Valentine M&M® Problem

Each student will get 10 M&Ms® from the 1/2 pound bag of Valentine M&Ms® (red, pink and white). Use the worksheet to record the colors of your M&Ms® by writing the first letter of the color in each circle.

W = White P = Pink R = Red

Count and record the number of each color.

Look at two other piles of M&Ms®. What color do you see the most of in each pile?

Pile 1: W P R
Pile 2: W P R

In your opinion, what color are most of the M&Ms® in this bag?

Why do you think so? (Record your answer.)

Grade Levels Pre-K-2

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In your opinion, what color are most of the M&Ms® in this bag?

Why do you think so? (Record your answer.)

Context

Periodically, we do a problem that involves probability. With practice, many of my students have become more able and/or comfortable making educated guesses. These kinds of problems reinforce the concept of chance and give students opportunities to be incorrect, correct or close by chance. I chose to use holiday M&Ms® for this task because it was around Valentine's Day. This could be done with any other candy or non-candy item.

What This Task Accomplishes

Students will:

- Count and classify groups of 10 M&Ms® by color.
- Record numbers of each color in one group.
- Record which color was represented the most in two other groups.
- Guess what color most of the M&Ms® in the bag might be.
- Explain why s/he made that guess.

What the Student Will Do

Most students will be able to count and record the color of a group of M&Ms®. Most will accurately record what color is represented the most in pile one and pile two.

The explanations of the guesses on the color of the rest of the M&Ms® include reasons such as:

- Certain colors are "popular".
- Certain colors came up the most in the three piles or two out of the three piles.
- Certain colors did not come up yet, therefore must be well represented in the leftover M&Ms®.
- Red would be represented the most because it is Valentine's Day.
- A certain color came up the most in that student's own pile.
- Confuse the words "color" and "number".
- Two colors are chosen because they were represented significantly more in all three examples.

Time Required for Task

20 minutes

Interdisciplinary Links

This task can be used with a unit on the study of weather or other units involving chance.

Teaching Tips

I would make the circles on the sheet much bigger and with a thinner pen so that students can clearly see the letter they recorded. After everyone has finished the problem, they can eat their M&Ms® or give them to a friend who likes them. We recorded the number of each color using the tally system. Each student came up and read his/her results (six pink, three red and one white). We also recorded pile one and pile two. Finally, we handed out the rest of the M&Ms® evenly and recorded those. We practiced counting using the tally system and discussed how our predictions compared to the results. We discussed the relationship of being "right" or "wrong" to the concept of chance. Students shared their reasoning and were clearly as comfortable with inaccurate guesses as correct. They were relieved that I had guessed incorrectly which led us to a discussion of limited samples.

Suggested Materials

- Half-pound bag of Valentine's Day M&Ms®, St. Patrick's Day M&Ms® or some candy with a variety of three or four colors
- Worksheet (page 5)
- Pencil

Possible Solutions

Every collection of M&Ms® or candy will have different results. Our bag had mostly pink with red

close behind. White was represented significantly less than pink and red. This problem could be extended to count other bags of candy of the same kind, size and type.

Benchmark Descriptors

Novice
This student applied inappropriate concepts to this problem despite the repetition and rewording of the question. His/her explanation is unrelated to the problem.

Apprentice
This student focused on his/her own sample to explain why s/he chose red. The explanation could have been more clearly presented. There is some evidence of mathematical reasoning. The explanation is not complete, indicating that the question/problem was not fully understood.

Practitioner
This student used effective mathematical reasoning to back up his/her guess. This student made it clear that s/he referred to all three samples before making a guess. The explanation is clear, indicating that this student had a broad understanding of the problem.

Expert
This student's explanation is clear and effective. This student's reasoning reflects a sophisticated thought process. The problem asked the students to guess one color, but this student chose two because there were mostly pinks and reds in all three samples. This student was able to see beyond the three samples and apply what s/he observed to more possible samples.

Valentine M&Ms® Problem Worksheet

Record the color of your M&Ms® by writing the first letter of the color in each circle below.

W = White P = Pink R = Red

1. How many do you have of each color?

   White (W): ____

   Pink (P): ____

   Red (R): ____

2. Look at two other piles of M&Ms®. What color do you see the most of in each pile?

   Pile 1: W P R

   Pile 2: W P R

3. In your opinion, what color are most of the M&Ms® in this bag? _____

   Why do you think so?

   _____

   _____

Novice

Record the colors of your M+Ms by writing the first letter of the color in each circle below.

W=White P=Pink R=Red

1. How many do you have of each color?

White (W): 1

Pink (P): 5

Red (R): 4

This part is accurate.

2. Look at two other piles of M+Ms. What color do you see the most of in each pile?

Pile 1: W P (R)

Pile 2: W (P) R

Student uses little math language to communicate.

3. In your opinion, what color are most of the M+Ms in this bag? 10 Why do you think so?

because most bags have that many.

Here the student shows misunderstanding of the question.

(I reread q. 3 to He still thought 10 was the color of most the M+Ms)

Apprentice

Record the colors of your M+Ms by writing the first letter of the color in each circle below.

W=White P=Pink R=Red

1. How many do you have of each color?

White (W): 0

Pink (P): 4

Red (R): 6

This student shows some understanding.

This part is accurate.

2. Look at two other piles of M+Ms. What color do you see the most of in each pile?

Pile 1: W P (R)

Pile 2: W (P) R

This student uses little math language.

3. In your opinion, what color are most of the M+Ms in this bag? R Why do you think so?

Bekus thar ur most UF
Red in my Piul UF IO

Practitioner

Record the colors of your M+Ms by writing the first letter of the color in each circle below.

W=White P=Pink R=Red

1. How many do you have of each color?

This part is accurate.

White (W): 2

Pink (P): 5

Red (R): 3

2. Look at two other piles of M+Ms. What color do you see the most of in each pile?

Pile 1: W P (R)

Pile 2: W (P) R

This student demonstrates a beginning understanding of probability and shows good reasoning.

3. In your opinion, what color are most of the M+Ms in this bag? P Why do you think so?

decas the pink has prete a of in the twopiyols

Expert

Record the colors of your M+Ms by writing the first letter of the color in each circle below.

W=White P=Pink R=Red

1. How many do you have of each color?

   White (W): one

   Pink (P): three

   Red (R): six

It is interesting how the student writes out each number versus using the symbol.

2. Look at two other piles of M+Ms. What color do you see the most of in each pile?

   Pile 1: W (P) R

   Pile 2: W P (R)

This student sees that there can be two reasonable possibilities.

3. In your opinion, what color are most of the M+Ms in this bag? R,P Why do you think so?

because i have sixs Reds and one of the other pils that i lokt at i think and p to