Big Idea(s):

Fractions with different numerators and denominators can represent the same part of a whole.

Essential Question(s):

How do we know when two fractions are equivalent?

Content Standard(s):

Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{(n \times a)}{(n \times b)}$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Mathematical Practice or Process Standard(s):

Model with mathematics.

Look and make use of structure.

Learning Intention(s):

Mathematical Learning Intentions

We are learning to:

- Use a model to demonstrate how two fractions are equivalent
- Create fractions that are equivalent to another fraction

Language Learning Intentions

We are learning to:

- Explain why two fractions are equivalent using the words for the parts of the fraction (numerator, denominator)

Social Learning Intentions

We are learning to:

- Listen to each other's explanations about equivalence
- Ask questions about other students' thinking
- Politely challenge or disagree with explanations
- Apply my reasoning about equivalence to different kinds of fraction models

Success Criteria (written in student voice):

I know I am successful when I can:

- Show equivalent fractions with models
- Recognize that two fractions are equivalent
- Find a fraction that is equivalent to another fraction
- Use the correct words to describe why two fractions are equivalent
- Participate in a class discussion about equivalent fractions
- Use the rules I found for equivalent fractions with several different models

Purpose:

☐ Conceptual Understanding ☐ Procedural Fluency ☑ Transfer

(*Continued*)

Task:

Carol's Cookie Corner

You are the manager of Carol's Cookie Corner. It is your busy season and almost all of your bakers are hard at work. A new order for your special Choco-oat-raisin cookies just came in and you have one baker, Sammy, who can make them. However, you only have a $\frac{1}{4}$ cup measuring cup and $\frac{1}{4}$ teaspoon handy because your other bakers are using all of your other measuring cups and spoons. Sammy needs help with fractions so you have to change all of the measures in the recipe so he can use the $\frac{1}{4}$ teaspoon and measuring cup.

You remember using a number line in school to work with fractions.

1. Rewrite all of the measures in the recipe as equivalent fractions that Sammy can use with the measurement tools you gave him.

Your business is booming and you may run out of measuring tools again. You decide to teach all of your bakers to use equivalent fractions.

2. Create a large number line on chart paper. Put the numbers from the recipe on the number line.

3. Add as many equivalent fractions as you can to the number line for each number you placed on the number line.

4. Be prepared to teach your fellow bakers about equivalent fractions. Explain in writing what you will say to them.

Materials (representations, manipulatives, other):

Recipe, $\frac{1}{4}$ measuring cup, $\frac{1}{4}$ teaspoon, chart paper, markers

Misconceptions or Common Errors:

- You cannot write a fraction for a whole number.
- Fractions don't work on a number line.
- A mixed number cannot be written as an improper fraction.

Format:

☑ Four-Part Lesson ☐ Game Format ☐ Small-Group Instruction

☐ Pairs ☐ Other_____

Formative Assessment:

Use the observation checklist to observe the following:

- Partners listening to one another
- Ordering of fractions on the number line
- Strategies/models selected to find equivalent fractions
- Number of equivalent fractions on the number line (including fraction forms of whole and mixed numbers)

Launch:

Introduce the first part of the problem with a discussion about the importance of precise measures in baking. Ask students questions such as:

- What happens when you do not use the precise measures called for in a recipe?
- How do you measure amounts when you cook? What tools do you use?
- Can you think of any other situations where precise measures are needed?
- What are some situations where you may need equivalent fractions?
- What is Carol's problem with her measuring tools?

Introduce the second part of the problem:
You remember using a number line in school to work with fractions.

1. Rewrite all of the measures in the recipe as equivalent fractions that Sammy can use with the measurement tools you gave him.

Your business is booming and you may run out of measuring tools again. You decide to teach all of your bakers to use equivalent fractions.

2. Create a large number line on chart paper. Put the numbers from the recipe on the number line.
3. Add as many equivalent fractions as you can to the number line for each number you placed on the number line.
4. Be prepared to teach your fellow bakers about equivalent fractions. Explain in writing what you will say to them.

Ask the students to identify what they need to do to solve the problem. Discuss any questions they may have.

Share success criteria.

Facilitate:

1. Students work in pairs to solve the problem after the launch discussion.
2. Pairs are given a copy of the recipe, chart paper, and $\frac{1}{4}$ teaspoons and measuring cups to complete the task.
3. As the pairs work together, monitor their work by asking questions such as these:
   How will you get started?
   What ideas did your partner have?
   What would a manager say to his or her bakers?
   What do you think bakers need to know about equivalent fractions to include in your talk?
   What strategy or strategies are you using to find equivalent fractions?
4. Encourage students to share their explanations to the bakers (read to the class).
5. Pose the second part of the problem.

   1. Rewrite all of the measures in the recipe as equivalent fractions that Sammy can use with the measurement tools you gave him.

   Your business is booming and you may run out of measuring tools again. You decide to teach all of your bakers to use equivalent fractions.

(*Continued*)

6. Create a PowerPoint or video to teach your bakers about equivalent fractions. You can create a large number line on chart paper and add the numbers from the recipe on the number line. You decide how to use the number line in your PowerPoint or video.

Closure:

Footprint—distribute cut out footprints to each student. Ask students to think about and then write what they are walking away with from their unit on equivalent fractions.

Recipe for Choco-oat-raisin Cookies

(Makes about 4 dozen cookies)

_____ 1 cup butter

_____ $1\frac{1}{4}$ cup brown sugar

_____ $\frac{1}{4}$ cup of granulated sugar

_____ 2 eggs

_____ $1\frac{1}{2}$ teaspoon vanilla

_____ $1\frac{1}{2}$ cups flour

_____ 1 teaspoon baking soda

_____ $\frac{1}{2}$ teaspoon cinnamon

_____ $\frac{1}{2}$ teaspoon salt

_____ 3 cups uncooked oatmeal

_____ $1\frac{1}{2}$ cup raisins

_____ $\frac{2}{8}$ cup chocolate chips

1. Heat oven to 350°F.
2. Beat together butter and sugars.
3. Add eggs and vanilla and beat well.
4. Add flour, baking soda, cinnamon, and salt and combine well.
5. Stir in oats, raisins, and chocolate chips. Mix well.
6. Drop by rounded tablespoons onto ungreased cookie sheet.
7. Bake 10 to 12 minutes.
8. Cool one minute on cookie sheet.

Write your equivalent fractions on the line next to each measure. Remember you only have a $\frac{1}{4}$ measuring cup and a $\frac{1}{4}$ teaspoon.

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