

LESSON PLAN

Cutting It Equal: What Fractions Really Mean When the Whole Belongs to All of Us

Ember Charter School · Math · 90 min

DRIVING INQUIRY

When something has to be shared fairly, how do we name the part each person gets — and prove it is actually equal?

LESSON OVERVIEW

Title

Cutting It Equal: What Fractions Really Mean When the Whole Belongs to All of Us

Grade / Subject	Math
Duration	90 min
Standards	<p>CCSS.MATH.CONTENT.3.NF.A.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is divided into b equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by a parts of size $\frac{1}{b}$.</p> <p>CCSS.MATH.CONTENT.3.NF.A.3.C Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.</p> <p>CCSS.MATH.CONTENT.3.NF.A.3.D Compare two fractions with the same numerator or the same denominator by reasoning about their size.</p> <p>CCSS.ELA-LITERACY.SL.3.1 Engage effectively in collaborative discussions with diverse partners.</p>
Objective	I can partition a whole into equal parts, write a fraction to name one or more of those parts, and explain what the numerator and denominator each mean in a real sharing situation.

TEACHING PLAYBOOK

Understanding Fractions

◆ The Core Idea

The one thing students must understand is that a fraction is not two separate numbers stacked on top of each other. It is one number — a single quantity — that lives between zero and one on a number line, or sometimes beyond one. The denominator names the world: it tells you how many equal pieces the whole was cut into. The numerator counts how many of those pieces you are talking about. Students who hold these two ideas in the right relationship can reason about fractions. Students who see the fraction bar as a division sign they have not learned yet, or who think the bigger the denominator the bigger the piece, are working with a broken mental model that will compound every fraction lesson after this one.

The misconception that derails more third graders than any other is the assumption that bigger numbers always mean bigger amounts. A student who has spent two and a half years learning that 8 is more than 3 is now being asked to accept that $1/8$ is less than $1/3$. That is not confusion — that is a student doing exactly what their prior learning told them to do. Honor that. Name it out loud. Then dismantle it with physical material and community scenarios before you ever touch a worksheet. If you skip this step, you will spend the rest of the unit patching the same crack.

The second deep idea here is equal parts. Not similar parts. Not approximately equal parts. Exactly equal. This matters because the concept of fairness is already alive in these students. They know when something is not even. Use that. When you cut a pan of cornbread into pieces and two pieces are larger than the others, no one at the table calls that thirds. They call it unfair. That intuition is mathematical. Your job is to give it precise language and notation, not to replace it with rules.

A student who truly understands fractions at the end of this lesson can tell you why $2/4$ and $1/2$ look different but name the same amount — not because they memorized equivalent fractions yet, but because they can see that two cuts in a four-piece whole covers the same territory as one cut in a two-piece whole. That spatial and proportional reasoning is the foundation. Guard it carefully. Rush the notation and you will have classrooms full of students who can write fractions but cannot think with them.

◆ Where Teachers Get Stuck

The most common instructional mistake with this lesson is going straight to the fraction bar and the two numbers without establishing what the whole is. Teachers write $\frac{1}{4}$ on the board and students have no referent for it — a fourth of what? A fourth of a dollar is twenty-five cents. A fourth of a minute is fifteen seconds. A fourth of the class might be seven students. The fraction changes meaning entirely depending on what counts as the whole, and students who are never asked to name the whole first become students who cannot apply fractions to anything outside a worksheet.

The second place teachers lose the room is the transition from area models to the number line. Most third graders are comfortable shading shapes. The circle, the rectangle, the square divided into pieces — these feel like coloring. The number line requires students to think of a fraction as a location, a magnitude, a distance from zero. That is a categorically different cognitive move, and many teachers skip it or rush it because the area model feels like enough. It is not enough. The standard requires both, and the number line model is the one that prepares students for fourth grade operations on fractions.

The third sticking point is language. Teachers say "out of" when they mean "of equal parts." Those are not the same thing. When a student hears "two out of four," it sounds like a score, like a ratio, like something that could be unequal. When they hear "two equal parts out of four equal parts," the constraint of equality is embedded in the language. The word "equal" needs to appear in the students' descriptions every single time until it is automatic. Teachers who let it slide in conversation will see it missing in student reasoning.

◆ The Bridge

The exact moment where confusion becomes clarity in this lesson is when a student physically holds two different-sized "halves" of the same object and is asked whether both pieces can honestly be called one-half. That is when the definition of equal parts stops being abstract. It becomes something you can feel in your hands and see with your eyes. Design that moment deliberately. It can be as simple as tearing a piece of paper unevenly and asking, "Can I call this half?" Let the debate happen. The correct answer emerges from the argument, not from you.

When a student hits the wall — usually on the number line, staring at the space between zero and one with no idea where $\frac{3}{4}$ lives — your in-the-moment move is to anchor the endpoints first. Ask: where is zero? Mark it. Where is one? Mark it. Now: if I had to cut this distance into four equal trips, where

would the first stop be? The second? Let them walk it physically if you can. Tape a number line on the floor. Let them stand at $\frac{1}{4}$, then step to $\frac{2}{4}$, then $\frac{3}{4}$. The body knows equal spacing before the pencil does.

SPEAKING LIFE: Before students open the worksheet, before anyone feels the weight of not knowing, say this exactly — You already understand fairness. You have known since you were four years old when something was not cut evenly. You have been doing fractional thinking your whole life at the dinner table, on the court, in the street dividing things up. Today we are just giving that knowledge a name and a notation so you can write it down and use it anywhere. This is not new territory. This is your thinking, dressed up in math language. You already belong here.

INTELLECTUAL COURAGE: Before we go further, I want someone to take a risk. Tell me what you think the bottom number in a fraction does — and I want you to commit to an answer even if you are not sure. Wrong answers are part of the lesson today.

INTELLECTUAL HUMILITY: After we work through the first example, I want you to go back to what you said before and ask yourself: do I need to change anything? Changing your mind when you have new evidence is not weakness. That is exactly what mathematicians do.

CRITICAL CONSCIOUSNESS: Fractions as a formal system were developed and documented across multiple civilizations — Egyptian, Babylonian, Indian, and Chinese mathematicians all worked with parts of wholes long before European textbooks named it. The version most American classrooms were handed came filtered through a very specific tradition. Knowing that, ask yourself: whose ways of counting and dividing have been called math, and whose have been called something else?

COGNITIVE RESTORATION · MATH · ELEMENTARY SCHOOL

Young learners (K-5) can sustain focused numerical reasoning for 7-9 minutes before working memory saturates. For this age, the transition between problems is as cognitively important as the problem itself — a 60-second physical reset measurably restores the prefrontal activation needed for the next task. If students are rushing or guessing, that is not laziness — it is a full working memory signaling overload. Singapore Math's concrete-pictorial-abstract sequence is the most evidence-validated response: slow down the abstract notation until the physical understanding is solid.

LESSON FLOW

ENTRY POINT (Opening) (8-10 min)

Before students sit down, have a whole pan of cornbread, a whole sheet of construction paper, or a drawn rectangle on the board — something that reads as one complete thing. Tell students: We have to share this equally between four people at the table. How do we cut it? Let them discuss with a partner for two minutes. Then cut it — or draw the cuts — in front of them. Ask: How much does each person get? What do we call that piece? Write whatever language they use on the board without correcting it. Students will say "a quarter," "one piece," "a fourth," "25 percent," "one out of four." Keep all of it. Tell them: every single one of those is trying to say the same thing, and today we are going to learn the precise mathematical language that lets us write it, compare it, and use it when the numbers get harder.

Then pose the driving inquiry directly: When something has to be shared fairly, how do we name the part each person gets — and prove it is actually equal? Post it on the wall. Tell students it stays up all day because they will be answering it in writing before they leave.

Reflection prompt: Who is talking? Who is quiet, and why? Is the quiet student confused, or are they a deep processor who needs wait time? Do not fill every silence. Notice what the opening reveals about who already has informal fraction language and who needs the physical model to stay with them.

THE BUILD (Direct Instruction) (12-15 min)

Begin by establishing the whole. Draw a rectangle on the board. Say: This is one whole. Write the word WHOLE beneath it. Tell students: Every fraction lives inside a whole. Before we can name a fraction, we have to know what counts as the whole. This is the most important sentence of the day. Say it again. Have them say it back.

Now divide the rectangle into four equal parts. Ask: How many parts? Write 4. Ask: What do we call each part? Build toward the language: one out of four equal parts. Then write: $\frac{1}{4}$. Say: The number on the bottom tells us how many equal parts the whole was cut into. We call it the denominator. The number on the top tells us how many of those parts we are counting. We call it the numerator. These are not two numbers. This is one number. It lives between zero and one on a number line, and it has a specific location.

Draw a number line. Label 0 and 1. Divide it into four equal spaces. Place $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ in their correct locations. Show that $\frac{4}{4}$ lands exactly on 1. Ask: What does that tell us about a whole? Sit with that for a moment.

Fraction Notation $\frac{a}{b}$ where a is the numerator and b is the denominator

Numerator (a) counts the number of equal parts being described; a is a whole number, a is greater than or equal to 0

Denominator (b) names the total number of equal parts the whole is divided into; b is a whole number, b is not equal to 0

Unit Fraction $\frac{1}{b}$, the single-piece fraction; represents exactly one equal part of a whole divided into b pieces

Fraction on a place $\frac{a}{b}$ by dividing the distance from 0 to 1 into b equal spaces and counting a spaces from 0

Number Line

Comparing Same when denominators match, the fraction with the larger numerator names more parts; $\frac{3}{4}$ is greater than $\frac{2}{4}$

Denominator Fractions

Comparing Same when numerators match, the fraction with the smaller denominator names larger parts because fewer cuts

Numerator Fractions means each piece is bigger; $\frac{1}{3}$ is greater than $\frac{1}{4}$

Worked example (teacher reference):

Scenario: Amara and three of her cousins are splitting one large sweet potato pie equally at their family cookout. Each person gets one equal share. We want to name the fraction of the pie each person receives and locate it on a number line.

Step 1: Name the whole — There is 1 pie. The whole is 1 pie.

Step 2: Count the equal parts — The pie is shared among 4 people, so it is cut into 4 equal parts. The denominator is 4.

Step 3: Count the parts one person receives — Each person gets 1 part. The numerator is 1.

Step 4: Write the fraction — $\frac{1}{4}$. One part out of four equal parts.

Step 5: Locate on number line — Divide the space from 0 to 1 into 4 equal jumps. Count 1 jump from zero. Mark $\frac{1}{4}$ at that location.

What this tells us: Each person at the cookout gets exactly one-fourth of the pie, and that amount lives one equal step away from zero on the number line.

Reflection prompt: Are students copying the steps, or are they tracking why each step happens? Watch for students who can reproduce the notation but cannot tell you what the denominator means when you ask them to put the pencil down and just talk. Compliance looks like writing. Understanding looks like explaining.

WORKSHOP (Guided Practice)
(15-20 min)

Students move into pairs or trios. Distribute the student worksheet. Direct students to the WORKED EXAMPLE and tell them: Read through Amara's example before you touch problems 2 and 3. Talk to your partner and identify: what does the denominator in her problem represent? What does the numerator represent? What would change if there were 6 people instead of 4?

Then release students to work through problems 2 and 3 together. Circulate immediately. Check first on students who were quiet during the opening — they have the most to show you here. Listen specifically for students who say "six pieces" when asked what $\frac{2}{6}$ means, without specifying equal pieces. That is the signal that the equality constraint has not landed yet. Also listen for students who swap numerator and denominator when writing the fraction. This is extremely common and almost always means the student has the concept but has not yet locked the convention.

Your second priority is the student who finishes early and says it was easy. Ask them: Can you show me where your fraction lives on the number line? Can you draw me two fractions with the same denominator and tell me which is bigger without counting? Push the depth before the worksheet asks for it.

Reflection prompt: Productive struggle looks like: a student staring at the problem for thirty seconds, then picking up the pencil. A student erasing and restarting with a different approach. Two students disagreeing about whether the parts are equal and asking you to settle it. Lost looks like: a student copying their partner's numbers without reading the problem. A student who writes a/b without any referent to the scenario. A student who has stopped engaging entirely and is waiting for the answer. These require different responses. Do not treat them the same.

OWN IT (Independent Practice)
(12-15 min)

Students work problems 4, 5, and 6 independently. Remind them before they start: You are not looking for permission to begin. You have everything you need on this page — the formula strip, the worked

example, and your own thinking from problems 2 and 3. Start with what you know. If you hit a wall, write down what you do know before you ask for help.

Circulate during this time but resist answering content questions immediately. When a student says "I don't get it," ask: What do you know for sure so far? What have you written down? What is the problem asking you to find? Let them locate their own entry point before you support.

Problem 6 is the advocacy problem. Some students will stall here because they have not been asked to write an argument in math class before. Prompt them: You used math to figure something out. Now tell someone who matters why it matters. Write it like you mean it.

Reflection prompt: By the time students are working independently, you have data. Who moved fluidly from the worked example to problems 2-3 to 4-5? Who needed scaffolding at each transition? Who got lost specifically at the number line? Who is struggling with the vocabulary but has the conceptual model correct? This is your small group roster for tomorrow. Write three names down before the period ends.

SYNTHESIS (Closing) (8-10 min)

Return to the driving inquiry posted on the wall. Ask students to write a two-sentence response in their math journal or on the back of the worksheet: When something has to be shared fairly, how do we name the part each person gets, and how do we prove it is actually equal? Their response must include the words numerator, denominator, and equal parts.

Collect the exit tickets. Before students leave, ask two or three students to share — not the students who always share. Call on one student who struggled in the workshop. Tell them: I want to hear your thinking, not a perfect answer. There is a difference.

Tell students that the Quick Practice they will see as a follow-up will ask them to do this same thinking faster and with less support. That is not a test. That is how you find out what has actually moved from the worksheet into your brain.

Reflection prompt: What did the exit ticket reveal that the workshop did not? Were there students who seemed to understand during collaboration but could not produce independent written reasoning? What does that tell you about the level of support they needed during guided practice? What is one specific adjustment you would make to the opening or direct instruction based on what you saw today?

NU TEACHER NOTES**WATCH FOR THESE MOMENTS**

- ▶ **First moment:** A student writes the fraction correctly but then draws the pieces of the area model in unequal sizes. This tells you the student has learned to produce the notation without internalizing the equal parts constraint. The underlying cause is that most fraction exposure before third grade involves coloring pre-drawn equal sections — students have never had to construct the equality themselves. Your move: draw two rectangles side by side, one with equal sections and one with unequal sections, and ask the student to tell you which one could actually be called thirds and why. Let them build the answer.
- ▶ **Second moment:** A student places fractions correctly on the number line for unit fractions but cannot place $\frac{2}{6}$ or $\frac{3}{4}$ because they keep resetting to zero for each count. This student understands $\frac{1}{4}$ as one jump from zero but does not yet see $\frac{3}{4}$ as three consecutive jumps of the same size — they see it as three separate $\frac{1}{4}$ fractions sitting independently. The underlying cause is that the cumulative nature of the number line has not clicked yet. Your move: physically walk the number line with them. Stand at zero. Take one step. Say: we are at $\frac{1}{4}$. Take another same-size step. Say: we did not go back — we kept going. We are at $\frac{2}{4}$. Let the body do what the pencil cannot.
- ▶ **Third moment:** A student correctly identifies numerator and denominator vocabulary but uses them interchangeably when talking — saying "the numerator is 4 because there are 4 pieces" when 4 is actually the denominator in that problem. This is a language-anchoring issue, not a conceptual failure. The student knows the ideas but has not yet stabilized which word goes to which position. Your move: create a physical anchor. Write denominator and draw a line under it: the denominator is down, at the bottom, it describes what is down below — the foundation of the whole. Use alliteration: denominator, down, divided, describes. Do not move on until the vocabulary is locked.
- ▶ **Fourth moment:** A student reads problem 5 and immediately uses 6 hours or 4 hoses in their calculation. This is a sophisticated problem-solving instinct — in every previous math experience, all numbers in a word problem were meant to be used. These students are not confused about fractions; they are applying a habit that has always worked before. The underlying cause is that most elementary word problems are written so that every number is relevant. Your move: say directly — not every number in a real-world problem is information you need. Part of mathematical thinking is deciding what matters. Ask: what is the question asking you to find? Now read each number. Does knowing the hours of sunlight change your answer? This is a critical thinking moment, not a fraction moment.

QUESTIONS THAT OPEN DOORS

- ◆ *One: When something gets divided in your neighborhood — like a building converted into apartments, or a block grant split between programs — who decides how many equal parts there are, and does everyone get the same size piece? How would you use what we learned today to describe whether it was fair?*
- ◆ *Two: If fractions were developed by mathematicians in Africa, India, and the Middle East long before they appeared in European classrooms, why do you think most math books do not mention that? What gets lost when we do not know where knowledge comes from?*
- ◆ *Three: Euphemia Lofton Haynes fought for decades to make sure Black students in Washington D.C. received an equal share of school resources. What would it mean to use fractions as evidence in that kind of fight — to show, with numbers, that the distribution was not equal?*
- ◆ *Four: You compared $\frac{1}{6}$ and $\frac{1}{6}$ in problem 5 and found they were equal. Is equal always the same as fair? Can you think of a situation where two people receive equal fractions of something but the situation is still not fair?*
- ◆ *Five: If you had to explain to a younger student what a denominator does, and you could not use the words top, bottom, or the number below the line — what would you say? What is the denominator actually doing in the real world situation?*

CRITICAL CONSCIOUSNESS

Students in under-resourced schools have often been taught to receive knowledge rather than generate it — to follow procedures rather than reason. Every lesson that asks “why does this work?” instead of “what is the answer?” is restoration work. Every moment you pause and say “your reasoning matters” is restoration work. This is not remediation. It is reclamation. You are not filling a deficit. You are clearing a path.

A THOUGHT TO CARRY

“You already know more about fractions than you think you do — and that knowing did not arrive from nowhere. It came from every moment you stayed with something confusing long enough to let it become clear. The lesson in front of you right now is not just a vehicle for students to understand parts and wholes. It is a chance for you to

notice what happens when you bring your full attention to something specific and small — because that attention changes what comes next, in ways that have nothing to do with the lesson plan. The ceiling you are bumping against in this unit, in this work, belongs to a method — not to you. And you are exactly the kind of person who changes methods.”

— Nu Renaissance

STUDENT PRACTICE WORK

Name: _____

Date: _____

Cutting It Equal: What Fractions Really Mean When the Whole Belongs to All of Us**WHY THIS MATTERS**

Fractions are not just a school topic — they are embedded in every decision about fair sharing, resource allocation, and equity that happens in communities like ours. Knowing how to name a part of a whole gives you language and precision where people often use vague terms to obscure how things are actually divided up. Euphemia Lofton Haynes, the first Black woman to earn a doctorate in mathematics in the United States, spent her career fighting for equitable distribution of resources in Washington D.C. schools — a fight that required her to count, name, and compare parts of a whole just like you are doing today. Formal fraction systems were developed by mathematicians across ancient Egypt, India, and Babylon long before European textbooks claimed the concept. That history was not always included in what got taught in American classrooms. You are reclaiming a way of thinking that was yours all along.

RETRIEVE · Quick recall. No notes. Do your best.

1. What is the difference between a line segment and a line? Name one thing a line segment has that a line does not.

Show your work here

2. Sharing the Bread

Jaylen's grandmother baked one loaf of banana bread and cut it into 2 equal pieces for Jaylen and his sister to share. Write the fraction that names the piece each person gets. Then draw a number line from 0 to 1, divide it into equal parts, and mark where Jaylen's share lives.

(Start with the denominator: how many equal pieces is the whole cut into?)

Show your work here

3. Splitting the Smoothie

Before you respond — write in your own words what this is actually asking. Break it into its parts. What are you finding? What do you know? What is unknown? Then solve.

Nadia and her four cousins are sharing one large pitcher of mango smoothie equally at a family gathering. Write the fraction that names the amount each person gets. Then draw a number line from 0 to 1 and mark where each person's share lives. If Nadia drinks her share and her one cousin drinks her share, write the fraction that names how much of the pitcher the two of them drank together.

Notice how this uses the same structure as the Worked Example and problem 2 — what stayed the same? What changed?

SHOW YOUR THINKING: After each step, write one sentence explaining why that move is valid.

A fraction is one number that names a specific amount — a part of a whole that has been cut into equal pieces. The denominator tells you the size of the world: how many equal pieces the whole was divided into. The numerator counts how many of those pieces you are working with. These two ideas have to live together. A denominator without a numerator is incomplete, and a numerator without a denominator is meaningless — you cannot count pieces if you do not know how big the pieces are. In Destiny's macaroni example and in Jaylen's banana bread and in Nadia's smoothie, the same structure appeared every time: identify the whole, count the equal parts, count your pieces, write the fraction, and locate it precisely. That structure does not change whether you are dividing a pan of food, a plot of land, or a city budget. The fraction belongs to any situation where something whole has been divided fairly and someone needs to name their share with precision.

Show your work here

Denominator

In my own words: _____

Numerator

In my own words: _____

THE CORE IDEA

A fraction is one number that names a specific amount — a part of a whole that has been cut into equal pieces. The denominator tells you the size of the whole: how many equal pieces the whole was divided into. The numerator counts how many of those pieces you are working with. These two ideas have to live together. A denominator without a numerator is incomplete, and a numerator without a denominator is meaningless — you cannot count pieces if you do not know how big the pieces are. In Destiny's macaroni example and in Jaylen's banana bread and in Nadia's smoothie, the same structure appeared every time: identify the whole, count the equal parts, count your pieces, write the fraction, and locate it precisely. That structure does not change whether you are dividing a pan of food, a plot of land, or a city budget. The fraction belongs to any situation where something whole has been divided fairly and someone needs to name their share with precision.

You were built for this kind of thinking. Show your work, not just your answer. A wrong answer with real reasoning behind it is worth more than a right answer with nothing behind it. The struggle is how we learn and grow.

PUT IT TO WORK

4. The Community Garden Plot

Keyonni's neighborhood has one community garden plot that the block association divided into 6 equal sections. Keyonni's family was assigned 2 of those sections to grow vegetables. Write the fraction that

names Keyonni's family's share of the garden. Then locate that fraction on a number line from 0 to 1. (Which number in your fraction tells you the size of each section? Which tells you how many sections Keyonni's family has?)

Show your work here

5. Planning What to Plant

Keyonni's family has their 2 sections of the garden. The block association told all families that they must use at least half their sections to grow food the community can harvest, and the rest can be used for flowers. The garden plot receives 6 hours of sunlight each day. Keyonni's family wants to plant tomatoes in 1 section and collard greens in 1 section. They read that tomatoes need more water than collard greens, and that the garden has 4 hoses available for the whole garden. Write the fraction of the whole garden that is planted with tomatoes. Write the fraction of the whole garden that is planted with collard greens. Then compare those two fractions and explain which is larger or whether they are equal, and why.

SHOW YOUR THINKING: Write one sentence after each step explaining why your move is valid. (Before you calculate anything, read the problem again. Which details do you actually need to answer what is being asked? Which details are present but do not change your answer?)

Show your work here

6. Making the Case

Keyonni wants to speak at the next block association meeting to ask for a second garden plot for the neighborhood. Using the fractions you found in problems 4 and 5, write one or two sentences that Keyonni could say to the block association to make the case that the community is using the garden responsibly and has outgrown the single plot.

(Your argument must use at least one specific fraction from your calculations. Numbers make arguments stronger than opinions alone.)

Show your work here

Before I started, I thought or assumed:	Now I understand or can do:
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HOW AM I DOING?**Circle one:**

☐ I can explain my reasoning clearly

☐ I need one more example

☐ I'm in the struggle — this is exactly where growth happens

THE MODEL · Nu Teacher Reference

FORMULA REFERENCE

Fraction notation: a/b

Numerator a : counts the parts being described

Denominator b : names the total number of equal parts, b is not equal to 0

Unit fraction: $1/b$ means one equal part of a whole cut into b pieces

Comparing same denominator: larger numerator means more parts, $3/4$ is greater than $2/4$

Comparing same numerator: smaller denominator means larger pieces, $1/3$ is greater than $1/4$

Number line placement: divide 0 to 1 into b equal spaces, count a spaces from 0

THE MODEL

Scenario: Destiny and her two brothers are splitting one large pan of macaroni and cheese equally. What fraction of the pan does each person get? Where does that fraction live on a number line?

Step 1: Name the whole

The whole is 1 pan of macaroni and cheese. Every fraction we write is a part of this one pan.

Step 2: Count the equal parts

Three people are sharing equally, so the pan is divided into 3 equal parts. The denominator is 3 because 3 is the total number of equal parts the whole is cut into.

Step 3: Count the parts one person receives

Each person gets 1 part. The numerator is 1 because we are counting 1 of those equal parts.

Step 4: Write the fraction

$1/3$. One part out of three equal parts. This is one number. It lives between 0 and 1.

Step 5: Place it on the number line

Draw a line. Mark 0 on the left end. Mark 1 on the right end. Divide the distance between them into 3 equal spaces. Count 1 space from zero and make a mark. Label it $\frac{1}{3}$.

What this tells us: Destiny and each of her brothers gets exactly one-third of the pan, and that amount is located one equal step away from zero on the number line — closer to zero than to one.

Now you try it — problems 2 and 3 use the same structure.

ANSWER KEY**Worked Example**

Each person receives $\frac{1}{3}$ of the pan. On the number line, $\frac{1}{3}$ is located one equal space to the right of zero when the distance from 0 to 1 is divided into three equal spaces.

Reasoning: The worked example models the core structure of the entire lesson — naming the whole, identifying the denominator from the number of equal shares, writing the unit fraction, and placing it precisely on a number line. This sequence is the algorithm students replicate in every problem that follows

TEACHER NOTE

Watch for students who draw the number line without dividing it into equal spaces — they may understand the fraction notation but have not yet connected notation to magnitude. Also watch for students who write $\frac{3}{1}$ instead of $\frac{1}{3}$. This reversal almost always indicates the student knows both numbers belong in the fraction but has not yet locked the convention of denominator on the bottom.

Problem 1**RECOMMENDED**

A line segment has two endpoints. A line does not have endpoints — it continues in both directions forever.

Reasoning: This retrieval item activates geometric vocabulary from a prior unit and primes students for the idea of defined boundaries, which connects loosely to the number line work in today's lesson where 0 and 1 serve as endpoints.

TEACHER NOTE

Students who cannot retrieve this concept may need a brief visual anchor before the number line work in THE BUILD. Consider drawing the number line with exaggerated endpoints to reinforce the boundary concept.

Problem 2

RECOMMENDED

Each person gets $\frac{1}{2}$ of the loaf. On the number line, $\frac{1}{2}$ is located at the exact midpoint between 0 and 1, one equal space from zero when the distance is divided into 2 equal spaces.

Reasoning: With only two people sharing, the denominator is 2 and the numerator is 1. This is the simplest possible unit fraction and gives students a successful entry into the problem structure before the complexity increases in problem 3.

TEACHER NOTE

Students who draw the number line but place $\frac{1}{2}$ off-center are showing you that they have the notation correct but the spatial model is not yet stable. This is very common and worth a quick one-on-one correction before problem 3.

Problem 3

RECOMMENDED

Each person gets $\frac{1}{5}$ of the pitcher. The denominator is 5 because five people share equally. On the number line, $\frac{1}{5}$ is located one equal space from zero when the distance from 0 to 1 is divided into 5 equal spaces. Nadia and her one cousin together drank 2 parts out of 5 equal parts, which is $\frac{2}{5}$. On the number line, $\frac{2}{5}$ is located two equal spaces from zero.

Reasoning: Students must correctly identify five as the total number of sharers (Nadia plus four cousins), write $\frac{1}{5}$ for each share, then add two unit fractions with the same denominator to find $\frac{2}{5}$. The multi-part structure of this problem is the first time students are asked to add fractions, though the concept is accessible because the denominator does not change.

TEACHER NOTE

The most common error here is writing $\frac{1}{4}$ because students count only the four cousins and forget to include Nadia. Remind students to read carefully: it says Nadia and her four cousins, meaning five people total. Also watch for students who write the sum as $\frac{2}{10}$ — they may be adding both numerators and both denominators, which is the classic fraction addition error to address now before it calcifies.

Problem 4

RECOMMENDED

Keyonni's family's share is $\frac{2}{6}$. The denominator is 6 because the whole garden is divided into 6 equal sections. The numerator is 2 because Keyonni's family has 2 of those sections. On the number line, $\frac{2}{6}$ is located two equal spaces from zero when the distance from 0 to 1 is divided into 6 equal spaces.

Reasoning: This is the first problem where the numerator is greater than 1, requiring students to extend from unit fractions to multi-unit fractions. The structure remains identical to all previous problems — the only change is counting two parts instead of one.

TEACHER NOTE

Watch for students who write $\frac{6}{2}$ rather than $\frac{2}{6}$. Also watch for students who correctly write $\frac{2}{6}$ but place it incorrectly on the number line — they may count two tick marks from zero without first checking that the spacing between marks is equal. If a student simplifies $\frac{2}{6}$ to $\frac{1}{3}$ without instruction, name that as impressive and set it aside for a future equivalence lesson rather than correcting it.

Problem 5

RECOMMENDED

Tomatoes are planted in 1 out of 6 equal sections, so the fraction is $\frac{1}{6}$. Collard greens are planted in 1 out of 6 equal sections, so the fraction is $\frac{1}{6}$. These two fractions are equal because both have the same numerator and the same denominator — both represent one equal section out of the same whole garden. The irrelevant information in this problem includes the number of hours of sunlight (6 hours) and the number of hoses available (4 hoses). Neither of those numbers changes how the garden is divided or what fraction of the whole each crop represents.

Reasoning: The problem embeds two numbers — 6 hours of sunlight and 4 hoses — that students may attempt to use because they appear to be mathematical data. Students who filter this information correctly are demonstrating close reading alongside fraction reasoning. The comparison of $\frac{1}{6}$ and $\frac{1}{6}$ is the simplest possible same-denominator comparison, but it requires students to recognize equality as a valid comparison outcome, not just greater than or less than.

TEACHER NOTE

Students who use 6 or 4 in their fraction calculations are telling you they have not yet learned to interrogate whether all numbers in a problem are relevant. This is a close-reading skill, not a math error — address it as such. Ask: What is the question actually asking you to find? Do you need to know how many hoses there are to figure out what fraction of the garden is tomatoes?

Problem 6

RECOMMENDED

A strong student response includes at least one specific fraction and makes a clear claim

directed at a real audience. Example: Keyonni could say — Our family has been caring for 2 out of 6 equal sections of the garden, and we have used every section productively, planting $\frac{1}{6}$ in tomatoes and $\frac{1}{6}$ in collard greens with nothing wasted. The garden is being used fully and our community has outgrown this single plot — we are ready for more space to grow. Any response that uses the correct fractions from problems 4 and 5, names a real audience, and makes a specific claim earns full credit regardless of phrasing.

Reasoning: The advocacy problem asks students to transfer mathematical results into a persuasive context. The fraction must appear as evidence, not decoration. Students who write only a general statement without specific numbers have not completed the transfer.

TEACHER NOTE

Students who write something like "we used a lot of the garden" without citing fractions need a direct prompt: What exact fraction did you find? Put that number in your sentence. The precision of mathematical language is the point of this problem. If a student advocates effectively but uses an incorrect fraction from an earlier error, award credit for the advocacy structure and note the calculation error separately.

CRITICAL CONSCIOUSNESS NOTE: Strong answers hold two things at once: genuine acknowledgment of the structural reality students are naming, AND evidence-based counter-argument. Honor the critique. Don't rush to resolution.

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