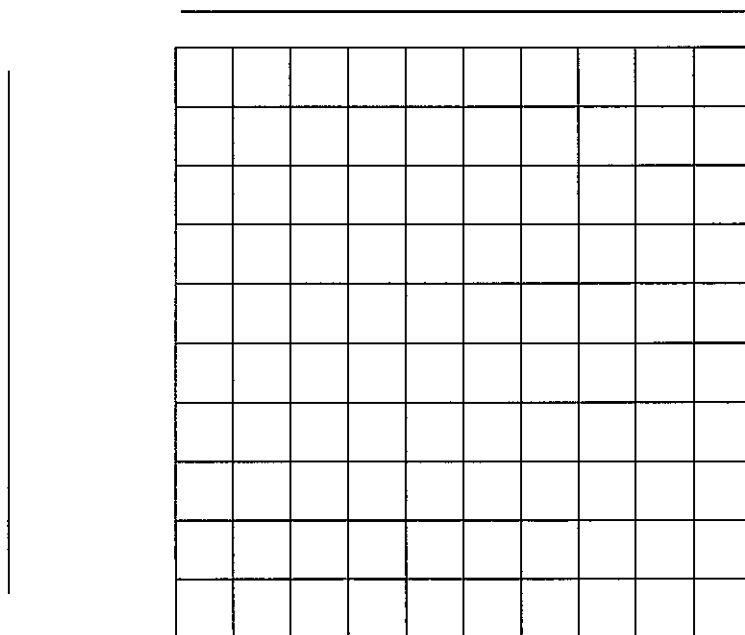


# Coin Dome Challenge

**Scenario:** A class was given a challenge. Each student was given a coin and water. The task was for each student to carefully determine how many drops of water can be placed on top of the coin before it overflows. Data Table 1 provides the results from several students.

Data Table 1					
Student	Trials – Total drops of water per coin				Avg.
Student 1	24	41	40	42	
Student 2	33	39	43	35	
Student 3	46	49	48	47	

1. What is the mean for Student C?
2. Write a testable question for this experiment.
3. What are two pieces of equipment that may be beneficial to this experiment?
4. Do the measurements seem reasonable? Explain.
5. Use the data from Data Table 1 to construct a graph on the grid below. Be sure to provide:
  - An appropriate title
  - Labeled axes with appropriate units
  - Appropriate number scales
  - Correctly plotted data



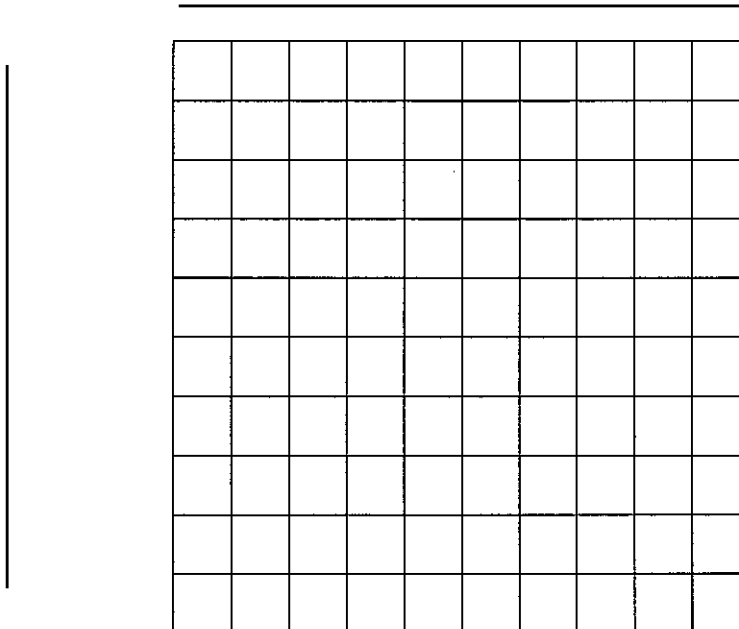


# Drying Out a Paper Towel

**Scenario:** Martha and Raul are experimenting with conditions that might affect evaporation time. They decided to pour a given amount of water on a paper towel and timed how long the water takes to dry (evaporate) just sitting on a desktop. Then, they repeated this experiment two more times. They collected the results shown in Data Table 1.

<b>Data Table 1</b>				
<b>Wind speed</b>	<b>Time to Dry (minutes)</b>			
	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>Avg.</b>
No wind (0 mph)	25	26	21	
5 mph	14	12	16	
10 mph	8	7	6	
20 mph	5	4	6	

1. Write a testable question for this experiment.
2. Write the independent variable and dependent variable for this experiment.
3. What are three important steps or procedures that would be required for this experiment?
4. Use the data from Data Table 1 to construct a graph on the grid below. Be sure to provide:
  - An appropriate title
  - Labeled axes with appropriate units
  - Appropriate number scales
  - Correctly plotted data



## Drying Out a Paper Towel

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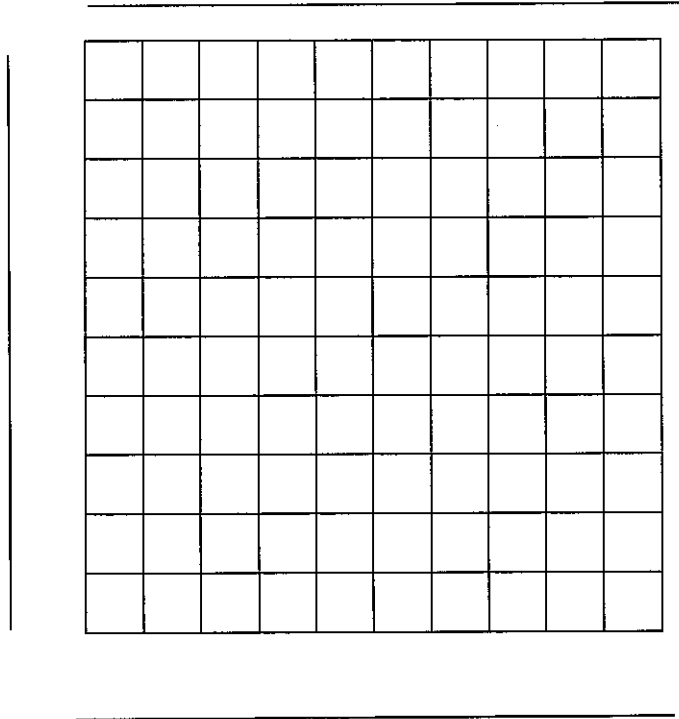
5. What is (are) the constants?
  
6. You have an opportunity to evaluate the design of the experiment. What are two possible suggestions for reasonable improvements to this experiment?
  - a.
  
  - b.
  
  
  
  
  
  
  
  
  
  
7. Write a conclusion for this experiment.

## Can Bush Bean Seeds grow under crowded conditions?

**Scenario:** The Missouri Agricultural Society wanted to determine if crowding plants like bush bean seeds effected their growth. Several scientists decided to perform a field test in Kansas City. Data Table 1 below shows the results from the field test.

Data Table 1												
Distance between Seeds (cm)	Height of Plants (cm)											Mean Height (cm)
	1	2	3	4	5	6	7	8	9	10	11	
0	4	5	5	3	4	4	5	6	4	1	0	
0.5	6	8	5	7	7	6	8	5	4	6	7	
1	15	14	13	12	16	12	11	13	12	14	13	
2	17	18	16	15	15	17	16	16	15	15	15	
4	18	17	17	18	16	15	19	16	18	17	17	

1. What is a testable question or problem that is the basis for this investigation?
2. Write an appropriate hypothesis for this investigation.
3. Identify the independent variable and dependent variable for this investigation.
4. Use the data from Data Table 1 to construct a single line graph on the grid below. Be sure to provide:
  - an appropriate title
  - labeled axes with appropriate units
  - appropriate number scales
  - correctly plotted data



## Can Bush Bean Seeds grow under crowded conditions?

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5. Using the data, what would the height of plants, in centimeters, if the seeds were placed 1.5 centimeters apart?
6. If each scientist measured the plant height from the top of the plant to the lowest leaf on the stalk, have they used collected the most accurate data possible? Explain.
7. A class wanted to do another experiment to see if the type of soil makes a difference in how much bush bean seeds grow. They set up the experiment with three different types of soil and planted the bush bean seeds. Identify two factors that will need to be measured during the experiment. Next to each one, identify the tool they will need to use.

**Factor to be measured**

**Tool(s) needed for measure**

1.

2.

8. Identify two factors that should be held constant for this investigation.

1.

2.

9. Identify three steps that are important to perform this experiment.

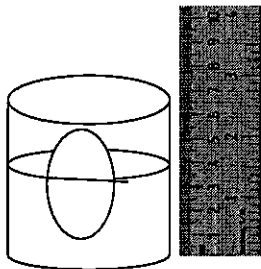
1.

2.

3.

## Can an Egg Float?

**Scenario:** Two students were doing an investigation to study the effect of salt water concentration on the amount an egg might float above the water level in a container. To determine the possible height an egg might float above a salt water solution, they increased the amount of salt in the water. The results of their experiment are shown in the data table.



<b>Amount of Salt (mL)</b>	<b>Trials - Height of Top of Eggs (cm)</b>			
	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>Avg</b>
0	4	4	4	
5	5	5	5	
10	5	6	5	
15	6	6	6	
20	8	8	8	

1. What is a testable question or problem that is the basis for this investigation?
2. Write an appropriate hypothesis for this investigation.
3. Identify the independent variable for this investigation.
4. Identify the dependent variable for this investigation.
5. Identify two variables, other than the one investigated, that could have an effect on the amount of egg floating above the water level.
  - 1.
  - 2.
6. Why is it important to hold some conditions constant during an investigation?
7. Identify two factors that should be held constant for this investigation.
  - 1.
  - 2.

## Can an Egg Float?

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8. Identify three pieces of laboratory equipment necessary to conduct this investigation.

1.

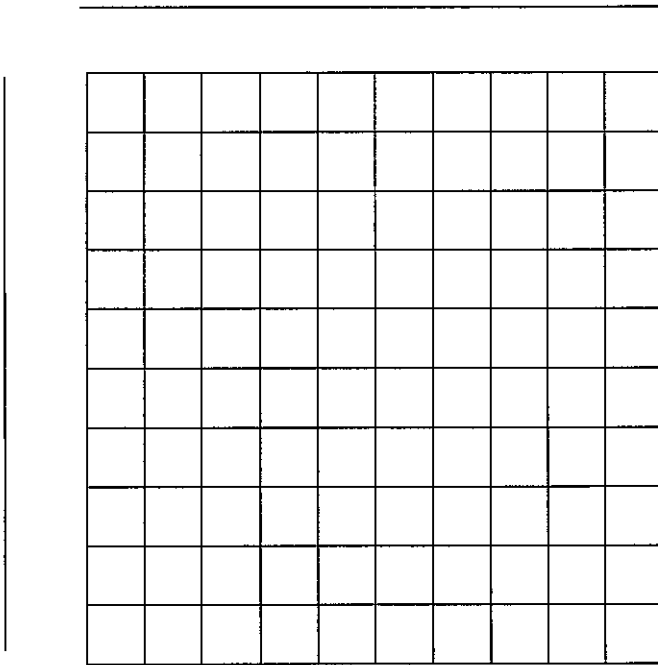
2.

3.

9. Use the data from Data Table 1 to construct a single line graph on the grid below.

Be sure to provide:

- an appropriate title
- labeled axes with appropriate units
- appropriate number scales
- correctly plotted data





## Which substance makes ice water the coldest?

**Scenario:** Jimmy wanted to know what substance would keep the ice in his cooler the coldest for the next Park Hill tail gate. He and his friends decided to perform an experiment to find out. The data from their experiment is shown below in Table 1.

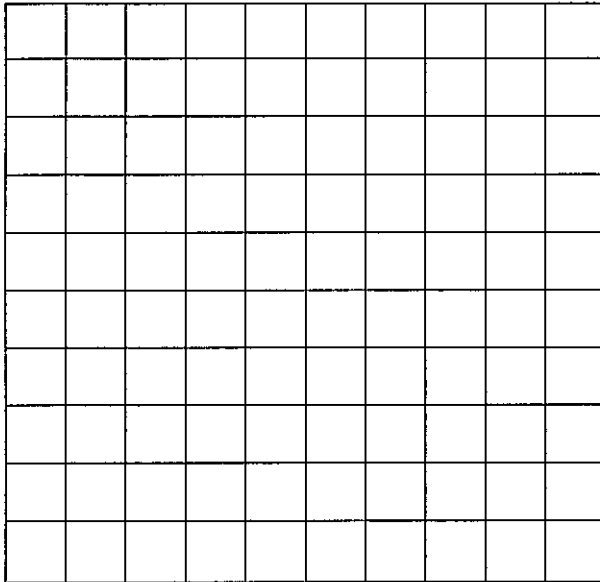
Ingredients added to water	Temperature of water (Degrees Fahrenheit)			Mean
No substance added	54	52	52	
Sugar added	50	48	56	
Salt added	48	46	50	

1. Identify the independent variable
2. Identify the dependent variable
3. Write an appropriate title for the lab
4. List three things Jimmy and his friends would want to keep constant in their experiment
5. Write a hypothesis for the experiment.
6. Look at the data table. Is the data shown reasonable? Explain.

## Which substance makes ice water the coldest?

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7. Use the data from Data Table 1 to construct a Bar Graph on the grid below. Be sure to provide:
- An appropriate title
  - Labeled axes with appropriate units
  - Appropriate number scales
  - Correctly plotted data



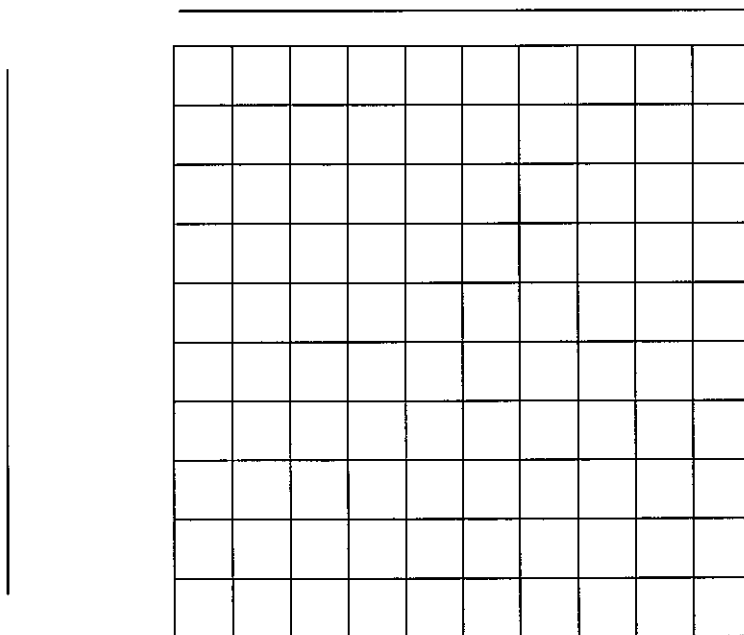
- 
8. Using the data, which substance should Jimmy add to the ice water in his cooler in order to keep his sodas the coldest? (Explain)
9. Identify three steps that are important to perform this experiment.
- - 
  -
10. Write a conclusion for Jimmy's experiment based on the data.

# Plant Growth

**Scenario:** Several students had noticed how tall several plants had grown in their classroom and other plants had not grown very well. The students wanted to investigate further to see if the amount of sunlight made a difference in the growth of plants. The results of their experiment are shown Data Table 1.

Data Table 1				
Amount of Sunlight	Trials – Plant Growth (centimeters)			
	T1	T2	T3	Avg.
No window	2	2	3	
One window	3	4	4	
Two windows	5	5	6	

1. What is the mean for Student C?
2. Write a testable question for this experiment.
3. What are two pieces of equipment that may be beneficial to this experiment?
4. Do the measurements seem reasonable? Explain.
5. Use the data from Data Table 1 to construct a graph on the grid below. Be sure to provide:
  - An appropriate title
  - Labeled axes with appropriate units
  - Appropriate number scales
  - Correctly plotted data



## Plant Growth

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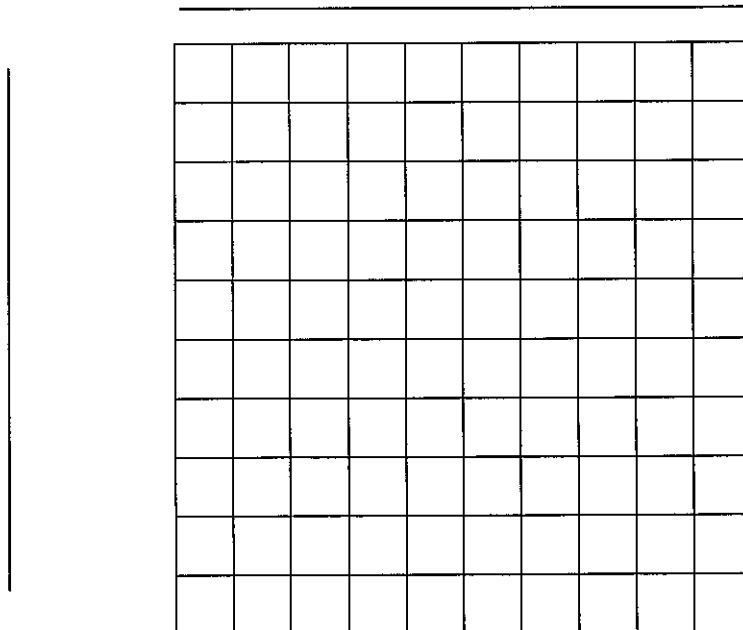
6. What is(are) the constants?
7. You have an opportunity to evaluate the design of the experiment. What are two possible suggestions for reasonable improvements to the experiment.
  - a.
  - b.
8. Write a conclusion for this experiment.

## Which type of football travels the furthest?

**Scenario:** Joey wanted to find out which type of football he can throw the furthest. He tested a nerf football (7 ounces), a NFL rubber football (11 ounces), and a NFL leather football (15 ounces). Joey marked a line to start from and had a friend mark where each football landed on a football field. He measured the distance each ball traveled and recorded it in his data table. He did 3 trials for each type of football. Joey made sure he threw each ball with the same amount of force and height and when there was no wind.

Type of ball	Trials – Distance each football travels (yards)			
	T1	T2	T3	Avg.
Nerf (7 ounces)	40	43	41	
Rubber (11 oz)	32	36	34	
leather (15 oz)	30	32	30	

1. What is the Independent Variable?
2. What is the Dependent Variable?
3. Write an appropriate hypothesis for this investigation.
4. Write an appropriate title for the Graph.
5. Use the data from Data Table 1 to construct a graph on the grid below. Be sure to provide:
  - An appropriate title
  - Labeled axes with appropriate units
  - Appropriate number scales
  - Correctly plotted data



## Which type of football travels the furthest?

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6. Write three important steps that would be required to perform this experiment?

7. Write a conclusion for this experiment.

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average

Science Warm-Up # \_\_\_\_\_

	Trial 1	Trial 2	Trial 3	Average



