


NAME: _____ **DATE:** _____

STUDENT #: _____ **TEACHER:** _____

Temperature Data Sheet

The temperature symbol () will represent 1° F. The pictograph scale will begin at 14° F. Your pictograph will show every degree over 14° for your sample.

Procedure:

1. Record your canister depth and the temperature from the canister in Data Table #1.
2. Round the temperature (T) to the nearest degree Farenheit, and record the rounded temperature the column labeled “T_{rounded}” in Data Table #1.
3. Calculate and record the number of temperature symbols needed to represent the temperature (T) using the formula below.

$$\text{\# of Temperature Symbols} = T_{\text{rounded}} - 14$$

DATA TABLE #1: TEMPERATURE

Canister Number	Canister Depth	T <i>(Temp °F)</i>	T _{rounded} <i>(Temp Rounded)</i>	Show your calculation using the formula above	Number of temperature symbols needed
1					
2					
3					
4					
5					
6					

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Plankton Weight Data Sheet

Procedure:

1. Record your canister depth in Data Table #2.
2. Place bag of plankton on scale.
3. Record the total weight in grams of the bag plus the plankton.
4. Calculate and record the weight of just the plankton by subtracting the weight of the bag, which is 0.5 g. Use the formula: **Weight of Plankton Only = Total Weight – 0.5 g**
5. Calculate the weight of the sample in centigrams using the formula:

Weight in centigrams = Weight in grams X 100

DATA TABLE #2: PLANKTON WEIGHT CALCULATIONS


Canister Number	Canister Depth, in feet	Total weight of plankton plus bag, in grams	Weight of plankton without bag, in grams	Show your calculations using the formulas above	Weight of plankton only, in centigrams
1					
2					
3					
4					
5					
6					

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Plankton Weight Data Sheet

Procedure continued:

6. Transfer your canister depth data from from Data Table #2 to Data Table #3.
7. Transfer your plankton weight, in centigrams, from Data Table #2 to Data Table #3.
8. Round your plankton weight in centigrams to the nearest multiple of 5, and record.
9. For this pictograph, the plankton symbol () represents 5cg of dried plankton. Calculate and record the number of plankton symbols needed to represent the plankton weight using the formula:

$$\# \text{ Plankton Symbols} = \frac{\text{Plankton Weight (rounded)}}{5}$$

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DATA TABLE #3: PLANKTON WEIGHT

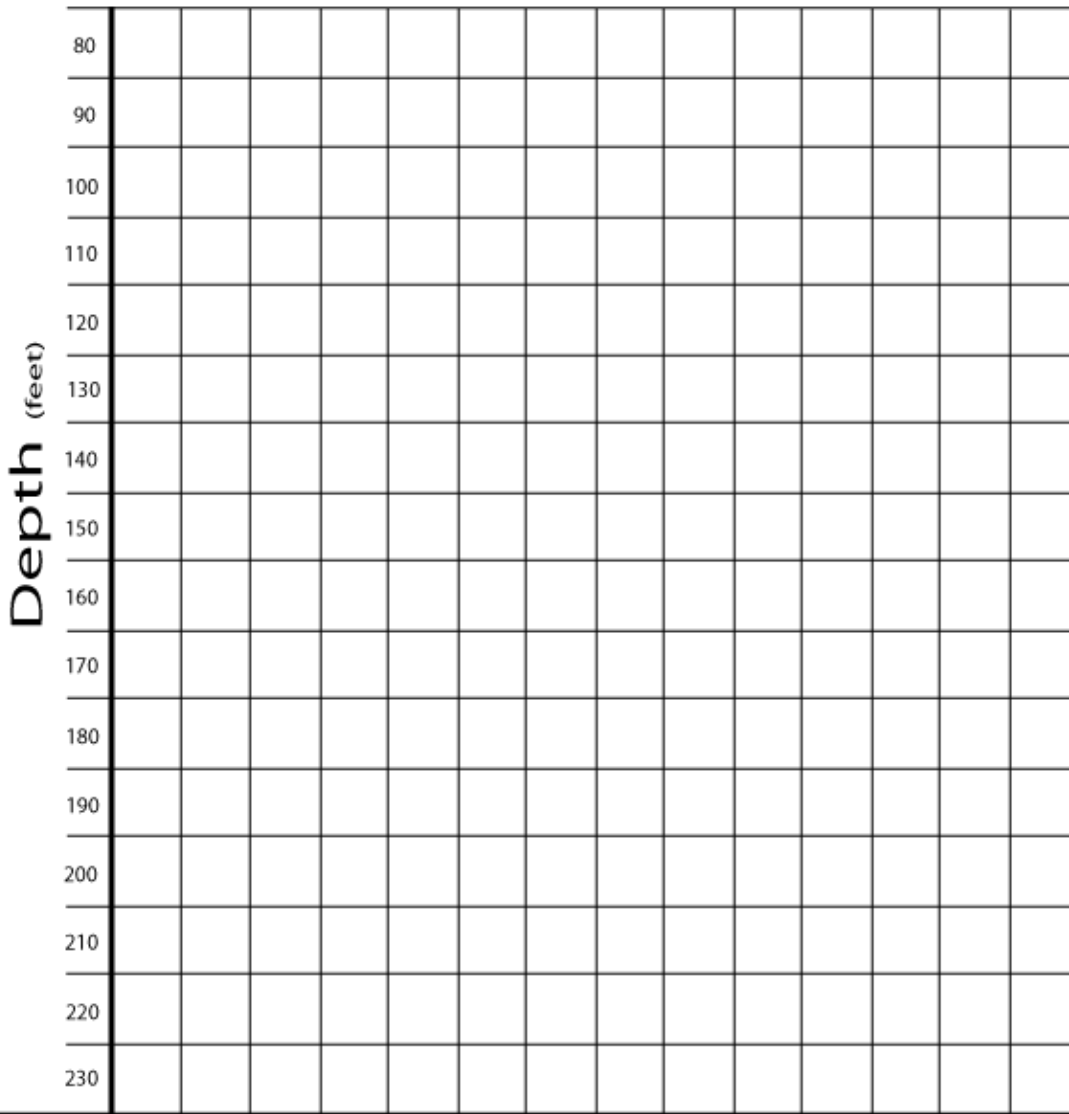
Canister Number	Canister Depth	Plankton Weight (cg)	Plankton Weight rounded to nearest multiple of 5	Show your calculation using formula above	Number of plankton symbols needed
1					
2					
3					
4					
5					
6					

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Temperature Pictograph Sheet

Use the information in your Data Table #1 to create a pictograph of the temperature data. Use the temperature symbol, , to complete your graph. Each symbol equals 1° F.



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Temperature (Degrees Fahrenheit)

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Whale Challenge Data Tables

Fill in the data tables as your classmates announce their results.

RELATIONSHIP #1	
DEPTH	TEMPERATURE (F)
80	
90	
100	
110	
120	
130	
140	
150	
160	
170	
180	
190	
200	
210	
220	
230	

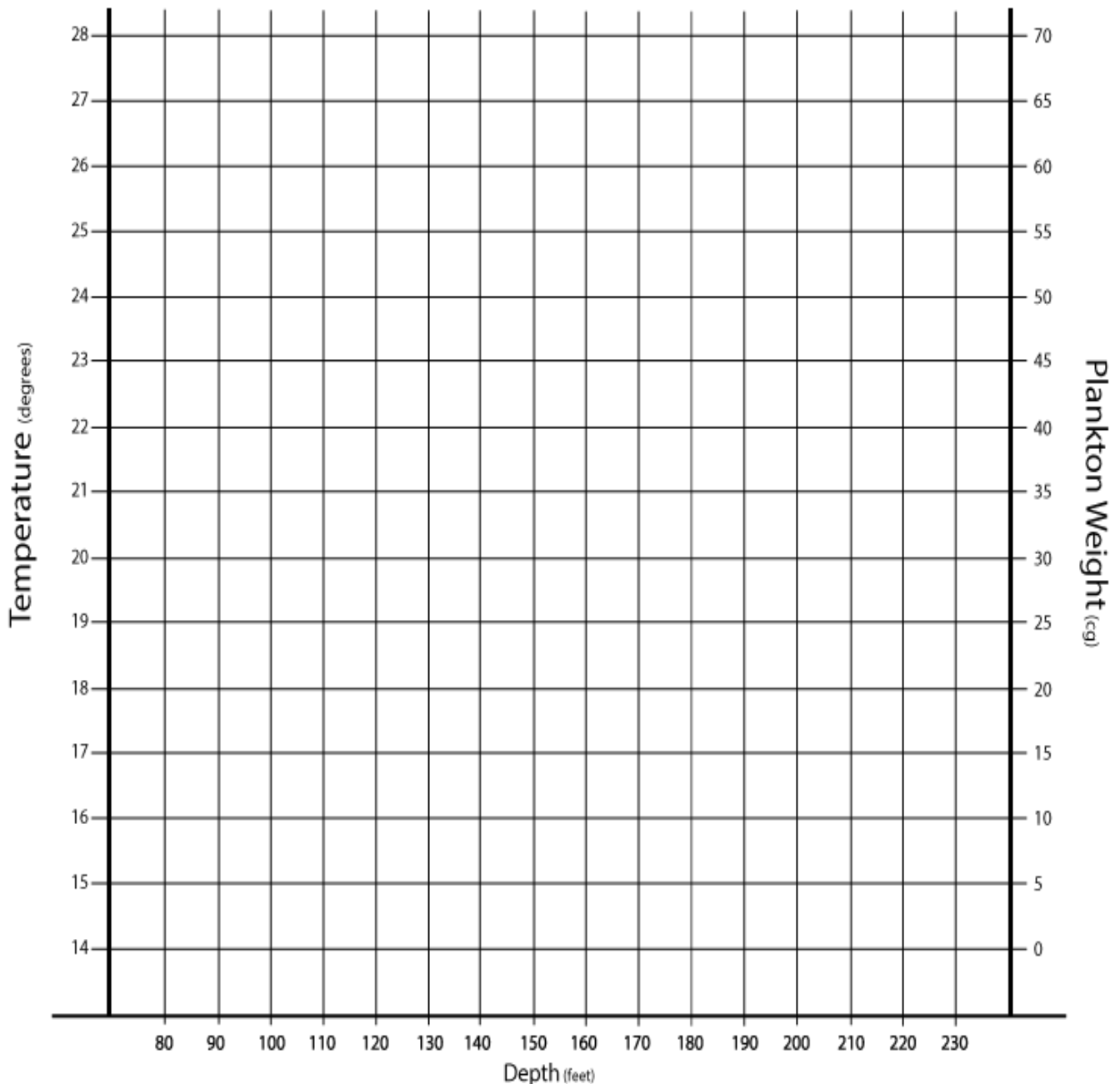
RELATIONSHIP #2	
DEPTH	WEIGHT (cg)
80	
90	
100	
110	
120	
130	
140	
150	
160	
170	
180	
190	
200	
210	
220	
230	

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Whale Challenge Coordinate Graph

Use the information from the *Whale Challenge Order Pairs* student sheet to graph your temperature and plankton weight data.



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Interpreting Graphs

Use your *Whale Challenge Coordinate Graph* student sheet to help answer these questions.

1. Identify the independent variable and dependent variable for each relationship.

Relationship #1: Depth and Temperature

Independent Variable: _____

Dependent Variable: _____

Relationship #2: Depth and Plankton Weight

Independent Variable: _____

Dependent Variable: _____

2. A line formed by the data on a graph is called a linear relationship. If the data from the graph does not form a line it is called a non-linear relationship. Describe the graphs you made as linear or non-linear.

Relationship #1: Depth and Temperature

Linear or Non-Linear? _____

Relationship #2: Depth and Plankton Weight

Linear or Non-Linear? _____

3. What is the desired depth for the whales to feed on plankton?
4. What temperature is it at the point where the most plankton live?

5. The mathematicians and scientists created the mathematical expression below for the relationship between depth and plankton:

$$\text{Dry Weight of Plankton} = (3.5 \times \text{depth}) - (0.012 \times \text{depth}^2) - 204$$

- a. Predict the dry weight of plankton at 125ft depth.

- b. Does your graph validate your prediction?

- c. How do you know that?

6. The mathematicians and scientists created the mathematical expression below for the relationship between depth and temperature:

$$\text{Temperature} = 27 - (0.03 \times \text{depth})$$

- a. Predict the temperature at 125ft depth.

- b. Does your graph validate your prediction?

- c. How do you know that?

NAME: _____ DATE: _____

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Letter to Dr. Ingall

Date: _____

Dear Dr. Ingall,

My class researched water samples from different depths in the Antarctic Ocean.

In our research on plankton, we found that _____
_____.

Based on our research, we decided that the research ship The Oden will / will not
(*circle one*) hit whales feeding in the area. We think this because _____

_____.

We also discovered that the plankton live most often at the following temperature:
_____ ° Fahrenheit.

Sincerely,

(Your name)

