

“How Many is Enough?”

Sample Size Activity

MATERIALS

- Bag containing random amount of M&M candies
- Data Sheet

How does sample size affect experimental results?

Have you ever wondered where political analysts get the data needed to say that John Smith will receive 55% of this year’s vote?

Obviously, they do not call every American on the phone, nor do they simply call 10 random people...so what do they do?

When collecting data from a small group in

order to draw conclusions that apply to a much larger group, the size of your initial sample is an important consideration.

In some situations, a scientist cannot avoid drawing conclusions from a

small sample (rocks from Mars, Tyrannosaurus Rex thigh bones, etc.). In those situations, a good scientist is

careful to avoid overgeneralizing, while still drawing valid conclusions whenever possible.



What can you really tell about a population from a small sample?

S.S.S. Addressed

S.C.C. 2.3

S.C.F. 1.3
2.3

S.C.H. 1.3
2.3
3.3

M.A.A. 4.4
5.4

M.A.E. 3.4

Activity Directions

Step One: One member from each group will randomly pick 6 M&Ms from an opaque container.

Step Two: Assign each student group one specific characteristic about M&Ms (color, printing quality, shape, condition, etc.)

Step Three: Each group will examine their sample for their characteristic and write a sentence description that describes the makeup of their sample.

Step Four: When the sentence is done, students are to create a pie graph that is an extrapolation of their sample observations to the contents of the entire bag.

Step Five: Each group is to present and explain their extrapolation graphs.

Step Six: After all sharing, open the full bag of M&Ms, and repeat steps 2 through 4.

Step Seven: Groups are to compare their small sample graphs to their whole bag graphs, writing a summary of how the two graphs compare.

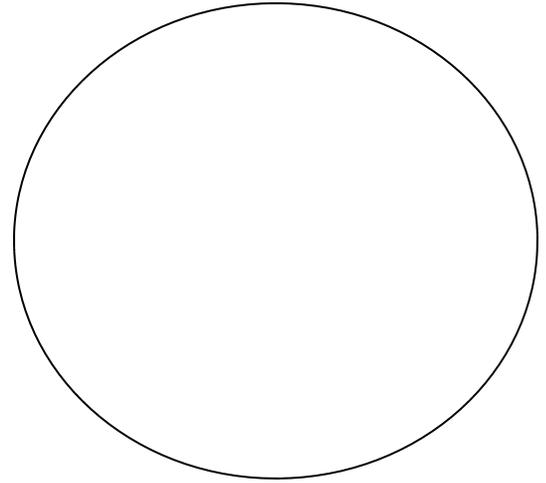
Step Eight: groups are to complete the conclusion questions found below the data section on the back of this paper

Student Activity Sheet

SMALL SAMPLE SIZE:

1. SENTENCE DESCRIPTION OF
COMPOSITION OF SMALL SAMPLE:

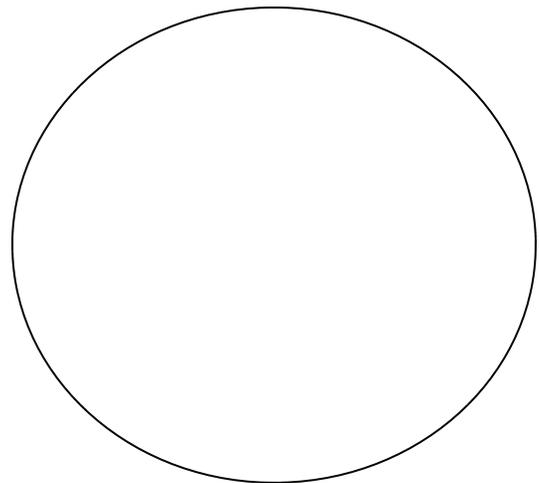
2. PIE GRAPH PREDICTION
OF ENTIRE BAG CONTENTS



FULL SAMPLE SIZE:

3. SENTENCE DESCRIPTION OF
COMPOSITION OF ENTIRE BAG

4. PIE GRAPH OF ACTUAL ENTIRE
BAG CONTENTS



Conclusion questions:

1. Why is it important for a scientist to use as large of a sample size as possible?
2. What are two examples where a scientist will be forced to use a small sample size?