

Sampling Experiments

NCTM Standards 1, 5, 6, 7, 8, 9

Five groups of fifth graders each pulled 20 counters from a bag one at a time, returning the counter to the bag each time.

Here are the results.

Groups	1	2	3	4	5
Red	8	11	8	12	9
Blue	7	5	6	4	8
Green	5	4	6	4	3

1 What fraction of the counters would you estimate are red? _____

2 What fraction of the counters would you estimate are blue? _____


3 What fraction of the counters would you estimate are green? _____

4 If there are 100 counters in the bag, what is the best guess we can make from our sample about how many are . . .

. . . red? _____ . . . blue? _____ . . . green? _____

5 If there are 10 counters in the bag, what is the best guess we can make about how many are . . .

. . . red? _____ . . . blue? _____ . . . green? _____

 6 Based only on the results of this experiment, it is impossible to say, even approximately, how many blue counters are in the bag. Explain why this is impossible.



7 A secret number of counters (maybe even zero) are put into a bag. All you know is that any counters that are now in the bag are all blue. Now you put 10 red counters, shake the bag well, and perform a sampling experiment. After 100 pulls, you count the occurrences of each color.

a If you recorded picking a red counter 100 times, what number of blue counters would you estimate were in the bag? _____

b If you recorded picking a red counter 49 times, what number of blue counters would you estimate were in the bag?



8 A bag contains a secret number (at least 10) yellow blocks. You take 10 blocks from the bag, mark each of them with a blue dot, and return them to the bag. You now perform a sampling experiment. After 100 pulls, you have recorded 49 with blue dots.

a How many blocks did you pull that are all yellow? _____

b About how many all-yellow blocks are in the bag? About how many blocks are in the bag? Tell why you think this is so. _____



9 Challenge To figure out how many dolphins are living in a region, marine biologists tag some of the dolphins and release them again. Each time a dolphin swims by, they see whether it has a tag or not. Imagine that they have tagged exactly 20 dolphins. In the following weeks, they keep a count of the dolphins they see, and stop after 100 sightings. Of those 100 sightings, 32 were dolphins with tags. About how many dolphins are in the region? Explain.
