LESSON 4

Partition Shapes Into Halves, Thirds, and Fourths

Standards
2.G.3; ELD-MA.2-3.E.E

Math Practices
MP.3 Construct viable arguments and critique the reasoning of others. MP.7 Look for and make use of structure.

Lesson Objectives
- Partition circles and rectangles into equal parts.
- Describe equal parts as halves, thirds, or fourths.

Campers will develop a sense of belonging to the MathCamp community. This sense will deepen as they make friends and feel seen and valued by others. Campers will make others feel welcome too.

MATERIALS FOR THE DAY

Download and Print
- L4 Math Camper Resources
- L4 Community Math Resources

Classroom Materials
- dry-erase markers
- plastic sleeves
- rulers or straightedges
- scissors

OPENING CAMPFIRE 15 MIN

Greet your campers by name. Have them put away their personal items and gather in a common area. Lead campers in a round of the "MathCamp Heroes Cheer."

Campers, today we're going to explore how we can decompose a shape to show halves, thirds, and fourths. Turn and share with a partner what you remember about decomposing a shape.

Invite one or two campers to share their ideas.

We're also going to work on developing a sense of belonging in our classroom community. When we feel like we belong, we have friends and people we like to be around. We are safe, and make others feel safe, asking questions or offering ideas. Turn and share with a partner something that makes you feel like you belong with your friends.

Ask one or two campers to share.

WORDS OF THE DAY

Review and add these words to your vocabulary wall. Encourage campers to use them in their discussions.

NEW	REVIEW
partition: to break a shape into equal parts	**third:** the name of each part when a shape is divided into three equal parts
divide: to split a shape or quantity into equal parts or groups	**fourth:** the name of each part when a shape is divided into four equal parts

MULTILINGUAL LEARNERS

Show campers how to "partition" their hands into individual fingers. Then have campers draw a face and identify the parts. Ask: *What else can we partition or break into equal parts?* Encourage them to find ways to use the new vocabulary words in the lesson.

FLASH MATH 5 MIN

Start the day with a quick fluency routine to warm up campers' math thinking. These engaging and fun activities support campers' number sense and fluency, building competence and confidence! You'll find the routines and instructions for how to do them in the back of this Leader's Guide.

MATH POWER: Partition Shapes Into Halves, Thirds, and Fourths

40 MIN

Introduce

In this lesson, campers will partition circles and rectangles into equal parts and describe the parts as halves, thirds, and fourths.

Distribute classroom materials and Worksheets 1 and 2 to campers.

Campers, have you ever shared food by splitting a whole into smaller parts? Give campers a moment to respond, then continue. ***Pizza is a kind of food that is already split into smaller pieces. Each slice is an equal part of the pizza. Can you think of any other foods that are already split into equal parts? Can you remember a time when you had to split food into equal parts yourself?*** Invite campers to share their experiences with the class.

Inspire

Two friends want to share their snacks. One friend has a granola bar. The other friend has a slice of watermelon. Look at the illustrations of the granola bar and watermelon on Worksheet 1. What do you notice about the granola bar and the watermelon? What do you wonder?

Give campers a few moments to think. Then have them turn and talk with a partner. Give partners a few moments to discuss.

Invite campers to share their noticings and wonderings. Encourage them to model belonging by listening respectfully, contributing to the conversation, and being open and accepting of other campers' contributions.

If campers do not mention cutting each snack into smaller, equal-sized pieces, ask these guiding questions to spark their thinking:

What is the shape of each snack?

How many people need to share each snack?

Then explain that in this activity campers will split shapes into equal parts and name the parts.

MULTILINGUAL LEARNERS

Ask: *What shape is the granola bar? Watermelon slice? How can you show splitting a shape? What does it mean to share a snack "equally"?* Challenge campers to come up with at least one clarifying question they can ask.

Investigate

Guide campers to Problem 1 on Worksheet 1.

Let's explore some math skills together! We can split up, or partition, a snack into smaller pieces to share it. Campers, why might we want to partition the snacks into equal parts? Give campers a moment to respond, then continue. ***Most people think that equal-sized pieces is the fairest way to share.***

The first questions we want to answer are: How can each snack be shared equally by two people? What part is each share? Take some time on your own to think about how we might partition

RANGE OF LEARNERS

Increase Access Place a plastic sleeve over the worksheet. Have campers use a dry-erase marker to try out partitions. Encourage campers to redraw as needed.

Increase Challenge For additional challenge, have campers show at least two different ways to partition each snack. Have them tell which way(s) they like best and why.

the snacks, or divide them into equal parts. Then we will meet and share with our partners. Give campers individual think time, then have them turn and talk about how the granola bar and the watermelon slice could be divided between two people. Listen in for different strategies.

Ask campers to share their strategies, and then use them to solve the problem. (Possible strategies include guessing, drawing lines, folding, using a ruler, creating rows and columns, or using a cookie cutter.) Invite campers to complete Problem 1 with a partner. Then have volunteers share strategies for how they partitioned each snack.

MULTILINGUAL LEARNERS

Have campers explain the steps for partitioning a rectangle or circle into equal parts. Provide sentence frames: *First, I review the problem, so I know _____. Next, I decide how many equal parts I need by _____. Then, I _____.*

Model different strategies on the board. Then ask: *How many parts did you divide each snack into? Why? Are those parts the same size? How do you know? We divide each snack into two equal parts because there are two people sharing. What could we call each person's share?* Let campers offer suggestions, then continue. *When a shape is divided into two equal parts, each part, or share, is called a half.* Then have campers write the answer on their worksheets.

Guide campers to look at Problem 2 on Worksheet 1. Repeat the previous steps, making sure campers understand that sharing a whole equally with three people means dividing it into three equal parts and each part is called a third.

Guide campers to look at Problem 3 on Worksheet 2.

Finally, let's think about another problem: Another day, four friends want to share a slice of watermelon. How can the watermelon slice be shared equally by four people? What part of the whole slice is each share? Again, repeat the steps, making sure campers understand that sharing a whole equally with four people means dividing it into four equal parts and each part is called a fourth.

Integrate

Guide campers to Problem 4 on Worksheet 2.

Have campers turn and talk about how they might determine whether or not a picture shows equal shares. Campers should understand that each granola bar is split into two parts, but not necessarily into equal parts. Camper suggestions may include measuring with a ruler, estimating with their fingers, using same-size tiles, or cutting out the parts for each granola bar and comparing the parts.

Then have campers circle the granola bar that shows equal shares and write or draw to explain how they know.

Check for Understanding

Review these questions with campers to land on the key points of the lesson.

- *Which granola bar shows equal parts? How do you know?*
- *How many equal parts are shown? What is the name of each part?*
- *How else could we divide a granola bar into two equal parts?*
- *What strategy can you use to find if a decomposed shape has equal parts?*
- *What strategy can you use to partition a shape?*

BUNK TIME 20 MIN

Distribute Bunk Time Worksheet 3 to campers.

Give campers a moment to stretch or move before settling down to work on their own. Read aloud the directions for the problems and check for understanding.

Circulate as campers work, conferring with individuals or small groups as needed.

RANGE OF LEARNERS

Increase Access Allow campers to work on a worksheet inside a plastic sleeve or have several copies of the worksheet available, so campers can try out ideas.

Increase Challenge Challenge campers to show more than one way to partition the shape for each problem.

BRING THE STRENGTH TO LIFE 10 MIN

Read aloud a selection from the Math Hero Reader and have campers follow along, or invite campers to choose a Math Hero from their readers and read on their own. Encourage campers to notice and wonder what makes someone a Math Hero.

Campers, are you inspired by the Math Heroes? Explore one of these ideas or one of your own. Then let your creativity flow and express yourself.

- *Think about a Math Hero who demonstrates one or more of the 7 Strengths. Then imagine that hero with one of the strengths as a superpower! Draw or write a scene where the Math Hero comes to the rescue.*
- *Imagine changing places with a Math Hero for a day. Draw, write, or act out what your day might be like as the hero. What might the hero's day be like as a Math Camper?*
- *Share a story about a Math Hero in your own life. Tell, draw, write, or act it out.*
- *Work with partners to create and perform a brief skit about a Math Hero. Consider questions like: What challenges did the Math Hero face? What discoveries did the Math Hero make? How might the 7 Strengths help Math Heroes solve problems?*

COMMUNITY MATH 20 MIN

Download and gather Community Math Resources and materials for the activity. Follow instructions for activity prep on the Activity Sheet.

Distribute materials to campers as needed.

Before beginning the activity, take a few minutes to review the Math Skill with campers. Invite questions and confirm understanding. Read aloud instructions for how to play the game and check for understanding.

Then play and have fun!

CLOSING CAMPFIRE 10 MIN

Word Challenge

Divide the group into two teams, Team A and Team B. Explain that you will give each team a word or a definition. If you give them a word, they must say the definition. If you give them a definition, they must say the word. You will set the timer for 30 seconds. If a team answers correctly, they get one point. If they answer incorrectly, the other team can answer to earn a point for a correct answer. Start with Team A and alternate until the Lightning Round.

MULTILINGUAL LEARNERS

Have campers make a journal entry using words and pictures to share what they learned about partitioning rectangles and squares into equal parts. Give each camper a thumbs-up as they complete their entries and demonstrate what they learned.

Team A: **The word is *partition*.** (The definition is, "to break a shape into equal parts.")

Team B: **The definition is "to split a shape or quantity into equal parts or groups."** (The word is *divide*.)

Team A: **The definition is "the name of each part when a shape is divided into two equal parts."** (The word is *half*.)

Team B: **The word is *third*.** (The definition is, "the name of each part when a shape is divided into three equal parts.")

Lightning Round: **The definition is "the name of each part when a shape is divided into four equal parts."** (The word is *fourth*.)

Reflection Questions

Have campers turn knee-to-knee and share their answers with a partner.

What made you feel a sense of belonging today at MathCamp?

What made you feel like a Math Hero?

Helping and learning together builds a sense of belonging among everyone in the group. Let's add that to our strengths board!

Offer concrete praise and affirmation for new skills or strategies campers tried today, or for ways they have demonstrated the strengths.

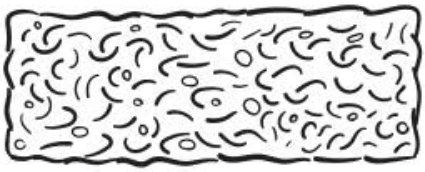
Partition Shapes Into Halves, Thirds, and Fourths

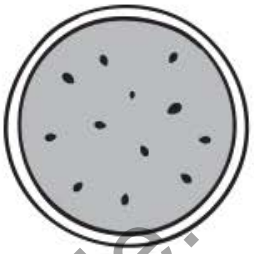
Inspire and Investigate

Problem 1

How can each snack be shared equally by two people? Draw a line on each snack to partition the snack. Check campers' drawings.

What part of the whole snack is each share?





Each share is a _____. half

Problem 2

How can the snack be shared equally by three people? Draw lines on the snack to partition the snack. Check campers' drawings.

What part of the whole snack is each share?

Each share is a _____. third

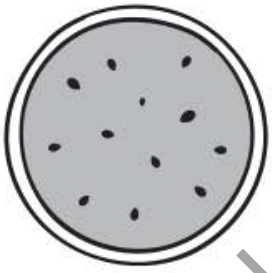
Partition Shapes Into Halves, Thirds, and Fourths

Investigate

Problem 3

How can the snack be shared equally by four people? Draw lines on the snack to partition the snack. Check campers' drawings.

What part of the whole snack is each share?



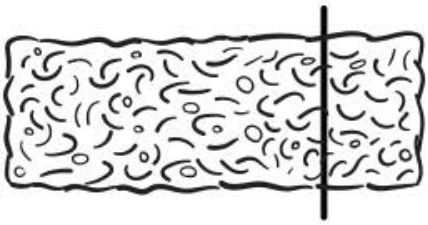
Each share is a _____. fourth

Integrate

Problem 4

Circle the granola bar that shows equal shares. Explain how you know.

The first granola bar should be circled.



I know the circled granola bar shows equal shares because _____

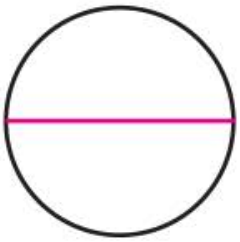
each of the two parts is the same size so each part is one-half

_____.

Partition Shapes Into Halves, Thirds, and Fourths

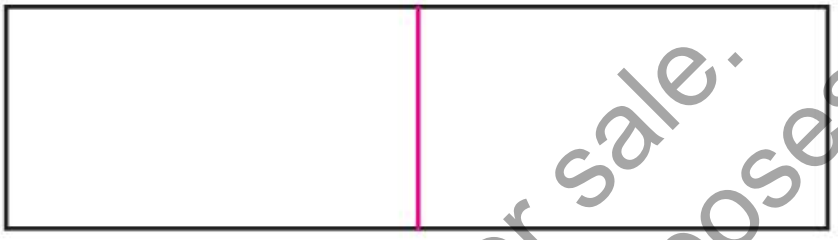
Draw lines to partition each shape.

Problem 1: Partition the circle to show halves.



possible answer

Problem 2: Partition the rectangle to show halves.

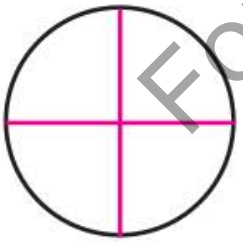


possible answer

Problem 3: Partition the rectangle to show thirds.

possible answer

Problem 4: Partition the circle to show fourths.



possible answer

LESSON 1

Welcome to MathCamp

Math Practices
MP.4 Model with mathematics.
MP.7 Look for and make use of structure.

Lesson Objectives
- Understand that numbers and mathematical structures are integral parts of our daily lives.
- Understand that math consists largely in recognizing, interpreting, and manipulating patterns in our world.

Campers will understand that they belong to the MathCamp community—a group of learners who are kind, curious, positive, and supportive of one another. Today, campers will get to know each other, explore their environment, and find out about MathCamp routines.

MATERIALS FOR THE DAY

Download and Print
- L1 Math Camper Resources
- L1 Community Math Resources

Classroom Materials
- colored pencils, crayons, or markers
- heavy paper or poster board (see instructions in Math Power Lesson)
- sticky notes

OPENING CAMPFIRE 15 MIN

Greet your campers by name. Have them put away their personal items and gather in a common area. Lead campers in a round of the "MathCamp Heroes Cheer."

Welcome to MathCamp! It's a community of learners who work and have fun together. Today, you'll find out about camp routines. You'll explore in and around our classroom looking for evidence of math. And you'll draw a special picture called a glyph that tells a story about you!

During Opening Campfire we'll prepare for the day. We'll find out about the math we'll be investigating and the strength we'll be using to support our learning. Turn and share with a partner something you wonder about MathCamp.

Give campers a moment to discuss, then invite volunteers to share with the whole group.

Let's get to know MathCamp and each other!

WORDS OF THE DAY

Review and add these words to your vocabulary wall. Encourage campers to use them in their discussions.

community: a group united by shared goals or interests

glyph: a picture that contains information about a person

hero: a person admired for strength of character and qualities such as courage, kindness, and a positive attitude

MULTILINGUAL LEARNERS

Use this section to encourage campers to make meaning of new terms. Help campers relate words like *hero* and *glyph* to their own experiences. This helps campers activate prior knowledge and build confidence and engagement. It also helps you identify inappropriate mental models to address ahead of the lesson.

FLASH MATH 5 MIN

Start the day with a quick fluency routine to warm up campers' math thinking. These engaging and fun activities support campers' number sense and fluency, building competence and confidence! You'll find the routines and instructions for how to do them in the back of this Leader's Guide.

MATH POWER: Welcome to MathCamp 40 MIN

Introduce

On this first day of MathCamp, campers will explore their surroundings looking for evidence of math. Then they'll draw a glyph to tell a story about themselves.

Explain to campers that today they're going to learn about MathCamp and you're going to learn about them. Tell them that during Bunk Time (following Math Power), they will take a math check-in. Assure them that the purpose of the check-in is to help you get to know them as math thinkers.

Distribute Worksheets 1 and 2 and colored pencils, crayons, or markers to campers.

Math Power is our time to explore and practice the day's math. Remember, today's strength focus is building community. We will build community by being friendly, considerate, and kind to one another—like true Math Heroes! Math Heroes discover new things no matter where they are. So, let's explore right where we are!

Inspire

Prepare your campers to take a "math walk" around your room, through the building, or outdoors, as is practical for your group. Make sure campers take Worksheet 1 and a pencil with them.

We're going to take a math walk to explore our surroundings. As we walk, keep your eyes open for evidence of math in and around our classroom. We'll pause along the way so you can write or draw what you notice and wonder. Remember, math is more than numbers; it's also shapes and patterns. Raise your hand if you already spy math in our room.

MULTILINGUAL LEARNERS

Multilingual learners benefit from engaging in grade-level content and practicing self-advocacy. Encourage campers to ask questions often. Model how to respond using full sentences. Campers can contribute in the language of their choice.

Guide campers on a walk in and around the room or outside. Encourage them to notice evidence of math, then write or draw what they notice and wonder. When you complete your walk, gather together to discuss what campers noticed.

Being observant is an important first step in math learning, because math is all around us! Let's share some of the math we noticed on our walk. Invite volunteers to share evidence of math they noticed, and what they wonder. If campers are unsure about volunteering, point out any obvious items in the room, such as a calendar, a clock, or the numbers on the door. List the items on the board, keeping track of how many campers noticed each one. Emphasize that campers made some of the same and some different observations. One way to build community is to appreciate both the similarities and differences in our responses to a shared experience.

Now that we've explored our surroundings, let's move on to the "Investigate" part of Math Power and do some problem solving!

Investigate

Have campers look at Worksheet 2.

What do you notice on the worksheet? Pause and guide campers to say "a circle." ***You're going to draw in and around that circle to make a picture called a glyph. In a glyph, different parts of the picture show information about you. You'll add features to your glyph based on your answers to questions I ask you. Ready? Listen carefully, then draw your glyph.***

Read the following questions and instructions to campers, allowing time for them to respond on their worksheets.

Eyes: ***Do you like to dance? If yes, make triangle eyes. If no, make circle eyes.***

Nose: ***What is your favorite subject at school? If it's math, draw a round nose. If it's language arts or reading, draw a square nose. If it's science, draw a triangle nose. If it's art, draw a diamond nose.***

Legs: ***What's your favorite color? Draw legs in your favorite color.***

Arms: ***Do you like to play games? If yes, draw arms reaching up. If no, draw arms hanging down.***

Hair: ***Do you have a pet? If you have a pet, make straight hair. If you do not have a pet, make curly hair.***

Ears: ***Are you left-handed? Draw 2 large ears. Are you right-handed? Draw 2 tiny ears.***

Spots: ***Draw spots to show the number of your birth date. For example, if you were born on the 5th, draw five spots. If you were born on the 30th, draw 30 spots!***

Teeth: ***Draw pointy teeth if you like summer best. Draw square teeth if you like winter best.***

Antennae: ***Do you like music? Draw 1 antenna if you do. Draw 2 antennae if you do not.***

Circulate as needed to help campers organize and clarify their responses. Post the glyph statements on heavy paper or poster board for campers to refer to.

RANGE OF LEARNERS

Increase Access Encourage campers to make bold, clear marks as they decorate their monsters, reinforcing with reminders such as *Those are great legs. So, green is your favorite color!*

Increase Challenge For additional challenge and to reinforce a sense of community, invite campers to use a range of colors in their glyphs. They may also wish to decorate the background if they finish early with the basic information.

MULTILINGUAL LEARNERS

In this section, group campers across English proficiency levels. Provide sentence frames and prompts to encourage collaboration. Ensure campers notice the prominent ways we use English in math. For example, we use conditional structures like *if/when* to argue conclusions.

Integrate

Now let's tape our glyphs up on the board and look at them. What do you notice about all of our glyphs? Give campers a few minutes to notice and compare. Invite campers to jot down their observations on sticky notes and post them on the board. Then ask: ***How many of us have pets? How do you know? What are some other questions we can answer using our glyphs?*** Have campers work in pairs to come up with a question based on the glyphs and write their question on a sticky note. Have them post the questions. If time allows, have campers answer some questions using the data from the glyphs.

Check for Understanding

Review these questions with campers to land on the key points of the lesson.

- ***What did you find most interesting about the glyphs? What was most surprising?***
- ***What are you curious about discovering?***
- ***What is one math problem you could propose based on the glyphs?***

BUNK TIME 20 MIN

Give campers a moment or two to stretch or move before settling down to work on their own.

Distribute Bunk Time Worksheet 3 face down. Remind campers to write their names at the top of their papers when you tell them to begin.

Explain that today campers will do a quick check-in. Assure them that this check-in will help you better understand them and their math thinking. Let them know they'll do another check-in at the end of MathCamp, which will show the progress they've made.

Campers, when I say "begin," you will turn your paper over and write your name at the top. You'll see a few problems to solve. Do your best and be sure to show your work. When I say "stop," put your pencils down, and I'll collect your papers.

RANGE OF LEARNERS

Increase Access Encourage hesitant learners to use hands-on materials and to think about what strategies they can try.

Increase Challenge Encourage campers to show multiple strategies for solving the problems.

MULTILINGUAL LEARNERS

If possible, share a version of today's check-in in campers' home languages. Research shows language skills should be separated from math skills when monitoring learning. If campers are comfortable in a mix of languages, the check-in can reflect that mix.

BRING THE STRENGTH TO LIFE 10 MIN

Read aloud a selection from the Math Hero Reader and have campers follow along, or invite campers to choose a Math Hero from their readers and read on their own. Encourage campers to notice and wonder what makes someone a Math Hero.

Campers, are you inspired by the Math Heroes? Explore one of these ideas or one of your own. Then let your creativity flow and express yourself.

- ***Think about a Math Hero who demonstrates one or more of the 7 Strengths. Then imagine that hero with one of the strengths as a superpower! Draw or write a scene where the Math Hero comes to the rescue.***
- ***Imagine changing places with a Math Hero for a day. Draw, write, or act out what your day might be like as the hero. What might the hero's day be like as a Math Camper?***
- ***Share a story about a Math Hero in your own life. Tell, draw, write, or act it out.***
- ***Work with partners to create and perform a brief skit about a Math Hero. Consider questions like: What challenges did the Math Hero face? What discoveries did the Math Hero make? How might the 7 Strengths help Math Heroes solve problems?***

COMMUNITY MATH 20 MIN

Download and gather Community Math Resources and materials for the activity. Follow instructions for activity prep on the Activity Sheet.

Distribute materials to campers as needed.

Before beginning the activity, take a few minutes to review the Math Skill with campers. Invite questions and confirm understanding. Read aloud instructions for how to play the game and check for understanding.

Then play and have fun!

CLOSING CAMPFIRE 10 MIN

Vocabulary Review

I will say a sentence. Then I will say two words that could complete the sentence. Raise your hand when you hear the word that correctly completes the sentence.

A picture that contains information about a person is a _____ glyph / elf. (glyph)

Someone who is admired for courage or kindness is a _____ hero / glyph. (hero)

A group where people have shared goals or interests is a _____ camp / community. (community)

Campers, you've done so much on your first day at MathCamp! Closing Campfire is a time to reflect on our learning and what we've accomplished together. Today, we found out about the MathCamp routine, we talked about being part of a community, and we found out about glyphs. Turn and share with a partner one thing that surprised you about MathCamp today.

Give partners a moment to share, then invite volunteers to share with the group.

MULTILINGUAL LEARNERS

Celebrate progress. Invite campers to identify the main thing they learned or struggled with and make a plan for talking about it at home. Sharing with family members helps campers simplify language, retain ideas, and share with purpose. It also helps bridge home and school!

Reflection Questions

Have campers turn knee-to-knee and share their answers with a partner.

What is something interesting you noticed at MathCamp today?

What is something you wonder about MathCamp?

Offer concrete praise and affirmation for new skills or strategies campers tried today, or for ways they have demonstrated the strengths.

Math Heroes are interested in the other learners in their community. Let's make that the first item on our strengths board!

Math Walk

Name: _____

I Notice	I Wonder

My Glyph

Name: _____

MathCamp Check-In

Name: _____

Complete the problems. Show your work. Simplify your answers for Problems 1 to 4.

1. On Sunday, Maddie spends $\frac{5}{8}$ of an hour reading. On Monday, she spends $\frac{2}{3}$ of an hour reading. How many hours in total does Maddie spend reading on Sunday and Monday?

   _____ hour(s) total $\frac{31}{24}$ or $1\frac{7}{24}$

2. In a class survey, $\frac{3}{4}$ of the class said their favorite subject was math, and $\frac{5}{12}$ said their favorite subject was art. As a fraction, how much more of the class said their favorite subject was math?

   _____ of the class $\frac{1}{3}$

3. A gardener plants $\frac{7}{12}$ of his garden with vegetables. He plants $\frac{2}{5}$ of the vegetable section with green beans. What fraction of the whole garden does the gardener plant with green beans?

   _____ of the whole garden $\frac{7}{30}$

4. Four campers are sharing $\frac{1}{2}$ bag of trail mix. If they share the trail mix equally, what fraction of a bag of trail mix does each camper get?

   _____ of a bag of trail mix $\frac{1}{8}$

5. Jayden and Pedro are on a swim relay team. Each swimmer swims the same distance. It takes Jayden 45.327 seconds to swim. It takes Pedro 45.237 seconds to swim. Who swims faster? Explain your reasoning.

   Pedro swims faster. Possible reasoning: Both swimmers' times have the same values in the tens and ones places. Jayden's time has a 3 in the tenths place while Pedro's time has a 2 in the tenths place. Two tenths are less than 3 tenths, so Pedro's time is less. Pedro swims faster.