M& M's

Performance Standard 6D.C

Manipulate M & M's to answer questions concerning fractions, percents, rates, and ratios:

- *Mathematical knowledge*: Represent fraction, percents, rates and ratios using M&Ms;
- *Strategic knowledge*: Solve problems using appropriate strategies;
- *Explanation*: Explain completely what was done and why it was done.

Procedures

1. ***In order to solve problems using comparison of quantities, ratios, proportions, and percents (6D),*** students should experience sufficient learning opportunities to develop the following:
   - Describe the relationship between two sets using ">", "<", and "=", "≠".
2. Place 24 M & M's in a plastic bag for each child.
3. Hand out bags of M & M's to each child.
4. Hand out Student Recording Sheets.
5. Direct students to show as well as write answers to each question on the Student Recording Sheet.
6. Students need to be directed to provide either a written or an oral explanation of how each task was completed and why their answers are correct.
7. Any item may be read to students who need assistance.
8. Evaluate student work using all three sections of the rubric. Check ***Mathematical Knowledge*** by assessing both the Student Recording Sheet for accurate answers and viewing the video-tape for correct manipulation of the M & M's. Check ***Strategic Knowledge*** by observing how students manipulated the M & M's and how the problems were solved. Check the ***Explanation*** portion by having students explain what they did to accomplish each part of the task (This can be done either orally or in written form.)
   - A score of ***4*** indicates that a student has done all work correctly, shown the correct manipulation of the M & M's, recorded all answers correctly, and provided an accurate and complete explanation of what was done and why each answer is correct.
   - A score of ***3*** in ***Mathematical Knowledge or Strategic Knowledge*** indicates a student may have made a minor calculation error, or a minor manipulation error. A score of ***3*** in ***Explanation*** means that a student explained what was done and why but may have left some parts of the explanation unclear.
   - A score of ***2*** in ***Mathematical Knowledge or Strategic Knowledge*** indicates that the student may have made major calculation and manipulation errors. A score of ***2*** in ***Explanation*** indicates that a student explained what was done or why, but not both.
   - A score of ***1*** in any area indicates that the student attempted to accomplish the task but major errors happened in all areas.
   - A score of ***0*** in any area indicates that the student made no attempt to complete the task
     Answer Key:
     - 12 M & M's are in each group.
     - 6 M & M's are in each group.
     - 12 M & M's are in 2/4 of the group.
     - 2/4 = ½
     - 12 of the M & M's would be eaten.
     - 4 M & M's would cost $.12.
     - 4 out of 12 chances that the M & M would be blue, 3 out of 12 chances that the M & M would be red, 2 out of 12 chances that the M & M would be brown.
     - 4 out of 12 > than 3 out of 12 4 out of 12 > 2 out of 12
     - 3 out of 12 < 4 out of 12 3 out of 12 > 2 out of 12
     - 2 out of 12 < 4 out of 12 2 out of 12 < 3 out of 12

Examples of Student Work not available

Time Requirements

- One class period

Resources

- Large bag of M & M's
- One plastic bag per child
- Copies of the "M & M's" student recording sheet
- Video camera to record this task
- Mathematics Rubric

NAME _____ DATE _____

M & M's

Student Recording Sheet

Students: You should each have a plastic bag containing 24 M & M's. Please check your bag to confirm this.

Part A: Take your M & M's out of your bag. Do not eat any of them yet.

1. Divide your group of M & M's in half. How many M & M's are in each group? _____
   Using your M & M's and this paper, show and explain how you got your answer and why your answer is correct.

   _____

   _____

   _____

   _____

   _____

   _____

2. Divide your group of M & M's into fourths. How many M & M's are in each group? _____
   Using your M & M's and this paper, show and explain how you got your answer and why your answer is correct.

   _____

   _____

   _____

   _____

   _____

   _____

3. Looking at your group of fourths, how many M & M's are in 2/4 of your total group. _____
   Using your M & M's and this paper, show and explain how you got your answer and why your answer is correct.

   _____

   _____

   _____

   _____

   _____

   _____

4. Write a number sentence showing the relationship between ½ of your M & M's and 2/4 of your M & M's.

I know my answer is correct because _____

_____

_____

_____

_____

_____

Part B: You are now going to work with percentages, ratios and rates.

5. Look at all of your M & M's. If you ate 50% of your M & M's, how many would you eat? _____

Using your M & M's and this paper show and explain how you know your answer is correct.

_____

_____

_____

_____

_____

6. Pretend that each M & M sold for $.03. How much would four M & M's cost? Show all of your work.
Four M & M's would cost _____.
I know this because _____

_____

_____

_____

_____

_____

7. Pretend you have 12 M & M's in your bag. You have 3 greens, 4 blues, 2 browns, and 3 reds. What are your chances of picking out a blue M & M? _____, a red M & M? _____, a brown M & M?_____

   I know my answers are correct because _____

   _____

   _____

   _____

   _____

   _____

8. Write a number sentence showing the relationship among these three sets of M & M's. (For example,3 out of 12 (greens) = to 3 out of 12 (reds)

   I know my answer is correct because _____

   _____

   _____

   _____

   _____

   _____