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### A Classroom Activity Involving Commonly Used Fractions

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#### Introduction

Teaching mathematics is an important task. Teaching ways to teach mathematics to college students is equally important. The following activity can be adapted for children and adults.

Beyond understanding whole numbers, students can be encouraged to understand and represent commonly used fractions in context. For example,  $\frac{1}{3}$  cup of brownie mix or  $\frac{1}{3}$  of the box, and to see fractions as part of a unit whole (the brownie mix) or of a collection (the box). (NCTM, p. 33)

Measurement lends itself especially well to the use of concrete materials. In fact, it is unlikely that children (or adults) can gain a deep understanding of measurement without handling materials, making comparisons physically, and measuring with tools. (p.44)

In order to find a solution to a problem, students must draw on their knowledge, and through this process, they will often develop new mathematical understandings. By learning problem solving in mathematics, students should acquire ways of thinking, habits of persistence and curiosity, and confidence in unfamiliar situations that will serve them well outside the mathematics classroom. (p. 52)

Problem solving skills include . . .

- Building new mathematical knowledge through problem solving
- Solving problems that arise in mathematics and in other contexts
- Applying and adapting a variety of appropriate strategies to solve problems
- Monitoring and reflecting on the process of mathematical problem solving

Problem solving is a process of inquiry and application. It is the means by which students use previously acquired knowledge, skills, and understanding to satisfy the demands of an unfamiliar situation.

Problem solving is a process or a way to extend mathematical knowledge and skills. Students solve problems that include real-world applications at every grade level, using various strategies to organize and execute their processes. Reasoning is necessary for problem solving and for understanding concepts and skills throughout the curriculum. (Alabama State Department of Education, p. 4)

One of the connections we need to make in mathematics classes is that math is part of everyday life. This activity provides one opportunity for students to make the connection of mathematics to everyday life.

### Description of the Activity

One activity that can be used in an elementary classroom (grades 4-6) is that of using a brownie mix to celebrate a birthday. Bringing a birthday cake for students to eat would not teach them anything mathematical, but using a brownie mix to decide how to separate the ingredients in the mix would teach the students several concepts in mathematics — fractions, measurement, and problem solving.

The classroom arrangement should consist of six groups of students. Three groups/tables should share a box of brownie mix. This means that measuring cups, spoons, bowls, ingredients, and plastic microwavable dishes are needed for three groups/tables.

#### **Groupings:**

Since three tables share a box of brownie mix, only one table is given the mix. Their instruction for this mix is to divide it into three equal parts. One of the parts is for their table and the other two parts go to their partner tables.

The second table in the group of three tables is to determine how much water ( $\frac{1}{2}$  cup of water total) each table will need to properly mix  $\frac{1}{3}$  of the box of brownie mix. The students are to divide the total amount of water into three equal parts. Then they provide the amount of water to the other two tables that they are partnered with.

The third table in the partner group is to determine how much of the egg(s) each group will need. In order to make this easier and safer, the students are provided Egg Beaters to use instead of regular eggs. Also, they must determine how much of the Egg Beater mix equals one egg. This information is found on the carton of Egg Beaters ( $1 \text{ egg} = \frac{1}{4} \text{ cup of Egg Beaters}$ ). The students must figure out how to divide the Egg Beaters and share with the other two partner tables.

### Observation and Experiences:

**Table One** (Divide the box of brownie mix into three equal parts.)

- One group chose to use a  $\frac{1}{3}$  cup measure and put  $\frac{1}{3}$  cup of mix into three bowls until they used up the brownie mix.
- The second group used estimation. They simply took the bag of mix and divided it into what they thought were three equal portions.

**Table Two** (Divide the  $\frac{1}{2}$  cup of water into three equal parts.)

- One group used tablespoons/teaspoons to measure the water into three equal parts.
- The second group used the guess and check technique. They guessed at what was  $\frac{1}{3}$  of the water and poured it into cups until it appeared to be equal. They checked to make sure the amounts were as close as possible to being equal.

**Table Three** (Divide the egg (a.k.a. Egg Beaters) into three equal parts.)

- One group used tablespoons/teaspoons to measure the  $\frac{1}{4}$  cup of Egg Beaters into three equal parts.
- The second group used trial and error to measure the egg into three clear plastic cups. They poured small amounts of the  $\frac{1}{4}$  cup of Egg Beaters into each cup. They continued to measure and observe until the amounts were equal.

### Conclusion

Determining how much of these items each of their partner tables was to receive was a problem solving activity for these students. All of the ways mentioned above are acceptable ways to solve this problem because there are no specific instructions about how they are to do this. After the groups shared their ingredients, they mixed their brownies and baked them in a microwave oven. The students were very pleased with the results they achieved.

### References

- [1] National Council of Teachers of Mathematics (2000), *Principles and Standards for School Mathematics*, Reston, VA.
- [2] Alabama State Department of Education (2003), *Alabama Course of Study: Mathematics*, Montgomery, AL.

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