The Meaning of Fractions

Overview

This activity:

- Uses hands on materials to explore the meaning of fraction words and symbols
- Begins with familiar, everyday fractions such as ½ , ¼ and ¾
- Extends the concept and notation to make sense of other fractions
- Uses circle shapes because it is the easiest to see when you have the whole

The circles can be thought of as cakes or pizzas and so build on the natural idea of sharing slices among people.

Skills and Knowledge

- Identifying simple fractions
- Naming fractions using words and symbols
- Relationship between some simple fractions

Preparing the Fraction Circle Kits for this activity does require time and effort. But they are a valuable teaching resource that can be used over and over again, so it is well worth the effort.

Preparation and Materials

Fraction Circle Kits
(Make 1 kit per 2 or 3 students.)

You will need 7 different colours of card or stiff paper.

Photocopy Activity Sheets 2 - 8 onto the card, using a different colour for each fraction, for example: white for the whole, red for halves; pink for quarters, green for thirds, etc

Cut the pieces and place each set in a labelled envelope so that each set contains 2 halves, 4 quarters, 3 thirds etc.

Photocopy Practice Sheet *Naming Fractions* (1 per student)

Collect some scrap A4 paper (at least 1 per student)

For later practice
Make 1 copy per students of Practice Sheets: *Fractions in the Kitchen* 1 & 2

Suggested Procedure

Arrange students into pairs (or the smallest groupings possible) to ensure they all have a chance to examine the fraction pieces and use the language of fractions by talking to each other.

Distribute one Fraction Circle Kit to each pair or group. Explain:

- *We are going to use the kits to explore a few things about fractions*
- *Some things you possibly know and some you may not*

Reassure your adult students that using the pieces may give them a different understanding of fractions than before. These are not childish things, adult students all over the world have used them and they find them very valuable.

Ask students to empty the kit onto the table and examine what is in it for a few minutes.

Encourage them to move pieces around and play with them before commencing the activity formally. [This allows them to become familiar with what's in the kit before they starting to use it. It also gives you a chance to circulate and listen to whether students use fraction language naturally.]

Introducing the activity: fraction concepts, words and symbols

Ask:

- *Arrange the pieces so that you have circles made of only one colour*

Explain:

- *We are going to use these circles so leave them on the table so you can see them clearly*

Pick up the whole circle and explain that this is the whole thing (you might want to imagine it as a whole pie, or cake or pizza).

Distribute Activity Sheet 1 (1 per student)

Copy the table onto the board for use in the activity.

Colour	*Symbol*	*Name*

Fill it in together as you ask learners the following type of questions.

Pick up a red piece (one half) and ask:

- *What do we call this in English?*
- *How do you say it?*
- *How do you spell it?*
- *How do you write it as a symbol?*
- *What does the symbol actually mean?*
- *What does it tell us?*

*You want students to understand that the symbol ½ means that the whole circle has been cut into 2 pieces, that they are **equal in size**, and this ½ piece is **one** of those pieces.*

Continue with all of the colours, filling in the table as you go. [Students for whom English is not a first language may need plenty of time to practice pronouncing the words for fractions, especially things like 'eighths' or 'tenths' but they usually have fun with that aspect.]

Extending the idea and language

Suggest some 'what if' scenarios to consolidate the idea, until you are sure it is clear:

- *What if we had seven (or sixteen or twenty) pieces?*
- *What would you write?*
- *How would you say it?*

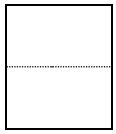
The table that you and the students have filled in should be kept for reference later - either in this session or another day, depending on students' familiarity with the ideas so far.

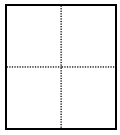
Check the concepts with a different shape

Take a piece of scrap A4 paper, and tell students you are going to make fractions with it.

Fold it in half, then in half again, asking as you go:

- *What fraction is this?*
- *And this?*





You might prefer to give the students the paper to fold themselves and circulate asking the questions individually.

Challenge them to see who can make the smallest fraction by halving each time.

It is a good idea to open the paper out so students can see the 4 quarters in the paper as a check.

Before making the next fold ask:

- *What fraction do you think we will get if I fold it again?*

Repeat this until it is not possible to go any further.

Encourage students to count the sections each time, and then decide on the fraction symbol and word. [You can't usually go further than 32 sections]

Extending to more than one piece

Focus again on the pieces of the Fraction Kit.

Pick up three of the one quarter pieces and ask:

- *What do we call this fraction – three of them together like this*?

Explain:

- *That when we write the fraction ¾, it means that the pieces are each ¼ in size*
- *And we have three of them*
- *In other words, the bottom number is telling us how big or what colour the pieces are, and the top number is telling us how many of them we have*

Ask students to:

- *Use the fraction pieces to make the following fractions:*

$^{3}/_{4}$ $^{5}/_{8}$ $^{3}/_{10}$ $^{4}/_{5}$ $^{2}/_{10}$

Check that all have the right idea before going further.

*If any students have heard the terms 'numerator' and 'denominator' before you might want to clarify them. The top number, the **numerat**or – 'numerates' or counts the number; the bottom number, the de**nom**inator – 'names' the type of fraction. But at this level the terms do not need to be used and may just cause bad memories for some learners.*

Same idea - different shape

Distribute some coloured pencils or textas and a piece of scrap A4 paper to each student. (They can use the paper they folded earlier if they did the folding themselves.)

The next segment could be done in two possible ways:

- One by one as a whole class (so students can listen to, and interpret the fraction as you say it aloud).
- Students working individually with your assistance from a list on the board (perhaps better if they differ greatly in ability).

Explain:

- *You will be using different colours to show some fractions on this paper*
- *You will need to fold the paper to make the fractions first*
- *Then colour and label the fractions:*
  - *one eighth*
  - *two eighths*
  - *three eighths*
  - *one sixteenth*
  - *two sixteenths*
  - *five sixteenths*

You may want to can draw students' attention to some fractions being equal to others during this exercise, for instance,2/8 is the same as a quarter and 2/16 is the same as one eighth. However, this is not intended to be turned into a lesson on equivalent fractions and their associated rules.

The idea of equivalence between fractions is explored in the Activity: Exploring Fraction Sizes.

Practice Sheets: *Naming Fractions 1 & 2* provide further practice at interpreting fraction symbols and names.

Practice Sheets: *Fractions in the Kitchen 1 & 2* require students to draw in the fraction lines to create fractions themselves.

Naming Fractions

Activity Sheet 1

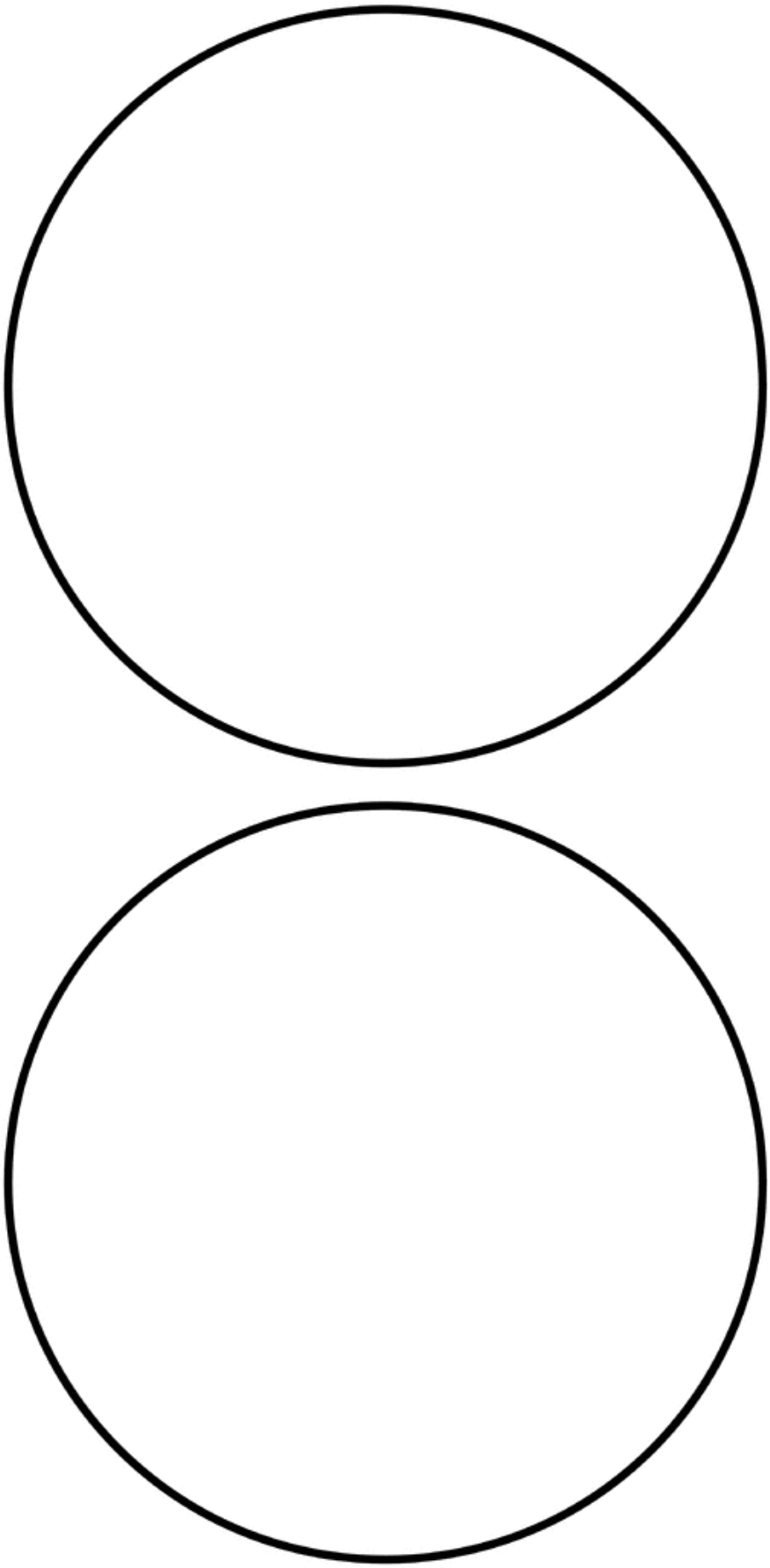
Fi in the table using the fraction pieces in your kit:

Colour	Symbol	Name
	1	one whole

Activity Sheet 2

1 whole

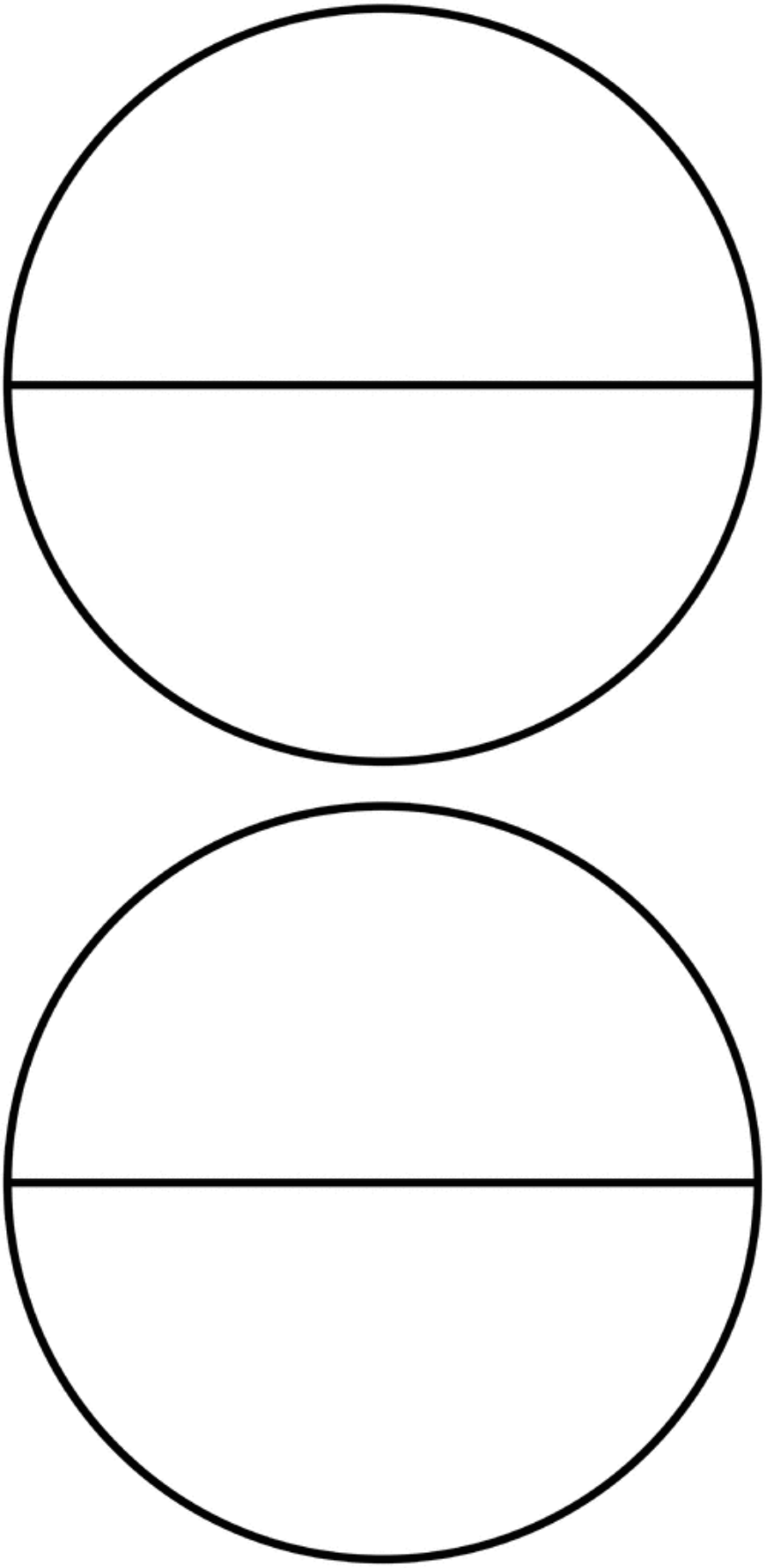
Naming Fractions



Activity

halves

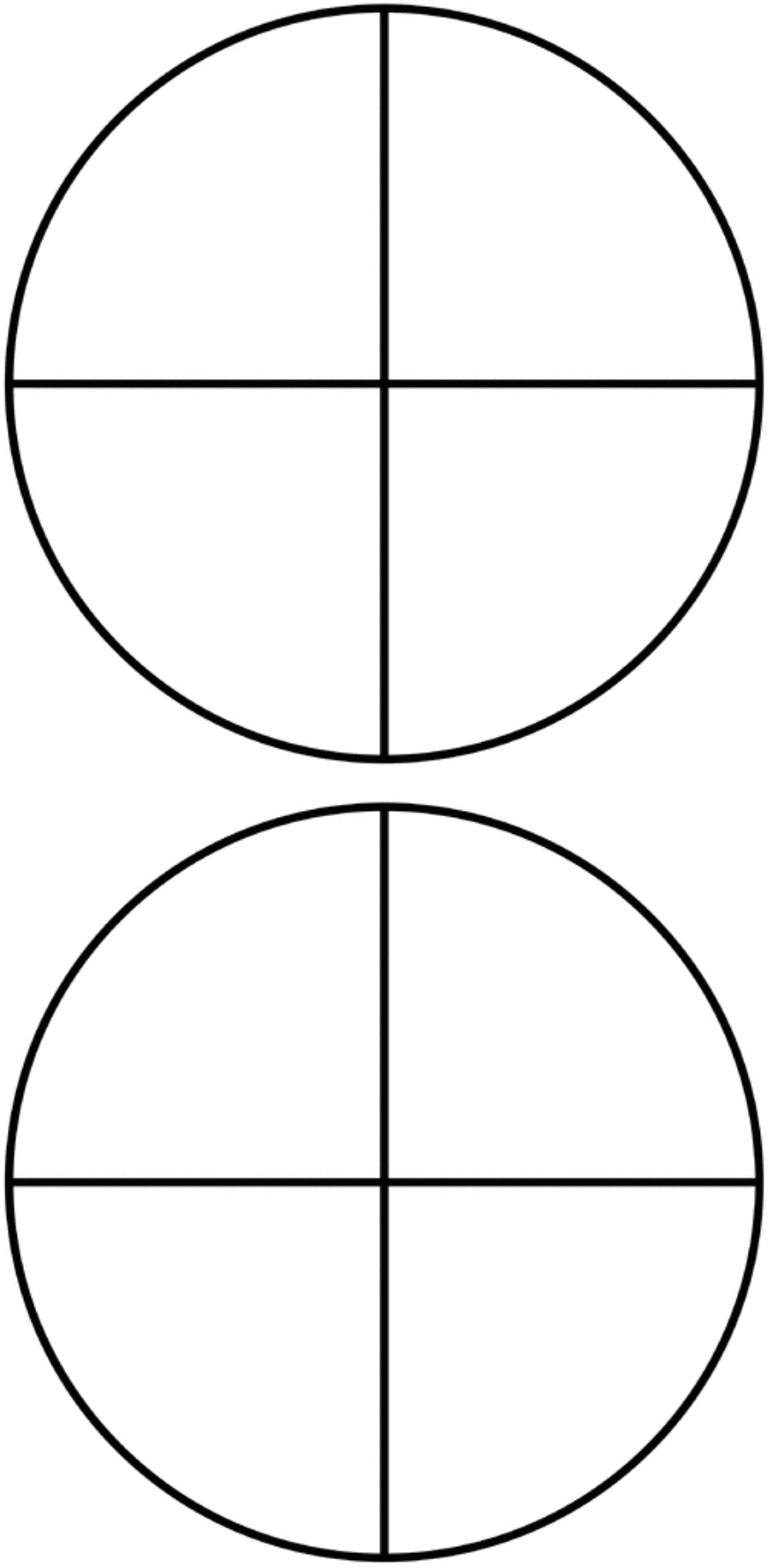
Naming Fractions



Naming Fractions

quarters

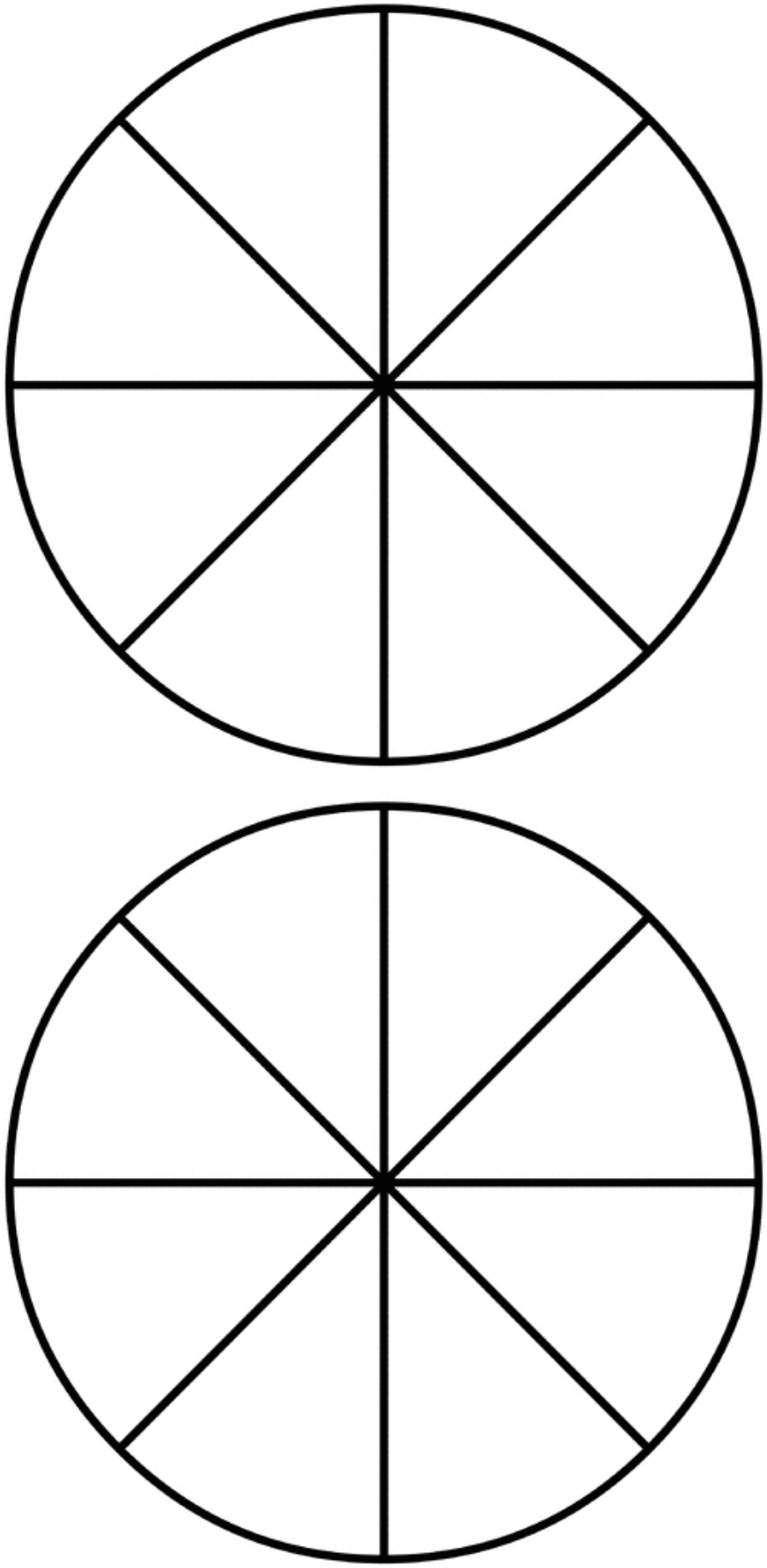
Activity Sheet 4



Activity Sheet 5

eighths

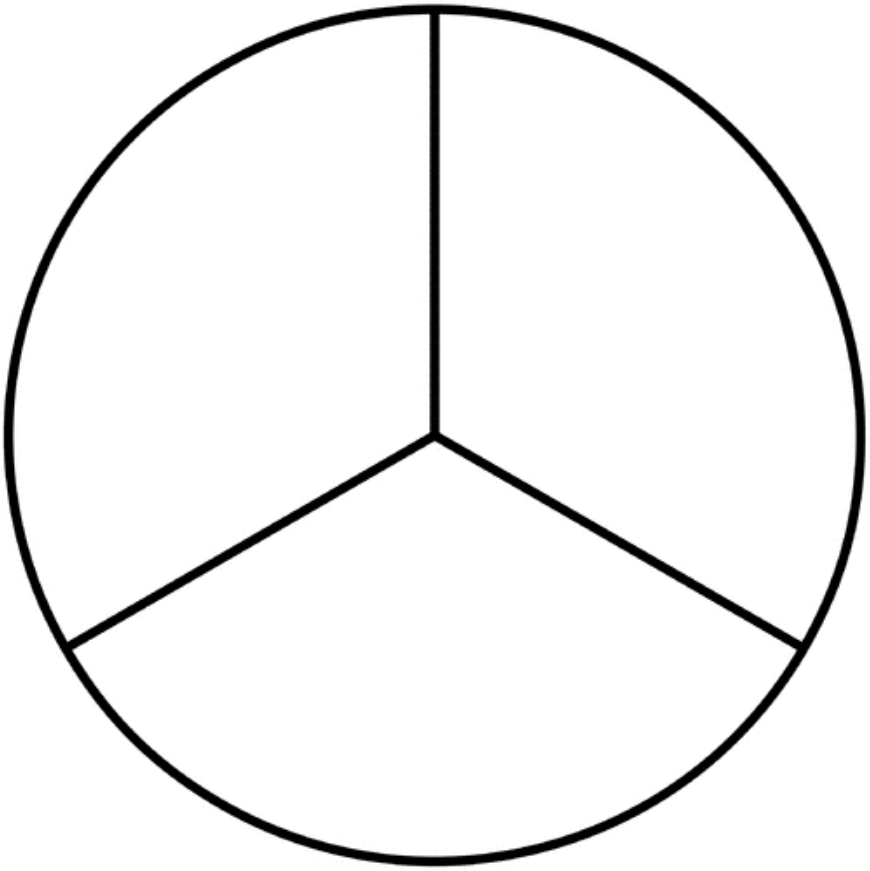
Naming Fractions

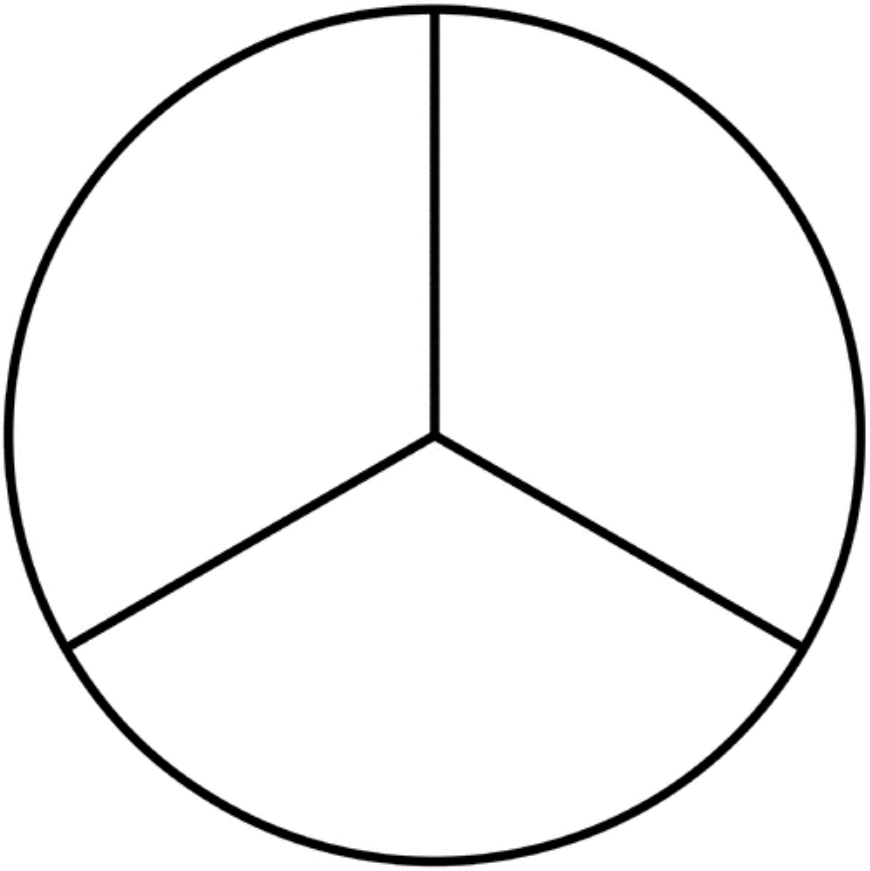


Activity Sheet 6

thirds

Naming Fractions

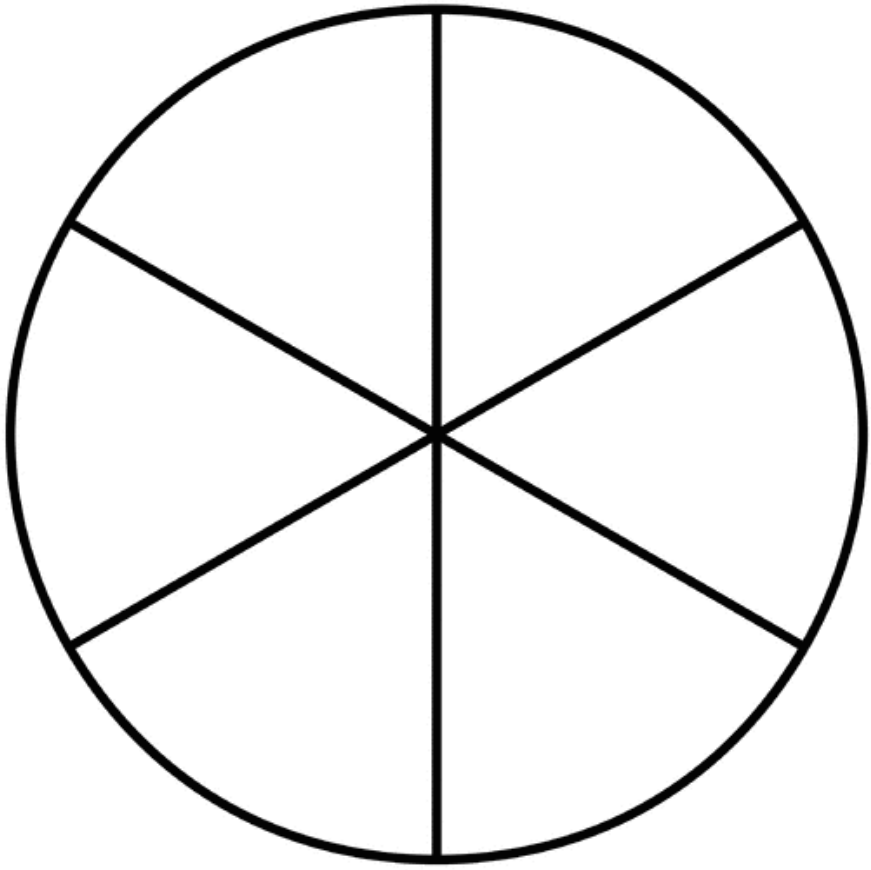


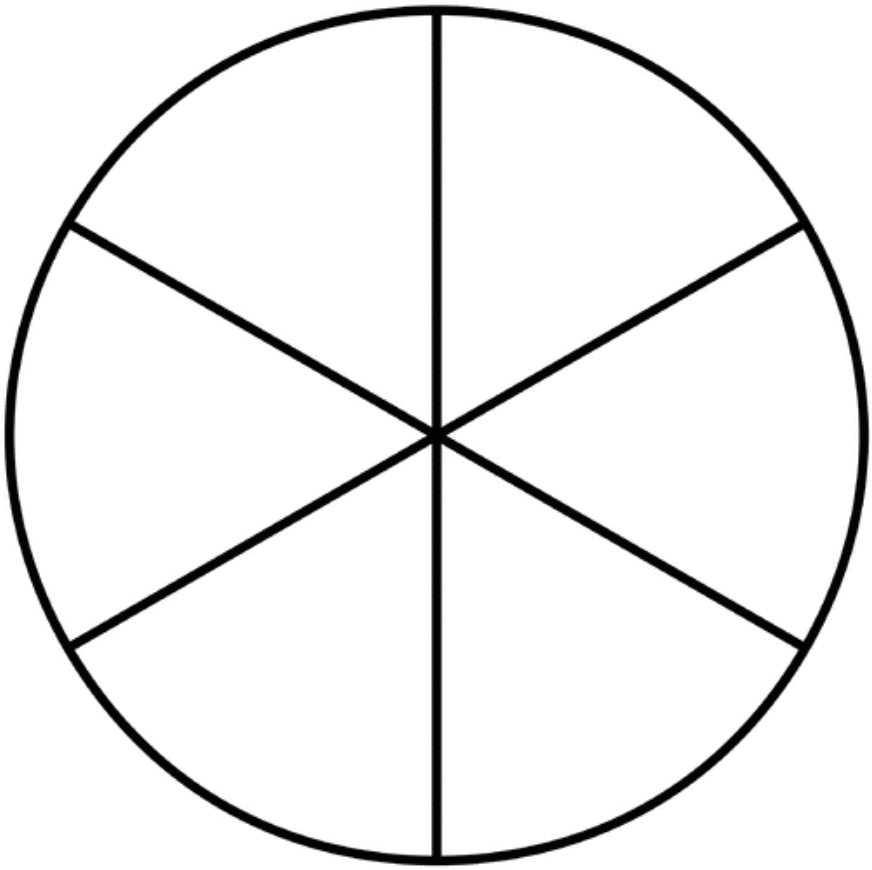


Activity Sheet 7

sixths

Naming Fractions

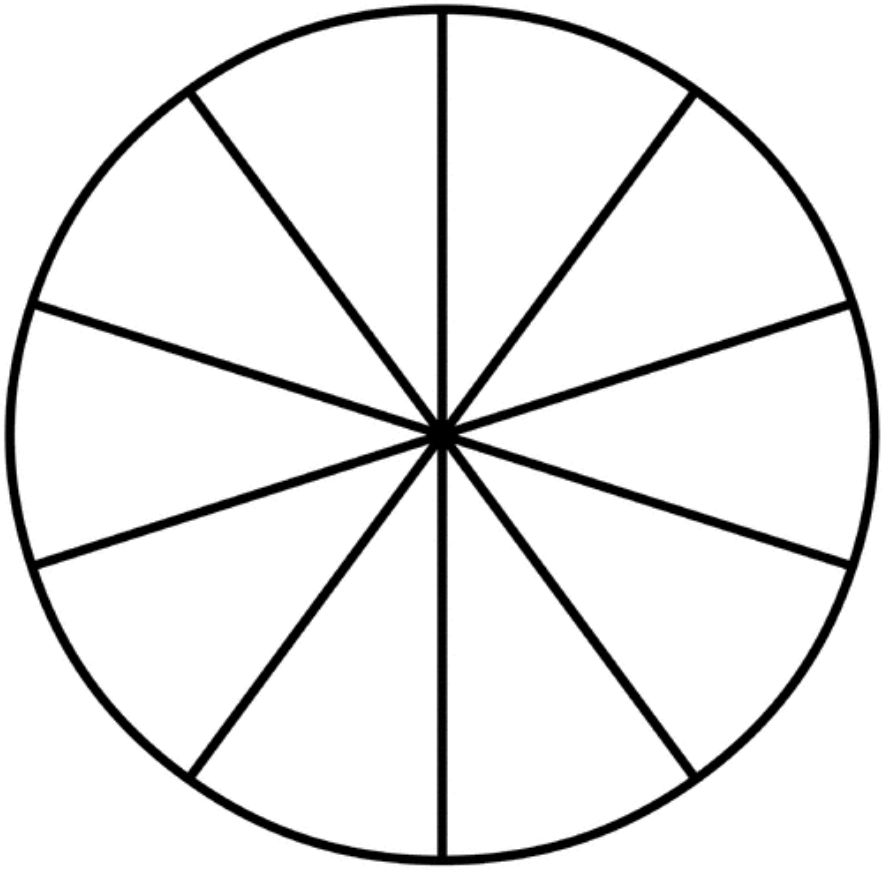


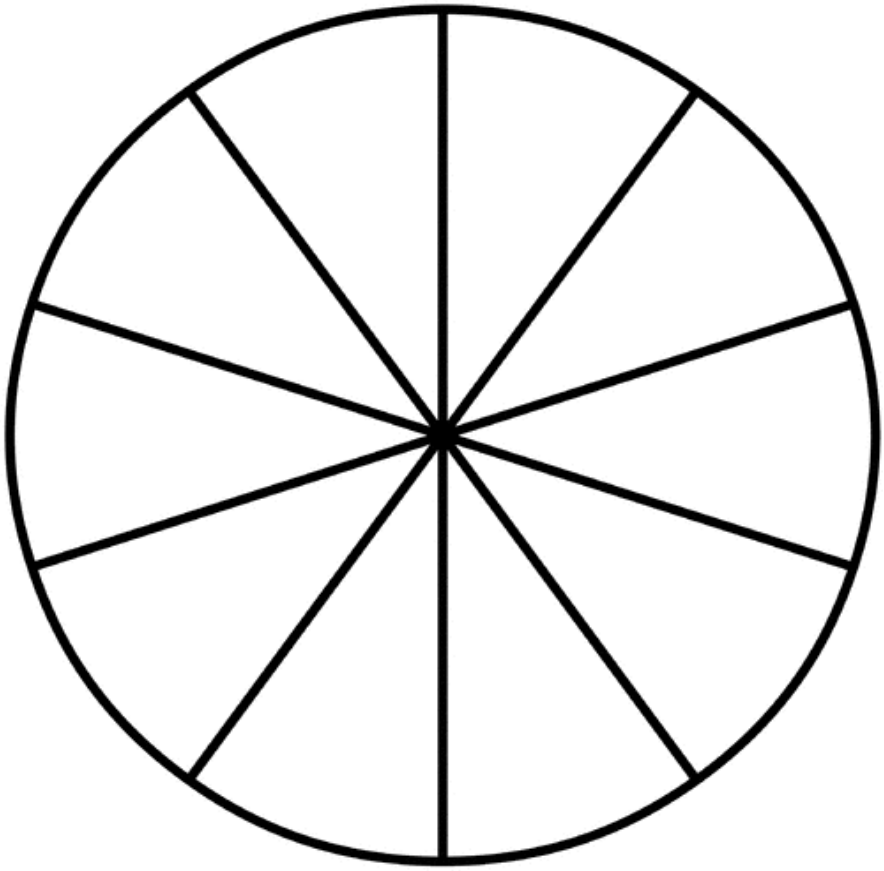


Activity Sheet 8

tenths

Naming Fractions

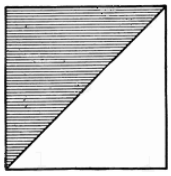
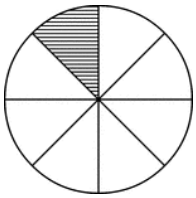
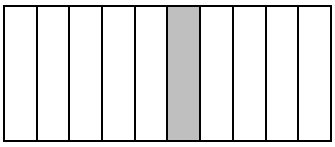
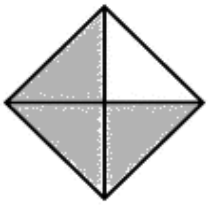
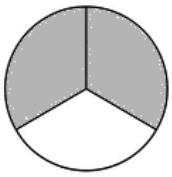
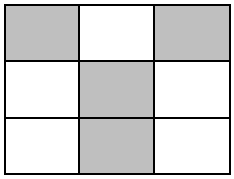
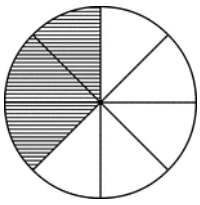
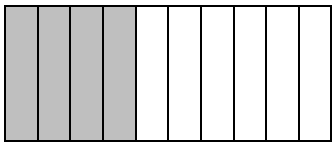
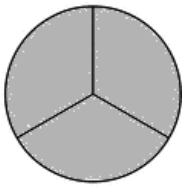




Naming Fractions

Practice Sheet 1

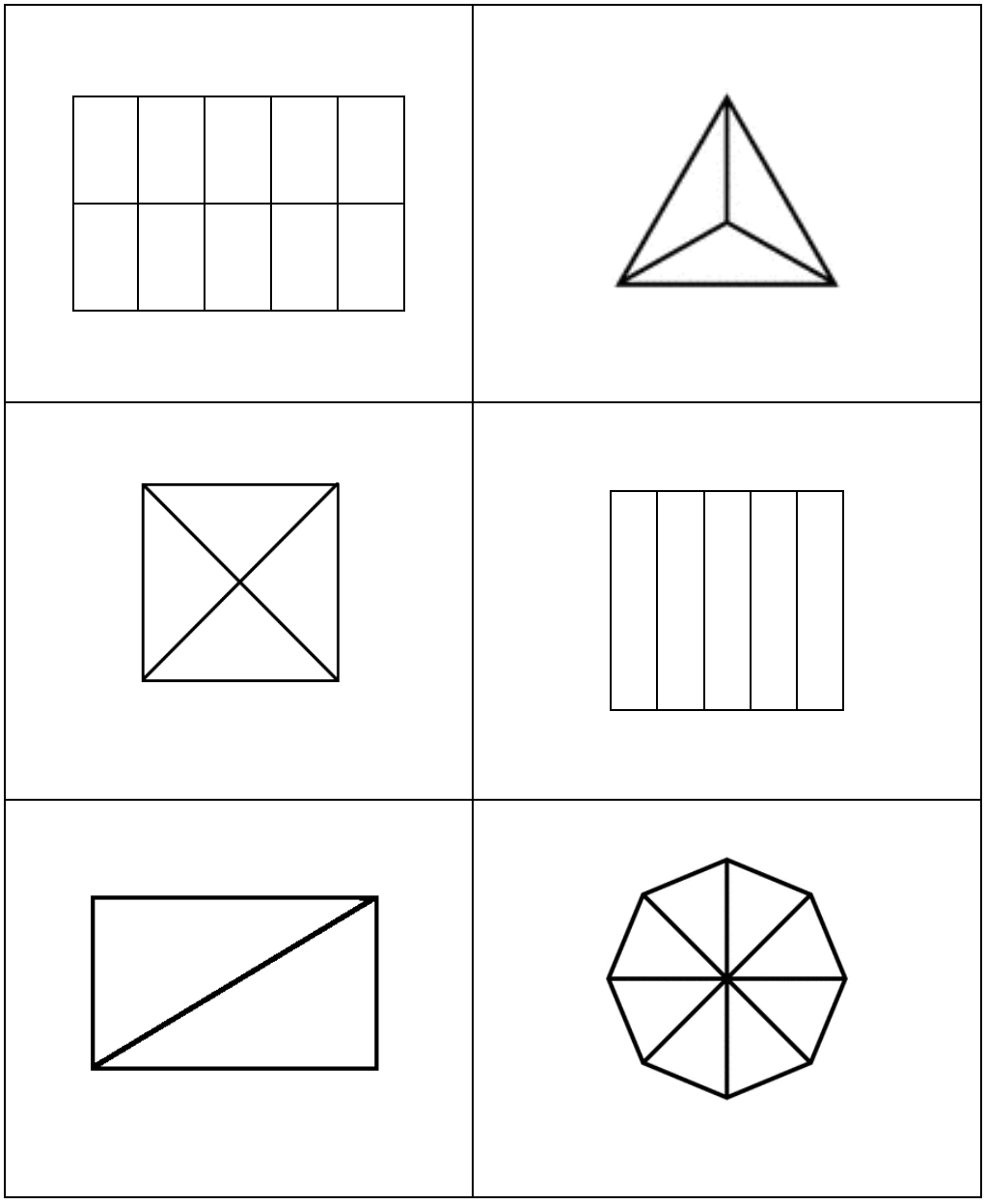
What fraction is shaded?

 Fraction symbol: …… Word: ……..	 Fraction symbol: …… Word: ……..	 Fraction symbol: …… Word: ……..
 Fraction symbol: …… Word: ……..	 Fraction symbol: …… Word: ……..	 Fraction symbol: …… Word: ……..
 Fraction symbol: …… Word: ……..	 Fraction symbol: …… Word: ……..	 Fraction symbol: …… Word: ……..

Naming Fractions

Practice Sheet 2

Choose the best shape and colour in these fractions: $^{1}/_{2}$ $^{2}/_{3}$ $^{3}/_{4}$ $^{3}/_{8}$ $^{4}/_{5}$ $^{1}/_{10}$



Fractions in the kitchen 1 Practice Sheet 3

Draw marks on the sides of these and then fill them to the fractions.

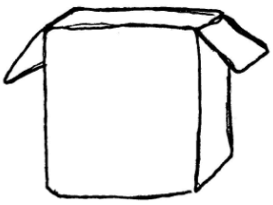
1/2 cup

1/4 cup

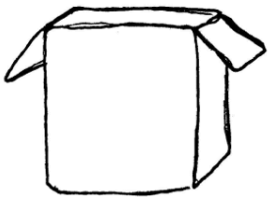
3/4 cup

1/3 cup

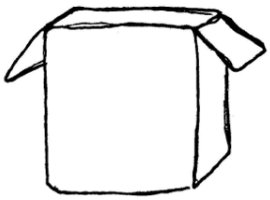
2/3 cup



1/4 box



1/5 box



2/5 box

1/2 bottle

2/3 bottle

4/5 bottle

2/4 bottle

Fractions in the kitchen 2 Practice Sheet 4

A litre holds 4 cups.

Mark the level when it is filled with:

1 cup

Fraction: ……

2 cups

Fraction: ……

3 cups

Fraction: ……

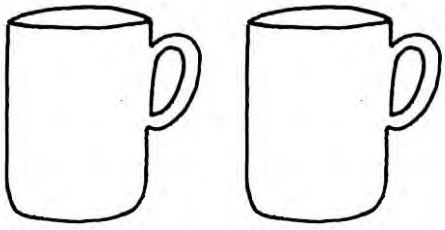
Here is a cake recipe:

$^1/_2$ cup butter	2 eggs
$^2/_3$ cup sugar	spices
$1^1/_2$ cups of flour	

Mark the levels on the cups

butter

sugar



flour

Four children share an apple. How much apple does each get?