


## Grade 4 Mathematics

### Number and Number Relations: Lesson 19

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol (  ) by them.

#### *Purpose of Lesson 19:*

- In this lesson, the tutor and the students will
  - ✓ locate fractions on a number line, and
  - ✓ use number sense and estimation skills with fractions.

#### *Equipment/Materials Needed:*

- Copies of Student Sheet 95
- Paper and pencils
- Chalkboard
- Blank sheets of paper for each student

#### *Preparations before beginning Lesson 19:*

- Run one copy of Student Sheet 95 for each student.
- Have paper and pencils available.
- Have blank paper available.

## Lesson 19: Number and Number Relations

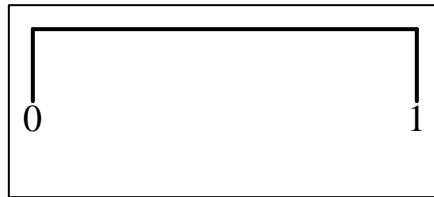
Say:

**In Lesson 18 of Number Relations, you looked at whole numbers on a number line. In this lesson, you are going to look at fractions on a number line. You are going to pretend to enlarge part of a ruler, the part between 0 and 1.**

Give students a blank sheet of paper. You need to demonstrate each step the students fold and label.

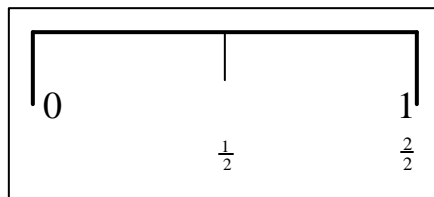
Say:

**Turn your sheet of paper sideways. Draw a line across the top of the paper from end to end. On each side of the paper, draw a line that starts at the top line and runs about halfway down the page. Get as close to the edges as possible. Label the line on the left, 0, and the line on the right, 1.**



Say:

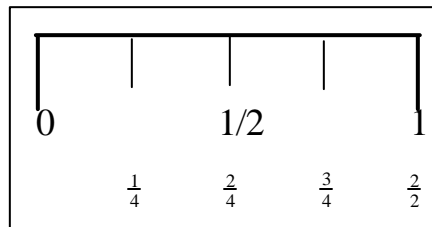
**Fold the paper in half.** You may need to show the students which way to fold the paper. **On the fold line, draw a line from the top line about half as long as the 0 and 1 lines.** Ask questions, such as the following: **When you folded the paper, how many pieces or parts were formed? (2) How far is it from the 0 line to the fold line? ( $\frac{1}{2}$  unit) What should we label the line as? ( $\frac{1}{2}$ ) How much farther is it to the 1 line? ( $\frac{1}{2}$  unit more) How many halves are in 1? (2)**



🕒 Have the students fold the paper in half again.

Say:

**On the new fold lines, draw a line from the top line about half as long as the 0 and 1 lines. Ask questions such as the following: When you folded the paper this time, how many pieces or parts were formed? (4) How far is it from the 0 line to the first fold? ( $\frac{1}{4}$  unit) Let's label this line as  $\frac{1}{4}$ . Look at  $\frac{1}{2}$ . How far is it to the  $\frac{1}{2}$  line in fourths? ( $\frac{2}{4}$  units) Let's write  $\frac{2}{4}$  under  $\frac{1}{2}$ . What should we label the third fold line? ( $\frac{3}{4}$ ) How far is it from 0 to 1 in fourths? ( $\frac{4}{4}$  units) How many fourths are in 1? (4) How many fourths are in  $\frac{1}{2}$ ? (2) Which is less  $\frac{1}{4}$  or  $\frac{3}{4}$ ? ( $\frac{1}{4}$ ) Is  $\frac{1}{4}$  closer to 0 or 1? (0)**

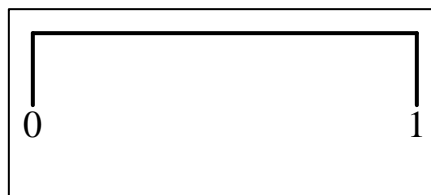


🕒 Have the students fold their papers in half again. Ask similar questions to the ones you asked for the fourths. This time you will be working with  $8^{\text{ths}}$ . To study a ruler, you should go to 16ths; but since students at this grade level do not have to know 16ths, I recommend you only go to 8ths.

🕒 Set that paper aside. Give the students a new blank sheet of paper.

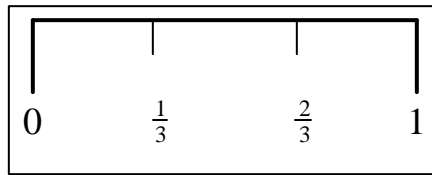
Say:

**Turn your sheet of paper sideways. Draw a line across the top of the paper from end to end. On each side of the paper, draw a line that starts at the top line and runs about halfway down the page. Get as close to the edges as possible. Label the line on the left, 0, and the line on the right, 1.**



Say:

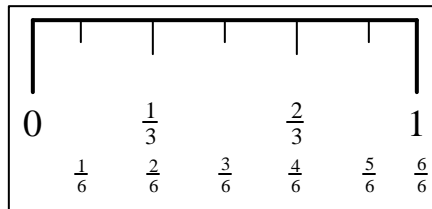
**This time we are going to fold the paper into thirds. Thirds are harder to fold.** Show the students how to fold a letter. **On the two fold lines, draw a line from the top line about half as long as the 0 and 1 lines. What should we label these lines?** ( $\frac{1}{3}$  and  $\frac{2}{3}$ .) **Why?** (We have 3 pieces or parts, so each one is one-third.) **Could we give the mark labeled with the number 1 another name?** (Yes,  $\frac{3}{3}$ .) **Is  $\frac{1}{3}$  closer to 0 or 1?** (0) **Is  $\frac{2}{3}$  closer to 0 or 1?** (1) **Which fraction is larger,  $\frac{1}{3}$  or  $\frac{2}{3}$ ?** ( $\frac{2}{3}$ )



🔧 Have the students fold the paper in halves this time. This fold will give the students six pieces or parts.

Say:

**We have three new fold lines. On each new fold line, draw lines from the top line about half as long as the  $\frac{1}{3}$  and  $\frac{2}{3}$  lines.** See whether the students can label the new lines on their own.



Ask questions such as these: **Did you find another name for  $\frac{2}{3}$ ?** (Yes,  $\frac{4}{6}$ .)

**Did you find another name for 1?** (Yes,  $\frac{6}{6}$ .) **Is  $\frac{1}{3}$  greater than  $\frac{2}{3}$ ?** (No.)

**Is  $\frac{5}{6}$  closer to 0 or 1?** (1) **Can you think of another name for  $\frac{3}{6}$ ?** (Yes,  $\frac{1}{2}$ .)

🔧 Give students Student Sheet 95. This first part of this sheet will focus on fractions in word problems.

Answers:

1. Drew
2. Monday
3. The last recipe or the one with  $\frac{1}{8}$  cup of milk
4. yellow

5 – 8. Answers will vary. Any of the following answers are correct.

5.  $\frac{1}{9}, \frac{1}{8}, \frac{1}{7}, \frac{1}{6}, \frac{2}{6}$ , etc.


6.  $\frac{7}{8}, \frac{3}{4}, \frac{8}{9}$ , etc.

7.  $\frac{1}{7}, \frac{1}{6}, \frac{1}{5}, \frac{1}{4}, \frac{1}{3}, \frac{2}{6}$ , etc.

8.  $\frac{1}{5}, \frac{1}{6}, \frac{1}{7}$ , etc.

9.  $\frac{1}{10}, \frac{1}{9}, \frac{1}{8}, \frac{1}{7}, \frac{1}{6}, \frac{1}{5}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}$

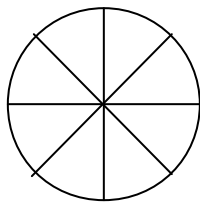
10.  $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}$

 Have one student summarize today's lesson. Visualizing fractions on a number line can help students understand the size relationships among fractions.

## Student Sheet 95 (Number Relations: Lesson 19)

Answer the following questions. Think about your number lines as you answer the questions.

1. Al, Barbara, Charmain, and Drew each ordered a large pizza. Al ate  $\frac{1}{8}$  of his pizza; Barbara ate  $\frac{2}{8}$  of her pizza; Charmain ate  $\frac{5}{8}$  of her pizza, and Drew ate  $\frac{7}{8}$  of his pizza. Who ate the most pizza?
2. After a hurricane a few years ago, many students were absent from school. In Ms. Elliot's class on Monday,  $\frac{1}{2}$  of the students were absent. On Tuesday,  $\frac{1}{3}$  were absent. On Wednesday,  $\frac{1}{8}$  were absent, and on Thursday,  $\frac{1}{6}$  were absent. On which day were the most students absent?
3. Debra was making cookies. She had 4 recipes in front of her. One recipe called for  $\frac{1}{2}$  cup of milk, one called for  $\frac{3}{4}$  cup of milk, one called for  $\frac{1}{3}$  cup of milk and the last one called for  $\frac{1}{8}$  cup of milk. Which recipe needed the least amount of milk?
4. Naomi made a spinner that looked like the one below.



She colored  $\frac{1}{8}$  of the spinner red,  $\frac{1}{4}$  of the spinner blue,  $\frac{2}{8}$  of the spinner green, and  $\frac{3}{8}$  of the spinner yellow. Which color was used most?

## Student Sheet 95 (Number Relations: Lesson 19) continued

Answer the following questions. Think about your number lines as you answer the questions.

5. Name a fraction that is closer to 0 than to 1.

6. Name a fraction that is closer to 1 than to 0.

7. Name a fraction that is between  $\frac{1}{8}$  and  $\frac{1}{2}$ .

8. Name a fraction that is between  $\frac{1}{4}$  and  $\frac{1}{10}$ .

9. Put these fractions in order from smallest to largest.

$$\frac{1}{8}, \frac{1}{2}, \frac{1}{4}, \frac{1}{3}, \frac{1}{7}, \frac{1}{5}, \frac{1}{6}, \frac{1}{10}, \frac{1}{9}$$

10. Put these fractions in order from smallest to largest.

$$\frac{1}{8}, \frac{5}{8}, \frac{7}{8}, \frac{2}{8}, \frac{3}{8}, \frac{6}{8}, \frac{8}{8}, \frac{4}{8}$$