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. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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

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**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? \_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Activity A:**  **Monkey business** | Get the Gizmo ready:   * Click **Clear**. * Check that **Show fraction** is turned on. | 1005SE3 |

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: \_\_\_\_\_\_\_\_

1. On the **ANALYZER 3000**, check that “What fraction of the toys are **monkeys**?” is selected.
   1. What fraction of the toys are monkeys? \_\_\_\_\_\_\_\_
   2. The **numerator** is the top number of a fraction. Place the cursor on the numerator. What does the numerator refer to? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. The **denominator** is the bottom number of a fraction. Place the cursor on the denominator. What does the denominator refer to? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. 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**?”)

1. 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.

|  |  |  |
| --- | --- | --- |
| **Activity B:**  **Bunny fractions** | Get the Gizmo ready:   * Click **Clear**. * Turn off **Show fraction**. | 1005SE4 |

At the factory, you receive an order for 8 toys. The order also says that three-quarters () 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? \_\_\_\_\_\_\_\_

1. If  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.
   1. How many rabbits are there, total? \_\_\_\_\_\_\_\_
   2. Turn on **Show fraction**. What fraction of the toys are rabbits? \_\_\_\_\_\_\_\_

1. Turn on **Simplify**. A **simplified** fraction is **equivalent** (equal) to another fraction but uses smaller numbers. What do you get when you simplify ? \_\_\_\_\_\_\_\_
2. 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: \_\_\_\_\_\_\_\_

1. Set the **ANALYZER 3000** to “What fraction of the toys are **monkeys**?” Turn on **Simplify**.
2. Click **Group**. How many equally-sized groups are there? \_\_\_\_\_\_\_\_
3. How many of the groups have only monkeys? \_\_\_\_\_\_\_\_
4. Turn on **Show fraction**. What is the simplified fraction of monkeys? \_\_\_\_\_\_\_\_
5. 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:  =  Rabbits: \_\_\_\_\_ = \_\_\_\_\_ Giraffes: \_\_\_\_\_ = \_\_\_\_\_

|  |  |  |
| --- | --- | --- |
| **Activity C:**  **Special orders** | Get the Gizmo ready:   * Click **Clear**. * Choose the **Advanced TOY-O-MATIC**. | 1005SE5 |

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:  of the toys should be red, and  of the toys should be green.

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

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1. Hilldale Toy World wants 8 toys:  of the toys should be blue,  of the toys should be giraffes, and there should be at least 4 monkeys.

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

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1. Ye Olde Toy Shoppe wants a set of toys:  of the toys should be blue, and  of the toys should be green.  of the toys should be giraffes, and  of the toys should be monkeys.

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

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1. The Spring Grove Drugstore wants 9 toys: of the giraffes should be green,  of the monkeys should be blue, and  of the rabbits should be red.

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

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