

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 1: Separating Mixtures

A boy had a box of animal crackers. He counted them out and found 20 cookies:

7 elephants

6 tigers

5 monkeys

2 zebras

Suppose the boy put all the animal crackers back into the box and took one out without looking. What is the probability of his choosing

- a. an elephant?
- b. a tiger?
- c. a monkey?
- d. a zebra?

Does the sum of the probabilities a, b, c, and d equal 1?

MATH EXTENSION—PROBLEM OF THE WEEK

Investigation 2: Developing Models

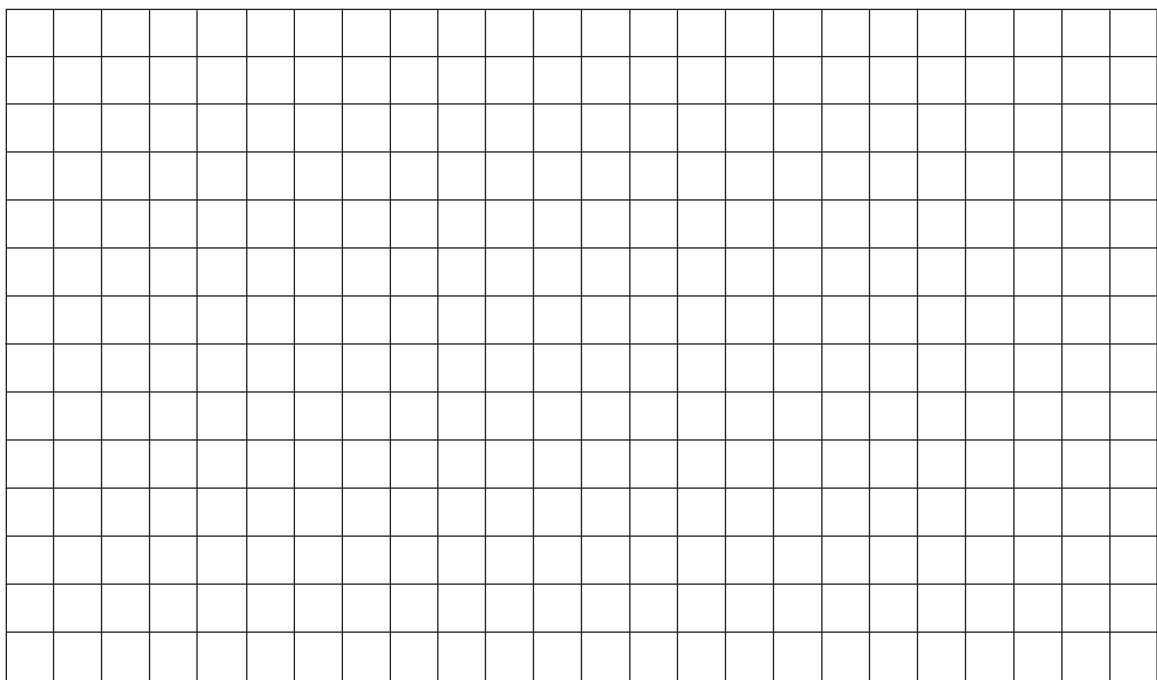
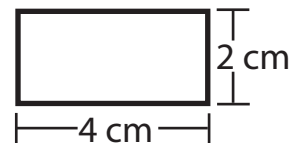
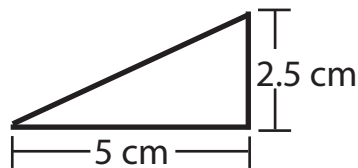
A class wanted to make their own black boxes, using small cereal boxes and cardboard shapes, to send to another class. They plan to make 24 boxes.

- One-half of the boxes will have one triangle inside.
- One-third of the boxes will have two rectangles inside.
- The rest of the boxes will have one triangle and one rectangle inside.

How many of each shape will they need? How do you know?

The dimensions of the triangles and rectangles are shown below. Use the centimeter grid to make a drawing to show how you would cut all the shapes from one piece of cardboard. (The shapes and grid are smaller than reality but are drawn to scale.)

What is the smallest piece of cardboard that all the triangles and rectangles can be cut from?



Centimeter graph paper

MATH EXTENSION—PROBLEM OF THE WEEK
.....

Investigation 3: Concentration

Eight students are working with concentration of powdered-drink solutions. When it comes time to taste their solutions, they realize they all have different amounts.

Student 1: $\frac{1}{6}$ L

Student 2: $\frac{1}{4}$ L

Student 3: $\frac{1}{3}$ L

Student 4: $\frac{1}{2}$ L

Student 5: $\frac{11}{12}$ L

Student 6: $\frac{3}{4}$ L

Student 7: $\frac{5}{6}$ L

Student 8: $\frac{1}{4}$ L

1. How much solution do they have?

2. How can they distribute the solution equally?

Name _____

Date _____

MATH EXTENSION—PROBLEM OF THE WEEK

.....

Investigation 4: Reaching Saturation

A teacher wants to have her class do the mystery substance challenge. She has 500 grams (g) of barium bromide to use as the mystery substance. It takes 52 g of barium bromide to saturate 50 milliliters (mL) of water.

The teacher wants to have 100 g extra so her students have enough barium bromide to have some material to filter and some to use if there is a spill.

The class has 32 students and they work in groups of four.

Will she have enough barium bromide for her students?

MATH EXTENSION—PROBLEM OF THE WEEK
.....**Investigation 5: Fizz Quiz**

My cousin was interested in reactions that produce carbon dioxide gas. She wondered if there was some way to predict how much gas a reaction would produce. She did a series of seven experiments and measured the amount of carbon dioxide released by each one.

Baking soda (spoons)	Calcium chloride (spoons)	Carbon dioxide (milliliters)
1	1	800
1	2	1600
1	3	1600
2	1	800
2	2	1600
2	3	2400
3	1	800

Based on my cousin's experimental results, answer these questions.

1. How many mL of gas would be produced if 3 spoons of baking soda reacted with 3 spoons of calcium chloride?
2. How many mL of gas would be produced if 2 spoons of baking soda reacted with 1.5 spoons of calcium chloride?
3. My cousin wanted to produce exactly 2000 mL of carbon dioxide. How much baking soda and calcium chloride should she use?