

Shake and Peek

Objective:

To determine how many objects of each color are in the mystery box.

Key Concepts:

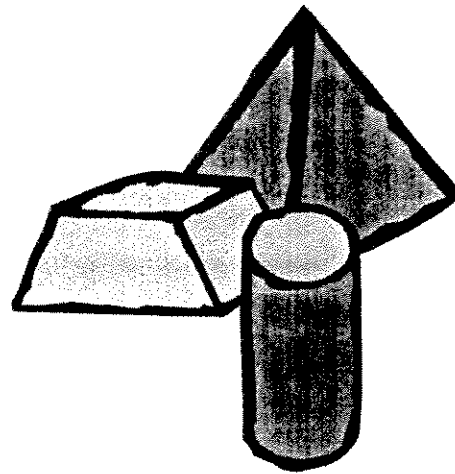
data analysis, comparison, number sense

TEKS:

Probability and Statistics: k-12a,12b; 1-9a,10a,10b; 2-11b,11c; 3-14a,14b,14c; 4-13a; 5-12a,13b

NCTM Standards:

Data Analysis and Probability, Communication



Real World Application:

When scientists are trying to get an idea about the characteristics of something they may take samples. For instance if they want to learn about the condition of the fish in the lake, they may "take a peek" at some of the fish by catching some in a net. Then they make inference about the condition of the rest of the fish in the lake since it is impossible to take a look at all the fish. Sampling is an important statistical tool.

Target Age:

8 and up

Activity:

Materials:

3 mystery boxes with a total of 10 small pom poms
data sheet
pencil
calculators

1. Each box has 10 items with 2 different colors.
2. How many items of each color are in the boxes?
3. Shake the box.
4. Peek in the opening. Record the color that is exposed.
5. Repeat at least 10 times.
6. How many of each color do you think are in the box?

Hints/Sample Questions:

How does your guess compare with the data collected by others?

Why might there be differences?

How did you use your "peeks" to make a guess?

Why do you need to shake the box at least 10 times? Is there any advantage to shaking the box and collecting data more than 10 times? Why? Why not?

Terms:

items, guess, compare, data, sample, and collecting data

Extensions:

1. Collect other kinds of data and draw conclusions. For example, how many people eat at a restaurant every week?
2. Make your own mystery box and collect data from other people on what they think is in the box.

Differentiating for varied learners and settings:

Need more experience with this concept:

- Start with a smaller number of items.
- Use several different spinners that have different probabilities and collect data on spins to see how probability works.

Ready for more:

- Create another mystery box with 3 variables and/or more pom poms.
- Research a real life question and use sampling to draw conclusions. For example, how many insects are in the yard or how many fish in the pond/aquarium?
- How many people where sneakers? Decide how many people you will sample.

Supplemental Resources

More Than One by Miriam Schlein

The book attempts to explain the concept of sets and provoke questions. The readers learn that one week can be seven days, one dozen is twelve and one forest can be a variable number of trees.

How Much Is a Million?

By David M. Schwartz

This unique counting book takes readers off on adventures asking them to imagine huge numbers rather than enumerate them.

Do You Want to Bet? by Jean Cushman

Resource: Marilyn Burns, Math Solutions

Coin Flipper

<http://www.mathcats.com/microworlds/coinflipper.html>

How many times will heads turn up when you flip a coin 100 times? Predict how many heads or tails will turn up when you flip a coin 100 times.

Card Trick

<http://www.mathcats.com/microworlds/cardtrick.html>

The computer guesses the card you have chosen, after scrambling the cards three times and asking you which row your card is in. Can you figure out how the trick works?

Fish Tank

www.bbc.co.uk/education/mathsf/shockwave/games/fish.html

Pythagora is diving in his fish tank. Can you figure out how many times he will catch a red fish?

Guess the Number

<http://funbrain.com/guess/index.html>

The FunBrain Magician will pick a secret number and put it in his hat. How many guesses will it take you to find the secret number?



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Sacude y observa

Mystery Box *Caja misteriosa* _____

Number of Shakes <i>Número de sacudidas</i>	Color <i>Color</i>
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

What do you think is in your mystery box?

¿Qué crees que contiene tu caja misteriosa?



**The Children's
Museum
of Houston**

