture of the scientist with your article !

Article should contain at least one scientific research, clearly mentioning topic of research and the goal of this research.

For Example

TOPIC: How shared molecular targets in different diseases lead to chronic kidney disease.

GOAL: is to find many ways to diagnose and treat chronic kidney disease before it becomes too invasive to treat.

The two assignments will count as a test grade and are due the second week of school (subject to change based on teacher discreation)

Note : Article should be about the research more than the scientist himself, also make sure topic is Biology related not pure chemistry, geology, earth science etc. Biochemistry is part of biology so that will suffice.