Class 6 – Fractions (7.0)

19th September 2025

N001: Learn that fractions represent equal sharing of whole units among people.

Pages: 151-153

Textbook Content: Opening dialogue between Shabnam and Mukta about sharing rotis equally. Introduction to fraction notation 1/2, 1/4. Comparison of unit fractions showing that more sharers means smaller shares.

Learning Goal: Students understand that fractions represent equal parts of a whole and can compare simple unit fractions.

Explanation:

Fractions are Just Pizza Slices!

Imagine you have a whole pizza in front of you.

What's a Fraction?

A fraction is just a way to talk about pieces of something whole. When we share a pizza by cutting it into equal pieces, each piece is a fraction of the whole pizza.

Let's Cut Some Pizza!

🍕 **Cut into 2 pieces:** Each piece = 1/2 (say "one half")

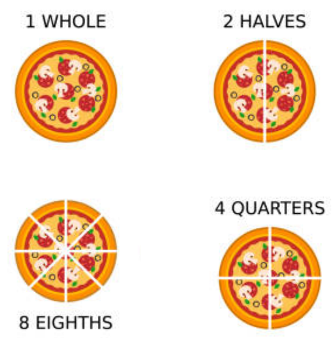
- You get a nice big slice!

🍕 **Cut into 4 pieces:** Each piece = 1/4 (say "one fourth")

- Still a good size slice

🍕 **Cut into 8 pieces:** Each piece = 1/8 (say "one eighth")

- Now the slices are getting smaller!



Reading Fractions is Easy!

In 3/4:

- Top number (3) = How many slices you took
- Bottom number (4) = How many slices the pizza was cut into
- So 3/4 means: "I took 3 slices from a pizza cut into 4 pieces"

So Which Slice is Bigger?

Think about it: If you're really hungry, would you rather have 1/2 of a pizza or 1/8 of a pizza?

1/2 is bigger! Because when you cut a pizza into only 2 pieces, each piece is much bigger than when you cut it into 8 pieces.

Quick Trick: The bigger the bottom number, the smaller the piece!

Try This: If you and 3 friends share a pizza equally, each person gets 1/4. But if just you and one friend share it, each gets 1/2. Who gets more pizza?

So what is the definition of a 'Fractional Unit' or 'Unit Fraction'?

A **fractional unit** is what you get when you divide 1 whole thing into equal parts and take just ONE of those parts.

In simple words: It's a fraction with 1 on top!

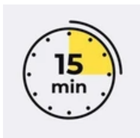
Examples:

⏰ **Time Fractions**

Every hour has 60 minutes to divide!

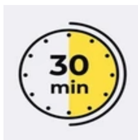
⏰ **Quarter past:** 15 minutes = 15/60

- The minute hand moved from 12 to 3



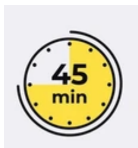
⏰ **Half past:** 30 minutes = 30/60

- The minute hand is pointing at 6 now



⏰ **Three-Quarters Past:** 45 minutes = 45/60

- The minute hand is now at 9 !



Did you notice?
Could we have written the same fractions as 3/12, 6/12, 9/12 as well (because those are the numbers on the clock?) 🤔🤔

N000: Understanding the Division Symbol and Operation

Pages: Pre-requisite knowledge Textbook Content: The division symbol ÷ and the division operation must be understood before students can grasp fraction notation.

Learning Goal: Students recognize division symbols and understand basic division as "splitting into equal groups."

Explanation:

What Does *Division* & This Symbol Mean ÷ ?

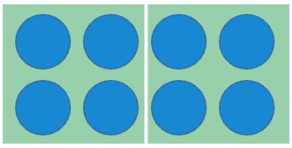
You've seen this symbol before: ÷

This is called the "division symbol" and it means "divided by."

Different Ways to Write Division

All of these mean the same thing:

- 8 ÷ 2
- 8 divided by 2
- "Eight divided by two"
- 8 / 2



What Division Actually Does

Division splits things into equal groups. When you see 8 ÷ 2, you're being asked: "Split 8 things into 2 equal groups. How many in each group?"

Try This: Look at this: 12 ÷ 3 This is asking: "Split 12 things into 3 equal groups." The answer is 4 (because 12 things make 3 groups of 4 each).

Quick Trick: The division symbol ÷ looks like it's splitting the two dots apart - just like division splits numbers apart!

Why Understanding Division Matters: Once you understand what ÷ means, you'll be ready to see how the same idea appears in fractions using a different symbol.

$$8 \div 2 = 8 \,/\, 2$$

N001_Enrichment: Exploring traditional fractions

Pages: Pre-requisite knowledge Textbook Content: The division symbol ÷ and the division operation must be understood before students can grasp fraction notation.

Learning Goal: Students recognize division symbols and understand basic division as "splitting into equal groups."

Explanation:

Fractions have been part of Indian mathematics for over 3,000 years! The words we use for fractions today - like 'paav' for quarter, 'adhaa' for half, and 'saadhey' for "and a half" - come directly from ancient Sanskrit. When the Rig Veda mentioned 'tri-pada' for three-quarters, it literally meant "three feet" or "three parts.

Examples from Real Life

Your grandmother saying "saadhey teen baje" (3:30) or asking for "paune do kilo" (1¾ kg) of vegetables is using mathematics from the Vedic period! Different Indian languages kept these ancient fraction words alive:

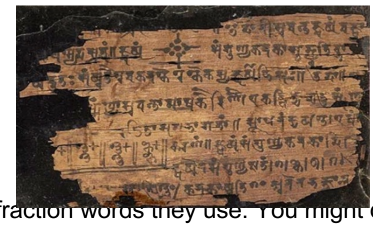
- Hindi: 'teen paav' (¾), 'saadhey do' (2½)
- Tamil: 'mukkaal' (¾), 'kaal' (¼)
- Telugu: 'mudu-kaalu' (¾) - literally "three parts"
- Bengali: 'saardhey' (½), 'pouney' (¾)

Image Ideas:

- Split image showing ancient Sanskrit text and modern kitchen scene with grandmother measuring
- Map of India with different regional fraction words marked by state

Historical Connection/ Special Box

Ancient Indian mathematicians like Brahmagupta (628 CE) didn't just invent fraction calculations - they created a language system that survived thousands of years. The Bakshali manuscript (300 CE) shows fractions written almost exactly like we do today. These weren't just academic exercises - merchants used fractions for trade, architects for temple construction, and families for daily cooking.



Your Turn: Ask your family what fraction words they use. You might discover your kitchen is a living museum of ancient mathematics!

N002: Recognizing fractional units as equal divisions of one whole unit

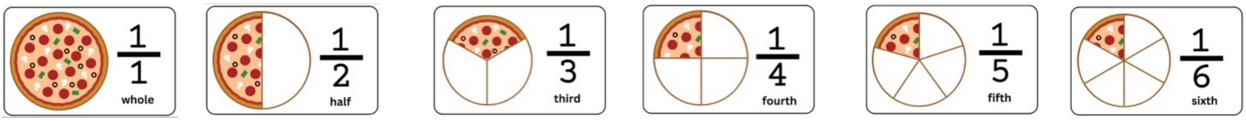
Pages:154-155

Textbook Content: Definition of fractional units (1/2, 1/3, 1/4, etc.). Visual representation of whole chikki divided into equal parts showing different fractional units. Understanding that equal divisions create same-sized fractional units regardless of shape.

Learning Goal: Students can identify and create fractional units by dividing wholes into equal parts.

Explanation:

A unit fraction is what you get when you take exactly ONE piece from something that's been divided into equal parts. The top number is always 1, and the bottom number tells you how many equal pieces the whole thing was cut into. Think of it as "one piece out of however many pieces total."



Real-World Connection

When you eat 1 slice from an 86-slice pizza, you ate 1/6 *(one by sixth)* of the pizza. Unit fractions are everywhere because we constantly take "one piece" of things.

What then are fractional units?

A unit fraction has numerator 1 and represents one equal part of a whole. Unit fractions are the building blocks of all fractions. Any fraction can be understood as multiple unit fractions added together. For example, 3/7 means three copies of the unit fraction 1/7.

Image Ideas:

- Mathematical notation showing: 3/7 = 1/7 + 1/7 + 1/7
- Building blocks diagram showing unit fractions (1/7) stacking to make larger fractions (3/7)

Quick Trick

Unit fractions always have "1 on top, something below."

Remember: "One on top means unit shop!"

N003_Support: Counting and Pattern Recognition in fractions

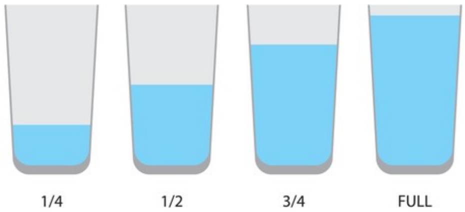
Explanation:

Think of fractions like collecting coins. When you count 1/4 + 1/4 + 1/4 + 1/4, you get 4/4 = 1 whole coin. Sometimes you collect more than one whole - like 1/2 + 1/2 + 1/2 = 3/2 = 1½. The pattern is: keep adding the same fractional pieces and you can build wholes and beyond.

Real-World Connection

Next time when someone at home is cooking, do ask them how they measure the water. When measuring water for cooking, you use the same small cup repeatedly. One cup may be 1/4 liter. So if you wanted 1 liter of water, you would use 4 cups.

But recipes often need more - 6 cups gives you 6/4 = 1½ liters. Your brain starts recognizing the pattern: every 4 scoops = 1 liter, so 6 scoops = 1 liter + 2 extra scoops.



So what are these patterns?

Systematic addition of identical fractional units follows the pattern n × (1/d) = n/d. When n equals d, the sum equals 1 whole unit. When n exceeds d, the result is an improper fraction greater than 1, which can be expressed as a mixed number.

$$1/3 + 1/3 + 1/3 \quad = \quad 3 \times 1/3 \quad = \quad 1$$

This pattern recognition is fundamental for understanding that fractions can accumulate beyond unity (1) and for developing fluency with equivalent representations of quantities greater than one whole.

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4. Quick Trick

Remember: "If *same bottom* number, add the tops - count until the pattern stops!"

Watch for the magic moment: 4/4 = 1. The pattern shows when you've built complete wholes plus extras.

N003: Fractional Units

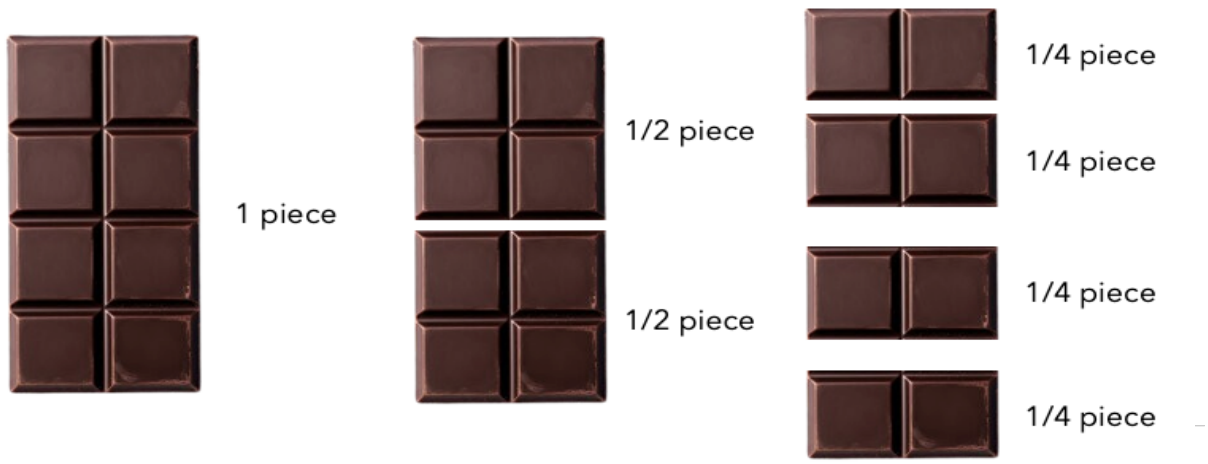
Pages:156-157

Textbook Content: Create fractional units through paper folding and build fractions by counting units. aper folding to create 1/2, 1/4, 1/8 AND counting fractional units (2×1/4=2/4, etc.)

Learning Goal: Students can create fractional units and build fractions by counting them. Should maybe ideally be broken into 2 different nodes - one for identifying fractional units and the other one for addition of fractional units in order to make a whole.

Explanation:

Think of breaking a chocolate bar into smaller pieces. When you snap it in half, you get two pieces. Snap each piece again, and you get four pieces. Keep breaking, and you can count these small pieces to make any amount you want - like counting "one piece, two pieces, three pieces" to build up your snack.



When you fold a roti or chapati for your tiffin box, you're creating fraction units. One fold makes 2 half-pieces, another fold makes 4 quarter-pieces. If you count "one quarter, two quarters, three quarters," you're building fractions (1/4, 2/4, 3/4).

Same thing happens when folding clothes - each fold creates equal sections that add up to the whole garment.

Folded In 1/2

Folded 1/4

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3. Quick Trick

Remember: "Fold and count - that's the fractional amount!"

Paper trick: Each fold gives you more equal pieces. 1 fold = 2 pieces (halves), 2 folds = 4 pieces (quarters). Count your pieces to build any fraction you need!

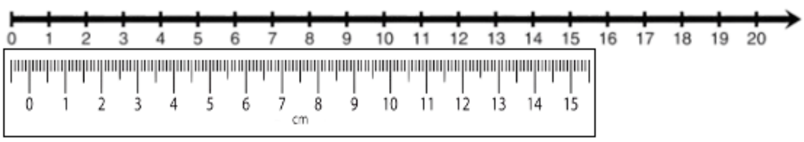
N004_Prerequisite_NumberLine: Understanding Number Lines

Pages: Needed for 159-160

Learning Goal: What is a number line? They must know that the number counting can be done on such a number line

Explanation:

Think of a number line as a straight road that shows numbers in order. It's like a ruler that goes on forever in both directions. Every spot on this line has a number.



Some spots have whole numbers like 1, 2, 3. But there are also spots between these numbers.

The number line helps us see which numbers are bigger or smaller than others.

Real-World Connection

Look at the corridor in your school. The classrooms are numbered 1, 2, 3, 4 in order.

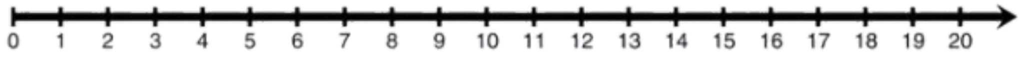
Your phone's volume works the same way. You can set it to 5, or 6, or something in between like 5.5.

A thermometer also follows this pattern. The temperature can be 25 degrees, or 26 degrees, or 25.2 degrees.

Every measurement follows the number line pattern - your height, time on a clock, or distance you walk.

From the Textbook

A number line is a straight line that represents all numbers. Each point on the line matches exactly one number.



Between any two numbers on the line, we can always find more numbers.

This helps us understand which numbers are larger or smaller. It also helps us see how far apart numbers are from each other.

Quick Trick

Remember: "Every number has a home on the line!"

Just like houses on a street have addresses, every number lives in one exact spot.

Bigger numbers live on the right side. Smaller numbers live on the left side.

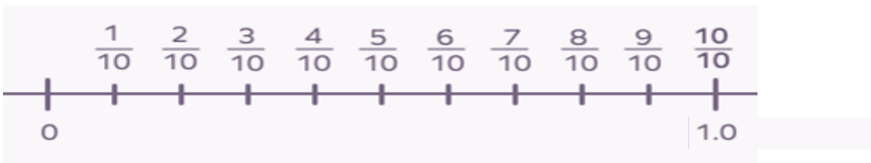
N004:”: Identifying fraction positions on the Number Line

Pages: 159-160

Textbook Content: Dividing unit intervals into equal parts. Marking fractional lengths like 1/2, 2/3, 3/5 on number lines. Understanding that fractions have specific positions between whole numbers.

Learning Goal: Students can locate and mark fractions accurately on number lines.

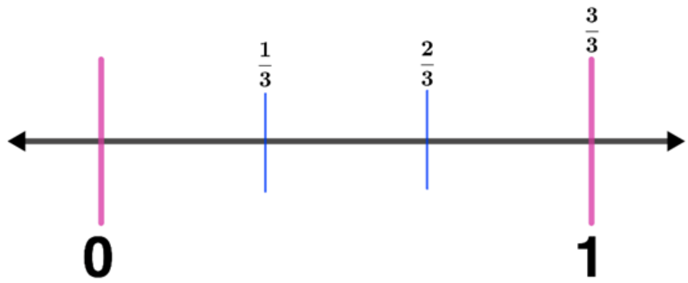
Explanation:



When we put fractions on a number line, we're finding their exact homes between whole numbers.

Think of it like cutting a chocolate bar. If you cut it into 3 equal pieces, each piece is 1/3 of the whole bar.

On a number line, 1/3 sits exactly one-third of the way from 0 to 1.



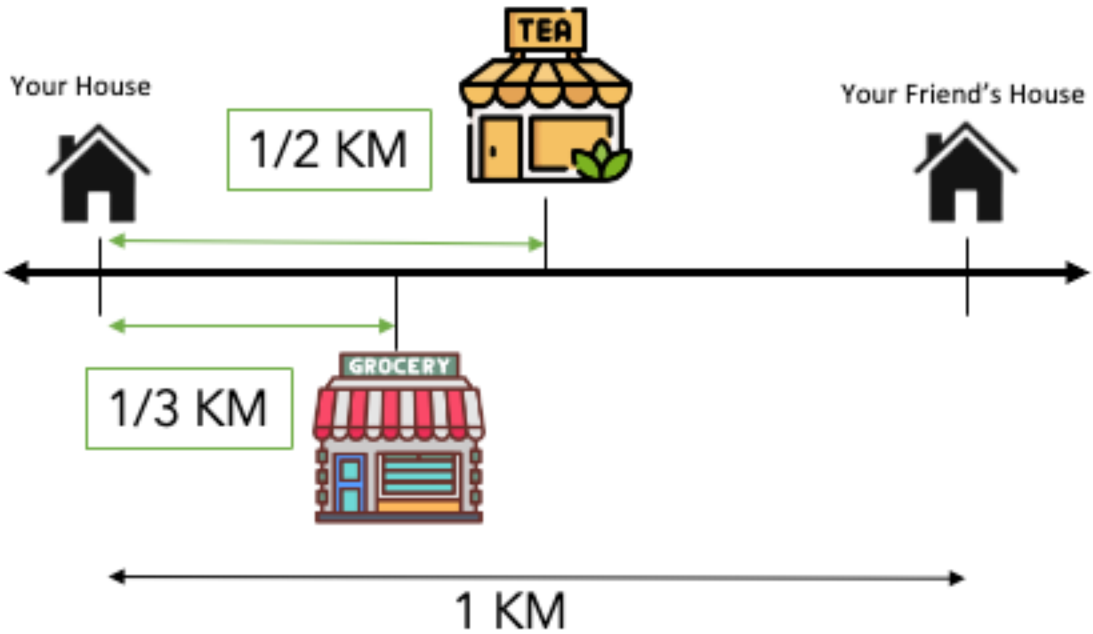
To place any fraction, we divide the space between 0 and 1 into equal parts, then count to find where our fraction lives.

Real-World Connection

Imagine you're walking from your house to your friend's house. The distance is exactly 1 kilometer.

If you stop at the tea stall that's exactly halfway, you're at the 1/2 position on your journey.

If there's a grocery store that's 1/3 of the way there, you walk past 1 out of every 3 equal parts of your journey.

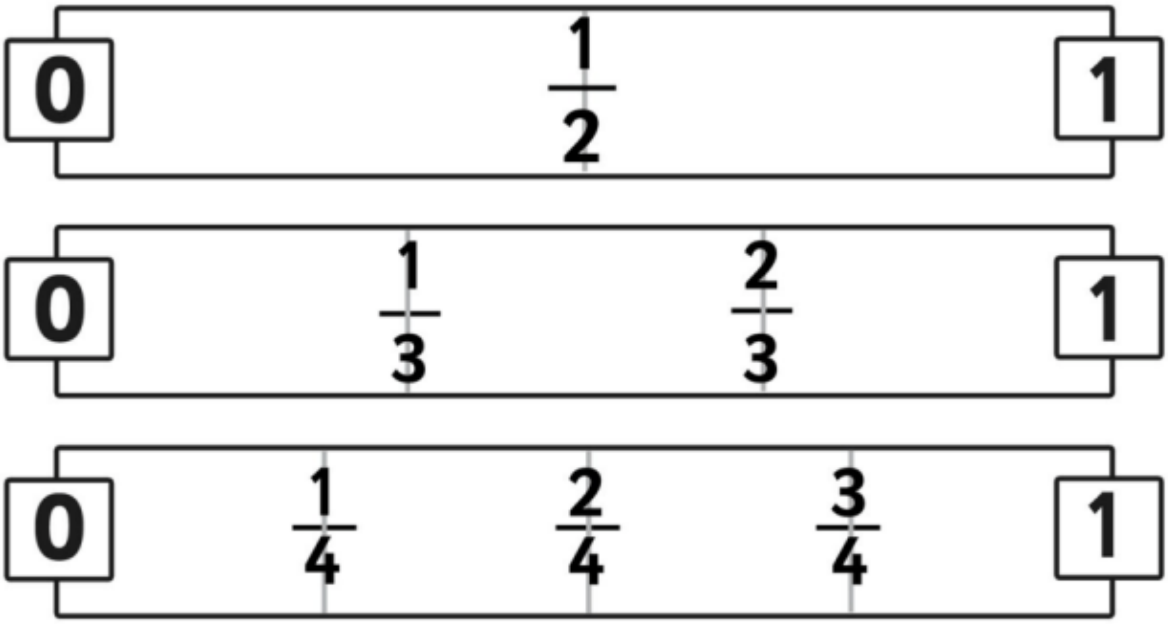


Your phone's battery percentage works the same way. At 75% charge, you're at 3/4 on the number line from empty (0) to full (1).

From the Textbook

To locate fractions on a number line, we divide the unit interval from 0 to 1 into equal segments.

The denominator tells us how many equal parts to create. The numerator tells us how many parts to count from zero.



For example, to mark 2/5, we divide the space from 0 to 1 into 5 equal parts, then count 2 parts from zero.

This method works for any proper fraction. Each fraction has one exact location on the number line.

Understanding fraction positions helps us compare their sizes and see relationships between different fractions.

N005a: Working with fractions greater than 1

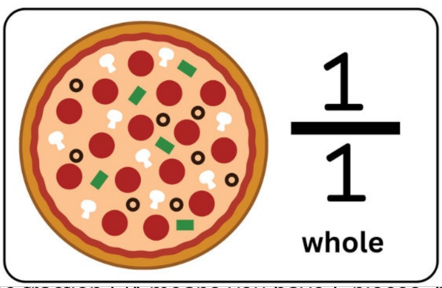
Pages: 161-162

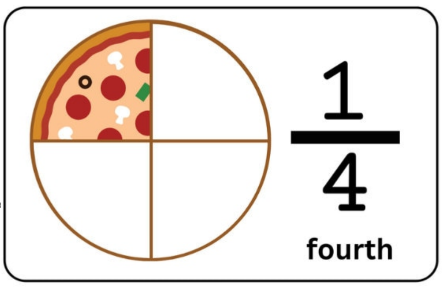
Textbook Content: Identifying fractions greater than 1 (numerator > denominator).

Learning Goal: Students should understand the concept of fractions being greater than 1 and what is the valid representation

Explanation:

Sometimes we have more than one whole thing, and fractions can show this too. When the top number is bigger than the bottom number, we have more than 1 whole.

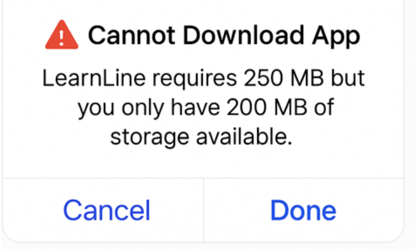




Th … pizza only has … 1 whole pi…

The fraction 5/4 means you have 5 pieces, but it takes only 4 pieces to make 1 whole pizza.

Your phone storage works similarly. If an app needs 250 MB but you only have 200 MB free space, the app needs 250/200 of your available space - more than what you have.



From the Textbook

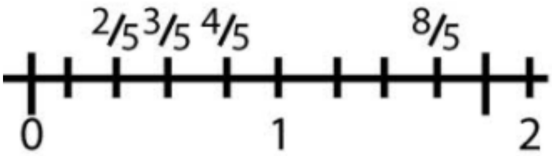
A fraction is greater than 1 when its numerator is larger than its denominator.

These fractions represent quantities that exceed one whole unit.

For example, 8/5 is greater than 1 because 8 > 5. This means we have 8 parts when only 5 parts make one whole.

Such fractions are called improper fractions. They show we have more than one complete unit.

On a number line, these fractions appear to the right of 1, between whole numbers like 1 and 2, or 2 and 3, and so on…



Please remember: We may also call these kind of fractions – **Improper Fractions !**

Quick Trick

Remember: "When the top is bigger, you have more than one whole!"

Look at the two numbers in a fraction. If the top number beats the bottom number, you have more than 1.

Examples: 3/2 (3 beats 2), 5/4 (5 beats 4), 7/6 (7 beats 6) - all bigger than 1.

But 2/3 (2 loses to 3), 4/5 (4 loses to 5) - these are less than 1.

Think of it a way of comparing numbers….

N005a_Prerequisite: Numerator and Denominator

Pages: 161-162

Learning Goal: Students should understand when we are comparing the top and bottom number of a fraction with the mathematical terminology of numerator and denominator

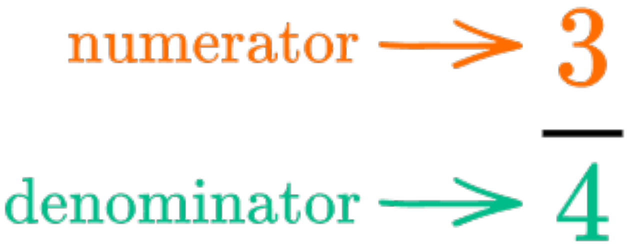
Explanation:

Every number written one above the other has two parts with special names.

The top number is called the numerator. The bottom number is called the denominator.

These are just fancy words for "top" and "bottom" - like knowing that your head is called a "cranium" in science class.

Learning these names helps us talk about numbers more clearly.



In mathematical notation, when two numbers are written with one above the other separated by a line, they have specific names.

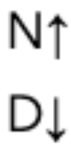
The number above the line is called the numerator. The number below the line is called the denominator.

These terms come from Latin words meaning "to number" and "to name" respectively.

Quick Trick

Remember: "Numerator is up, Denominator is down!"

Think of "Numerator" starting with "N" like "North" - it points up to the sky.



Think of "Denominator" starting with "D" like "Down" - it points toward the ground.

"N up, D down" - that's how you remember which is which.

N005b: Converting between mixed fraction and improper fraction

Pages: 162-163

Textbook Content: Learning how to write fractions greater than 1 as mixed fractions and viceversa, Converting improper fractions to mixed numbers (7/3 = 2 1/3). Converting mixed numbers back to improper fractions. Understanding whole and fractional parts.

Learning Goal: Students can convert between improper fractions and mixed numbers.

Explanation:

Sometimes we can write the same amount in two different ways.

When we have more than 1 whole, we can write it as one big fraction or split it into wholes plus a leftover piece.

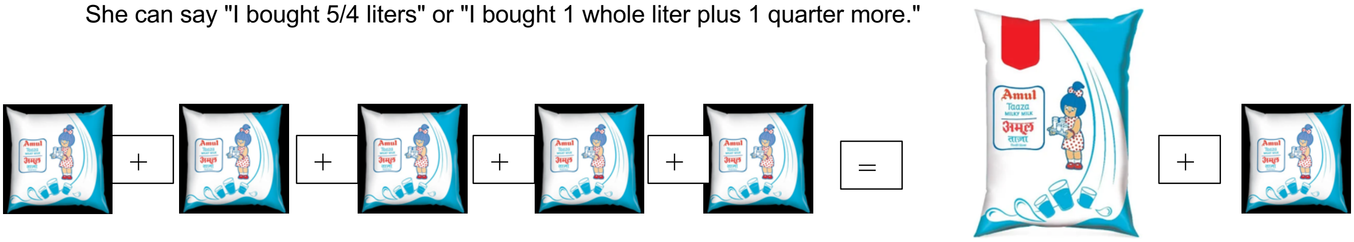
For example, 7/3 is the same as 2 and 1/3. Both show the exact same amount.

It's like having 7 cookies when it takes 3 cookies to fill one box - you can fill 2 whole boxes and have 1 cookie left over.

Real-World Connection

Your mother buys 5 quarters of milk from the dairy. Each whole liter needs 4 quarters.

She can say "I bought 5/4 liters" or "I bought 1 whole liter plus 1 quarter more."



Both ways describe the same amount of milk - just written differently.

When you eat 3 halves of an apple, you ate 3/2 apples. You can also say you ate 1 whole apple plus half of another apple.

Your phone shows 130% battery when using power bank. That's the same as saying 1 full charge plus 30% extra.

From the Textbook

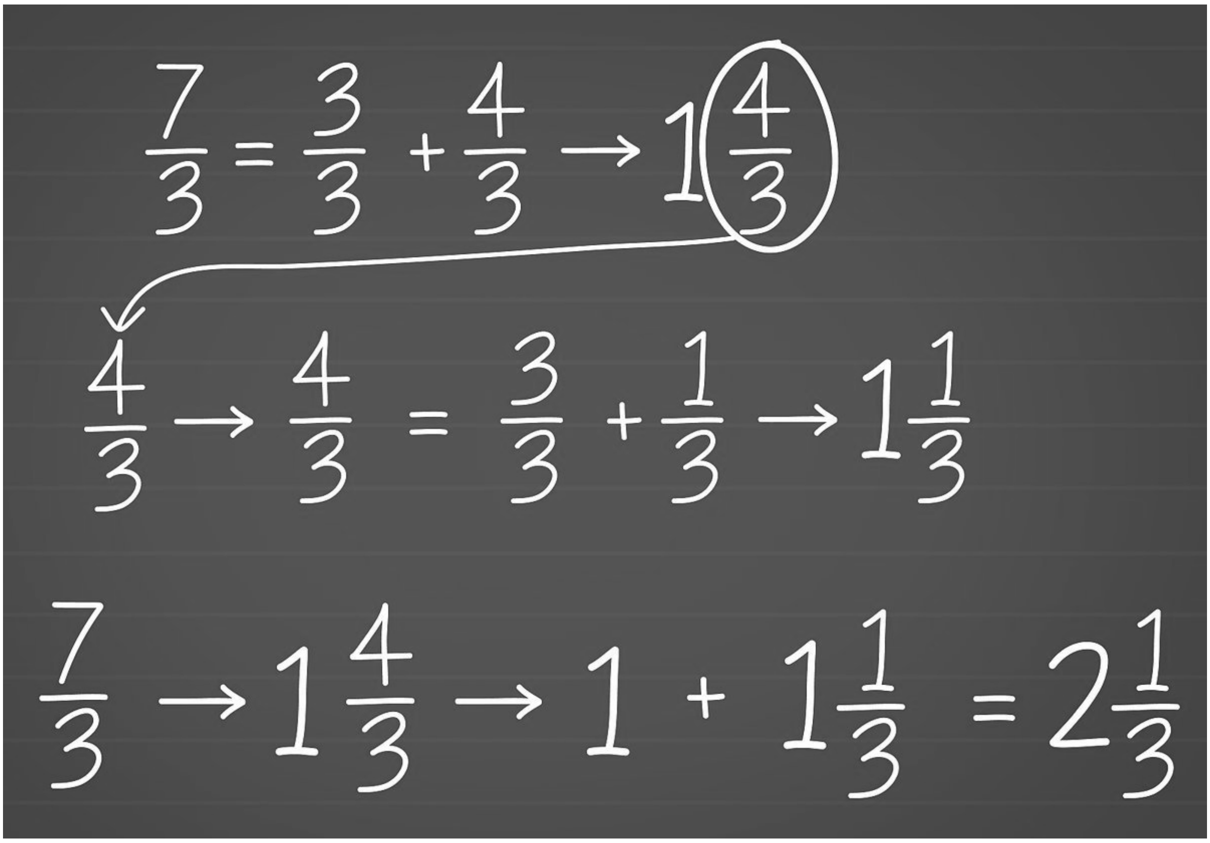
An improper fraction can be converted to a mixed number by division.

To convert 7/3 to mixed form: divide 7 by 3 to get 2 with remainder 1. Write as 2 and 1/3.

To convert a mixed number back to improper fraction: multiply the whole number by the denominator, add the numerator.

For 2 and 1/3: multiply 2 × 3 = 6, add 1 = 7, write as 7/3.

Both forms represent identical values but serve different purposes in mathematical operations.



Quick Trick

Remember: "Divide to split, multiply to join!"

To change 11/4 into mixed: divide 11 ÷ 4 = 2 remainder 3, so 2 and 3/4.

To change 3 and 1/5 into improper: multiply 3 × 5 + 1 = 16, so 16/5.

Think "split the big fraction" or "join the pieces back."

N006a: Identifying Equivalent Fractions

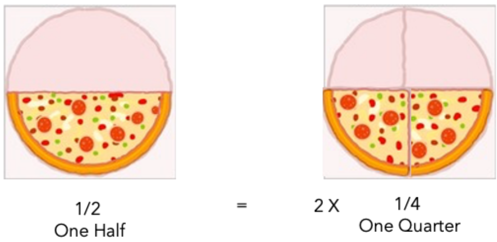
Pages: 163-165

Textbook Content: Fraction walls and paper strips showing equal lengths (1/2 = 2/4 = 4/8)

Learning Goal: Students can identify equivalent fractions using visual models.

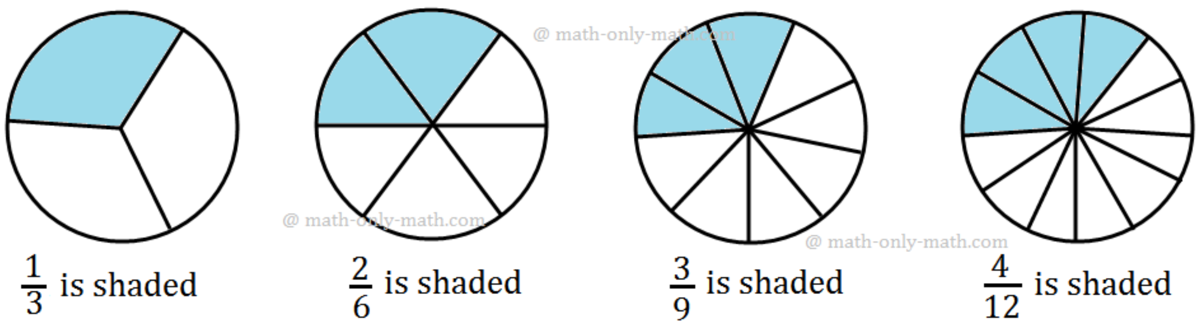
Explanation:

Think of fractions like different sized pizza slices that give you the same amount of pizza. When you cut one pizza into 2 pieces and take 1 piece, you get the same amount as cutting another identical pizza into 4 pieces and taking 2 pieces. Different fractions can represent the exact same quantity.



3. From the Textbook

Equivalent fractions are fractions that represent the same numerical value or the same part of a whole, even though they have different numerators and denominators. When fractions are equivalent, they occupy the same position on the number line and can be obtained by multiplying or dividing both the numerator and denominator by the same non-zero number. Visual models like fraction strips, number lines, and area models help demonstrate that fractions such as 1/2, 2/4, and 4/8 are mathematically equivalent.



N006_Support: Multiplication and Division fluency

Pages: Supporting Node 6a

Learning Goal: Ability to multiply and divide whole numbers fluently, essential for equivalent fraction operations

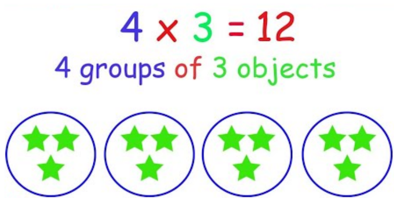
Explanation:

Multiplication is repeated addition - when you multiply 2 × 3, you're adding 2 three times (2+2+2=6).

Division splits numbers into equal groups - if you have 6 items and divide by 2, you get 3 in each group. These skills help you solve math problems quickly.

2. Real-World Connection

When you buy 3 packs of pencils with 4 pencils each, you multiply 3 × 4 to get 12 total pencils. If 8 students need to pair up, you divide 8 ÷ 2 to find there are 4 pairs. At lunch, if you share 6 chapatis equally among 3 friends, division tells you each gets 2 chapatis.



3. From the Textbook

Multiplication and division are inverse operations fundamental to mathematical computation. Multiplication represents repeated addition while division represents equal grouping or repeated subtraction.

N006b: Understanding Equivalent Fractions through different sharing scenarios

Pages: 165-167

Textbook Content: Understanding the equivalent fractions through different sharing scenarios.

Learning Goal: Students understand that different divisions can yield equal shares.

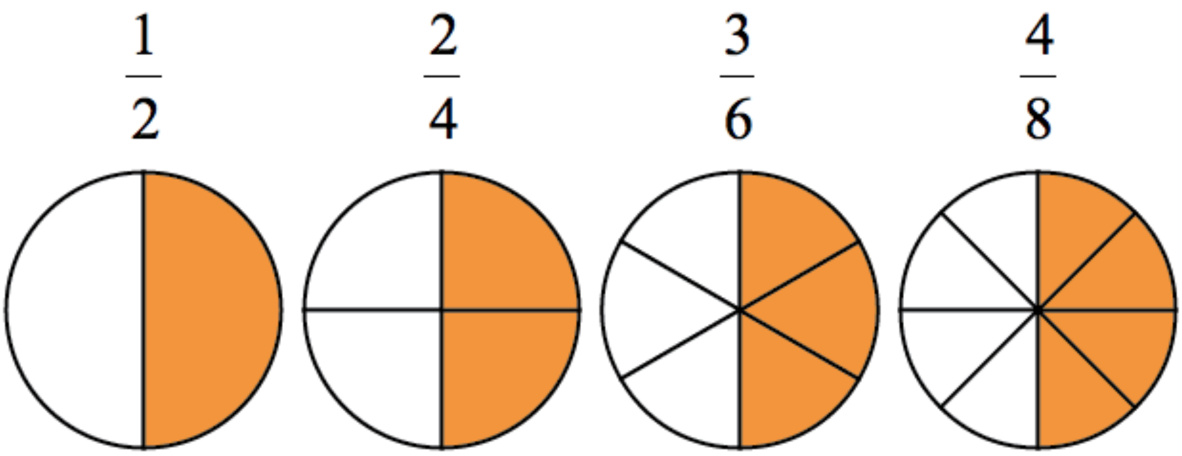
Explanation:

When you share the same total amount among different numbers of people, you can still end up with equal individual shares. Think of it like cutting the same size cake differently - one cake cut into 2 big pieces gives the same amount per person as two identical cakes cut into 4 smaller pieces when shared properly. Different sharing methods can create the same result.

ADD another picture of multiple things being shared between increasing number of people

From the Textbook

Equivalent fractions emerge when different division scenarios yield identical individual shares. When the numerator and denominator of fractions are multiplied by the same factor, the fractional value remains constant. This concept demonstrates that 1/2 = 2/4 = 3/6 through equal sharing contexts.



4. Quick Trick

Remember: "Same share, different care!" When both the number of items AND the number of people multiply by the same amount, everyone still gets the same portion. Check by asking: "Does each person get the same amount in both situations?"

N006c: Creating Equivalent Fractions using multiplication methods for comparison

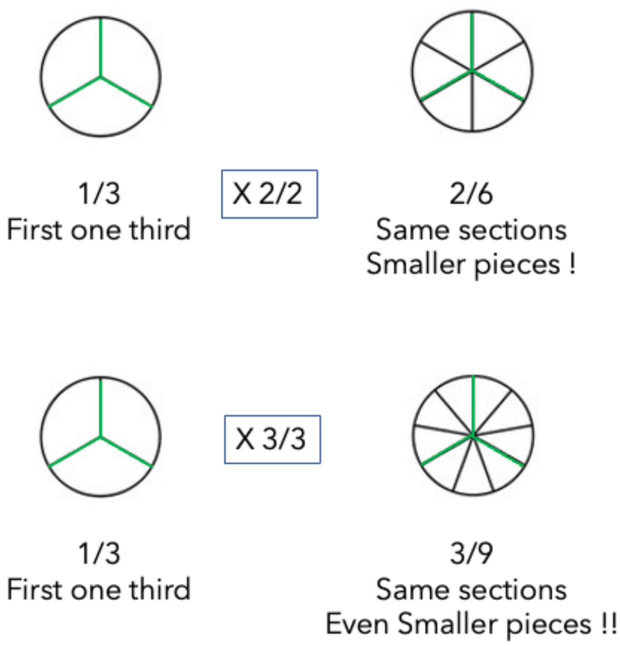
Pages: 167-171

Textbook Content: Method to generate equivalent fractions and find common denominator

Learning Goal: Students can create equivalent fractions and use them for comparison.

Explanation:

You can create equivalent fractions by multiplying both the top and bottom numbers by the same amount. Think of it like making copies - if you have 1/3 and multiply both 1 and 3 by 2, you get 2/6, which is the same value. It's like having one cookie cut in three pieces (or) cut into six pieces – and give each person $2/6^{th}$



Comparing Fractions Using Equivalent Forms

To compare fractions with different denominators, you need to make equivalent fractions with the same bottom number (denominator). Once they have the same denominator, just compare the top numbers - the bigger numerator means the bigger fraction.

The Process

Let's use a simpler example: comparing 1/2 and 4/6

1. Find a common denominator: We can see that in order to make the bottom number the same – we find that 6 itself is a suitable number.
2. Create equivalent fractions:
    - 1/2 = 3/6 (multiply both top and bottom by 3)
    - 4/6 = 4/6 (multiply both top and bottom by 1, remember you multiply anything by 1 – you get back the same number !)
3. Compare: Now we can see that 3/6 < 4/6, so 1/2 < 4/6 !

Why This Works

The multiplication method maintains the same fractional value while giving us a common basis for comparison. It's like having different sized pizza slices - you need to cut them the same way to see which is actually bigger.

3. From the Textbook

Equivalent fractions are generated through systematic multiplication of both numerator and denominator by identical non-zero integers. This process maintains fractional equivalence while creating common denominators necessary for comparison operations.

4. Quick Trick

Remember: "Wh … the same number. Use small multipliers … common denominator by multiplying each fraction appropriately. Then just compare the top numbers !

N006c_Enrichment: Comparing fractions by equating the numerator

Pages: Supports 6c

Learning Goal: Adding the additional tip that one may be able to equalise the numerators as well and compare the denominators between 2 different fractions.

Explanation:

Sometimes finding a common denominator can involve big numbers that are hard to work with. In those cases, you can try making the numerators (top numbers) the same instead! Once the top numbers match, the fraction with the smaller bottom number is actually the larger fraction.

For example, to compare 3/8 and 2/5, multiply to get equal numerators: 3/8 becomes 6/16 and 2/5 becomes 6/15. Since 6/15 has a smaller denominator than 6/16, we know 2/5 > 3/8.

Quick Trick

Remember: "Same top, smaller bottom wins!" When numerators are equal, the fraction with fewer total parts (smaller denominator) gives you bigger individual pieces.

Image Ideas: Two pizzas with same slices taken but different total cuts showing which gives bigger portions, simple comparison chart showing inverse relationship between denominator size and fraction value.

N006d: Express Fractions in Lowest Terms

Pages: 172

Textbook Content: Reducing fractions to lowest terms by dividing by common factors.

Learning Goal: Students can express fractions in simplest form.

Explanation:

A fraction is in lowest terms when you can't make the top and bottom numbers any smaller while keeping the same value. Think of it like cleaning up - you remove all common factors that both numbers share until they have no common factors left except 1. This gives you the simplest, cleanest form of the fraction.

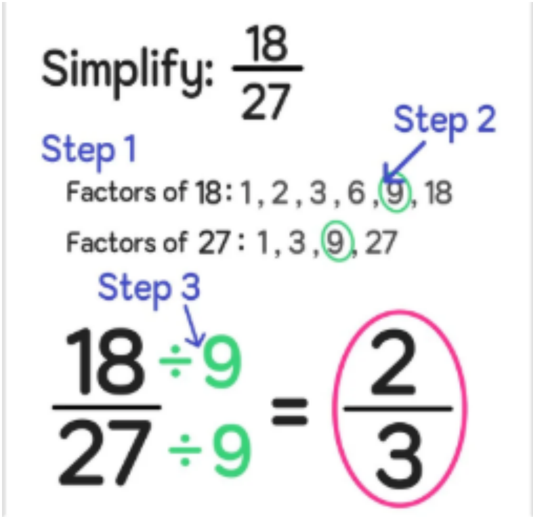
$$\frac{4 \div 2}{10 \div 2} = \frac{2}{5}$$

2. Real-World Connection

When you're dividing things equally, you naturally use the simplest form. If 6 students want to share 8 cookies equally, instead of saying "each gets 6/8 cookies," you'd say "each gets 3/4 cookies" because it's cleaner and easier to understand. In cooking, recipes use 1/2 cup instead of 4/8 cup because it's simpler to measure and remember.

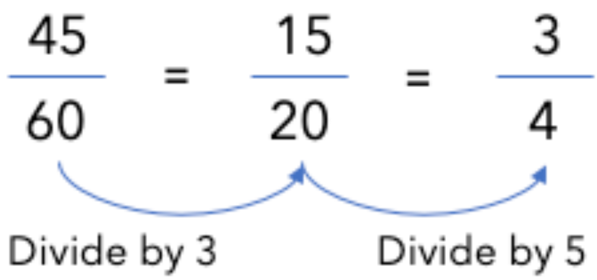
3. From the Textbook

Expressing fractions in lowest terms involves finding the greatest common factor of the numerator and denominator, then dividing both by this factor. A fraction is in simplest form when the numerator and denominator share no common factors other than 1. This process maintains the fraction's value while presenting it in its most reduced mathematical form.



4. Quick Trick

Remember: "Divide top and bottom by the same number until you can't anymore!" Start with small numbers like 2, 3, or 5 and keep going until no common factors remain. Check your work - can both numbers still be divided by anything other than 1?



N006d_Support: Common Factor

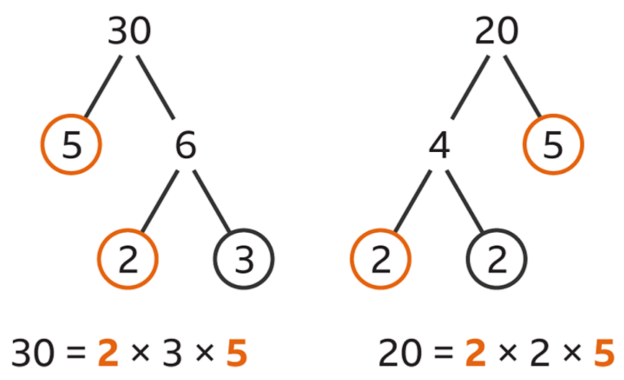
Pages: 172 – supports simplification of fractions

Learning Goal: The concept of common factor between the numerator and the denominator should be known to students in order to employ simplification.

Explanation:

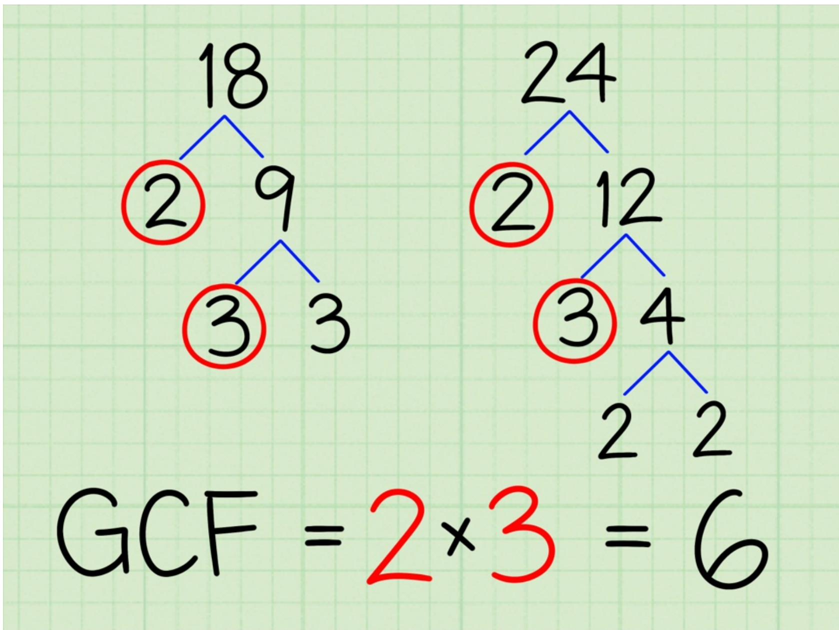
A common factor is a number that divides evenly into two or more numbers. Think of it like finding something that both numbers share - if you can divide both the top and bottom of a fraction by the same number, that number is their common factor.

It's like finding the biggest group size that works for organizing different amounts.



3. From the Textbook

Common factors are integers that divide two or more numbers without remainder. The greatest common factor (GCF) is the largest such number that divides both the numerator and denominator of a fraction. Identifying common factors enables fraction simplification by reducing both terms proportionally while maintaining equivalent value.



4. Quick Trick

Remember: "Test the small ones first!" Start with 2 - can both numbers be divided by 2? Then try 3, then 5. Keep checking until you find the biggest number that divides both evenly.

N007: Compare Fractions by finding common denominator

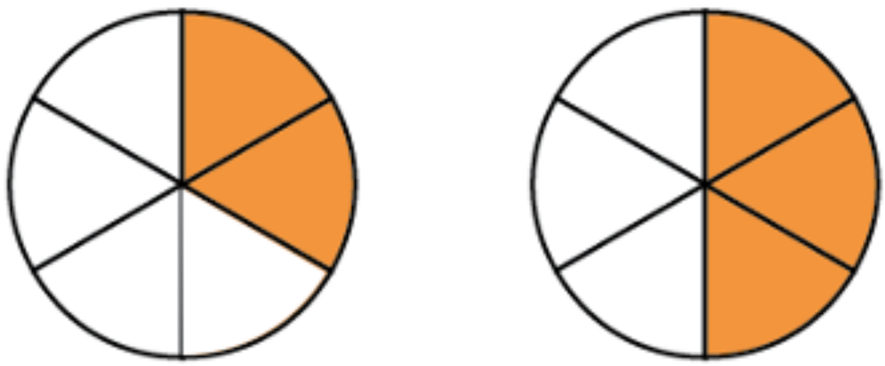
Pages: 172

Textbook Content: Converting fractions to common denominators for comparison. Comparing fractions with same denominators by comparing numerators. Ordering fractions in ascending and descending order. Understanding when one fraction is greater than another.

Learning Goal: Students can compare any two fractions and arrange multiple fractions in order.

Explanation:

To compare fractions, make the bottom numbers the same first. Then just look at the top numbers - bigger top number means bigger fraction. It's like having the same size pizza cut differently - you need to cut them the same way to see who has more.



$$\frac{2}{6} = \frac{1}{3} \qquad \frac{3}{6} = \frac{1}{2}$$

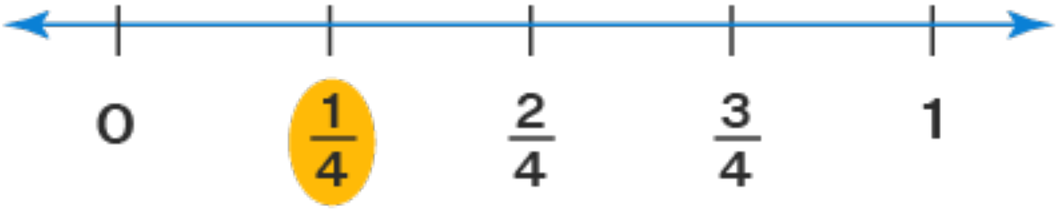
2. Real-World Connection

To compare 1/2 and 1/3 of a circular chocolate, change both to sixths: 1/2 becomes 3/6 and 1/3 becomes 2/6. Now you can see 3/6 is bigger than 2/6, so 1/2 is more chocolate.

When your mom gives you 2/3 of an apple and your friend gets 3/5, convert both to fifteenths to see who got more.

3. From the Textbook

Students compare fractions by converting to common denominators and comparing numerators. This method works for ordering multiple fractions and determining which fraction represents a greater quantity. The process involves finding equivalent fractions that share the same denominator value.



4. Quick Trick

Remember: "Make bottoms match, then check the tops!" Find a number both bottom numbers go into, change both fractions, then the bigger top number wins.

N008a: Understand Fraction Addition using Visual models

Pages: 175-176

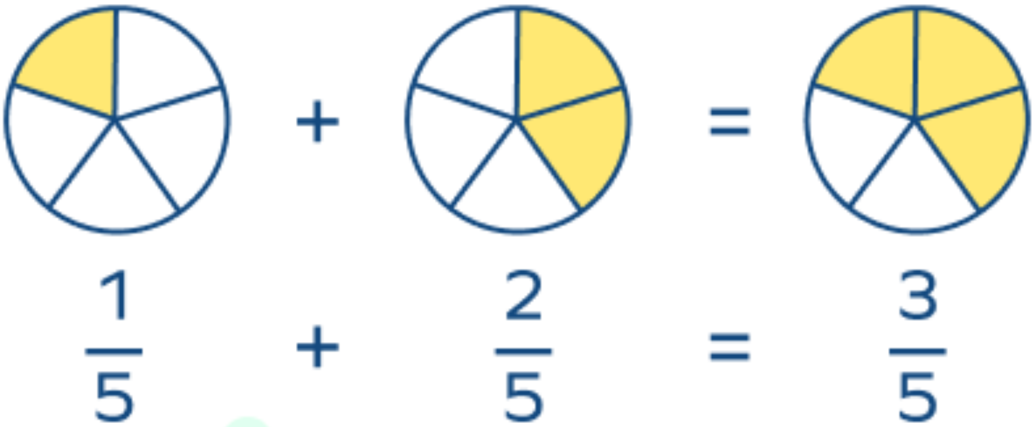
Textbook Content: Using rectangular strips and visual models to understand addition

Learning Goal: Students can visualize fraction addition.

Explanation:

1. Simple Explanation

When adding fractions, you're combining parts to see the total amount. Visual models help you see exactly what you're adding together. If both fractions have the same denominator, just add the numerators and keep the same denominator.



2. Real-World Connection

If you eat 2/8 of a pizza and then eat 3/8 more, you can see by looking at the pizza slices that you've eaten 5/8 total. At home, if you use 1/4 cup of oil for cooking and then add another 2/4 cups, the measuring cups show you've used 3/4 cups altogether.

N008b: Visual models to understand adding fractions to get more than 1

Pages: 176-177

Textbook Content: Using rectangular strips and visual models to understand addition

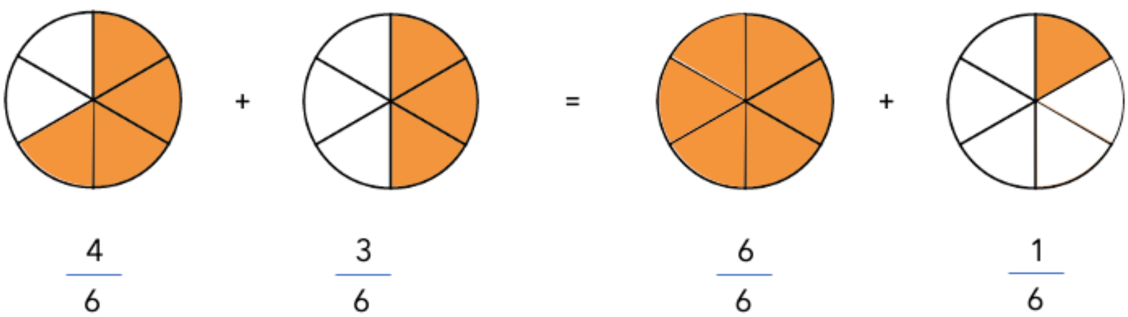
Learning Goal: Students can visualize fraction addition.

Explanation:

Sometimes when you add fractions, the total goes beyond one whole. Visual models help you see when you've crossed into more than one complete unit. The parts that go beyond the first complete shape show you the extra amount.

Real-World Example

If you eat 4/6 of one pizza and then eat 3/6 of another identical pizza, you can see you've eaten more than one whole pizza. The visual shows one complete pizza plus 1/6 of another pizza, which equals **1 1/6** pizzas total.



Quick Trick

Remember: "When the top gets bigger than the bottom, you have more than one whole!" Count complete wholes first, then see what's left over as the remaining fraction.

Adding a Fraction to a Whole Number

When you add a whole number to a fraction, think of the whole number as having a denominator of 1. For example, to add 2 + 3/4, you can think of it as 2/1 + 3/4.

Convert 2 to quarters: 2 = 8/4. Now add: 8/4 + 3/4 = 11/4 = 2 3/4.

Visual Connection

If you have 2 whole pizzas and someone gives you 3/4 of another pizza, you can see you have 2 complete pizzas plus 3 extra slices (if each pizza is cut into 4 pieces). This gives you 2 3/4 pizzas total.

Image Ideas: Two complete pizza circles plus 3/4 of a third pizza showing the total amount, number line showing jump from 2 to 2 3/4.

N008C: Adding Fractions with unlike denominators with Brahmagupta Method

N008C: Adding Fractions with unlike denominators with Brahmagupta Method

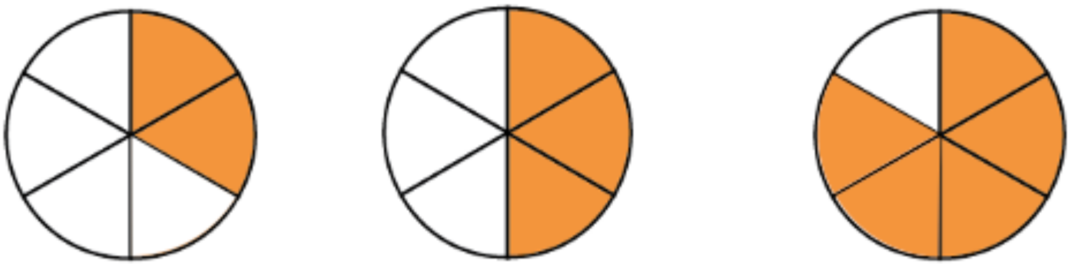
Pages: 178-179

Textbook Content: Adding fractions with same and different denominators using systematic method

Learning Goal: Students can add any fractions using Brahmagupta's method (LCM)

Explanation:

When you add fractions like 1/2 + 1/3, the bottom numbers are different. You cannot add them directly. First make both bottom numbers the same, then add the top numbers.



$$\frac{1\text{x}2}{3\text{x}2} = \frac{2}{6} \quad + \quad \frac{1\text{x}3}{2\text{x}3} = \frac{3}{6} \quad = \quad \frac{5}{6}$$

From the Textbook

To add fractions with different denominators, find the least common multiple of the denominators. Convert both fractions to equivalent fractions using this common denominator. Then add the numerators and keep the common denominator.

$$(\mathbf{1/3}) + (\mathbf{1/2})$$

$$= (\mathbf{1} * \mathbf{2})/(\mathbf{3} * \mathbf{2}) + (\mathbf{1} * \mathbf{3})/(\mathbf{2} * \mathbf{3})$$

$$= \mathbf{2/6} + \mathbf{3/6}$$

$$= \mathbf{5/6}$$

We know that the LCM of 2 and 3 is 6. Hence we multiply each fraction by the respective number that will make the denominator 6 !

Quick Trick

Remember: "Different bottoms? Find LCM first! Same bottoms? Add tops only!" Always make the bottom numbers match before adding the top numbers.

N008C_Support: LCM

Pages: 178-179 Support

Learning Goal: Student should understand the concept of LCM

Explanation:

LCM is the smallest number that both numbers can fit into evenly. Like finding when two buses with different schedules arrive together.

Real-World Connection

Bus A comes every 4 minutes. Bus B comes every 6 minutes. When do they both come together? Count: Bus A (4, 8, 12, 16, 20, 24...), Bus B (6, 12, 18, 24...). At 12 minutes, both buses come - that's LCM of 4 and 6.

$$Bus\ A: 4, 8, 12, 16, 20, 24, \ldots$$

$$Bus\ B: 6, 12, 18, 24, \ldots$$

$$At\ 12\ minutes\ \rightarrow\ Both\ buses\ come\ together.$$

$$So, LCM(4, 6)\ =\ 12$$

You buy pencils in packs of 3. Your friend buys erasers in packs of 5. To have equal numbers, you need 15 pencils and 15 erasers. The number 15 is LCM of 3 and 5.

$$Pencils: 3, 6, 9, 12, 15, \ldots$$

$$Erasers: 5, 10, 15, \ldots$$

$$At\ 15\ \rightarrow\ Both\, match.$$

$$So, LCM(3, 5)\ =\ 15$$

LCM is the smallest number divisible by both given numbers. Find it by listing multiples of each number until you find the first matching one.

Quick Trick

Remember: "Count by each number until they meet!" For 3 and 4: count 3, 6, 9, 12 and count 4, 8, 12. First match is 12.

LCM OF TWO NUMBERS

5	15 , 25
5	3 , 5
3	3 , 1
	1 , 1

$$\text{L.C.M} = 5 \times 5 \times 3$$
$$= 75$$

N008D: Subtract Fractions Using Visual Aid

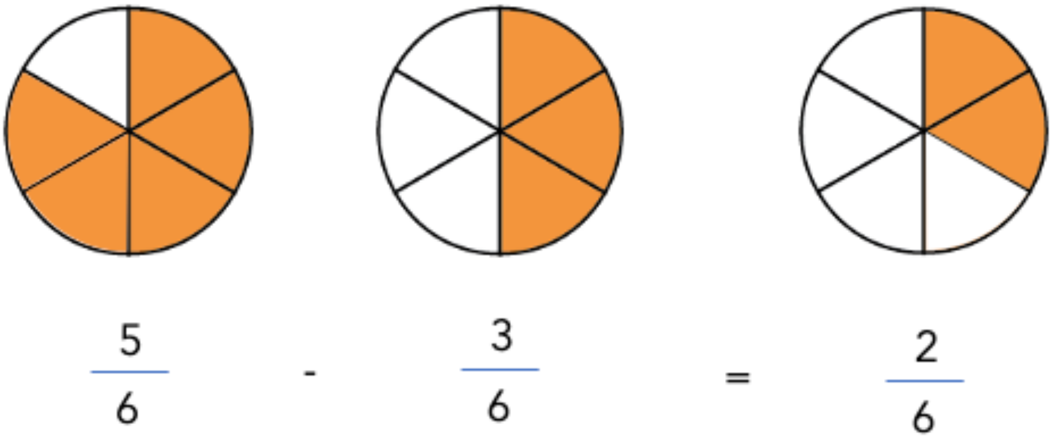
Pages: 180

Textbook Content: Subtracting fractions with same denominator and from mixed fractions

Learning Goal: Understand the concept of subtracting fractions using visuals

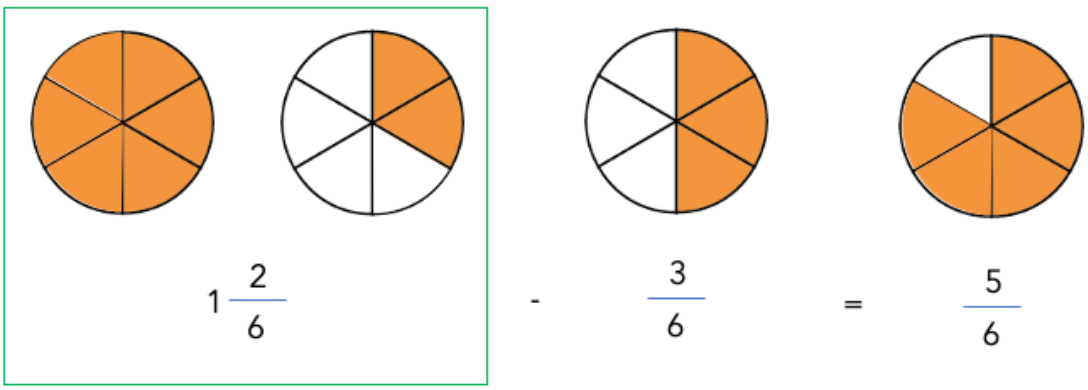
Explanation:

Subtracting fractions means taking away parts. If you have 5/6 of a roti and eat 2/6, you have 3/6 left. With pictures, you can see what gets taken away and what remains.



From the Textbook

Visual subtraction of fractions demonstrates the concept by showing parts being removed from a whole. When denominators are equal, subtract the numerators while keeping the denominator constant. Visual models help students understand the process concretely.



Quick Trick

Remember: "Same bottom, minus the top - draw it out, cross it out!" Always draw the whole, show what you take away, then count what's left.

In addition we add the parts of the whole, in subtraction – we take away the parts of the whole !

N008E: Subtract Fractions using LCM methods (Brahmagupta)

Pages: 181

Textbook Content: Subtracting fractions with different denominator

Learning Goal: Understand the concept of subtracting fractions using LCM (Brahmagupta Method)

Explanation:

When subtracting fractions like 3/4 - 1/3, the bottom numbers are different. First make both bottom numbers the same using LCM, then subtract the top numbers only.

$$(3/4) - (1/3)$$

$$= (3 * 3)/(4 * 3) - (1 * 4)/(3 * 4)$$

$$= 9/12 - 4/12$$

$$= 5/12$$

The LCM of the numbers 3 and 4 is 12.

Real-World Connection

At home, if 2/3 of rice is cooked and 1/4 is served, your mother changes both to the same bottom number to see how much rice is left in the pot.

$$(\mathbf{2/3}) - (\mathbf{1/4})$$

$$= (\mathbf{2 * 4})/(\mathbf{3 * 4}) - (\mathbf{1 * 3})/(\mathbf{4 * 3})$$

$$= \mathbf{8/12} - \mathbf{3/12}$$

$$= \mathbf{5/12}$$

Noticed that subtracting different numbers gave us the same result still ?!

From the Textbook

To subtract fractions with different denominators, find the LCM of denominators and convert both fractions to equivalent fractions. Subtract the numerators while keeping the common denominator unchanged.

Quick Trick

Remember: "Different bottoms? LCM first! Same bottoms? Subtract tops only!" Make the bottom numbers match, then take away the top numbers.

N009: History and Conclusion of Fractions Class 6

Pages: 182-184

Textbook Content: History of fractions and inventions from India. Puzzles on understanding fractions on a deeper level

Learning Goal: Understand fractions better with puzzles – truly understand that it is a part of a whole – a representation

Explanation:

Long ago, people needed to share things fairly - bread, land, water. Different cultures found different ways to write "parts of a whole." Indians created the method we use today with one number on top and one below.

Imagine ancient Indian merchants 1400 years ago trading spices. They needed to measure 3/4 kg of turmeric or 2/5 kg of cardamom.

They invented our fraction system because it was easier than the Egyptian way of writing everything as unit fractions like 1/2 + 1/4.

In ancient Egypt, bakers had to write 3/4 as 1/2 + 1/4 because they only used fractions with 1 on top. Our Indian system made calculations much faster for traders and builders.

From the Textbook

Historical Puzzle: Can you find three different unit fractions (fractions with 1 on top) that add up to 1?

Solution: The only solution is 1/2 + 1/3 + 1/6 = 1

$$\textit{Start with:}$$

$$(1/3) + (1/3) + (1/3) = 1$$

$$Replace\ one\ 1/3\ by\ a\ larger\ fraction, 1/2:$$

$$(1/2) + ? + ? = 1$$

$$So\ the\ remaining\ two\ must\ satisfy:$$

$$? + ? = 1/2$$

$$Two\ equal\ smaller\ fractions\ work\ but\ are\ not\ different:$$

$$(1/4) + (1/4) = 1/2 \rightarrow (1/2) + (1/4) + (1/4) = 1\ (last\ two\ are\ equal)$$

$$Try\ one\ smaller\ and\ one\ medium\ fraction. Note:$$

$$(1/6) + (1/3) = (1/6) + (2/6) = 3/6 = 1/2$$

$$Thus\ choose\ the\ distinct\ pair\ 1/3\ and\ 1/6:$$

$$(1/2) + (1/3) + (1/6) = 1$$

$$Verify\ by\ converting\ to\ sixths:$$

$$(3/6) + (2/6) + (1/6) = (3 + 2 + 1)/6 = 6/6 = 1$$

Quick Trick

Remember: "Fractions tell the story - how many parts, what size parts!" Every fraction answers two questions: "How many pieces do I have?" (top) and "How many pieces make the whole?" (bottom).