

Title: A Do Something Day

Brief Overview:

Students will take a trip around their community. They will help community workers solve problems involving equivalent fractions and fractional sets. They will visit a baker at the bakery, a pet shop owner, and the zookeeper. The students will complete a zoo activity using their knowledge of equivalent fractions and parts of a set.

NCTM 2000 Principles for School Mathematics:

- **Equity:** *Excellence in mathematics education requires equity - high expectations and strong support for all students.*
- **Curriculum:** *A curriculum is more than a collection of activities: it must be coherent, focused on important mathematics, and well articulated across the grades.*
- **Teaching:** *Effective mathematics teaching requires understanding what students know and need to learn and then challenging and supporting them to learn it well.*
- **Learning:** *Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.*
- **Assessment:** *Assessment should support the learning of important mathematics and furnish useful information to both teachers and students.*
- **Technology:** *Technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students' learning.*

Links to NCTM 2000 Standards:

- **Content Standards**

- **Number and Operations**

- Students will develop a meaning for fractions as part of a whole. They will recognize and use common fraction equivalents.

- **Data Analysis and Probability**

- Students will organize data, using tables and graphs. They will use their graphs to analyze data. They also will have to justify conclusions based on their data.

- **Process Standards**

Problem Solving

Students will use their ability to solve problems with real-world applications using fractions. They will solve problems using manipulatives, problems in a cooperative group setting, and problems with open-ended answers.

Communication

Students will communicate mathematically by reasoning, writing, and discussing math through the terms associated with fractions.

Connections

Students will use mathematical strategies to solve problems in their community. They will understand how mathematical ideas build on one another to produce a coherent whole.

Representation

Students will create, organize, and communicate mathematical ideas.

Grade/Level:

Grades 3-4

Duration/Length:

This unit will require three to four days.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Recognizing equivalent fractions
- Recognizing fractions as part of a whole
- Expressing thoughts through writing
- Completing a table
- Constructing a pictograph

Student Outcomes:

Students will:

- work in cooperative groups.
- identify fractions as part of a whole.
- identify equivalent fractions.
- organize, record, analyze, and display data.

Materials/Resources/Printed Materials:

- Crayons
- Geoboards
- Fraction Islands
- Unifix cubes
- Pictures of animals
- The Do-Something Day by Joe Lasker
- How Much is That Guinea Pig in the Window? By Joanne Rocklin
- If Anything Ever Goes Wrong at the Zoo by Mary Jean Hendrick and Jane Dryer
- Student Resource Sheets #1-10
- Teacher Resource Sheets #1-11

Development/Procedures:

Day One

- Review and brainstorm a list of places to visit in your community.
- Explain to the students that they will be taking an imaginary trip to a bakery.
- Read the book The Do-Something Day.
- Model equivalent fractions to the students using geoboards. Have students work in groups to generate a list of equivalent fractions. Write the list on the board or the overhead.
- Record in their math journals: “What is an equivalent fraction?” Call on several students who have correctly explained the concept to share their journal entries.
- Distribute Student Resource Sheets 1 and 2.

Day Two

- Explain that today we will take an imaginary trip to a pet store. Generate a list of animals that can be found in a pet store.
- Read the book How Much is That Guinea Pig in the Window?
- Distribute pictures of animals to each student. Have groups of three/four students think of a fractional set that would identify something the animals have in common. Do a sample together, such as: cat, dog, and bird. $\frac{2}{3}$ are mammals. Each group will present their set in front of the class.
- Gather all pictures together on board or rug. Use the pictures to create more fractional sets. Such as, $\frac{1}{2}$ the pets are exotic. How many have beaks?
- Distribute Student Resource Sheets 3 and 4.

Day Three

- Explain that today our last stop on the trip is to the zoo.
- Brainstorm a list of zoo animals. Discuss the types of jobs a zookeeper is responsible for doing at the zoo.
- Read the book If Anything Ever Goes Wrong at the Zoo.
- Review Day One and Day Two Activities with the children.
- Distribute Student Resource Sheets 5 -10. This task may take more than one day.

Performance Assessment:

Each child will complete the zoo task sheets (Student Resource Sheets 5-10) dealing with equivalent fractions and fractional parts of a set. They also will be required to construct a pictograph. A scoring rubric is provided for Student Resource Sheets 5-10 on Teacher Resource Sheet 11.

Extension/Follow Up:

- Explore other places in the community.
- Incorporate probability activities.
- Design other areas in your community, such as a park, using fractional parts.
- Construct other types of graphs with their data.

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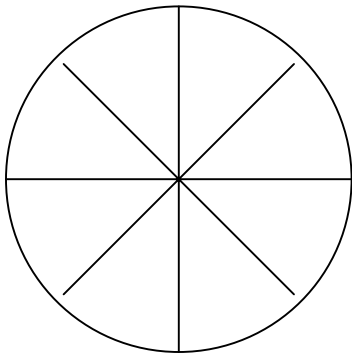
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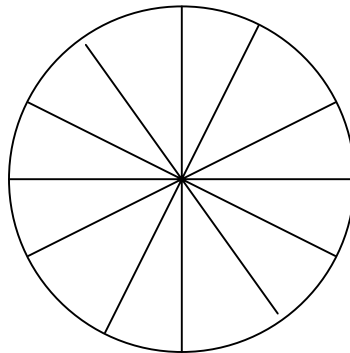
The Cake Place

You have decided to do something today! Your first stop on your “do-something day” is to visit The Cake Place. When you arrive, the baker has a puzzled look upon his face. He asks you to help him solve his fraction dilemma. He is having trouble giving his customers fair shares and decorating his cakes in equal sections. He can't seem to remember how to make equivalent fractions. Can you help him?

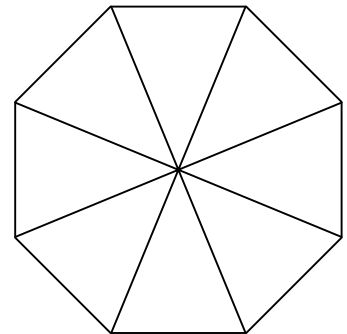
- Below are cakes that the baker has already cut, but they are not the right amounts! You will need to fix these cakes so they have the correct fractional amount. Color the cakes with the right equivalent fraction.



$$\frac{3}{4} = \frac{\quad}{8}$$



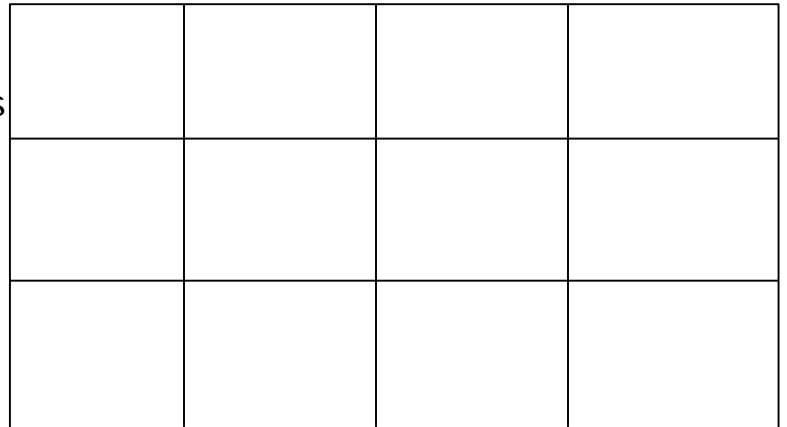
$$\frac{2}{3} = \frac{\quad}{12}$$



$$\frac{1}{2} = \frac{\quad}{8}$$

2. The baker has a huge sheet cake that he needs to decorate. Help him decorate the cake according to his directions. You may use geoboards to help solve this problem.

- $\frac{1}{3}$ pink frosting
- $\frac{1}{2}$ colored sprinkles
- $\frac{1}{6}$ blue flowers



3. Now explain to the baker how you knew a way to decorate the cake.

Name _____ Date _____

The Pet Store

When you arrive at the pet store, you go straight to the fish aquarium. You see some beautifully colored fish. The pet store owner is so glad to see you because a customer wants to buy some fish, but the customer forgot to tell the owner how many fish.

Here is what the customer wants:

- $\frac{1}{5}$ goldfish
- $\frac{1}{4}$ striped fish
- $\frac{3}{10}$ red
- The remainder are black fish, but he forgot the fraction.

If 20 fish will fit in the owner's tank, how many of each fish should he get?

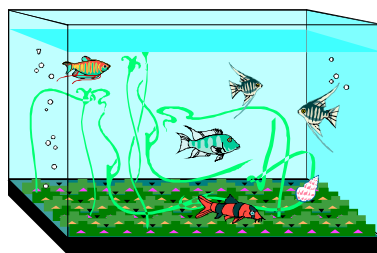
1. Draw and color the correct number of each kind of fish below in the tank. You may use cubes to help you solve this problem.

Fish Tank



2. Look at the fish tank and complete the table.

Fish	Fraction	Number of fish	Explain Your Thinking
Gold			
Striped			
Red			
Black			



Name _____ Date _____




Visit to the Zoo

Task 1

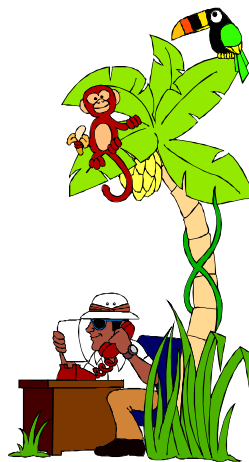
Your last stop is the zoo! When you get there, the zookeeper has a dilemma. He is trying to move the monkeys into new monkey houses. He has 36 monkeys that he must put into 3 houses. Can you help him understand these directions?

1. Put $\frac{1}{2}$ of the monkeys into House A.
2. Put $\frac{2}{3}$ of the monkeys that are left into House B.
3. Put the rest of the monkeys into House C.
4. Write the number in each house below.

You may use cubes to help you solve the problem.

A	B	C
		

5. Explain to the zookeeper how you figured out the correct number of monkeys for each house.



Task 2

The zookeeper would like you to design a new layout for the zoo. Using the grid map and directions below, design a new zoo.

Read all the directions first. You may use geoboards to help you solve the problem.

1. $\frac{1}{4}$ of the space is for giraffes.
2. $\frac{3}{10}$ of the space is for elephants.
3. $\frac{3}{20}$ of the space is for birds.
4. $\frac{1}{4}$ of the space is for monkeys, but they can't be near the birds.
5. $\frac{1}{20}$ of the space is for a watering hole. All animals must be able to get to it.
6. Shade in each area in a different color.
7. Complete the map key to indicate each animal's area.



Map of Zoo

Map Key

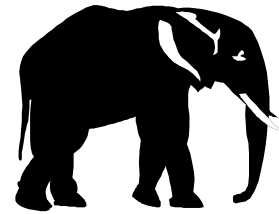
Giraffes Elephants Birds Monkeys Watering Hole

8. Explain why you placed the animals in this way.

Task 3

Now that you have completed the new zoo design, the zookeeper would like to display a graph for visitors, showing how many animals the zoo has. He has asked you to create a pictograph using the data below.

- | |
|---|
| <ul style="list-style-type: none"> • 36 monkeys • 6 elephants • 5 giraffes • 20 birds |
|---|



Key	

1. Explain how a visitor would be able to read your pictograph.

2. Based on your data, write a fraction for each set of animals.
Remember to calculate the total number of animals first.

Monkeys _____

Elephants _____

Giraffes _____

Birds _____

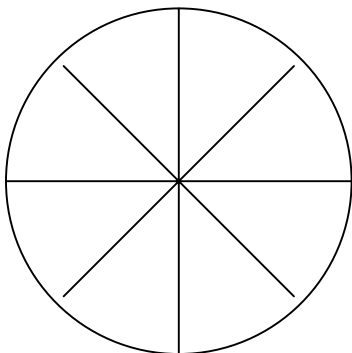
Name _____ Date _____



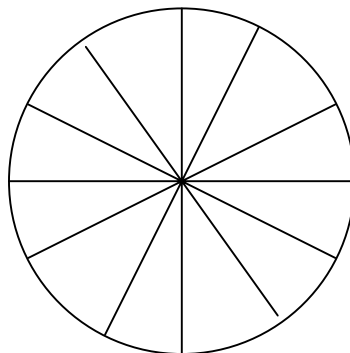
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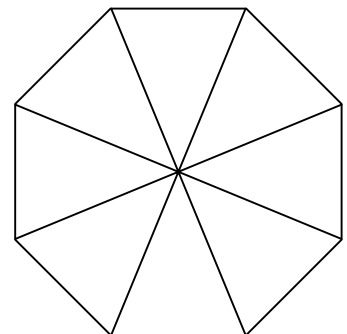
- Below are cakes that the baker has already cut, but they are not the right amounts! You will need to fix these cakes so they have the correct fractional amount. Color the cakes with the right equivalent fraction.



$$\frac{3}{4} = \frac{6}{8}$$



$$\frac{2}{3} = \frac{8}{12}$$



$$\frac{1}{2} = \frac{4}{8}$$

2. The baker has a huge sheet cake that he needs to decorate. Help him decorate the cake according to his directions. You may use geoboards to help solve this problem.

- $\frac{1}{3}$ pink frosting
- $\frac{1}{2}$ colored sprinkles
- $\frac{1}{6}$ blue flowers

$\frac{1}{3} = 4$ squares pink $\frac{1}{2} = 6$ squares sprinkles $\frac{1}{6} = 2$ squares blue

3. Now explain to the baker how you knew a way to decorate the cake.

Answers may vary.

Name _____ Date _____

The Pet Store

When you arrive at the pet store, you go straight to the fish aquarium. You see some beautifully colored fish. The pet store owner is so glad to see you because a customer wants to buy some fish, but the customer forgot to tell the owner how many fish.

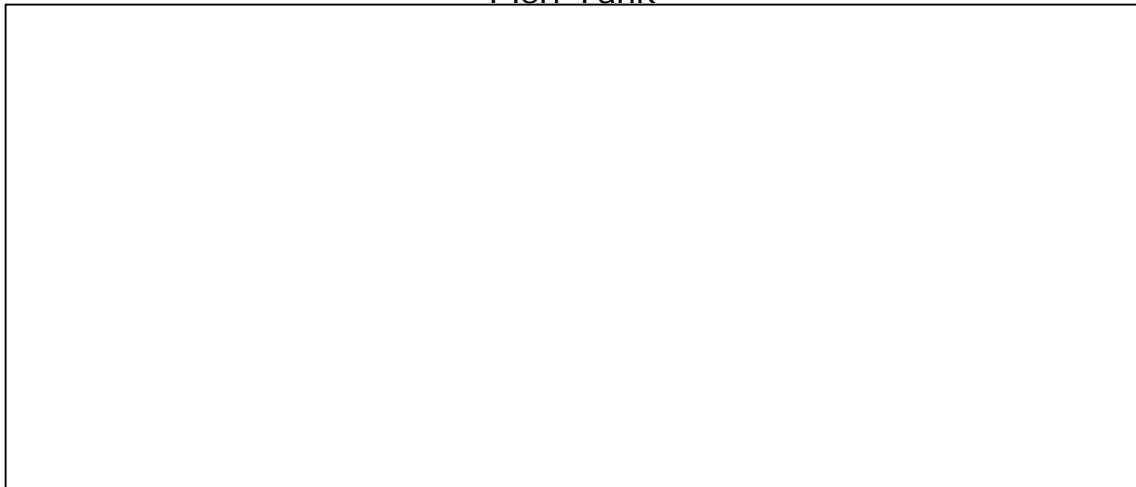
Here is what the customer wants:

- $\frac{1}{5}$ goldfish
- $\frac{1}{4}$ striped fish
- $\frac{3}{10}$ red
- The remainder are black fish, but he forgot the fraction.

If 20 fish will fit in the owner's tank, how many of each fish should he get?

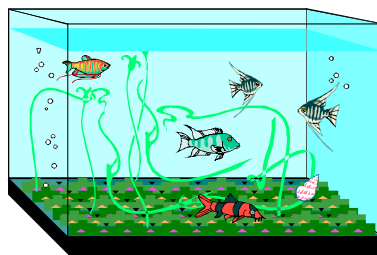
1. Draw and color the correct number of each kind of fish below in the tank. You may use cubes to help you solve this problem.
*See chart on Teacher Resource Sheet 4 for correct number of fish.

Fish Tank



2. Look at the fish tank and complete the table.

Fish	Fraction	Number of fish	Explain Your Thinking
Gold	1/5	4	Answers may vary.
Striped	1/4	5	Answers may vary.
Red	3/10	6	Answers may vary.
Black	1/4	5	Answers may vary.



Name _____ Date _____

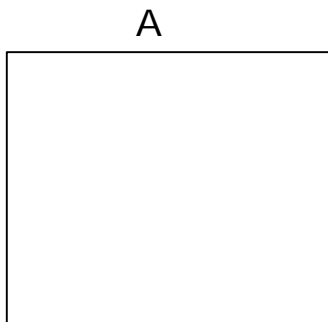
Visit to the Zoo

Task 1

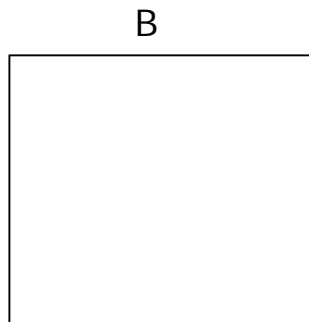
Your last stop is the zoo! When you get there, the zookeeper has a dilemma. He is trying to move the monkeys into new monkey houses. He has 36 monkeys that he must put into 3 houses. Can you help him understand these directions?

1. Put $\frac{1}{2}$ of the monkeys into House A.
2. Put $\frac{2}{3}$ of the monkeys that are left into House B.
3. Put the rest of the monkeys into House C.
4. Write the number in each house below.

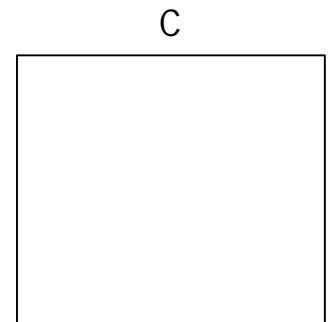
You may use cubes to help you solve the problem.



*18 monkeys



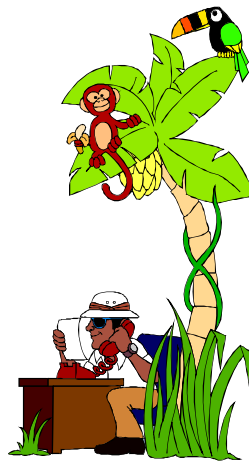
*12 monkeys



*6 monkeys

5. Explain to the zookeeper how you figured out the correct number of monkeys for each house.

***Answers may vary**



Task 2

The zookeeper would like you to design a new layout for the zoo. Using the grid map and directions below, design a new zoo. Read all the directions first. You may use geoboards to help you solve the problem.

1. $\frac{1}{4}$ of the space is for giraffes
2. $\frac{3}{10}$ of the space is for elephants
3. $\frac{3}{20}$ of the space is for birds
4. $\frac{1}{4}$ of the space is for monkeys, but they can't be near the birds
5. $\frac{1}{20}$ of the space is for a watering hole. All animals must be able to get to it.
6. Shade in each area in a different color.
7. Complete the map key to indicate each animal's area.



Map of Zoo

Map Key

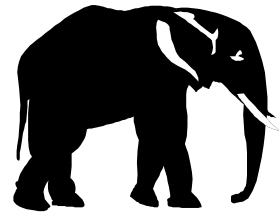
Giraffes Elephants Birds Monkeys Watering Hole
*5 squares *6 squares *3 squares *5 squares *1 square

8. Explain why you placed the animals in this way. (Answers may vary.)

Task 3

Now that you have completed the new zoo design, the zookeeper would like to display a graph for visitors, showing how many animals the zoo has. He has asked you to create a pictograph using the data below.

- 36 monkeys
- 6 elephants
- 5 giraffes
- 20 birds



___Title of Graph___

<p>Animal order may vary.</p>	<p>Number of symbols drawn must match data and key.</p>
<p>Key</p>	

1. Explain how a visitor would be able to read your pictograph.

***Answers may vary.**

2. Based on your data, write a fraction for each set of animals.
Remember to calculate the total number of animals first.

Monkeys _____ **36/67**

Elephants _____ **6/67**

Giraffes _____ **5/67**

Birds _____ **20/67**

Scoring Rubrics for Student Resources 5-10

Task One

- 3** - Student has all the correct answers and their written response shows thorough mathematical reasoning.
- 2** - Student has two correct answers and their written response shows adequate mathematical reasoning.
- 1** - Student has one of the correct answers and their written response some mathematical reasoning.
- 0** - Student has no correct answers and their written response shows little or no mathematical reasoning.

Task Two

- 3** - Student has correctly followed all the directions for this task. Student's written response shows thorough mathematical reasoning.
- 2** - Student has correctly shaded in three of the five fractional parts. Written response shows adequate mathematical reasoning.
- 1** - Student has correctly shaded in two or one of the five fractional parts. Written response shows some mathematical reasoning.
- 0** - Student has not correctly followed any of the directions. Written response shows little or no mathematical reasoning.

Task Three

- 3** - Student has included all elements of a pictograph (title, data, key). Student shows a thorough explanation of their graph. Student shows correct fractional sets.
- 2** - Student is missing 1 element on their graph. Student shows an adequate explanation of their graph. Student shows 2 correct fractional sets.
- 1** - Student is missing 2 elements on their graph. Student shows some explanation of their graph. Student shows 1 correct fractional set.
- 0** - Student has 3 or more errors on their graph. Student shows no understanding of their graph. Student has no correct fractional sets.