Afterschool Adventure!

Appetite for Fractions

Powered by a Ready To Learn Grant

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Introduction

In this week’s Afterschool Adventure, Appetite for Fractions, children will explore fractions as they help create, divvy up, and serve a variety of real and virtual snacks. First, children will practice using fractions as a way to represent equal shares of whole items like pizza and cake. Then they will use fractions to represent and divide up multiple items, like apple slices, sandwiches, and chocolates in a box. At the end of the unit, children will have the chance to work with fractional measurements like 1/4 of a tank of fuel and 1/2 cup of water. The unit culminates with children using fractions to create a bird feeder to feed local birds.

Math Overview

Children begin to learn about fractions through the concept of “fair sharing” when they are in pre-kindergarten and kindergarten. As children enter first and second grade, their understanding of fractions grows more sophisticated. They learn that fractions can describe a part of whole (2/3 of a cake is two of the three equal pieces), part of a set (3/4 of the buttons is three of the four buttons), or a measurement (3/4 of a cup). Although children do not yet add, subtract, and multiply with fractions, they should grapple with equivalent fractions (two 1/4 pieces is the same as one 1/2 piece) and consider which of two fractions is bigger or smaller. Common fractions that children will encounter at this age are halves, thirds, fourths, and eighths.

Refer to More About Math to learn additional information about these math topics as they relate to the Appetite for Fractions learning activities.

Before You Begin

Create a free account on PBS LearningMedia to access videos for this Afterschool Adventure at http://www.pbslearningmedia.org/

Print the Appetite for Fractions: Pizza handout (on cardstock if possible).
Hands-on Activities

Part 1: One Pizza, Many Fractions
- Appetite for Fractions: Pizza handout
  one copy of each pizza per child

Part 2: Sharing Apples
- Apples or balls of clay, and a knife to cut them.

Part 4: Measuring Nectar

Part 5: Bird Feeder Fractions

Bird Feeder Fractions
Materials to make bird feeders:
- Measuring cups
- 4 pinecones or pieces of whole fruit (such as an apple)
- Peanut butter
- Peanuts, raisins, sunflower seeds, and cranberries for bird seed mixture
- Mixing bowl
- Dull knife for spreading
- String

Related Books

Part 1: Full House: An Invitation to Fractions by Dayle Ann Dodds
Part 2: Whole-y Cow!: Fractions are Fun by Taryn Souders
  The Doorbell Rang by Pat Hutchins
Part 3: If You Were a Fraction by Trisha Speed Shaskan
Part 5: PIECE = PART = PORTION by Scott Gifford
Part 1: One Pizza, Many Fractions (20 minutes)

WATCH

Odd Squad: Welcome to the Break Room (2:00)
Learn how to divide a pizza into halves, fourths, and eighths as Oksana, the Odd Squad chef, shows off all of the delectable treats she makes with pudding.

Begin by gathering the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

Leader: Welcome to the Appetite for Fractions Afterschool Adventure! This week, we’re going to learn about fractions, and how they can be used to make and share all sorts of delicious foods. As usual, we’ll get a little help from our friends at PBS KIDS as we complete the adventure. Let’s begin with this video featuring Oksana, the chef from Odd Squad.

Access the video and press play. Pause at 1:07 after Oksana says “two equal parts, halves.” Ask, How many halves make a whole pizza? (2)

Continue the video, and press pause at 1:22 after Oksana says, “four.” Ask, How many fourths make a whole pizza? (4)

Continue the video and pause one last time at 1:46, after Oksana says, “eight.” Ask, How many eighths make a whole pizza? (8)

Play the rest of the video, and then discuss what happened. Ask:

• When Oksana sliced the pizza, did she slice it into equal or unequal pieces? (equal)
• What happened to the size of each slice as the pizza was divided into more and more pieces? (each slice became smaller)
• We’ve been talking a lot about pieces and slices. Does anyone know another word that means a part of a whole? (fraction)

Discuss the idea of fractions further with the children.

Leader: When Odd Squad agents eat a pizza, they like to share it so that everyone gets a part. A fraction is another word for a part of something. For example, if eight agents are eating a pizza, they will slice it into eight equal pieces, and each agent will eat a 1/8 fraction of the pizza.

Write 1/8 on your whiteboard or blackboard.

Leader: This is how you write a fraction. The number on the top of the fraction shows how many slices of pizza each Odd Squad agent gets. The number on the bottom of the pizza shows how many equal slices are in the whole pizza.

Give each child a copy of Appetite for Fractions: Pizza handout. Ask the children to choose a serving that represents 1/2 of a pizza, 1/4 of a pizza, and 1/8 of a pizza. Then challenge them to choose servings that represent 3/8 of a pizza, or 2/4 of a pizza. (You may need to remind them about what each of the numbers in a fraction represents.)

As they are playing with the pizzas, the children may notice that 2/4 of a pizza is the same as 1/2 of a pizza. Encourage them to see if they can find other equivalencies. How many 1/8 slices are in 1/4 of a pizza? How about 1/2?

Leader: Thank you all for your hard work today in dividing up pizzas into fractions. I hope you are developing an appetite for working with fractions! We’ll explore fractions with a different food—apples—the next time we meet.

Keep Going! If you have more time, explore the following resources on the next page.
WATCH

Cyberchase: Misadventures of Buzz and Delete: Any Way You Slice It (1:58)
In this video clip, Buzz and Delete take a break for a piece of cake. Buzz chooses a 1/8 slice over a 1/3 slice — he thinks it will be bigger, since eight is a bigger number than three. But he’s in for a big surprise! Watch with your children to reinforce what the numbers in a fraction really represent. Then have the children write a story about a time when a fraction surprised them.

READ

Full House: An Invitation to Fractions by Dayle Ann Dodds
Five guests and one hostess share a cake at the Strawberry Inn. Read the book aloud to children and talk about how the size of the slices might change if there were more or fewer guests.

EXPLORE

Sharing Brownies
Cake and pizza are circular. A pan of brownies is rectangular. But brownies can still be shared equally among friends! Challenge your children to draw a rectangle to represent a pan of brownies and then draw how they would cut them to create fair shares for two, four, or eight people.
**Part 2: Sharing Apples (20 minutes)**

**WATCH**

*Cyberchase: Two Apples Three Heads (2:44)*

Inez, Jackie, Matt, and Digit figure out how to split two apples equally among three heads.

Begin by gathering the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

**Leader:** Welcome back to the Appetite for Fractions afterschool adventure! Yesterday we learned how to use fractions to divide up one pizza. But what happens when you have more than one thing to divide up? Today, we’re going to figure out how to divide two apples into three equal shares. Let’s watch this Cyberchase video to find out more.

Access the video and press play. Pause at 2:08 after Inez says, “How do we share two apples equally with three heads?”

Ask children to identify the problem: *How can the two apples be fairly shared among the three heads?* Divide children into groups and ask them to try to come up with a solution to the problem. You may wish to give them real apples (you can do the cutting for them) or manipulatives like balls of clay.

Once each group has had time to come up with a solution, bring the groups together and ask them to share their ideas. Then play the rest of the video. Afterwards, ask:

- How did Jackie, Matt, and Inez divide up the apples? (they divided the apples into thirds and gave each head two pieces)
- How was their solution similar to or different from your idea?
- How much of the apples did each head get? (2/3 of an apple each)

Have the children continue playing with the apples or clay, posing questions like:

- What if there were four apples and two heads? How many would each head get? (two apples)
- What if there were three apples and two heads? How many would each head get? (1 1/4 apples)
- What if there were three apples and four heads? How many would each head get? (3/4 apple)

If children get stuck, remind them that they can use the same strategy that Jackie, Inez, and Matt used: Start with one apple and cut it into equal pieces so that there is one slice for each head. Then do the same thing for the remaining apples. Put all the slices of apple together and pass them out until every head has the same amount.

**Leader:** Thank you all for your hard work today in dividing up apples into equal shares. Now you know not only how to fair share one item—like a pizza—but a set of items—like apple slices. Next time we meet, we’ll explore some more yummy fractions.

**Keep Going!** If you have more time, explore the following resources on the next page.
**WATCH**

**Cyberchase: Harry’s Sweet Job (3:26)**

On the job at a chocolate shop, Harry shows Harley how to fill customers’ orders. Watch the video with your children, pausing each time a customer uses a fraction to order chocolates. Challenge the children to explain what each number in the fraction represents.

**READ**

**Whole-y Cow!: Fractions are Fun by Taryn Souders**

A little cow decides to have some fun, painting half of her body in blue, going for a dip in a colorful bathing suit, and generally having a great time on the farm. The book contains riddles about fractions that relate to the cow’s antics, covering both partitioning whole objects and sets of objects. Read the book aloud and challenge the children to answer the riddles as you go.

**READ**

**The Doorbell Rang by Pat Hutchins**

Mom has just baked a dozen cookies and set them out for her two children to share. Then the doorbell rings…and rings…and rings! Ask your children to figure out what fraction of the cookies each child in the book will get as the story progresses.
**Odd Squad: Creature Duty**

Odd Squad agents take care of all kinds of strange creatures—like unicorns, griffins, and even spider-cats! In this game, children will keep a collection of strange and wonderful creatures happy by making sure each gets its fair share of the right kind of food.

Begin by gathering the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

**Leader:** Welcome back to the Appetite for Fractions Afterschool Adventure! So far, we've learned how to use fractions to help us fairly share pizza and apples. Today, we're going to continue fair sharing different foods using fractions. And wait until you see who's doing the eating!

Access the game and play the short introductory video. Then, press the start button. Explain that the area on screen is where Odd Squad agents take care of a variety of strange little creatures until they are big enough to go home.

Play one round with the children, choosing a space for the new creature, and then clicking on each area to feed the creatures. Ask for the children's help in selecting the box of food that matches the creatures' preferences. Demonstrate how to fair share the food that is available so that each creature gets the same amount. You may need to use a “fractionator” – a cookie cutter-like tool – to divide up sandwiches so that each creature gets a fair share.

Once you are sure children understand how to play, have them continue playing on their own or in small groups. Rotate through the room as they work, checking in with children and asking questions like:

- Which food do you think these creatures would like? How do you know?
- Will you need to use the “fractionator” to share the food? Why do you think it's called that?
- What is the best way to share this food fairly? Is there any other way to share it so that each creature gets an equal share?

If possible, let the children continue playing until at least one creature grows big enough to be released.

**Leader:** Thank you all for your hard work today in choosing and fair sharing food for our creatures and helping them grow up and return home. We'll learn more about fractions—and what some other animals like to eat—the next time we meet.

**Keep Going!** If you have more time, explore the following resources on the next page.
Part 3: (continued)

READ

If You Were a Fraction by Trisha Speed Shaskan
This book shows different ways to divide up pizza, apples, flags, and more. Read it aloud to the children, and see if they can come up with new ways to divide the items into equal pieces.

PLAY

Peg + Cat: Make the Cake
Peg and Cat are having a birthday party for some friends. They need help partitioning cakes into fair shares, and divvying up toppings so that everyone gets an equal amount.

PLAY

Fizzy’s Lunch Lab: Find Freddy
In addition to fair sharing, the Creature Duty game also asks children to use their deductive reasoning skills. For more practice using deductive reasoning, have children play Find Freddy.
Part 4: Measuring Nectar (20 minutes)

PLAY

Wild Kratts: Flower Flier
The Hummingbird Power Suits need nectar to keep them going. Help the Kratt Brothers make it to their various destinations by lapping up just the right amount of nectar for the journey.

Begin by gathering the children at your computer or interactive whiteboard. Have the children sit or stand around the screen so they can all see.

Leader: Welcome back to the Appetite for Fractions afterschool adventure! So far, we’ve learned how to use fractions to help us fairly share pizza, apples, and creature food. Today, we’re going to think about fractions as a way to measure.

Show children your 1/4 cup measure and your 1 cup measure. Ask, How many 1/4 cups do you think it will take to fill up the 1 cup measure?

Call on a volunteer or volunteers to try it out, dipping the 1/4 cup into the pitcher of water and pouring it into the 1-cup measure until it is full. They should determine that it takes 4 1/4 cups fill the 1 cup measure.

Leader: You already know that a fraction means a part of a whole. That’s what the fraction on this smaller measuring cup means. It holds a fraction of the water that a whole cup holds. The 1/4 means that if you divide all the water in this big cup into four parts, this small cup would hold one of those four small parts.

Explain that children are now going to have the chance to use what they know about fractions and measurement to figure out how much flower nectar to give some hummingbirds.

Access the Wild Kratts: Flower Flier game and click on “Watch Video.” Afterwards, reiterate the problem: The Kratt brothers are trying to rescue hummingbird eggs from a chef who wants to eat them. They are wearing suits that give them hummingbird powers. They need to lap up nectar so they have enough energy to keep flying—just like real hummingbirds.

Next, click on “Learn to Play” and listen to the Kratt brothers explain the game and give an overview of fractions. Once you are sure children understand how to play, have them continue playing on their own or in small groups. Rotate through the room as they work, checking in with children and asking questions like:

- How many parts of the nectar tank do you need to fill to get to the next flower? (Remind children to look at the top number in the fraction to answer this question.)
- What fraction of your tank is full right now?

If possible, keep playing until all the children have completed the game.

Leader: Thank you all for your hard work today in filling up the hummingbird tanks with delicious nectar. You were able to keep the Kratt brothers flying high! Next time we’re together, we’ll keep exploring fractions as a way of measuring.

Keep Going! If you have more time, explore the following resources on the next page.
Part 4: (continued)

**PLAY**

**Cyberchase: Space Flyer**

If children enjoyed making the hummingbird fly, have them try their hand at this game, in which kids steer a spaceship into the different numbers to count by 2s, 5s, or 10s.

**EXPLORE**

**Fill It Up!**

To further explore measuring volume with children, use this activity to guide the group in some hands-on water play. The activity asks children to compare the side of different containers, estimate how much water they hold, and measure to find out.
Part 5: Bird Feeder Fractions (20 minutes)

EXPLORE

Bird Feeder Fractions

In this activity, children create a bird feeder while building their measuring and fraction skills.

Gather your children around a table or in an area where they can work and get messy.

Lay out the materials needed for this activity.

Leader: Welcome back to the Appetite for Fractions afterschool adventure! So far, we’ve learned how to use fractions to help us fair share pizza, apples, and creature food. We also used fractions to measure nectar for hummingbirds. Today we’re going to use fractions to make something—a bird feeder for our own local birds to snack on!

Mix the Bird Food

1. Ask a volunteer to lay the measuring cups from smallest (1/4 cup) to biggest (1 cup). If you have a single measuring cup, help the children identify the fractions on the side of the cup. Reiterate that a fraction is a part of a whole. If you divide a whole cup into four parts, and fill one part, you’ll have 1/4 cup.

2. Measure 1 cup of each of the following: peanuts, raisins, sunflower seeds, and cranberries. Pour these into a mixing bowl.

3. Explain to the children that the four parts of the birdseed mixture equal one whole batch of birdseed. Remind them that they just put four measuring cups of bird food into the bowl. Now ask:
   - Seeds make up what fraction of the mixture? (1/4, or one cup out of four cups total)
   - Nuts make up what fraction of the mixture? (1/4, or one cup out of four cups total)
   - Fruits make up what fraction of the mixture? (2/4, or two cups out of four cups total)

4. Now measure 1 and 1/3 cup peanut butter. Ask, How many 1/3 cups of peanut butter would it take to get one cup? (It would take three of the 1/3 measuring cups to make 1 cup of peanut butter.)

Build the Bird Feeders

1. Divide children into four groups. Give each group a spoon or dull knife and have them spread peanut butter over the outside of the pinecones or whole fruit.

2. Roll the pinecones or fruit in the bird food mixture.

3. Tie a string to the tops of your bird feeders and hang them from a tree branch.

4. Take some time to observe the birds that come to your feeders!

Leader: We’re done—we completed the Appetite for Fractions afterschool adventure! We learned about fractions and had fun making, sharing, and serving food using fractions in all sorts of different ways. Great work!

Keep Going! If you have more time, explore the following resources on the next page.
**Part 5: (continued)**

**READ**

PIECE = PART = PORTION by Scott Gifford

This book shows clear visual representations of a range of fractions. Read aloud, and have children write down the fraction represented on each page.

**EXPLORE**

Bird Tally

After you have hung them up, observe your bird feeders daily. Use tally marks to keep track of the different kinds of birds that eat from the bird feeder. Add up the tally marks for each kind of bird and then use fractions to compare your findings. (For example: Eight birds ate at the feeder. Two of them were cardinals, so 2/8 of the birds eating at the feeder were cardinals).