3 Module 9

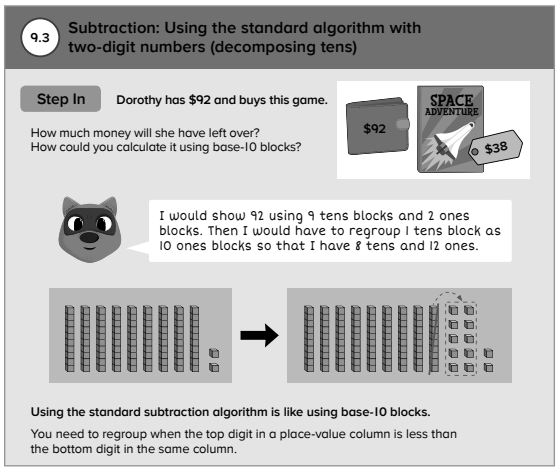
ORIGO STEPPING STONES 2.0

Core Focus

- Subtraction: Making estimates and standard algorithm
- Subtraction: Compensation strategy
- Common fractions: Comparisons

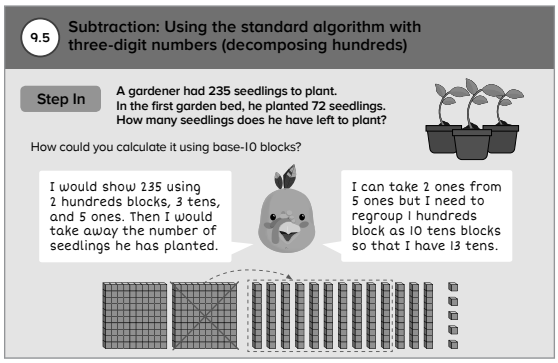
Subtraction

- Students explore subtracting two- and three-digit numbers using the standard subtraction algorithm.
- In the standard subtraction algorithm, what was called borrowing is now called **regrouping**.



In this example, 92 is regrouped as 80 +12, so 80 − 30 and 12 − 8 can be subtracted more easily.

- Because students have had many experiences with composing and decomposing to make numbers easier to add or subtract, they should find the standard subtraction algorithm makes sense and easy to work with.



In this lesson, students use the standard subtraction algorithm to subtract three-digit numbers.

Ideas for Home

- Ask your child to regroup the same quantity of money in different ways. E.g. $1.38 is 1 hundred (dollar), 3 tens (dimes), and 8 ones (pennies), which can be regrouped as 13 tens and 8 ones, or 12 tens and 18 ones, or 11 tens and 28 ones.
- When practicing the algorithm, ask your child to use place-value language while subtracting. E.g. for 457 - 228, 457 can be regrouped as 44 hundreds, 4 tens and 17 ones.

Glossary

- The **standard subtraction algorithm** is the familiar paper-and-pencil procedure most adults learned for subtracting multi-digit numbers.
- **Regrouping** is when numbers are regrouped as new place values to combine the quantities.

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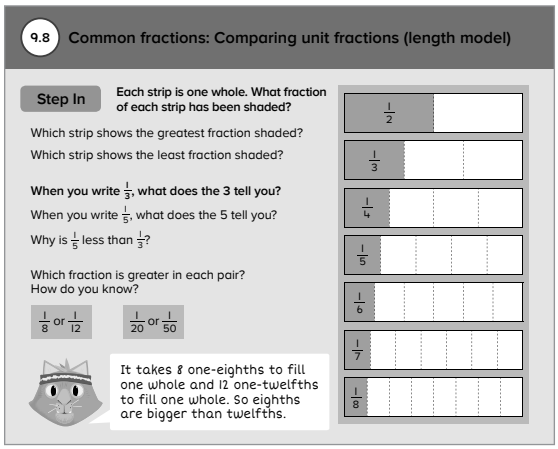
Fractions

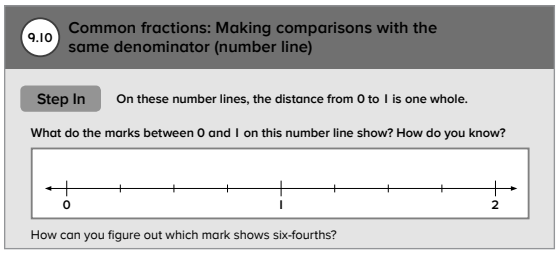
- Students explore **equivalent fractions** and compare fractions to determine which is greater. The fraction chart (see below) helps to find equivalent fractions and compare fractions of different sizes.



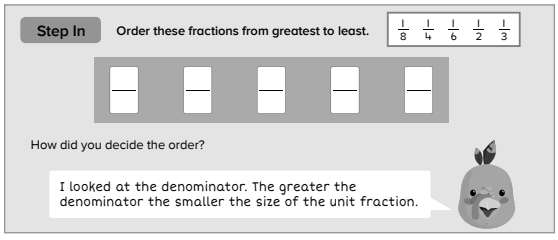
These length models in a fraction chart show that $\frac{1}{4}$ is equivalent to $\frac{2}{8}$; and $\frac{2}{6}$ is greater than $\frac{2}{8}$.

- Students visualize fractions on a number line. The same point on a number line can be labeled with different fraction names, which are equivalent fractions.

- They use number lines to compare fractions with the same denominator, which shows how many equal-sized parts divide the distance from 0 to 1.

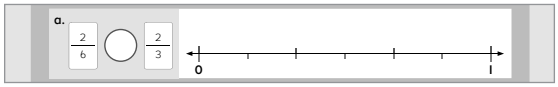


- Students use a number line to order fractions from least to greatest. Comparing unit fractions is an effective way to get a sense for the size of a fraction.



- When students can visualize where $\frac{1}{4}$ and $\frac{1}{8}$ are on a number line, it is obvious that $\frac{1}{8}$ is less than $\frac{1}{4}$, even though 8 is greater than 4 in whole numbers.

- To compare fractions with different denominators, the number line can be divided to represent both denominators. E.g. thirds (above the line) and sixths (below it).



Ideas for Home

- Notice how a ruler is like a number line. One inch is divided into $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$ and $\frac{1}{16}$. Practice counting by unit fractions. Notice the equivalent fractions. E.g. $\frac{4}{16}$ is equivalent to $\frac{1}{4}$.

Glossary

- **Equivalent fractions** are fractions described in different ways, but are the same distance on the number line. $\frac{3}{6}$ is equivalent to $\frac{1}{2}$.