



Core Focus

- Using and writing addition equations and inequalities
- Thinking about one-fourth in a variety of ways

Algebraic Thinking

- At this point in Grade 1, students have had many experiences representing addition and subtraction situations with equations and now they extend their understanding of equality using balance scales as a visual model.
- The purpose of showing equality using a balance scale is that whenever two quantities are equal, the two sides of the scale must balance, just as the two sides of any equation must be the same. This concept is foundational to the future study of algebra.

9.2 Balancing Equations (More Than Two Addends)

Look at this balance picture.
How many more blocks do you need to draw to make the balance picture true?
How do you know?

Draw the blocks.

What addition equation could you write to match the picture?

+ = +

In this lesson, students work with addition equations that have two addends on each side of the equals symbol. E.g. $6 + 5 = 9 + \underline{\quad}$

- Building on the learning from Module 8, students use the model of the pan balance to decide which part of the equation is the unknown number. Students use cubes to represent what is known to help figure out what is unknown.

9.3 Working with Equality

Look at this balance picture.
Write an addition equation to match.

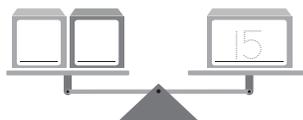
+ =

Draw one more block on the left side.
What must you do to the other side so that the quantities remain balanced?

In this lesson, students use a pan balance to explore equality and learn that what happens to one pan must happen to the other pan to maintain the balance or equality.

- After some experience with the balance, students analyze story problems to decide where the number in the situation should be placed on the pan balance.

- a. There are 15 students in a class. There are 8 boys.
How many girls are there?

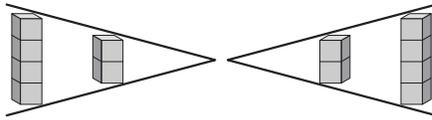


$$8 + \underline{\quad} = 15$$

Ideas for Home

- Your child's understanding of equality and inequality can be developed by experiences with everyday items, for example, place 2 apples (cookies, carrots, anything that is countable) on one plate and 2 on another. Ask, "Will these two groups balance?" or "Are these groups the same?"
- Practice inequality and addition equations: e.g. place 30 pennies on one plate and 25 pennies on another. Ask, "Are these groups the same? Which is greater? Which is less? How do you know?" Point to the plate with 25 pennies and ask, "How many more do we need to put on this plate to make both plates the same?"

- Inequality, when one side is **greater than** or **less than** the other, is also explored using the pan balance. The comparison symbols that mean “is less than” ($<$) and “is greater than” ($>$) to record inequalities are introduced.



These symbols show that 4 is greater than 2 ($4 > 2$) and 2 is less than 4 ($2 < 4$).

Fractions: One-Fourth

- Following the investigation of one-half in Module 7, students now explore the notion of sharing among four, which leads to students dividing a whole into four groups/pieces of equal size and introducing “one-fourth” as the name for each group/piece.
- Two things are important to understand about “one-fourth” (or one-quarter): one-fourth involves dividing something into four groups or pieces, and the four groups or pieces must be the same size.

Ideas for Home

- Talk about one-fourth: Put two apples (or anything countable) on each of four identical plates and ask, “How many apples in total? How many apples on each plate? Is each group the same size? How many is one-fourth of four? How do you know?”
- Explore “one-fourth” by cutting out paper shapes and folding them in half and folding them in half again. Then unfold the paper to see how the creases create fourths. Remind your child that just dividing the shape into four parts does not necessarily make fourths. To make fourths, the four parts of the shape must also be the same size (in terms of area).

9.10 Identifying One-Fourth of a Region

Look at this sheet of paper.
Describe the fraction that you see.
What is another name for one-fourth?
What other ways could you fold the paper to show one-fourth?

How many different ways can you show one-fourth?
How can you prove that a sheet of paper has been folded to show one-fourth?

Which of these shows one-fourth? How do you know?

In this lesson, students identify which pictures have been divided and shaded to show one-fourth.

- To wrap up the module, students identify one-fourth within the real-life context of money.

9.12 Identifying One-Fourth of Amounts of Money

Four friends want to equally share this money.
How can you figure out one-fourth of this amount?
What other amounts can you share equally among 4?
What amount cannot be shared equally among 4? How do you know?

In this lesson, students identify one-fourth of amounts of money.