

# Starburst Factory Investigation: A Sampling Activity

It is well-known at the Starburst factory that a secret distribution of the various colors exists. It's a closely guarded secret; the exact distribution is unknown to the public, but it's crucial for the unique Starburst experience. Your mission, as an undercover employee of a competitor company, is to investigate this mystery through the power of sampling and determine the secret distribution.

**Objective:** Students will use basic data collection and statistical methods to observe the effects of sample size on the perceived distribution of Starburst candy colors.

**Hypothesis:** Write down your personal guess regarding the secret distribution of colors in Starburst candies (e.g. "25%-25%-25%-25%"):

## Individual Sample

1. Each student will take an individual sample of Starburst candies from the provided bags.
2. Compute the percentage of each color in your individual sample.
3. Record your data in the following table:

Color	Count	Percentage
Red		
Orange		
Yellow		
Pink		

**Reflection:** Based on your individual sample, what do you think the true distribution of colors is?

## Group Sample

4. Now, aggregate your individual samples with others in your group.
5. Compute the percentage of each color in your group's combined sample.
6. Record your data in the following table:

Color	Count	Percentage
Red		
Orange		
Yellow		
Pink		

**Reflection:** Based on your group sample, what do you think the true distribution of colors is? Has your opinion changed from your individual sample?

## Class Sample

7. Finally, aggregate your group samples with the other groups to form a class-wide sample.
8. Compute the percentage of each color in the class sample.
9. Record your data in the following table:

Color	Count	Percentage
Red		
Orange		
Yellow		
Pink		

**Reflection:** Based on the class sample, what do you think the true distribution of colors is? Has your opinion changed since the group sample?

## Discussion Questions

1. Based on last class's discussion of sampling do you think these (individual, group, and class samples) were good or bad samples? Why?
2. How did the perceived distribution of Starburst colors change as the sample size increased from individual to group to class?
3. Do you think the class sample distribution closely represents the true distribution at the Starburst factory? Why or why not?
4. Was it just luck that your individual or group sample distribution matched (or didn't match) the class distribution, or do you think it was a matter of good sampling?
5. Why might larger samples provide a distribution that's closer to the true population distribution?