Lesson 1.1

Algebra- Number patterns

A **pattern** is an ordered set of numbers or objects.
The order helps you predict what will come next.

Use the addition table to find patterns.

+	0	1	2	3	4
0	0	1	2	3	4
1	1	2	3	4	5
2	2	3	4	5	6
3	3	4	5	6	7
4	4	5	6	7	8

- Color the row that starts with 1. What pattern do you see?

  The numbers increase by 1.

- Color the column that starts with 1. What pattern do you see?

  The numbers increase by 1. The numbers

  are the same as in the row starting with 1.

- Circle the sum of 4 in the column you colored. Circle the addends for that sum. What two addition sentences can you write for that sum of 4?

  $3 + 1 = 4$ and $1 + 3 = 4$

  The addends are the same. The sum is the same.

The **Commutative Property of Addition** states that you can add two or more numbers in any order and get the same sum.

Lesson 1.2

Round to the nearest ten or hundred

When you **round** a number, you find a number that tells you *about* how much or *about* how many.

Use place value to round 76 to the nearest ten.

Step 1 Look at the digit to the right of the tens place.

- If the ones digit is 5 or more, the tens digit increases by one.

- If the ones digit is less than 5, the tens digit stays the same.

Step 2 Write zero for the ones digit.

76

↑
ones place

The digit in the ones place is 6.

$6 > 5$

So, the digit 7 in the tens place increases to 8.

So, 76 rounded to the nearest ten is 80.

Think: To round to the nearest hundred, look at the tens digit. So, 128 rounded to the nearest hundred is 100.

128

↑
tens place

Lesson 1.3

Estimate sums

An **estimate** is a number close to an exact amount.

You can use **compatible numbers** to estimate. Compatible numbers are easy to compute mentally and are close to the real numbers.

Estimate. Use compatible numbers.

$73 + 21 = \blacksquare$

So, $73 + 21$ is about 100.

$$73 \longrightarrow 75$$
$$+21 \longrightarrow +25$$
$$\overline{100}$$

Another way to estimate is to round numbers to the same place value.

Estimate. Round each number to the nearest hundred. $214 + 678 = \blacksquare$

Step 1 Look at the digit to the right of the hundreds place.

- $1 < 5$, so the digit 2 stays the same.
- $7 > 5$, so the digit 6 increases by 1 to become 7.

$$214 \longrightarrow 200$$
$$+678 \longrightarrow +700$$
$$\overline{900}$$

Step 2 Write zeros for the tens and ones places.

So, $214 + 678$ is about 900.
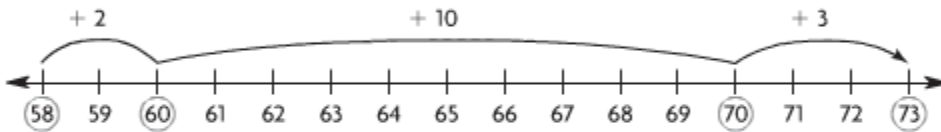
Lesson 1.4

Mental math strategies for addition

You can count by tens and ones to find a sum.

Find 58 + 15.

Step 1 Count on to the nearest ten. Start at 58. Count to 60.
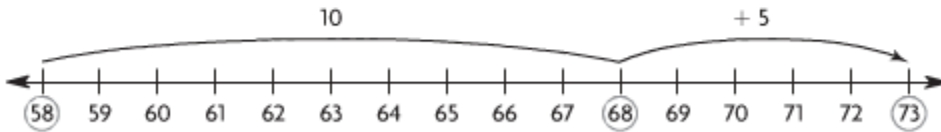
Step 2 Count by tens. Start at 60. Count to 70.

Step 3 Then count by ones. Start at 70. Count to 73.

$+ 2$ $+ 10$ $+ 3$

⊷ (58) 59 (60) 61 62 63 64 65 66 67 68 69 (70) 71 72 (73) ⟶

Think: 58 + 2 + 10 + 3 = 73

So, 58 + 15 = 73.

You can also count on by tens first and then by ones.

10     $+ 5$

⊷ (58) 59 60 61 62 63 64 65 66 67 (68) 69 70 71 72 (73) ⟶

Think: 58 + 10 + 5 = 73

So, 58 + 15 = 73.

Lesson 1.5

Algebra-Use properties to add

Find 3 + 14 + 21.	Find 7 + (3 + 22).
The **Commutative Property of Addition** states that you can add numbers in any order and still get the same sum.	The **Associative Property of Addition** states that you can group addends in different ways and still get the same sum.
Step 1 Look for numbers that are easy to add. **Think:** Make doubles. $3 + 1 = 4$ and $4 + 4 = 8$.	**Step 1** Look for numbers that are easy to add. **Think:** Make a ten. $7 + 3 = 10$
Step 2 Use the Commutative Property to change the order. $3 + 14 + 21 = 3 + 21 + 14$	**Step 2** Use the Associative Property to change the grouping. $7 + (3 + 22) = (7 + 3) + 22$
Step 3 Add. $3 + 21 + 14 = 24 + 14$ $24 + 14 = 30 + 8$	**Step 3** Add. $(7 + 3) + 22 = 10 + 22$ $10 + 22 = 32$
So, $3 + 14 + 21 = 38$.	So, $7 + (3 + 22) = 32$.

Lesson 1.6

Use the break apart strategy to add

You can use the break apart strategy to add.

Add. 263 + 215

Think and Record	**Model**

Step 1 Estimate. Round to the nearest hundred.

$$300 + 200 = 500$$

263 = 2 hundreds + 6 tens + 3 ones

Step 2 Start with the hundreds. Break apart the addends. Then add each place value.

$$263 = 200 + 60 + 3$$
$$215 = 200 + 10 + 5$$
$$\overline{400 + 70 + 8}$$
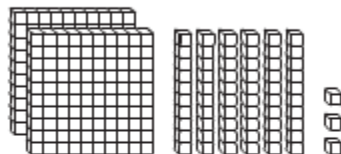
215 = 2 hundreds + 1 ten + 5 ones

Step 3 Add the sums.

$$400 + 70 + 8 = 478$$

So, 263 + 215 = 478.
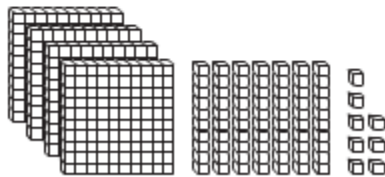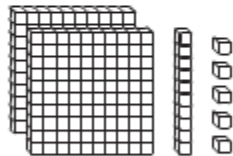
4 hundreds + 7 tens + 8 ones = 478

Lesson 1.7

Use place value to add

You can use place value to add 3-digit numbers.
Add. 268 + 195 **Estimate.** 300 + 200 = 500

Step 1 Add the ones. If there are 10 or more ones,
regroup as tens and ones.

$$\begin{array}{r} 1 \\ 268 \\ + \ 195 \\ \hline 3 \end{array}$$

8 ones + 5 ones = 13 ones

13 ones = 1 ten 3 ones

Step 2 Add the tens. Regroup the tens as hundreds and tens.

$$\begin{array}{r} 11 \\ 268 \\ + 195 \\ \hline 63 \end{array}$$

1 ten + 6 tens + 9 tens = 16 tens

16 tens = 1 hundred 6 tens

Step 3 Add the hundreds.

$$\begin{array}{r} 11 \\ 268 \\ + \ 195 \\ \hline 463 \end{array}$$

1 hundred + 2 hundreds + 1 hundred = 4 hundreds

So, 268 + 195 = 463.

Lesson 1.8

Estimate differences

You can use what you know about estimating sums to estimate differences.

Estimate. Use compatible numbers.
$78 - 47 = $ ■

Think: Compatible numbers are easy to subtract.

$$
\begin{array}{rcr}
78 & \longrightarrow & 75 \\
-47 & \longrightarrow & -50 \\
\hline
& & 25
\end{array}
$$

So, $78 - 47$ is about 25.

Another way to estimate is to round to the same place value.

Estimate. Round each number to the nearest hundred. $687 - 516 = $ ■

Step 1 Look at the digit to the right of the hundreds place.

- $8 > 5$, so the digit in the hundreds place increases by 1.

- $1 < 5$, so the digit in the hundreds place stays the same.

$$
\begin{array}{rcr}
687 & \longrightarrow & 700 \\
-516 & \longrightarrow & -500 \\
\hline
& & 200
\end{array}
$$

Step 2 Write zeros for the tens and ones places.
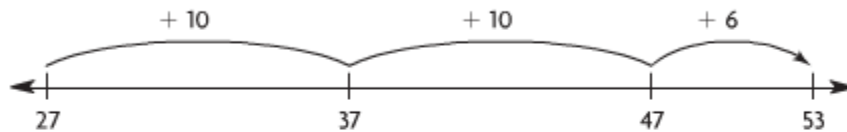
So, $687 - 516$ is about 200.

Lesson 1.9

Mental math strategies for subtraction

You can count up on a number line to find a difference.

Find 53 − 27.

Step 1 Count up by tens.
Start at 27. Count up to 47.

Step 2 Count up by ones.
Start at 47. Count up to 53.

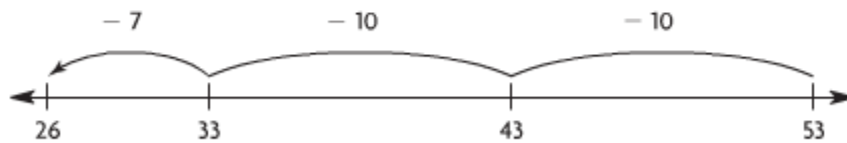$$+10 \qquad +10 \qquad +6$$

27   37   47   53

Think: $10 + 10 + 6 = 26$.

So, $53 − 27 = 26$.

You can take away tens and ones to find a difference.

Step 1 Take away tens.
Start at 53.

Step 2 Take away ones.
Start at 33.

$$-7 \qquad -10 \qquad -10$$

26   33   43   53

Think: $53 − 10 − 10 − 7 = 26$.

So, $53 − 27 = 26$.

1.10

Use place value to subtract

You can use place value to subtract 3-digit numbers.

Subtract. 352 − 167   **Estimate.** 400 − 200 = 200

Step 1 Subtract the ones.

$$
\begin{array}{r}
{\scriptstyle 4\ 12} \\
3\,\cancel{5}\,\cancel{2} \\
-\,1\,6\,7 \\
\hline
5
\end{array}
$$

Are there enough ones to subtract 7?
There are not enough ones.
Regroup 5 tens 2 ones as 4 tens 12 ones.
12 ones − 7 ones = 5 ones

Step 2 Subtract the tens.

$$
\begin{array}{r}
{\scriptstyle 14} \\
{\scriptstyle 2\ \cancel{4}\ 12} \\
\cancel{3}\,\cancel{5}\,\cancel{2} \\
-\,1\,6\,7 \\
\hline
8\,5
\end{array}
$$

Are there enough tens to subtract 6?
There are not enough tens.
Regroup 3 hundreds 4 tens as 2 hundreds 14 tens.
14 tens − 6 tens = 8 tens

Step 3 Subtract the hundreds.

$$
\begin{array}{r}
{\scriptstyle 14} \\
{\scriptstyle 2\ \cancel{4}\ 12} \\
\cancel{3}\,\cancel{5}\,\cancel{2} \\
-\,1\,6\,7 \\
\hline
1\,8\,5
\end{array}
$$

2 hundreds − 1 hundred = 1 hundred

So, 352 − 167 = 185.

1.11

Combine place values to subtract

You can combine place values to subtract. Think of two digits next to each other as one number.

Subtract. $354 - 248$

Estimate. $350 - 250 = 100$

Step 1 Look at the digits in the ones place.	Step 2 Combine the tens and ones places.	Step 3 Subtract the hundreds.
Think: $8 > 4$, so combine place values.	**Think:** There are 54 ones and 48 ones. Subtract the ones. Write 0 for the tens.	
$\begin{array}{r} 35\!\!4 \\ -\ 24\!\!8 \\ \hline \end{array}$	$\begin{array}{r} 354 \\ -\ 248 \\ \hline 06 \end{array}$	$\begin{array}{r} 354 \\ -\ 248 \\ \hline 106 \end{array}$

So, $354 - 248 = 106$.

Remember: You can also combine hundreds and tens to subtract.

1.12

Problem solving—Model addition and subtraction

Kim sold 127 tickets to the school play. Jon sold 89 tickets.
How many more tickets did Kim sell than Jon?

Read the Problem	Solve the Problem
What do I need to find? I need to find how many more tickets Kim sold than Jon _____ .	Complete the bar model. Kim [127 tickets] Jon [89 tickets] ▢ tickets
What information do I need to use? I know that Kim sold 127 tickets and Jon sold 89 tickets.	Subtract to find the unknown part. 127 − 89 = 38 ■ = 38 tickets
How will I use the information? I will draw a bar model to help me see what operation to use to solve the problem.	So, Kim sold 38 more tickets than Jon.