



Apple Fractions

By Service Member Daniel Marbury, Michigan

Theme

- Fraction Math and Symmetry
- Knife Skills
- Healthful Cooking

Ages/Grade Level

-3-5

Subject Area: Math

Summary:

Prepare a class batch of applesauce to share through this activity, which encourages students to visualize fractions while preparing apples to cook.



Prep Time: 15 minutes to assemble materials

Materials:

- One knife, one small bowl, and one cutting board for each pair of students
- One apple for each pair of students
- Apple Fractions worksheet
- *Applesauce cooking materials:* large pot with a lid, stove top or portable burner, large spoon, a potato masher, fork, or immersion blender, measuring cups and spoons, cinnamon, water, bowls/cups and spoons to serve applesauce

Learning Objectives:

Students will develop their understanding of fractions through a hands-on food activity that will provide a visual model of parts and a whole. The lesson culminates with an applesauce making activity using the cut up apples.

Common Core Standards Addressed:

3.NF.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$

3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

3.G.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as $1/4$ of the area of the shape.

4.NF.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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.

4.NF.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize



Name _____ Date _____

that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

4.NF.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

4.G.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

5.NF.A.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, $2/3 + 5/4 = 8/12 + 15/12 = 23/12$. (In general, $a/b + c/d = (ad + bc)/bd$.)*

Lesson Procedure:

Time: 1hr

Opening: Introduce the Apple Fractions activity by explaining to students the importance of applying their knowledge of fractions to real world examples. Show students the apples and explain how apples are a great food to learn about fractions with and how they also make a healthy snack option. Explain that students will be working in pairs for this activity and must work together as a team and share responsibilities of slicing apples, determining fractions, and recording answers on both of their worksheets. Review safe knife handling skills prior to passing out knives.

1. Have students wash their hands with soap and water.
2. Organize students into groups of two. Review safe knife handling skills. Then pass out materials for the first half of the activity: cutting boards, knives, washed apples, and worksheets.
3. Guide students through the four main steps (Halves, Quarters, Eighths, and Sixteenths) on the Apple Fractions worksheet. Supervise students' use of knives. Circulate and ask students questions about their answers about the fractions they are slicing.
 - a. As students proceed through each step, regroup as a class and share out answers. Ask students to explain their answers.
4. After all students have finished cutting their apples into sixteenths and have finished their worksheet, students will bring their bowl of sliced apples to the large pot.
5. Review recipe with students. Add apples and water to the large pot.
6. Follow the recipe to make applesauce. While applesauce cooks, have students clean up their desks and wash their cutting boards and knives and turn in worksheets.

Class Applesauce Recipe:

1. Put apples in a large pot and add $\frac{1}{2}$ inch of water to cover the bottom of the pot.
2. Bring the water to a boil.
3. Lower the heat, add $\frac{1}{8}$ teaspoon cinnamon per medium sized apple, cover the pot with a lid, and simmer 15-20 minutes until apples are soft enough to mash. You may want to allow apples to cool.
4. Mash with a fork, potato masher, immersion blender, or transfer to a blender.
5. Serve and Enjoy!

Wrap up:

When applesauce is ready, pass out a small cup or bowl and a spoon for each student to sample. Wrap up the lesson by asking students about other real-world examples they can think of that involve the knowledge of and use of fractions. Encourage them to think about other cooking and food examples, too.

Extensions:



Name _____ **Date** _____

If students have already practiced cutting foods into equivalent portions and if they are already familiar with basic fractions, you may extend this lesson by hosting the Apple Fraction Applesauce Game Show in class. Group students into two teams and situate each team around a station with a cutting board. Create an appropriate number of fraction math problems (which can include any fraction operations appropriate to your class) for students to solve and present the answer in the form of slices of an apple. (Tips: start with fractions having a larger denominator and follow up with a smaller ones so you can reuse the same apple. E.g. $\frac{2}{3}$ then $\frac{3}{12^{\text{th}}}$).



Name _____ Date _____

Fraction Applesauce

Step 1 Cutting in Half:



Working with a partner to check the middle of the apple, cut the apple in half as shown by the dotted line.

How many pieces of apple are there in total now? _____

Give one of the pieces to your partner.
How many pieces of the apple do YOU have? _____

Write your piece as a fraction of the whole apple:

How many pieces you have: $\frac{\quad}{\quad}$ (This top number is the numerator)

Total number of pieces: $\frac{\quad}{\quad}$ (This bottom number is the denominator)

Step 2 Cutting into Quarters:



With your half and your partner's half of the apple lying flat on the cutting board. Take turns cutting your pieces in half again as shown.

Counting both your pieces, how many pieces are there in total? _____

Write the fraction that describes 1 of the total pieces: $\frac{1}{\quad}$

Total number of pieces: $\frac{\quad}{\quad}$

Step 3 Cutting into Eighths:

First, carefully cut out the seeds and core from the middle of your pieces. Next, take turns cutting each of your quarters in half.

Counting both your pieces, how many pieces are there in total? _____

Write the fraction that describes 1 of the total pieces: $\frac{1}{\quad}$
(On the dotted line write the total number of pieces)



Name _____ Date _____

Step 4 Cutting into Sixteenths:

Take turns cutting each of your sixteenths in half.

You and your partner each set aside 2 pieces of apple in a bowl to add to the applesauce pot.

How many pieces are in the bowl? _ _

How many pieces remain on the cutting board? _ _

Write the fraction that describes the pieces in the bowl: $\frac{_ _}{_ _}$

Write the fraction that describes the pieces on the cutting board: $\frac{_ _}{_ _}$

Put all of your pieces in the bowl. _ _

Write the fraction that describes the pieces in the bowl: $\frac{_ _}{_ _}$

Wait for your teacher's instructions to begin cooking the apples into sauce.

Class Applesauce Recipe:

1. Put apples in a large pot and add ¼ inch of water to cover the bottom of the pot.
2. Bring the water to a boil
3. Lower the heat, add 1/8 teaspoon cinnamon per medium sized apple, cover the pot with a lid, and simmer 15-20 minutes until apples are soft enough to mash. (Allow apples to cool slightly.)
4. Mash with a fork, potato masher, immersion blender, or transfer to a blender.
5. Serve warm, or cool in the refrigerator and enjoy!