MISSISSIPPI DEPARTMENT OF EDUCATION

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Mississippi Mathematics Manipulatives Manual

Featured Activity

"Skittles, an Equal Taste of the Rainbow"

7.SP.6

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Carey M. Wright, Ed.D.
STATE SUPERINTENDENT OF EDUCATION

Nathan Oakley, Ph.D.
CHIEF ACADEMIC OFFICER

Wendy Clemons
EXECUTIVE DIRECTOR
Office of Secondary Education, Dropout Prevention, & Professional Development

Marla Davis, Ph.D.
STATE DIRECTOR OF CURRICULUM AND INSTRUCTION
Office of Secondary Education

Tommisha Johnson
K-12 MATHEMATICS CONTENT DIRECTOR
Office of Secondary Education

As we continue our efforts to develop high-quality instructional materials (HQIM) and resources, the Mississippi Department of Education (MDE), through the Academic Education Office, would like to showcase instructional practices and activities that foster conceptual understanding through the use of manipulatives in the mathematics classroom.

The **Mississippi Mathematics Manipulatives Manual** features activities meant to serve as short, hands-on procedures that may be implemented before, during, or after a lesson to support the teaching and learning process of the Mississippi College- and Career-Readiness Standards (MCCRS) for Mathematics. Alignment with the MCCRS Scaffolding Document has been included for additional support. Teachers may contact staff at the MDE if they would like to borrow manipulatives for classroom use.

Teachers may modify these activities to meet the needs of the students they serve and their instructional delivery model (virtual, in-person, or hybrid).

Special Thanks:
Jennifer Gaston, Ed.S.,
Ocean Springs School District

Skittles, an Equal Taste of the Rainbow

MANIPULATIVE(s):

- Large bag of the original Skittles
- Small Cups

GRADE LEVEL OR COURSE TITLE:

CCRS Mathematics Grade 7

DOMAIN AND CLUSTER HEADING:

Statistics and Probability (SP):
Investigate chance processes and develop, use, and evaluate probability models

STANDARD(S):

7.SP.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*

PREREQUISITE SKILLS:

- Know that the definition of probability is "the likelihood of something happening or being the case".
- Describe and show frequency of an event happening, (i.e., dot plot).
- Know an approximation is close to the actual value of a number, but not completely accurate or exact.
- Know how to set up ratios.
- Know how to solve proportions.
- Be able to simplify and evaluate rational operations that include fractions and decimals.
- Know how to convert between fractions, decimals, and percentages.

ACTIVITY:

Note: Activity Sheet Attached

1. Ensure students have an undetermined amount of Skittles. This can be done by having students use their own bag of Skittles and you provide them with a cup, or you may empty a large bag of Skittles into cups and distribute the cups to each pair or group of four or five students.
2. Have all students sort, count, and record how many of each color of Skittles are in the cup.
3. Review how to find theoretical probability with students. Then have students write the theoretical probability of selecting each color of Skittles by writing the ratio of the number of Skittles for each color to the total number of Skittles in the cup.
4. Review with students the difference between theoretical probability and experimental probability.
5. Next, have students place all Skittles back in the cup, shake the cup, and blindly (without looking) take out one Skittle. Record the result.
6. Allow students to follow this same procedure for a total of 20 trials, making sure to return each Skittle to the cup after selecting it.
7. Now, instruct students to write the experimental probability of selecting each color from their cup of Skittles.
8. Have students discuss how close the theoretical probability is to the experimental probability.

QUESTIONS TO CONSIDER:

- How do you find the probability of an event occurring?
- What does it mean to have a theory? What do you think theoretical probability means?
- What happens when we conduct an experiment? What do you think experimental probability means?
- How is theoretical probability different from experimental probability?

RESOURCES:

- Mississippi Mathematics Scaffolding Document (Grade 7, Page 32)
- 2016 MCCRS for Mathematics

Optional: The University of Mississippi's Center for Mathematics and Science Education has an extensive inventory of math (and science and technology) tools and manipulatives that teachers may borrow for classroom use at no charge. Click the link below to access the inventory list and complete a check-out request.

- CMSE Manipulatives

BEYOND THE ACTIVITY:

- **Assessment:** Use this activity as an assessment to determine if students are ready to move on to understanding "independent events" and "dependent events" of probability.
- **Extension:** Students work together to gather class data and predict the probability of selecting each color out of 600, 900, and 1500 Skittles using theoretical probability.

Activity Sheet

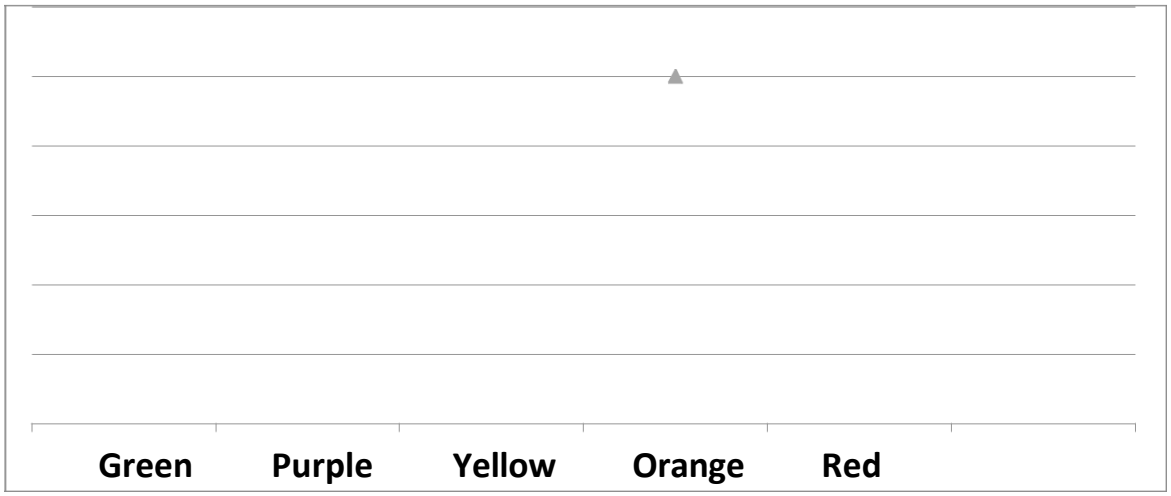
Skittles: An Equal Taste of the Rainbow

Procedure:

1. Sort your Skittles according to their color.
2. Count the total number of each color and record it in the table below.
3. Write the ratio of the total number of each color to the total number of Skittles. Write your response in fraction form.
4. Find the theoretical probability of each color.

Color	Total number	Ratio of the total # of each color to the total # of Skittles	Theoretical probability
Green			
Purple			
Yellow			
Orange			
Red			
	Total:		

5. Place all Skittles back in the cup, shake the cup, and randomly take out one Skittle. Record the result on the grid/graph below. Be sure to label your y-axis accordingly.
6. Use the same procedure for a total of 20 trials, making sure to return each Skittle to the cup after selecting it.
7. Now, write the experimental probability of selecting each color from your cup of Skittles.



Extension:

1. How many of each color would your predict to be in the entire bag?
2. How many of each color would you predict to find in a total of 600 Skittles? 900? 1500?

Optional - Exit Ticket:

1. Will theoretical probability and experimental probability always be the same value? Explain your response.
2. If I have 63 jellybeans and 7 of them are purple. What is the probability of selecting a purple jellybean? Does this represent theoretical or experiment probability? Explain your response.