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### Thoughts on the Scientific Method

Circle True or False for each question. GIVE A REASON FOR YOUR RESPONSE IN A COMPLETE SENTENCE.

1. Scientists have no definite method they can follow when they set out to solve a problem. T F
2. As a rule, men make better scientists than women. T F
3. After making a discovery, scientists must also try to find ways to use it. T F
4. Science has been part of human existence since our earliest ancestors thousands of years ago. T F
5. A scientist can make a general conclusion after an experiment is done once. T F
6. When I graduate, I would like to choose a career in a field related to science or

### technology. T F

1. Science has played a great part in improving our standard of living. T F

9. Scientists often make errors and become frustrated because their experiments are

### not successful. T F

# Objectives

* Introduce the scientific method including terminology.
* Provide an activity for students to experience how the scientific method is used.

## Terminology

**The following words will be defined during class.**

Hypothesis -

Multiple Trials -

Average -

Median -

Mode -

## Procedure

 1. Get 1 bag of gummi bears per table group.

 2. Read the question posed on the next page. (DO NOT OPEN THE BAG.)

 3. Guess what the answer to your question might be (hypothesize). Circle the

 hypothesis that is closest to your guess. (DO NOT OPEN THE BAG.)

 4. Open your bag of gummi bears.

 5. Be sure to count & record the total number of gummi bears in your bag and the

 number of each color gummi bear in your bag. DO NOT EAT UNTIL ALL

 DATA COLLECTION IS COMPLETE.

**Question posed:** Are all the colors of gummi bears equally represented in each bag?

**Hypothesis:** If each bag is the same, then there will be more \_\_\_\_\_\_ gummi bears than any other color.

 **OR**….. If each bag is the same, then all colors will be equally represented.

**Data – table & class**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Group # | Total Numberof Gummi Bears in bag | Number of Yellow Gummi Bears | Number of Red Gummi Bears | Number of Orange GummiBears | Number of Green Gummi Bears |  | Number of Clear/White Gummi Bears |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |
| 6 |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |
| ClassAverages |  |  |  |  |  |  |  |
|  |

\*\* Graph the **class averages** for each color (in **percents**) in a pie chart....

### And a histogram.

 

**Analysis**

1. a. If a large container of gummi Bears was brought out, would you know anything about

 it based on your data?

 b. Define inference

1. Look at the class data. Does it seem as if there are quality controls placed on the number of bears of each color per bag? (In other words, do they attempt to make all the bags similar or does it seem random?)
2. What other questions could you test with these bags of gummi bears? Name