

Name: _____ Date: _____ Period: _____

Scientific Method Practice Scenarios

Experiment Scenario 1: A Biology student wants to conduct a study of how the amount of sunlight affects the length of sleep for mice. She sets up four cages with a mouse in each cage.

	Mouse 1	Mouse 2	Mouse 3	Mouse 4
Size of cage	30cm x 30cm	30cm x 30cm	30cm x 30cm	30cm x 30cm
Amount of Water per Day	50 mL	50 mL	50 mL	50 mL
Amount of food per day	1 serving per day, 25 grams	1 serving per day, 25 grams	1 serving per day, 25 grams	1 serving per day, 25 grams
Temperature in cage	20 °C	20 °C	20 °C	20 °C
Amount of Sunlight per Day	12 hours	8 hours	15 hours	18 hours
Exercise wheel?	Yes	yes	Yes	yes

What are the constants (variables that stay the same- also called controlled variables)?

What is the independent variable? _____

What is the dependent variable? _____

What data do you need to collect during this experiment? _____

Experiment Scenario 2: A Biology student wants to conduct a study of how the amount of food affects the weight gain for mice. He sets up four cages with a mouse in each cage. Fill in the boxes that would allow the biology student to complete the study correctly.

	Mouse 1	Mouse 2	Mouse 3	Mouse 4
Size of cage	30cm x 30cm			
Amount of Water per Day	50 mL			
Amount of food per day	4 servings per day, 25 grams each			
Temperature in cage	20 °C			
Amount of Sunlight per Day	12 hours			
Exercise wheel?	yes			

What are the constants (variables that stay the same- also called controlled variables)?

What is the independent variable? _____

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Experiment Scenario 3: A biologist set up an experiment to study nine mice. On day 1 of the study, the mice were measured for a variety of characteristics. Then the mice were put into individual cages and kept under the following conditions:

Mice 1, 2, 3	Mice 4, 5, 6, 7	Mice 8, 9
14 hours of light per day	14 hours of light per day	14 hours of light per day
Food one time/day – 5 oz.	Food one time/day – 5 oz	Food one time/day – 5 oz
Temp. 70 ° F	Temp. 85 ° F	Temp. 50 ° F
Wheel for exercise	Wheel for exercise	Wheel for exercise
Cage size: 3 feet by 1 foot	Cage size: 3 feet by 1 foot	Cage size: 3 feet by 1 foot

After the study, which lasted for 28 days, the same data about the mice was collected. Some of the data is given below:

Mouse Number	Weight (grams)		Length (cm)	
	Before	After	Before	After
1	352	392	24.7	25.4
2	346	395	25.1	25.8
3	355	410	24.9	25.4
4	353	385	24.9	25.3
5	359	382	25.0	25.7
6	357	386	24.8	25.3
7	349	378	25.0	25.3
8	345	365	22.9	22.9
9	352	361	24.3	24.5

What are the constants (variables that stay the same- also called controlled variables)?

What is the independent variable? _____

What is the dependent variable? _____

What data do you need to collect during this experiment? _____

What flaw in the design of the experiment can you find? Explain.

What conclusion(s) can be drawn from the data? Explain, using data to support your conclusion(s).

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14 hours of light per day	14 hours of light per day	14 hours of light per day
Food one time/day – 5 oz.	Food one time/day – 5 oz	Food one time/day – 5 oz
Temp. 70 ° F	Temp. 85 ° F	Temp. 50 ° F
Wheel for exercise	Wheel for exercise	Wheel for exercise
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