

## GUESS THE COLOR

### Performance Standard 10C.B

Determine how many of each color are in a bag of blue, red and white cubes and predict the probability of each of those colors being pulled out of the bag accordingly:

- *Mathematical knowledge:* Accurately determine the number of each color and the probability of each color being pulled out of the bag.
- *Strategic knowledge:* Consistently use a strategy to record data and use it to make predictions.
- *Explanation:* Explain completely and clearly what was done and why it was done; justify the prediction of the number of each color and the probability of a color being pulled out of a bag.

### Procedures

1. ***In order to determine, describe and apply the probabilities of events (10C)***, students should experience sufficient learning opportunities to develop the following:
  - Identify and discuss likely, unlikely, and impossible events.
  - Communicate and display results of probability events in order to make predictions of future events.
2. Have students review and discuss the task and how it will be evaluated. Using another bag of cubes with a different number of colors and cubes, demonstrate that one cube is to be drawn from the bag at a time and returned to the bag before drawing the next cube. The chances of a color being pulled out will depend upon how many cubes of that color are in the bag. If a bag of 10 cubes has 5 red cubes in it, then red has a 50% (or 1 in 2) chance of being pulled out each time a cube is drawn from the bag. If there are 3 blue cubes in that bag, blue will have a 3 in 10 chance of being pulled out.
3. Administer this assessment in small groups in order to listen to student conversation. The explanation part of this assessment may also be audiotaped or videotaped.
4. Put seven cubes in a bag – 3 blue, 3 red, and 1 white. Be certain that no students observe the preparation of the bag. Tell students that you have seven cubes in the bag and that some cubes are blue, some are red and some are white. Pass the bag around so that only one cube is pulled out at least for 21 trials. After a student pulls out a cube, he/she should show it to the group and replace it in the bag. Students should use “Guess the Color” recording sheet #1 to record each cube that is selected. Each student should devise his/her own strategy for recording and determining the number of each color. Direct the students to complete their prediction of the cube colors that they will find in the bag after the 21<sup>st</sup> trial.
5. Show the cubes that are in the bag. Direct students to complete “Guess the Color” recording sheet #2 that deals with likely, unlikely, and impossible events and explain their reasoning in writing (or record students’ explanations).
6. Evaluate each student’s work, using all the rubric as follows and add the total number of points and use the guide on the rubric to determine the performance level:
  - *Mathematical knowledge:* Listen to the reasoning for the color choices and check for the correct colors and fill-in-the-blank answers on the recording sheet.
  - *Strategic knowledge:* Observe the way the student records the data and uses it to make a prediction.
  - *Explanation:* Check the recording sheet for appropriate justification for answers. Write the total number of points in each component at the bottom of each column.

### Examples of Student Work follow

### Resources

- Paper bag with 3 blue, 3 red, and 1 white cube
- Copies of recording sheets #1 and #2
- Mathematics Rubric

### Time Requirements

- One class period

NAME \_\_\_\_\_ DATE \_\_\_\_\_

## GUESS THE COLOR – RECORDING SHEET #1

Use this space to record the collected data.

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I predict the cube colors are as follows:

--	--	--	--	--	--	--

(Write "blue," "red," or "white" in each block):

NAME \_\_\_\_\_ DATE \_\_\_\_\_

## GUESS THE COLOR – RECORDING SHEET #2

It is likely that the color(s) \_\_\_\_\_ will be picked because

It is unlikely, but not impossible, that the color(s) \_\_\_\_\_ will be picked because

It is impossible that the color(s) \_\_\_\_\_ will be picked because

If 5 cubes were in the bag with the same results as before, my prediction would be

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(Look at your data on recording sheet #1.)

because \_\_\_\_\_


\_\_\_\_\_

NAME \_\_\_\_\_ DATE \_\_\_\_\_

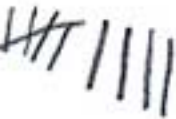
**Guess the Color**

**Recording Sheet #1**

Use this space to record the collected data.

Red 

White 

Blue 

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I predict the cube colors are:



NAME \_\_\_\_\_ DATE \_\_\_\_\_

Guess the Color

Recording Sheet #2

It is likely that the color(s) blue Red will be picked because

They had more tallies

It is unlikely, but not impossible, that the color(s) white will be picked because

it had less tallies

It is impossible that the color(s) Siver will be picked because

it was not on here

If there were 5 cubes in the bag with the same results as before, my prediction would be



because

3 blue 3 red 1 white

Name \_\_\_\_\_ Date \_\_\_\_\_

### Guess the Color

#### Recording Sheet #1

Use this space to record the collected data.

RED

~~||||~~

WHITE

||

BLUE

~~||||~~  
~~||||~~  
|||

I predict the cube colors are:



B

B

B

R

R

R

W

Name \_\_\_\_\_ Date \_\_\_\_\_

### Guess the Color

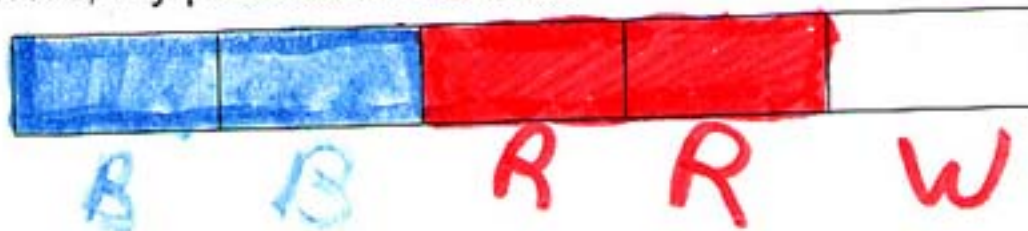
#### Recording Sheet #2

It is likely that the color Red will be picked because it is a big number of it.

It is unlikely, but not impossible, that the color white will be picked because it has the least number.

It is impossible that the color purple will be picked because there is no purple.

If there were 5 cubes in the bag with the same results as before, my prediction would be



because there is probably the same of R and B and least of W.