



Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Student Exploration: Toy Factory

**Vocabulary:** denominator, equivalent, fraction, numerator, simplify

**Prior Knowledge Questions** (Do these BEFORE using the Gizmo.)

Look at the set of stuffed animals shown to the right.



1. Grace says half the toys are giraffes. Is she correct? \_\_\_\_\_

Explain. \_\_\_\_\_

\_\_\_\_\_

2. Bobby says that half the toys are monkeys. Is he correct? \_\_\_\_\_ Explain. \_\_\_\_\_

\_\_\_\_\_

3. Louis says that half the toys are red. Is he correct? \_\_\_\_\_ Explain. \_\_\_\_\_

\_\_\_\_\_

### Gizmo Warm-up

Welcome to the *Toy Factory* Gizmo! Using the brand-new **TOY-O-MATIC** machine, you can create stuffed monkeys, rabbits, and giraffes by clicking the buttons. The **ANALYZER 3000** tells you what fraction of each toy you have.



Click each animal button once to produce a set of toys: one monkey, one rabbit, and one giraffe.


1. How many toys are there, total? \_\_\_\_\_

2. How many toys are monkeys? \_\_\_\_\_

3. A **fraction** shows how a part of a set is related to the whole set. Check that the **ANALYZER 3000** is set to “What fraction of the toys are **monkeys**?”

Check that **Show fraction** is on. What fraction of the toys are monkeys? \_\_\_\_\_



<b>Activity A:</b> <b>Monkey business</b>	<u>Get the Gizmo ready:</u> <ul style="list-style-type: none"> <li>• Click <b>Clear</b>.</li> <li>• Check that <b>Show fraction</b> is turned on.</li> </ul>	
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You've just been hired to manage the Gizmo Toy Company's new factory. Your first job is to learn to use the equipment: the **TOY-O-MATIC** and the **ANALYZER 3000**.

1. On the **TOY-O-MATIC**, click the three animal buttons to create a set of toys. Make sure there is at least one of each kind. Record how many of each kind you have in your set.

Monkeys: \_\_\_\_\_ Rabbits: \_\_\_\_\_ Giraffes: \_\_\_\_\_ Total: \_\_\_\_\_

2. On the **ANALYZER 3000**, check that "What fraction of the toys are **monkeys**?" is selected.

A. What fraction of the toys are monkeys? \_\_\_\_\_

B. The **numerator** is the top number of a fraction. Place the cursor on the numerator.

What does the numerator refer to? \_\_\_\_\_

C. The **denominator** is the bottom number of a fraction. Place the cursor on the

denominator. What does the denominator refer to? \_\_\_\_\_

3. Turn off **Show fraction**. Write down the fractions of rabbits and giraffes in your set below.

Fraction of rabbits: \_\_\_\_\_

Fraction of giraffes: \_\_\_\_\_


Turn on **Show fraction** to check your answers. (Set the **ANALYZER 3000** to "What fraction of the toys are **rabbits**?" and to "What fraction of the toys are **giraffes**?")

4. Turn off **Show fraction** and click **Random**. Fill in the first two columns of the table below with the numbers and fractions.

Toy	Number	Fraction	Correct?
Monkey			
Rabbit			
Giraffe			
Total animals			

Use the **ANALYZER 3000** to check your answers. Correct your answers if necessary.



<p><b>Activity B:</b> <b>Bunny fractions</b></p>	<p><u>Get the Gizmo ready:</u></p> <ul style="list-style-type: none"> <li>• Click <b>Clear</b>.</li> <li>• Turn off <b>Show fraction</b>.</li> </ul>	
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At the factory, you receive an order for 8 toys. The order also says that three-quarters ( $\frac{3}{4}$ ) of the toys must be rabbits. How can this be done?

1. Create a set of 8 toys. Drag the toys so there are 4 equally-sized groups.

How many toys are in each group? \_\_\_\_\_

2. If  $\frac{3}{4}$  of the toys are rabbits, then you should be able to make 3 groups of just rabbits and 1 group with no rabbits. Add and remove rabbits and rearrange the toys until you have this.

A. How many rabbits are there, total? \_\_\_\_\_

B. Turn on **Show fraction**. What fraction of the toys are rabbits? \_\_\_\_\_

3. Turn on **Simplify**. A **simplified** fraction is **equivalent** (equal) to another fraction but uses smaller numbers. What do you get when you simplify  $\frac{6}{8}$ ? \_\_\_\_\_

4. Turn off **Show fraction** and **Simplify**. Click **Clear**. Create the following set: 2 monkeys, 4 rabbits, and 6 giraffes. Write the fraction of each kind of toy.

Monkeys: \_\_\_\_\_

Rabbits: \_\_\_\_\_

Giraffes: \_\_\_\_\_

5. Set the **ANALYZER 3000** to “What fraction of the toys are **monkeys**?” Turn on **Simplify**.

A. Click **Group**. How many equally-sized groups are there? \_\_\_\_\_

B. How many of the groups have only monkeys? \_\_\_\_\_

C. Turn on **Show fraction**. What is the simplified fraction of monkeys? \_\_\_\_\_


6. Turn off **Show fraction**. Using the same toys, find the simplified fractions of rabbits and giraffes. Write the original and simplified fractions. (The monkey fractions are done for you.)

Monkeys:  $\frac{2}{12} = \frac{1}{6}$

Rabbits: \_\_\_\_\_ = \_\_\_\_\_

Giraffes: \_\_\_\_\_ = \_\_\_\_\_



<p><b>Activity C:</b> <b>Special orders</b></p>	<p><u>Get the Gizmo ready:</u></p> <ul style="list-style-type: none"> <li>• Click <b>Clear</b>.</li> <li>• Choose the <b>Advanced TOY-O-MATIC</b>.</li> </ul>	
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With the new advanced **TOY-O-MATIC**, you can create colored toys by clicking a color and then clicking a toy. That's a good thing, because special orders are pouring in!

Describe a set of toys that would fill each special order. If you like, click the camera to take a snapshot of each order, and then paste the image into a blank document.

1. Ray's Toys wants 6 toys:  $\frac{1}{3}$  of the toys should be red, and  $\frac{1}{2}$  of the toys should be green.

Description: \_\_\_\_\_

\_\_\_\_\_

2. Hilldale Toy World wants 8 toys:  $\frac{3}{4}$  of the toys should be blue,  $\frac{1}{4}$  of the toys should be giraffes, and there should be at least 4 monkeys.

Description: \_\_\_\_\_

\_\_\_\_\_

3. Ye Olde Toy Shoppe wants a set of toys:  $\frac{1}{4}$  of the toys should be blue, and  $\frac{1}{2}$  of the toys should be green.  $\frac{2}{3}$  of the toys should be giraffes, and  $\frac{1}{4}$  of the toys should be monkeys.

Description: \_\_\_\_\_

\_\_\_\_\_

4. The Spring Grove Drugstore wants 9 toys:  $\frac{1}{2}$  of the giraffes should be green,  $\frac{1}{4}$  of the monkeys should be blue, and  $\frac{2}{3}$  of the rabbits should be red.

Description: \_\_\_\_\_

\_\_\_\_\_

