4 Module 2

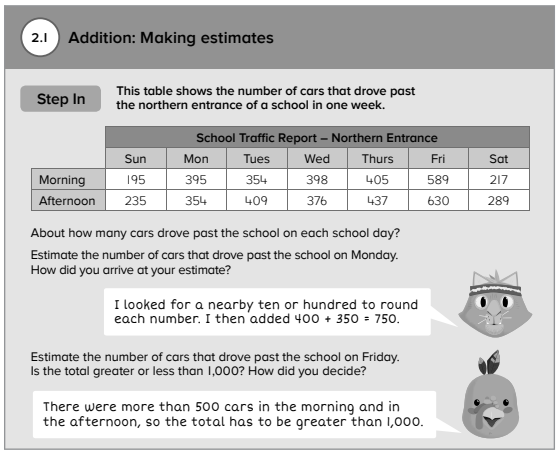
ORIGO STEPPING STONES 2.0

Core Focus

- Addition: Making estimates
- Addition: Using the standard algorithm
- Multiplication: Extending the fives and nines facts

Estimates

- Strategies for adding numbers mentally are important for real-life situations. Students use strategies based on place value to estimate addition totals.
- Students **estimate** purchase prices then calculate exact solutions using composing strategies to relate classroom mathematics to real-world uses.



2.1 Addition: Making estimates

Step In

This table shows the number of cars that drove past the northern entrance of a school in one week.

School Traffic Report – Northern Entrance							
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat
Morning	195	395	354	398	405	589	217
Afternoon	235	354	409	376	437	630	289

About how many cars drove past the school on each school day?

Estimate the number of cars that drove past the school on Monday.
How did you arrive at your estimate?

I looked for a nearby ten or hundred to round each number. I then added 400 + 350 = 750.

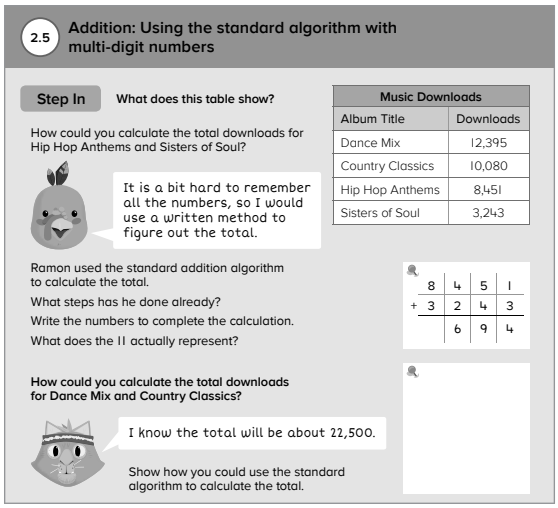
Estimate the number of cars that drove past the school on Friday.
Is the total greater or less than 1,000? How did you decide?

There were more than 500 cars in the morning and in the afternoon, so the total has to be greater than 1,000.

In this lesson, students use estimation strategies to solve addition situations.

Standard algorithm

- The **standard addition algorithm** is the familiar paper-and-pencil procedure for adding multi-digit numbers that most adults were taught in school.
- What was called *carrying* is now called **regrouping** because numbers are regrouped into new place values in order to combine the quantities.



2.5 Addition: Using the standard algorithm with multi-digit numbers

Step In

What does this table show?

Music Downloads	
Album Title	Downloads
Dance Mix	12,395
Country Classics	10,080
Hip Hop Anthems	8,451
Sisters of Soul	3,243

How could you calculate the total downloads for Hip Hop Anthems and Sisters of Soul?

It is a bit hard to remember all the numbers, so I would use a written method to figure out the total.

Ramon used the standard addition algorithm to calculate the total.
What steps has he done already?
Write the numbers to complete the calculation.
What does the 11 actually represent?

	8	4	5	1
+	3	2	4	3
		6	9	4

How could you calculate the total downloads for Dance Mix and Country Classics?

I know the total will be about 22,500.

Show how you could use the standard algorithm to calculate the total.

In this lesson, students use the standard algorithm on multi-digit numbers and relate composing and regrouping to estimating.

Ideas for Home

- Model for your child how you think about estimating totals when spending money at the store or driving distances in the car.
- Help your child practice estimating answers before calculating them exactly. In real life, an estimate is often all we need, so it is important to become good at estimating answers mentally.

Glossary

- **Estimating** is a mathematical skill that relates easily to the world outside the classroom.
- Though the **standard algorithm** is systematic and produces correct answers if performed correctly, mistakes can easily happen if students do not understand the underlying mathematical reasoning that makes the algorithm work. This is why the algorithm is introduced in later grades, while mental calculation methods are emphasized in earlier years.
- **Regrouping** and carrying may appear to be the same thing, but regrouping refers to the underlying action that carrying only names — in other words, numbers are grouped into different place values in order to perform an operation.

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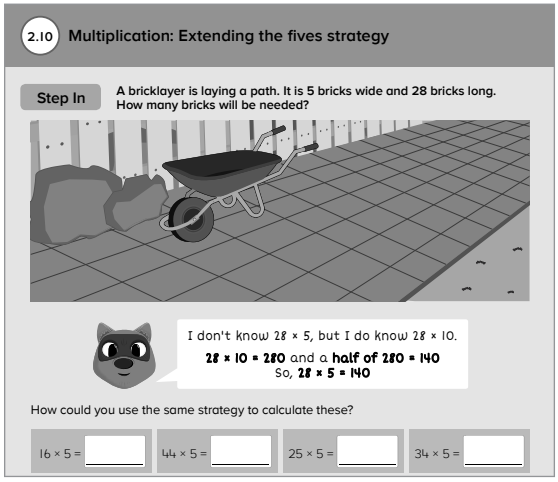
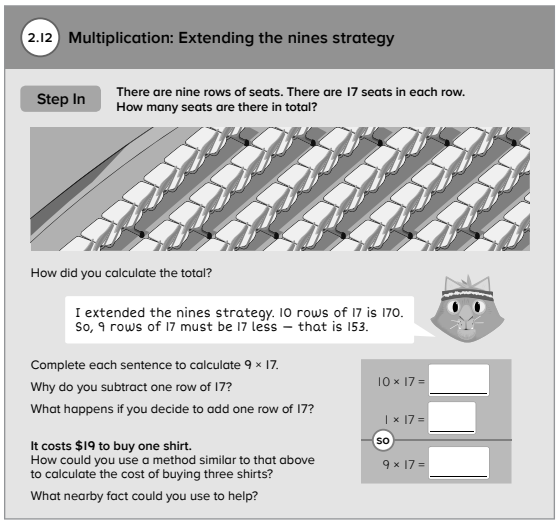
Multiplication

- Students extend the fives and nines **strategies**, which are related to multiplying by 10.



In this lesson, students use the knowledge that 2 × 5 = 10 to help calculate other problems where greater factors are multiplied by five.



In this lesson, students use the knowledge that nine multiplied by a given number is nine less than ten multiplied by that given number to calculate the answer to problems where nine is a factor. In the example above, 9 × 17 is the same as (10 × 17) − (1 × 17), or 170 − 17 = 153.

Ideas for Home

- With your child, practice the basic multiplication facts – what were once known as *times tables* or *multiplication tables* – to strengthen mental multiplication strategies.

Glossary

- **Mental strategies** build and reinforce natural mathematical understanding. Emphasizing mental calculation strategies in early mathematical learning helps students tackle more complex concepts and procedures in later years.

Helpful videos

View these short one-minute videos to see these ideas in action.

www.bit.ly/O1_3
www.bit.ly/O1_8