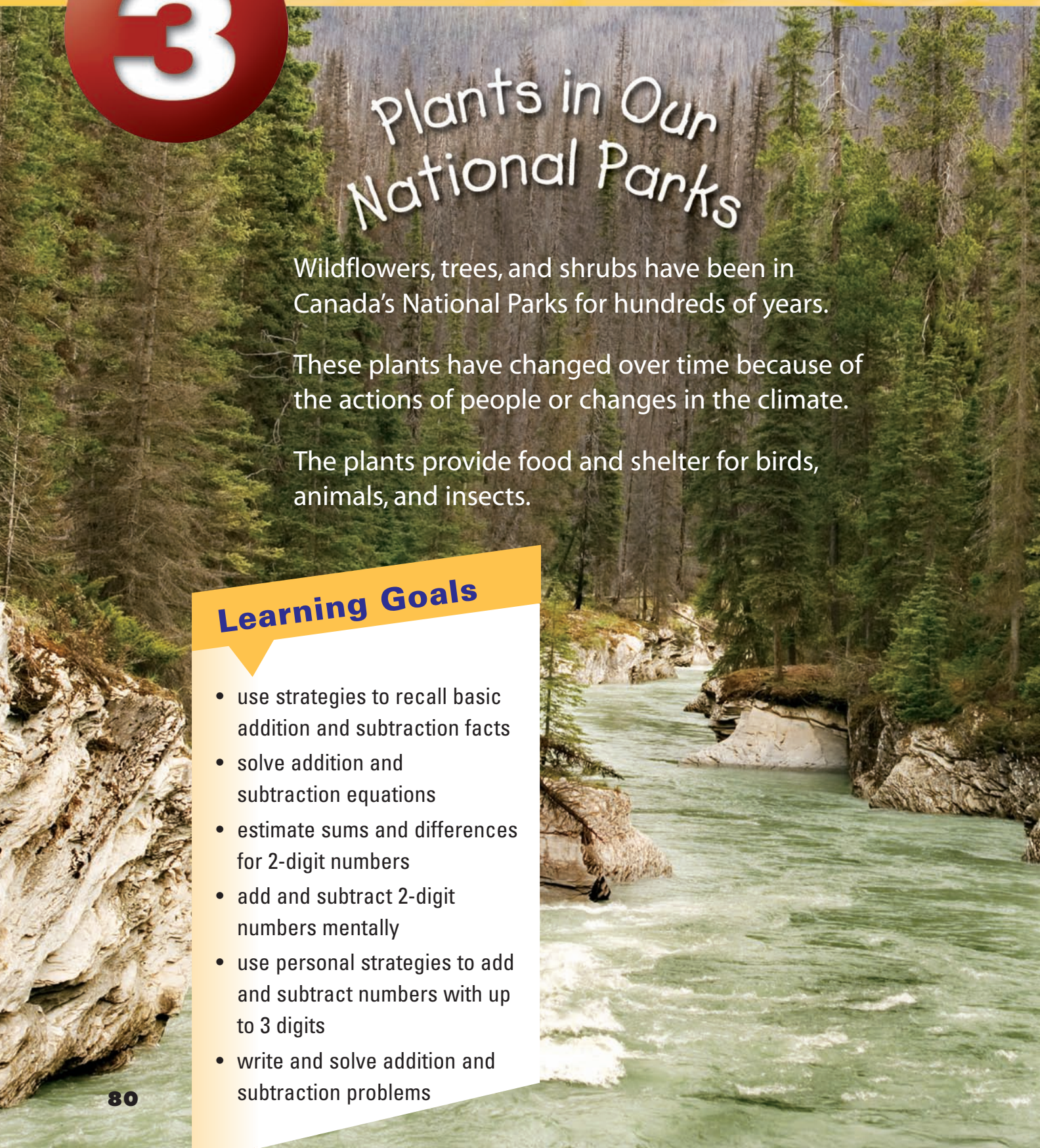
UNIT 3

Addition and



Plants in Our National Parks

Wildflowers, trees, and shrubs have been in Canada's National Parks for hundreds of years.

These plants have changed over time because of the actions of people or changes in the climate.

The plants provide food and shelter for birds, animals, and insects.

Learning Goals

- use strategies to recall basic addition and subtraction facts
- solve addition and subtraction equations
- estimate sums and differences for 2-digit numbers
- add and subtract 2-digit numbers mentally
- use personal strategies to add and subtract numbers with up to 3 digits
- write and solve addition and subtraction problems

Subtraction

Key Words

- addition facts
- doubles
- near doubles
- sum
- related facts
- subtraction facts
- equation
- estimate
- mental math
- difference

NUMBER OF PLANTS STUDIED

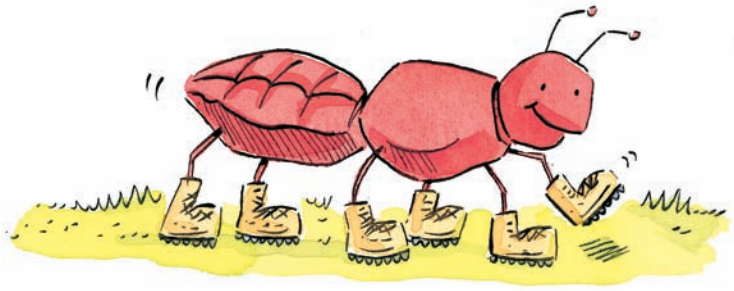
	TINA	MARCEL	SYLVIE	ALASIE
Week 1	8	5	6	5
Week 2	3	5	4	9
Week 3	5	7	0	1
Week 4	2	0	3	1
Total	18	17	13	16

- Who studied the most plants?
- Which weeks did someone not study any plants? How do you know?
- What else can you find out from the chart?
- Make up a question about the chart. Answer your own question.

LESSON 1

Strategies for Addition Facts

What doubles fact does the ant show?



How can you use this fact to find 3 + 4 and 3 + 5?

Explore

This addition chart is partly filled in.
What patterns do you see?

Find ways that these patterns can help you figure out some **addition facts**.

+	0	1	2	3	4	5	6	7	8	9
0	0	1								
1	1	2	3							10
2		3	4	5					10	
3			5	6	7			10		
4				7	8	9	10			
5					9	10	11			
6					10	11	12	13		
7				10			13	14	15	
8			10					15	16	17
9		10							17	18

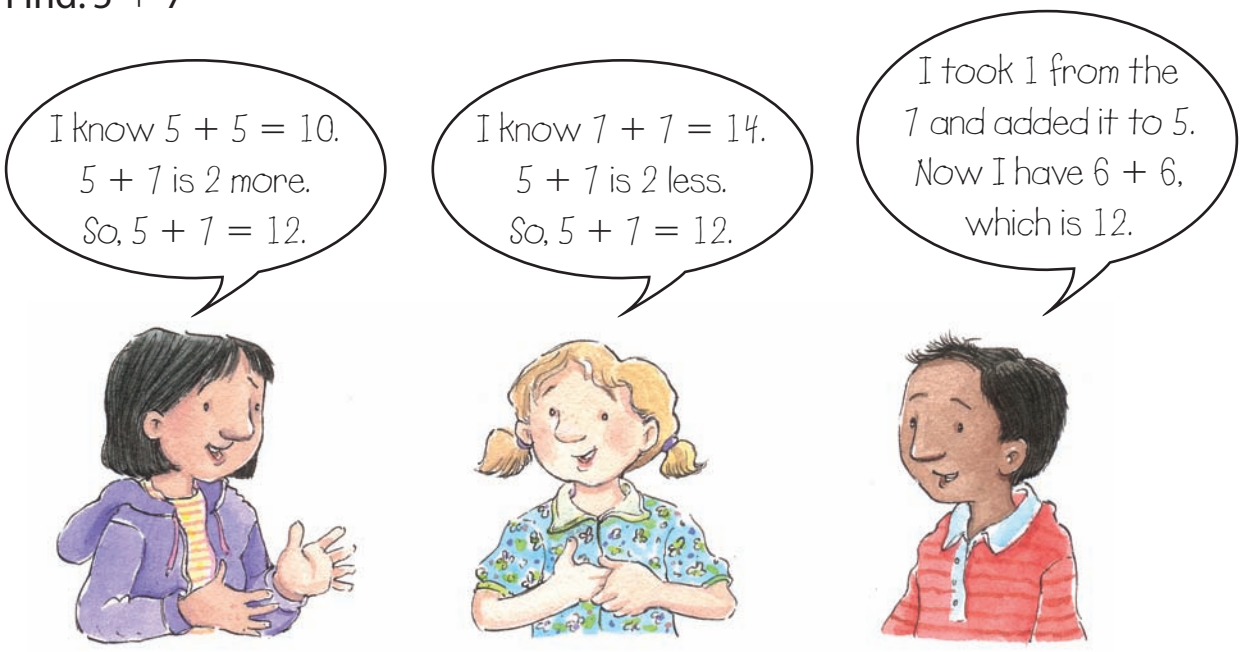
Show *and* Share

Talk to your partner about the addition facts in the chart.
Record any addition strategies you talk about.

Connect

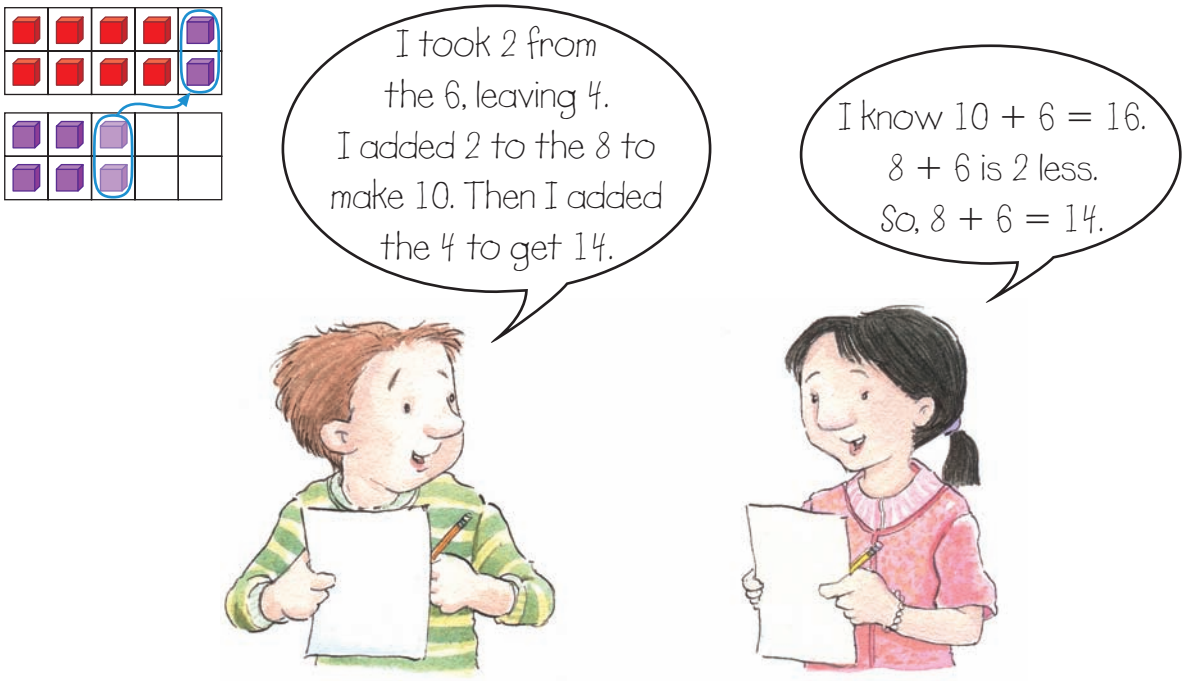
➤ In the addition chart, the **doubles** are in the blue diagonal.
The green and pink diagonals show **near doubles**.
Near doubles are 1 more or 1 less or 2 more or 2 less than a double.

Find: 5 + 7



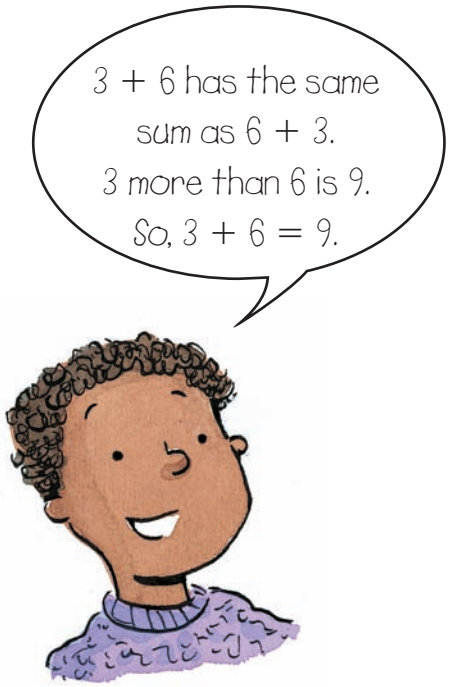
➤ The yellow diagonal in the addition chart shows **sums** of 10.
Making 10 or using 10 can help you figure out other facts.

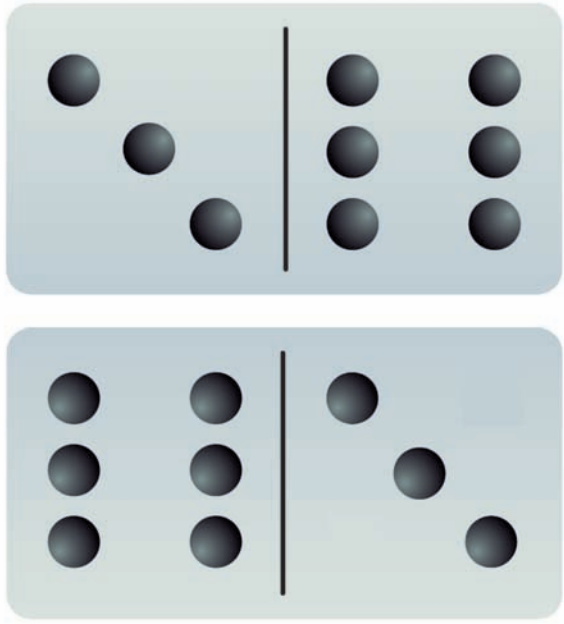
Find: 8 + 6



➤ When you add, the order does not matter.
You may find it easier to add from the larger number.

Find: 3 + 6





Practice

1. Think of the doubles fact 5 + 5 = 10. Find each sum.

a) 5 + 6 **b)** 5 + 4

c) 5 + 7 **d)** 5 + 3

2. Add. Show 2 strategies for each addition.

a) 7 + 8 **b)** 6 + 4

c) 9 + 8 **d)** 6 + 7

3. Add. What patterns do you see?

a) 6 + 2
6 + 3
6 + 4
6 + 5

b) 3 + 4
2 + 5
1 + 6
0 + 7

4. Add. How can making 10 or using 10 help you?

a) $8 + 5$ **b)** $3 + 9$

c) $9 + 6$ **d)** $4 + 7$

5. **a)** Add. What pattern do you notice in your answers?

$1 + 0$ $7 + 0$

$3 + 0$ $9 + 0$

b) Write a rule for adding 0.

6. Add. Use any strategy you like.
Show your strategy.

a) $7 + 9$ **b)** $0 + 9$

c) $5 + 8$ **d)** $4 + 8$

e) $1 + 5$ **f)** $8 + 7$

g) $8 + 9$ **h)** $6 + 5$

7. There were 9 children in a swimming pool.
Eight more children jumped in.
How many children are in the pool?
What strategy did you use to find out?

8. Use 2 or more of these numbers each time:

1, 2, 3, 4, 5, 6, 7, 8

Find ways to make 10.
How can you tell when you have found all the ways?
Show your work.

Reflect

What are some addition strategies you use? Use words, pictures, or numbers to show some examples.

LESSON 2

Relating Addition and Subtraction

Jan has 5 goldfish.

What are 2 addition facts you can write about Jan's goldfish?

Here are 2 **related facts**.

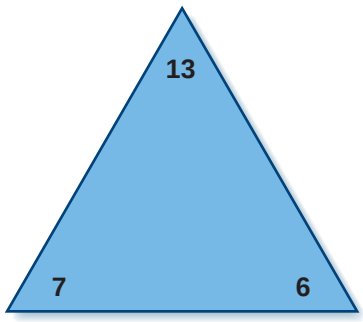
$5 - 2 = 3$ } These are **subtraction**
$5 - 3 = 2$ } **facts**.

Think about subtraction as the opposite of addition.

Explore

Game

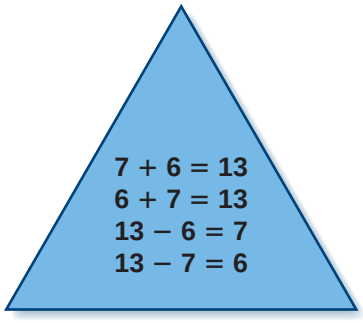
You will need about 20 blank triangle cards.



- Choose 2 numbers between 0 and 9. Add them.
  - On a card, write each number in a corner.
  - Write all the related facts on the other side.
- Continue to build your card collection.

Show *and* Share

Share the cards to play a game. Take turns.



- Player 1, show the 3 numbers on the front of a card.
- Player 2, tell what facts are on the back of the card.
- You win the card when you give all the correct facts.

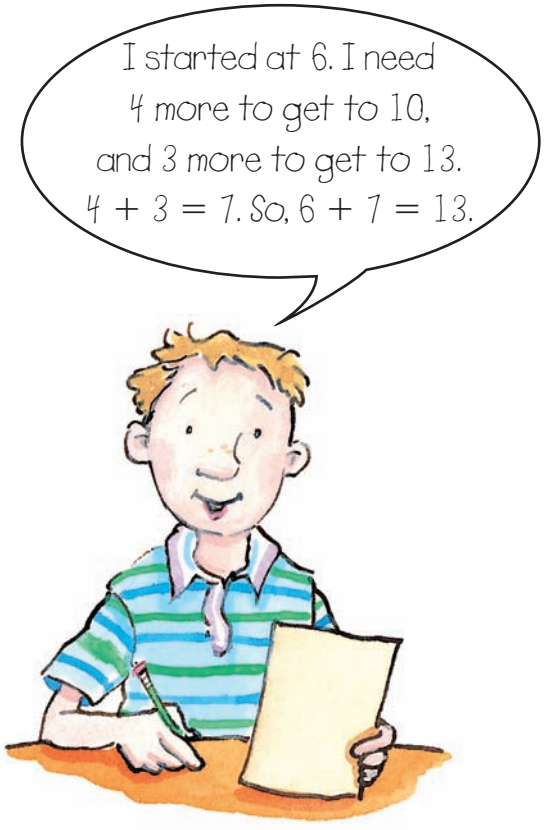
The winner is the one with the most cards at the end.

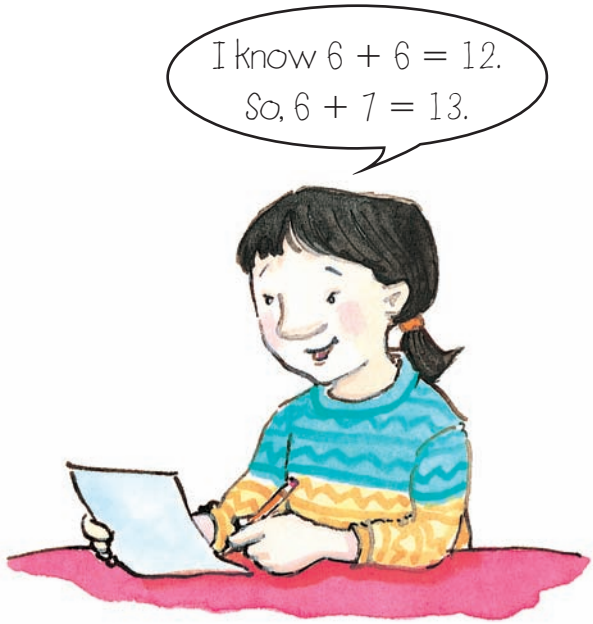
Connect

Every subtraction fact has a related addition fact.
To subtract, we can think addition.

On Monday, 13 children signed up for lacrosse.
On Tuesday, 6 more children signed up.
How many more children signed up on Monday?

Find $13 - 6$.
Think addition.
$6 + ? = 13$
What do I add to 6 to get 13?





Since $6 + 7 = 13$, then $13 - 6 = 7$.

Practice

1. Write the related facts for each fact.

a) $5 + 9 = 14$ **b)** $6 + 7 = 13$ **c)** $12 - 4 = 8$ **d)** $14 - 7 = 7$

2. Write the related addition facts for each subtraction fact.

a) $15 - 8 = 7$ **b)** $10 - 6 = 4$ **c)** $17 - 8 = 9$ **d)** $11 - 5 = 6$

3. Write all the related facts that use each set of numbers.

a) 11, 4, 7 **b)** 6, 5, 11 **c)** 9, 9, 18 **d)** 3, 9, 12

4. Subtract. Explain your strategy.

a) $10 - 7$ **b)** $14 - 6$ **c)** $18 - 9$

d) $15 - 8$ **e)** $12 - 7$ **f)** $14 - 5$

5. **a)** Subtract. What pattern do you notice in the answers?

$2 - 0$ $4 - 0$ $6 - 0$ $8 - 0$

b) Write a rule for subtraction facts where one of the numbers is 0.

6. There were 17 children in line for the school bus.
Eight children got on the bus.
How many children were still in line?

7. Chintan read 16 books in 4 weeks.
He read 7 books in the first 2 weeks.
How many books did Chintan read in the last 2 weeks?

8. Five is one number in a subtraction fact.
What might the other numbers be?
Write the subtraction fact. Write all the related facts.

Reflect

How can you use addition to help you recall the answer to a subtraction fact?

LESSON 3

Addition and Subtraction Equations

Explore

Game

How Many Are Missing?

You will need 18 counters. Take turns.

- Take between 10 and 18 counters.
- Put some counters in one hand and some in the other.
- Tell your partner how many counters you have altogether.
- Show how many you have in one hand.
  Ask your partner how many you have in the other hand.

Show *and* Share

What strategies did you use to find the missing number?
Share your ideas with another pair of classmates.

Connect

An **equation** is a statement that 2 things are equal.
These are all equations.

$7 + 3 = 10$
$10 = 7 + 3$
$2 + 8 = 7 + 3$
$7 + \square = 10$

$8 - 3 = 5$
$5 = 8 - 3$
$10 - 5 = 8 - 3$
$8 - \square = 5$

Kelsey's mother bought 15 cupcakes.
She put 6 cupcakes on a plate
and left the rest in the box.

How many cupcakes are in the box?
Use an equation to find out.

You can use a symbol to represent
the number of cupcakes in the box.

You know:

and ? makes 15 altogether

You can use any symbol you like for the missing number. We use △.

So, we can write this equation: $6 + \triangle = 15$

Here are some strategies children used
to solve this equation.

Solving an equation means finding the missing number.

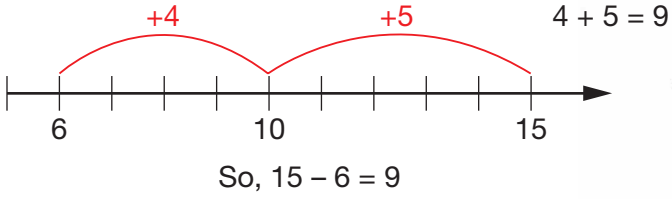
➤ Lisa took 15 counters.
She put 6 of the counters in a group to show
the number of cupcakes on the plate.
Lisa had 9 counters left over.

So, the missing number is 9.

➤ Abe used mental math.
He knows $6 + 10 = 16$, so $6 + 9 = 15$.
So, the missing number is 9.

➤ Byron used guess and check to solve $6 + \triangle = 15$.
He guessed 6 for $\triangle$ and added: $6 + 6 = 12$
The sum is too low.
He guessed 8 for $\triangle$ and added: $6 + 8 = 14$
The sum is too low, but closer to 15.
He guessed 9 for $\triangle$ and added: $6 + 9 = 15$
So, the missing number is 9.

➤ Avril started at 6 and counted up to 15.
She used a number line to keep track.



So, 15 – 6 = 9

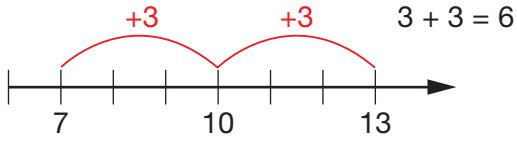
The missing number is 9.
There are 9 cupcakes in the box.

Practice

1. True or false?

a) $4 + 5 = 9$
b) $4 + 3 = 7 + 1$
c) $5 + 2 = 3 + 4$
d) $9 = 2 + 7$
e) $7 + 2 = 8 + 1$
f) $7 = 12 - 6$
g) $3 + 1 = 10 - 6$
h) $7 + 5 = 12 - 5$

2. Jim counted up to solve the equation $7 + \square = 13$.
He used a number line to keep track.
Solve the equation.
How does the number line show the solution?



So, 13 – 7 = 6

3. Write each equation with a different symbol.
Use counters to solve each equation. Sketch your counters.

a) $5 + \bigcirc = 14$ **b)** $\bigcirc + 3 = 11$ **c)** $5 = 5 - \bigcirc$

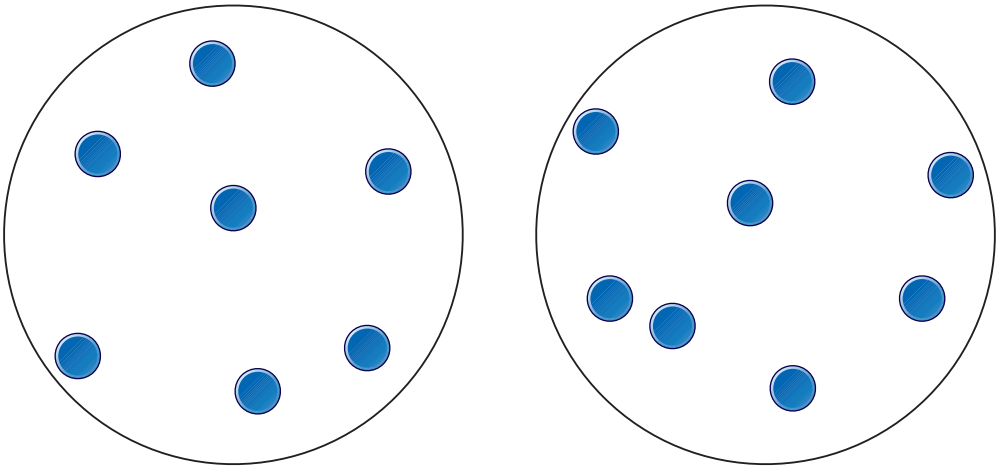
4. Use guess and check to solve each equation.

a) $6 + \triangle = 11$ **b)** $\bigcirc - 6 = 7$ **c)** $14 - \bigcirc = 7$

5. Solve each equation. Use any strategy you wish.

a) $12 - \square = 7$ **b)** $13 = 8 + \bigcirc$ **c)** $10 - \triangle = 8$

6. Use $+$, $-$, $=$, and $\square$, together with numbers.
Write all the equations you can for the pictures below.



7. Sophie saw 11 lemurs at a zoo.
Seven of them were red-ruffed lemurs.
The others were ring-tailed lemurs.
How many ring-tailed lemurs did Sophie see?
Explain your strategy.

Reflect

What is your favourite strategy for solving an addition equation?
Can you always use it?
Use words and numbers to explain.

LESSON 4

Estimating Sums

When you do not need an exact answer, you **estimate**.
When you estimate a sum, you predict a number that is close to the number you would get by adding.

Explore

Evan's class is earning money for a charity.
They earn $46 selling tickets to a movie and $38 at their craft sale.
About how much money did they earn?

Explain how you estimated.

Show *and* Share

Share your estimate with another pair of classmates.
What strategies did you use?
Did you each have different answers?
Why do you think that happened?

Connect

Kaori and Brian are rolling nickels their class collected for a charity.
Kaori counted 59 nickels.
Brian counted 23 nickels.
About how many nickels did they roll altogether?

Estimate to predict the sum: 59 + 23

➤ Kaori adds only the digits in the tens place.
59 has 5 tens.
23 has 2 tens.
Add the tens: 5 tens + 2 tens = 7 tens, or 70
Kaori estimates they rolled about 70 nickels.

➤ Brian takes each number to the closest 10.
59 is closest to 60.
23 is closest to 20.
Add: 60 + 20 = 80
Brian estimates they rolled about 80 nickels.

➤ Gemma takes one number to the closest 10.
59 is closest to 60.
Add: 60 + 23 = 83
Gemma estimates they rolled about 83 nickels.

There are many ways to estimate a sum.

Practice

1. Which number is the better estimate for each sum?
a) 61 + 22 is about 80 or 90? **b)** 54 + 13 is about 60 or 70?

2. Estimate each sum.
a) 29 + 38 **b)** 71 + 12 **c)** 11 + 45 **d)** 44 + 44

3. Sally estimated these sums.
Tell whether you think each estimate is greater than or less than the sum.
Why do you think so?
a) 54 + 36 is about 80
b) 19 + 17 is about 40
c) 27 + 62 is about 87
d) 36 + 35 is about 70

4. Caroline's friends donated 43 stuffed animals and 26 toy cars to a toy drive.
They estimate that they donated about 70 toys.
How might they have estimated?

5. Debra has 52 stickers in her sticker book.
She was given a bag of 39 stickers.
About how many stickers does Debra have?

6. Some children chose a Canadian astronaut and a space shuttle as the topic for a project.
Forty-three chose Julie Payette on the Space Shuttle Discovery.
Thirty-eight chose Dave Williams on the Space Shuttle Endeavour.

a) About how many worked on the projects?
Explain 2 strategies to estimate the solution.

b) Which strategy do you prefer? Why?

7. Thirty-two boys and 42 girls will be at a fair.
Each child will receive a prize.
Trudy and Greg want to estimate the number of prizes needed.
Trudy estimated: $30 + 40 = 70$
Greg estimated: $30 + 50 = 80$

a) Show a different way to estimate the number of prizes.

b) Which estimate would you use? Why?

Reflect

Explain the difference between guessing and estimating.
When is an estimate all that is needed?
Use examples to show your thinking.

LESSON 5

Adding 2-Digit Numbers

Explore

Jordan's school had a Walk-A-Thon to raise money for an animal shelter.
The teachers gave out 46 bottles of juice and 18 bottles of water.
How many drinks did the teachers give out?

- Estimate to predict the answer.
- Use any materials or strategies you wish to solve the problem.

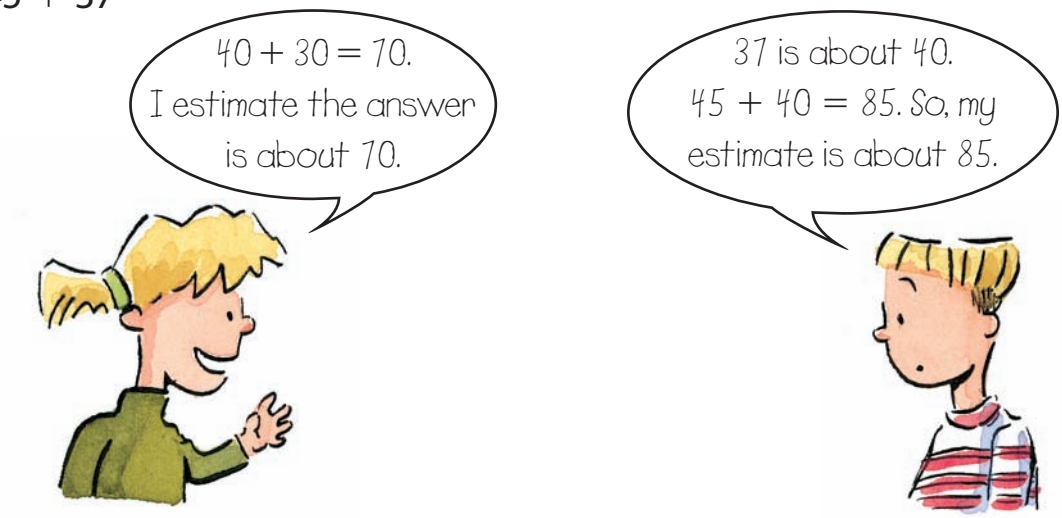
Show *and* Share

Share your strategies with another pair of classmates.
Which strategy do you find easiest to understand?

Connect

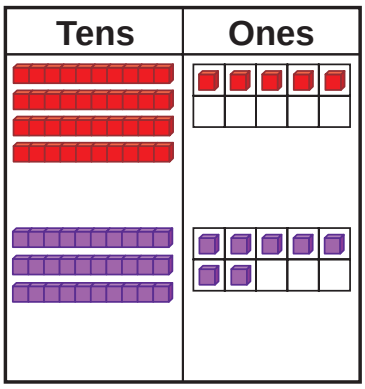
There are 45 dogs in the animal shelter.
There are 37 cats at the same shelter.
How many cats and dogs are there in the shelter?

Find: 45 + 37



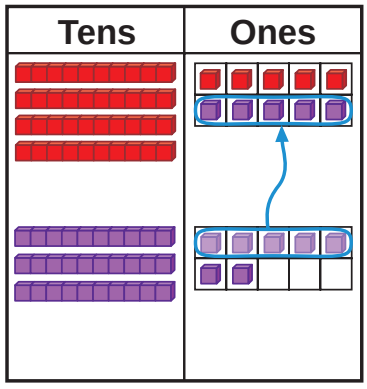
Here are different strategies children used to solve the problem.

➤ Hannah uses Base Ten Blocks on a place-value mat to add 45 + 37.

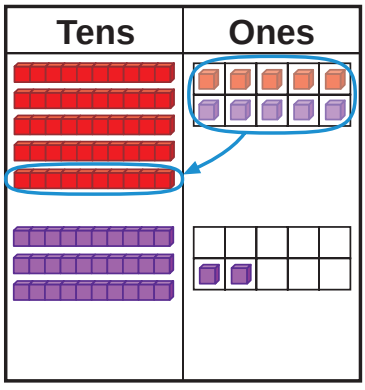


Show 45 with 4 tens and 5 ones.
Show 37 with 3 tens and 7 ones.

$$\begin{array}{r} 45 \\ +\ 37 \\ \hline \end{array}$$

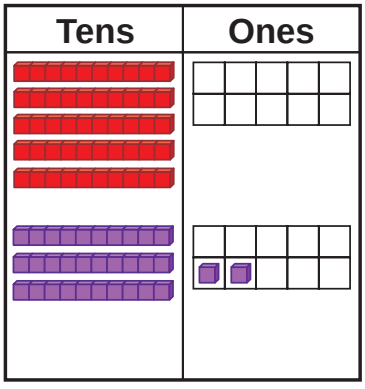


5 ones and 7 ones is 12 ones.
Put 10 ones together to make 10.



Trade 10 ones for 1 ten.

$$\begin{array}{r} {\scriptstyle 1} \\ 45 \\ +\ 37 \\ \hline 2 \end{array}$$



This makes 8 tens and 2 ones.

$$\begin{array}{r} {\scriptstyle 1} \\ 45 \\ +\ 37 \\ \hline 82 \end{array}$$

➤ Marissa and Jeremy record 45 and 37 as tens and ones.
$45 = 40 + 5$
$37 = 30 + 7$
They add the tens and ones separately and combine the results.

- Marissa adds from left to right.
  Add the tens: $40 + 30$
  Add the ones: $5 + 7$
  Add the sums: $70 + 12$

$40 + 30 = 70$
$5 + 7 = 12$
$70 + 12 = 82$

- Jeremy adds from right to left.
  Add $7 + 5$.
  Add $30 + 40$.
  Add $12 + 70$.

$$\begin{array}{r} 37 \\ +45 \\ \hline 12 \\ 70 \\ \hline 82 \end{array}$$

You can add $37 + 45$ or $45 + 37$.

There are 82 cats and dogs in the animal shelter.
The answer 82 is close to the estimates 70 and 85.

Practice

1. Estimate first. Then add.
a) $25 + 13$ **b)** $11 + 67$ **c)** $30 + 28$ **d)** $44 + 34$

2. Add. Use any strategies you wish.
a) $43 + 9$ **b)** $56 + 6$ **c)** $24 + 8$ **d)** $67 + 27$

3. Add. Show your strategies.

a) $\begin{array}{r} 57 \\ +\ 7 \\ \hline \end{array}$ **b)** $\begin{array}{r} 35 \\ +\ 19 \\ \hline \end{array}$ **c)** $\begin{array}{r} 16 \\ +\ 78 \\ \hline \end{array}$ **d)** $\begin{array}{r} 28 \\ +\ 6 \\ \hline \end{array}$

4. Add. Record each addition sentence.

a) 50 + 35 **b)** 49 + 34 **c)** 48 + 33 **d)** 47 + 32

What patterns do you see in your answers?

5. The sum of 2 numbers is 68.
What might the numbers be?

6. Write a story problem for each addition question.

a) 63 + 28 **b)** 54 + 9

7. Children collected bottles to recycle.
On Monday they brought in 47 bottles.
On Tuesday they brought in 39 bottles.
How many bottles were brought in altogether?

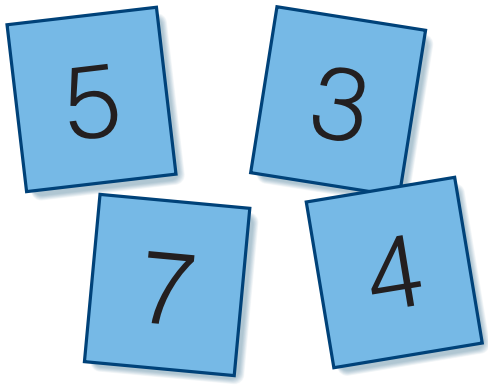
8. For each number:
Write an addition story problem.
Estimate to predict your answer.
Solve your problem using strategies of your choice.
Use your estimate to check.

a) 35 **b)** 82

9. Make a card for each digit: 5, 3, 7, 4
Arrange the cards to make addition questions with two 2-digit numbers.

a) Find as many sums as you can.
Record each sum.

b) What is the greatest possible sum?
What is the least possible sum?
How do you know?



Reflect

What strategy do you prefer to use to add two 2-digit numbers?
Explain.

LESSON 6

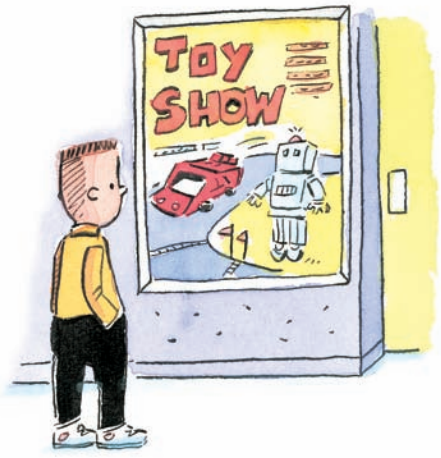
Using Mental Math to Add

When you add in your head, you do **mental math**.

Explore

The Toy Show has been on for 36 days.
It will be on for another 48 days.
How many days is that altogether?

Use mental math to find out.



Show *and* Share

Share your strategies with another classmate.

Connect

Here are some ways to use mental math to add.

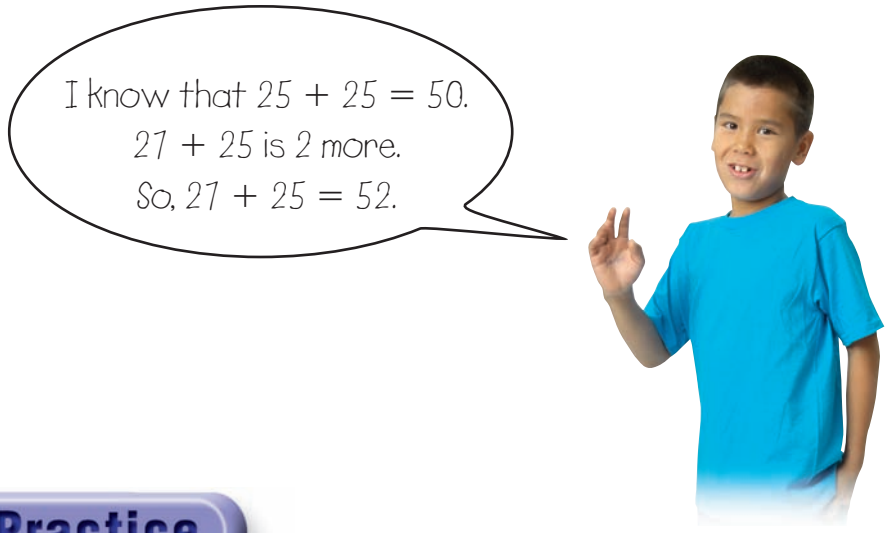
➤ Maya adds from left to right to add 63 + 15.

I know 63 = 60 + 3
and 15 = 10 + 5.
60 + 10 = 70
3 + 5 = 8
70 + 8 = 78
So, 63 + 15 = 78.

➤ Edmond uses a "friendly" number to add 58 + 29.

60 is close to 58.
60 + 29 = 89
58 + 29 is 2 less.
So, 58 + 29 = 87.

➤ Kumail uses doubles to add 27 + 25.



Practice

Use mental math.

1. Add. What patterns do you see?
a) 32 + 10 **b)** 32 + 20 **c)** 32 + 30 **d)** 32 + 40

2. Add. Use any strategies you wish.
a) 21 + 26 **b)** 36 + 48 **c)** 45 + 15 **d)** 39 + 27

3. Add.
a) 35 + 29 **b)** 48 + 18 **c)** 23 + 67 **d)** 16 + 55

4. How many different ways can you find 29 + 55?
Use words, pictures, or numbers to show each way.

5. Josh and Kara were counting licence plates.
Josh counted 49 plates from Alberta.
Kara counted 33 plates from Manitoba.
How many licence plates did they count?
Use words, pictures, or numbers to explain your strategy.

Reflect

Describe 2 strategies you could use to add 48 + 24 in your head.

LESSON 7

Adding 3-Digit Numbers

Explore

St. Mark's School sells T-shirts for gym classes.
236 children ordered blue T-shirts.
175 children ordered red T-shirts.

How many T-shirts were ordered?
Use materials or strategies of your choice to solve this problem.

Show *and* Share

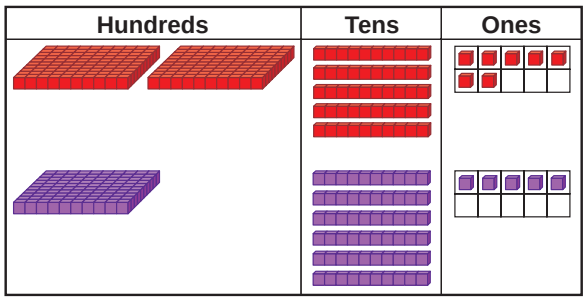
Show how you found the total number of T-shirts.
Share your strategy with another pair of classmates.
Try the strategy of another pair to add two 3-digit numbers.

Connect

St. Mark's School also sells hats.
It sold 257 blue hats and 165 white hats.
How many hats were sold altogether?

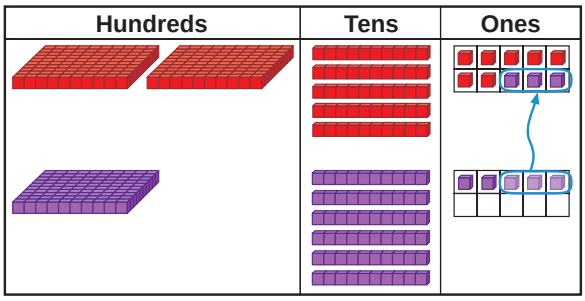
Find: 257 + 165

➤ Ross uses Base Ten Blocks on a place-value mat to add 257 + 165.

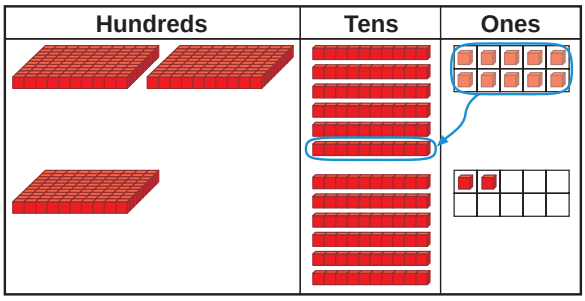


Show 257 with
2 hundreds, 5 tens, and 7 ones.
Show 165 with
1 hundred, 6 tens, and 5 ones.

$$\begin{array}{r} 257 \\ +\ 165 \\ \hline \end{array}$$

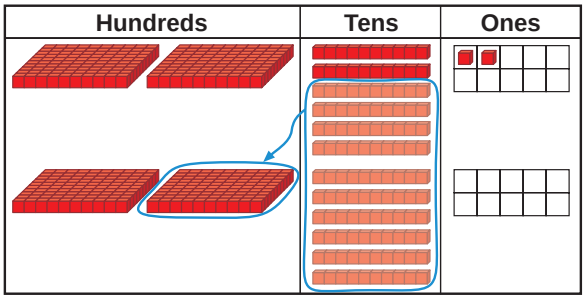


Add the ones:
7 ones + 5 ones = 12 ones
Put 10 ones together to make 10.



Regroup 10 ones as 1 ten.

$$\begin{array}{r} {\scriptstyle 1} \\ 257 \\ +\ 165 \\ \hline 2 \end{array}$$



Add the tens:
1 ten + 5 tens + 6 tens = 12 tens
Regroup 10 tens as 1 hundred.
That's 4 hundreds, 2 tens, and 2 ones.

$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 257 \\ +\ 165 \\ \hline 422 \end{array}$$

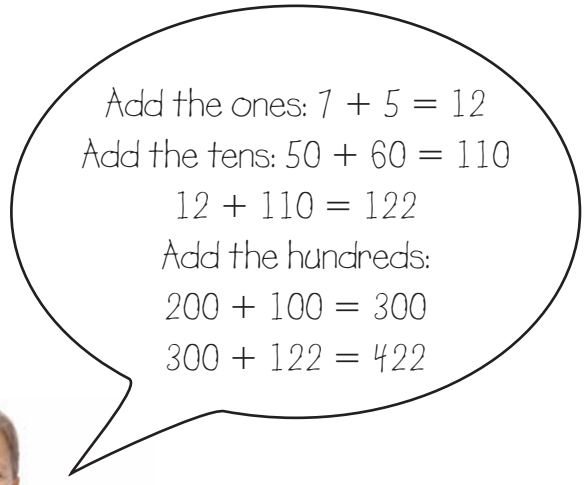
➤ Jas and Nadia think of 165 as 100 + 60 + 5.
They think of 257 as 200 + 50 + 7.

- Jas uses the order 165 + 257 and adds from left to right.

100 + 200 = 300
60 + 50 = 110
5 + 7 = 12
300 + 110 = 410
410 + 12 = 422

- Nadia uses the order 257 + 165 and adds from right to left.

7 + 5 = 12
50 + 60 = 110
12 + 110 = 122
200 + 100 = 300
300 + 122 = 422



There are 422 hats.

Think of other ways to solve the problem.

Practice

1. Add.

a) 290 + 61 **b)** 9 + 479 **c)** 502 + 349 **d)** 177 + 674

2. Use any strategy to find the sum.

a)
$$\begin{array}{r} 340 \\ +\ 270 \\ \hline \end{array}$$

b)
$$\begin{array}{r} 71 \\ +\ 459 \\ \hline \end{array}$$

c)
$$\begin{array}{r} 382 \\ +\ 8 \\ \hline \end{array}$$

d)
$$\begin{array}{r} 293 \\ +\ 237 \\ \hline \end{array}$$

3. A family reunion was held in a park.
There were 137 children and 218 adults.
How many lunches were needed
for the people at the reunion?

4. Write a story problem that can be solved by adding two 3-digit numbers.
Solve the problem.
Explain your solution.

5. The sum of 2 numbers is 624.
What might the numbers be for each of these?

a) One number has 1 digit.
The other number has 3 digits.

b) One number has 2 digits.
The other number has 3 digits.

c) Each number has 3 digits.

6. Add. What patterns do you see in the answers?
Explain the patterns.

a)
4 + 5
40 + 50
400 + 500

b)
400 + 213
400 + 313
400 + 413
400 + 513

Reflect

How is adding two 3-digit numbers like adding two 2-digit numbers? How is it different? Explain.

Tic Tac Add

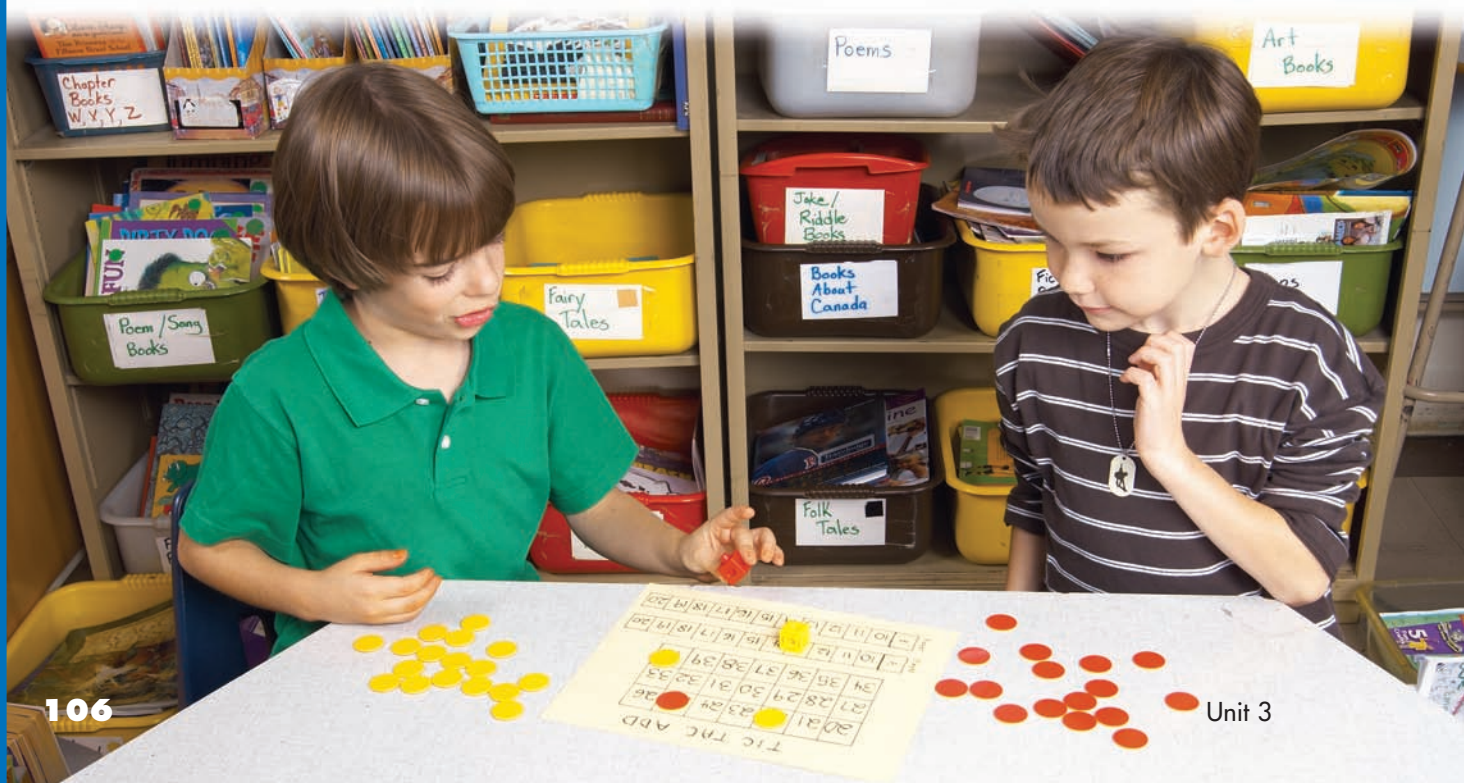
You will need a *Tic Tac Add* game board, 1 red Snap Cube, 1 yellow Snap Cube, 18 red counters, and 18 yellow counters.

The object of the game is to get 3 counters in a row.

- Player A puts a red Snap Cube on any number in the Player A row.
- Player B puts a yellow Snap Cube on any number in the Player B row.
- Player B adds the numbers under the Snap Cubes.
  Player A adds to check.
  Player B puts a yellow counter over the sum on the game board.

Use any strategy you wish.

- Player A moves the red Snap Cube to a different number in the Player A row.
- Player A adds the numbers under the Snap Cubes.
  Player B adds to check.
  Player A puts a red counter over the sum on the game board.
- You may only put 1 counter over a number on the game board.
  Continue taking turns until someone gets 3 in a row.



LESSON 8

Estimating Differences

When you estimate a **difference**, you predict a number that is close to the number you would get by subtracting.

Explore

Calaway Park is in Calgary, Alberta.
It has a ride called the Dream Machine that can take 56 passengers.
Thirty-three people are on the ride.

How many more people can get on the ride?

Estimate to predict a number that is close to the answer.
Record how you estimate.

Show *and* Share

Share estimates and strategies with another pair of classmates.
Are the estimates different for different strategies?

Connect

Marla had 87¢.
She spent some of her money.
She has 34¢ left.
About how much did Marla spend?

Estimate to predict the difference: 87 − 34

Here are different strategies children used to estimate.

➤ Jill writes each number to the closest 10.
87 is closest to 90.
34 is closest to 30.
Subtract: $90 - 30 = 60$
Jill estimates that Marla spent about 60¢.

➤ Robert subtracts only the digits in the tens place.
87 has 8 tens.
34 has 3 tens.
Subtract the tens: 8 tens − 3 tens = 5 tens, or 50
Robert estimates that Marla spent about 50¢.

➤ Max uses the number of tens for the number he subtracts.
34 has 3 tens.
Subtract 3 tens: $87 - 30 = 57$
Max estimates that Marla spent about 57¢.

Think of other estimation strategies.

Practice

1. Estimate each difference.

a) $64 - 35$ **b)** $87 - 68$
c) $34 - 15$ **d)** $75 - 55$
e) $53 - 40$ **f)** $91 - 29$

2. Tell how Al might have estimated each difference.

a) $52 - 24$ is about 32 **b)** $84 - 58$ is about 30
c) $79 - 17$ is about 60 **d)** $63 - 36$ is about 20

3. Choose one part in question 2.
Show another way to estimate the difference.

4. The Yukon Arctic Wolves soccer team won 3 out of 5 games at the national championships in 2007. They had 92 people watching their game against Saskatchewan. Fifty-nine of the people took pictures.
About how many people did not take pictures?

5. Jerome had a package of 85 balloons.
He used 57 balloons for a party.
He estimates that he has about 30 balloons left.

a) How might Jerome have estimated?

b) Use a different strategy to estimate the number of balloons Jerome has left.
Compare your estimate with Jerome's.

6. Faizal had 136 marbles. He gave away 25.
Faizal says he now has about 80 marbles.
Do you agree? Why or why not?

7. Heidi went to Calaway Park.
She counted the people in line for the Flying Ace.
She counted the people in line for the Ocean Motion.
Heidi estimated the difference was about 10 people.
How many people might be in each line?
Use words, pictures, or numbers to explain your thinking.

At Home

Next time you go shopping, find a way to estimate a sum or difference.

Reflect

Strategies for estimating differences can give different estimates. Sometimes the estimates are the same.
Use examples to show this.

LESSON 9

Subtracting 2-Digit Numbers

Explore

Baby salmon are called fry.
There were 74 fry swimming in a stream.
Forty-seven of them swam into the ocean.
How many fry didn't swim into the ocean?

- First, estimate to predict the answer.
- Then use any materials or strategies you wish to solve the problem.
- Use your estimate to check your solution.

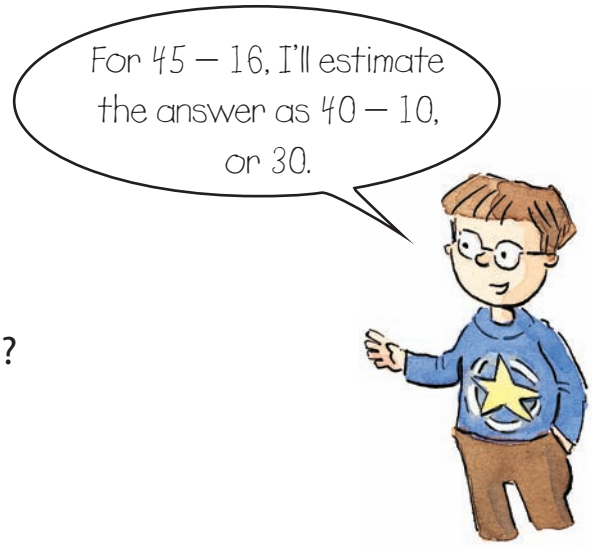
Show *and* Share

Share your answers and strategies with another pair of classmates.

Connect

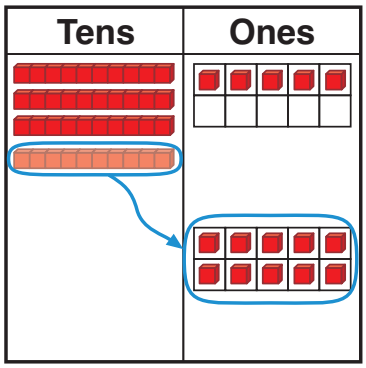
Some children were given the numbers 45 and 16 to create a subtraction problem.
They created this problem.

Carlo's farm has 45 horses.
Sixteen of the horses are colts.
How many of the horses are not colts?



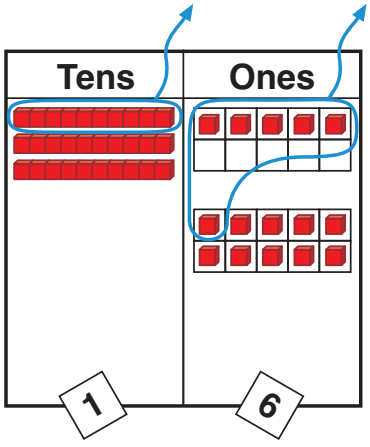
Here are different strategies children used to subtract 45 − 16.

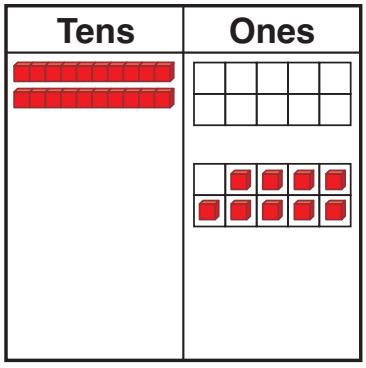
➤ Cory uses Base Ten Blocks on a place value mat.



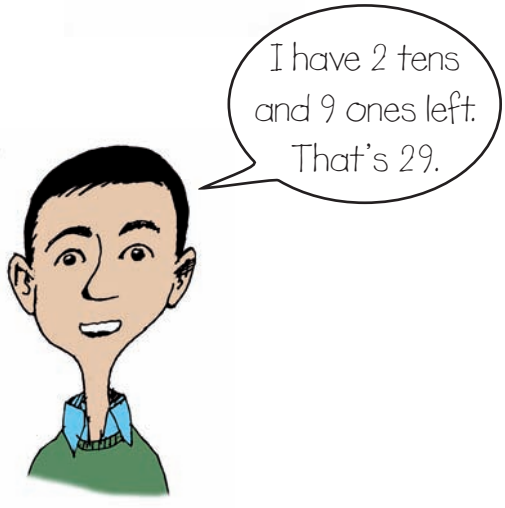
$$\begin{array}{r} 45 \\ -\ 16 \\ \hline \end{array}$$

$$\begin{array}{r} {\scriptstyle 3\ 15} \\ \not{4}\not{5} \\ -\ 16 \\ \hline \end{array}$$

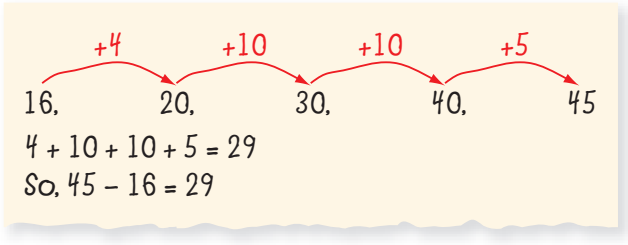




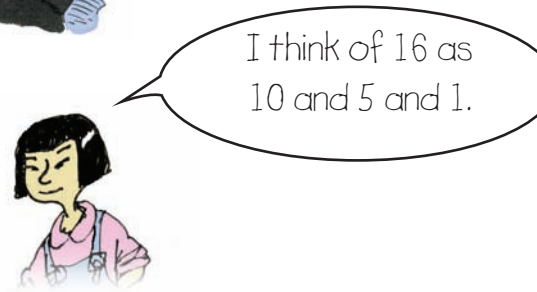
$$\begin{array}{r} {\scriptstyle 3\ 15} \\ \not{4}\not{5} \\ -\ 16 \\ \hline 29 \end{array}$$



➤ Paul counts on from 16 to 45.



➤ Petra subtracts by skip counting backward.



Start at 45.
Subtract 10, then 5, then 1.
45 … 35 … 30 … 29

45 – 10 = 35
35 – 5 = 30
30 – 1 = 29
So, 45 – 16 = 29

There are 29 horses that are not colts.
The answer is close to the estimate of 30.

Practice

1. Estimate. Which answers will be more than 20?
Subtract if the estimate is less than 20.

a) 58 − 24 **b)** 39 − 25 **c)** 57 − 23 **d)** 66 − 22

2. Use any strategy you wish to find each difference.
Show your strategy.

a) 35 − 9 **b)** 74 − 48 **c)** 43 − 7 **d)** 82 − 76

3. Subtract.

a) 47 − 20 **b)** 56 − 29 **c)** 50 − 9 **d)** 89 − 62

4. Subtract.
91 − 56
91 − 66
91 − 76
91 − 86
What patterns do you see in your answers?

5. There were 16 girls in the gym. After the boys arrived, there were 25 children in the gym.
How many boys came into the gym?

6. A Grade 3 class had a family movie night.
They counted 73 students and 56 parents.
Were there more students or more parents? How many more?
Estimate first, then calculate.
Use your estimate to check your answer.

7. The difference of two 2-digit numbers is 35.

a) What might the numbers be?
Find 4 answers.
Write the subtraction equation for each answer.
What strategy did you use to find the answers?

b) Choose a subtraction from part a.
Create a story problem to match it.

Reflect

Suppose a friend missed school today.
Use words, pictures, or numbers to explain to your friend how to subtract two 2-digit numbers.

LESSON 10

Using Mental Math to Subtract

Explore

There were 43 people skating.
Twenty-seven people left.
How many people are still skating?

Use mental math to find out.

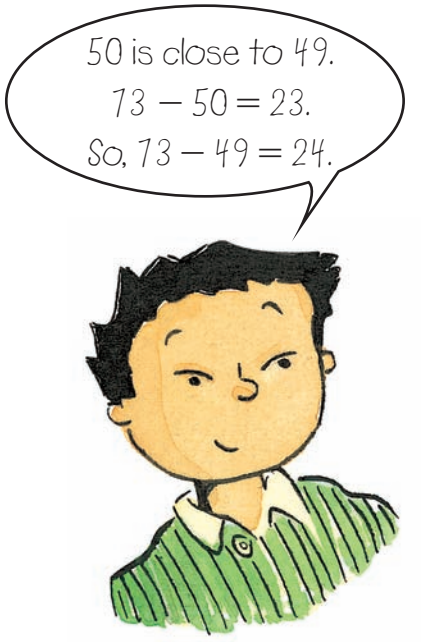
Show *and* Share

Share your strategies with another pair of classmates.

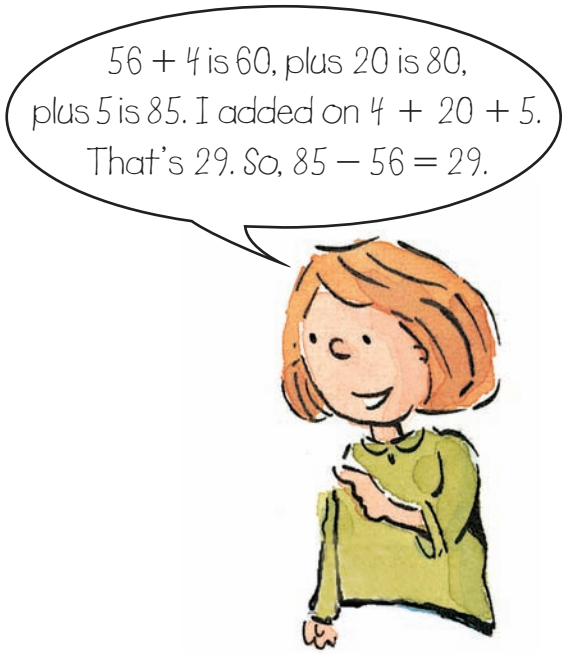
Connect

Here are some ways to use mental math to subtract.

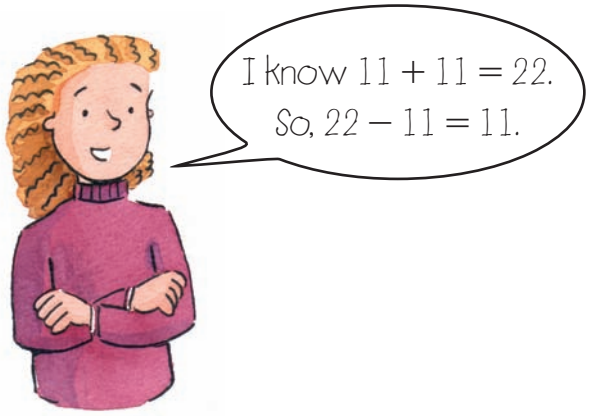
- Ross uses a "friendly" number to subtract 73 − 49.



- Bonnie finds 85 − 56 by counting up from 56 to 85.



➤ Olivia thinks of addition and uses doubles to subtract 22 − 11.



➤ Lars matches the ones to subtract 64 − 38.

I can add 4 to 64 to get 68.
68 - 38 = 30
Then, I take away the 4 I added.
30 - 4 = 26
So, 64 - 38 = 26

Practice

Use mental math.

1. Subtract. What patterns do you see?

a) 63 − 41 **b)** 73 − 31 **c)** 83 − 21 **d)** 93 − 11

2. Subtract. Show your strategies.

a) 87 − 78 **b)** 53 − 49 **c)** 35 − 27 **d)** 72 − 69

3. Subtract.

a) 74 − 56 **b)** 92 − 18 **c)** 67 − 35 **d)** 85 − 47

4. What different ways can you use mental math to find 81 − 58?
Use words, pictures, or numbers to show each way.

5. There were 32 geese on a beach.
More geese flew in. Then there were 61 geese.
How many geese flew in?

6. The answer is 43. What could the subtraction problem be?

Reflect

Explain 2 mental math strategies you can use to subtract.

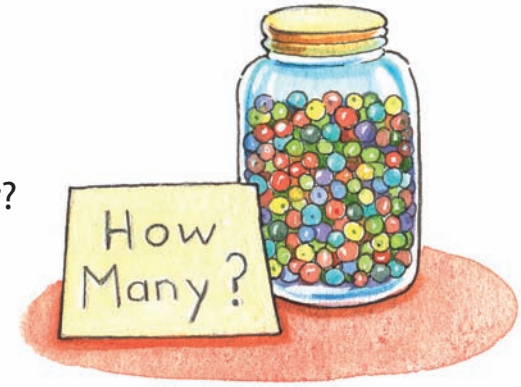
LESSON 11

Subtracting 3-Digit Numbers

Explore

There are 282 beads in the jar.
Robert estimated 300.
Brenda estimated 269.

Whose estimate was closer? How much closer?



Show *and* Share

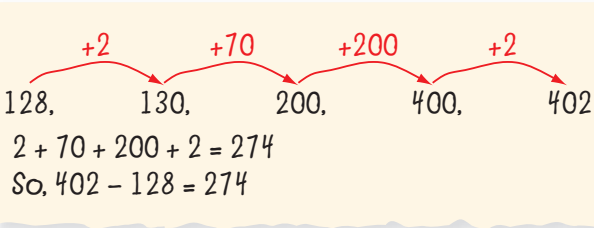
Share your solution with another pair of classmates.
What strategies did you use?

Connect

Sundin and Bonita had a ball bouncing contest.
Sundin bounced a ball 402 times.
Bonita bounced a ball 128 times.
How many more times did Sundin bounce a ball?

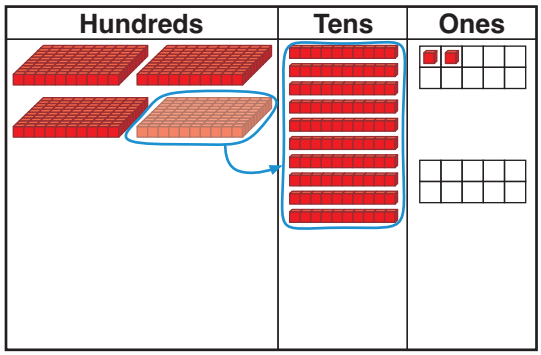
Find: 402 − 128

➤ Tasia counts up from 128 to 402.



➤ Joe uses Base Ten Blocks on a place-value mat to subtract.

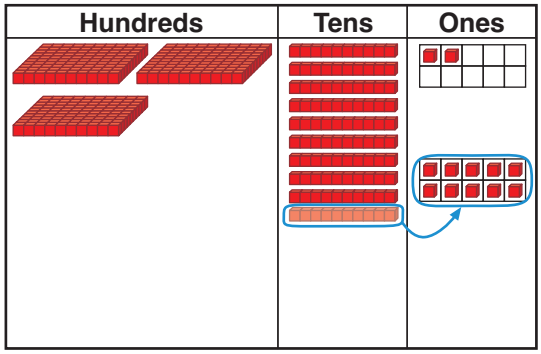
$$\begin{array}{r} 402 \\ -\ 128 \\ \hline \end{array}$$



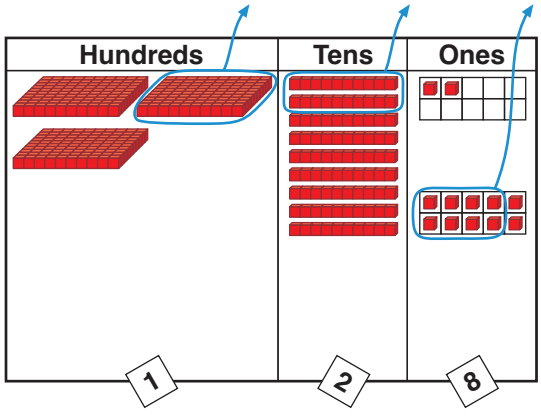
I can split 402 into 300 + 100 + 2, which is 3 hundreds, 10 tens, and 2 ones.

3 10
4Ø2
− 128

... I need more ones. I trade 1 ten for 10 ones. So, I have 3 hundreds, 9 tens, and 12 ones.

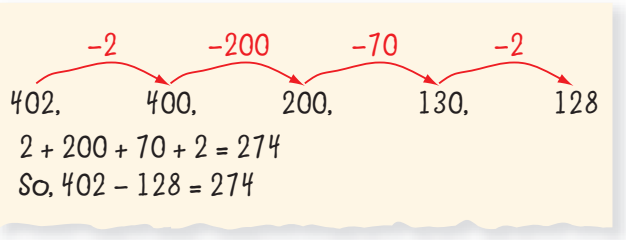


... I take away 1 hundred, 2 tens, and 8 ones. That leaves 2 hundreds, 7 tens, and 4 ones. That's 274.



9
3 ~~10~~ 12
4Ø2
− 128
274

➤ Tom counts backward to subtract 402 − 128.

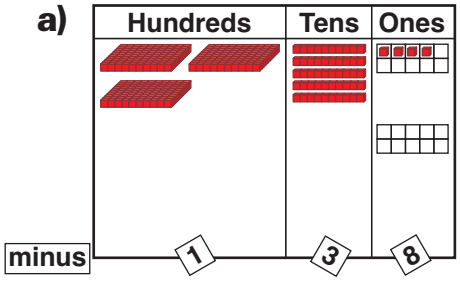


Sundin bounced a ball 274 more times.

Practice

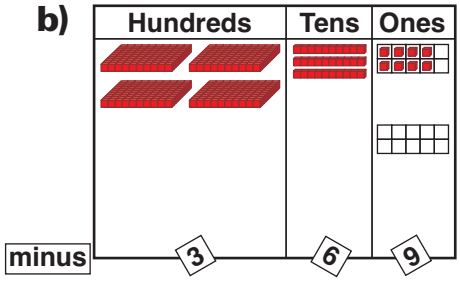
1. Subtract.

a)



354
− 138

b)



438
− 369

2. Subtract. Explain your strategies.

a) 876 − 9 **b)** 923 − 10 **c)** 635 − 22 **d)** 599 − 86

3. Subtract.

a) 756 − 49 **b)** 830 − 7 **c)** 687 − 39 **d)** 940 − 35

4. Subtract.

a) 483 − 156 **b)** 557 − 230 **c)** 654 − 327 **d)** 701 − 374

5. Subtract.

a) $200 - 82$ **b)** $300 - 183$ **c)** $400 - 284$ **d)** $500 - 285$

6. Jenna subtracted $785 - 575$ like this.

$700 - 500 = 200$
$80 - 70 = 10$
$5 - 5 = 0$

a) Finish Jenna's subtraction.
Explain her strategy.

b) Use a different strategy to subtract the same numbers.

c) Compare the strategies in parts a and b.
Which strategy do you prefer? Why?

7. A campground is 475 km from the Kapurs' home.
Before lunch the Kapurs drove 238 km.
How far do they still have to drive?
Show how you solved the problem.

8. On Monday, Kim's family drove 458 km from Castlegar to Kamloops.
On Tuesday, they drove from Kamloops to Merritt.
They drove a total of 544 km over the 2 days.
How many kilometres did they drive on Tuesday?
Write an equation to solve the problem.
Solve the equation.
Answer the question in the problem.

9. Write a story problem that can be solved using $652 - 328$.
Solve the problem. Explain your strategy.

Reflect

What strategy would you use to find $300 - 157$?
Use pictures, numbers, or words to explain.

LESSON 12

Solving Addition and Subtraction Problems

Explore

Lu-Anne and Fisher helped clean up in the gym.
Lu-Anne picked up 243 bean bags.
Fisher picked up 206 bean bags.

- Make an addition problem and a subtraction problem about picking up the bean bags.
- Solve your problems.

Show *and* Share

Share your problems and solutions with another pair of classmates.
How did you know whether to add or subtract?

Connect

Sometimes you need to decide whether to add or subtract when you solve a problem.

One year, it rained on 148 days in Victoria, British Columbia.
The next year, it rained on 163 days in Victoria.

➤ On how many days did it rain during these 2 years?

Jason added to solve the problem.
He thought of 148 as 100 + 40 + 8 and 163 as 100 + 60 + 3.
He then added from left to right.

148 = 100 + 40 + 8
163 = 100 + 60 + 3
100 + 100 = 200
40 + 60 = 100
8 + 3 = 11
200 + 100 + 11 = 311

There are many strategies Jason could use.

It rained on 311 days during these 2 years.

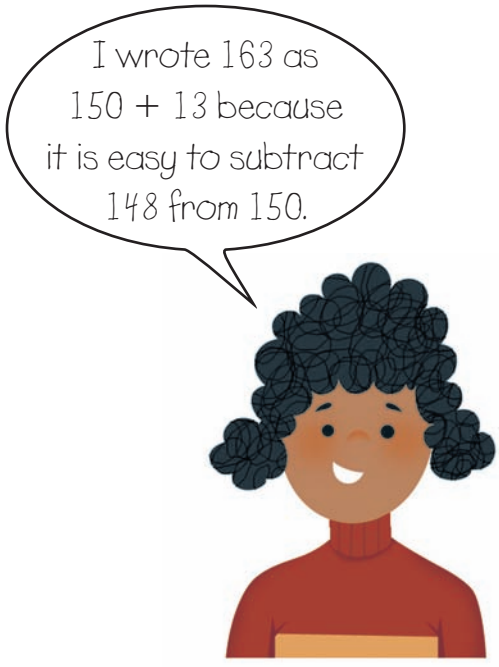
➤ How many more days did it rain in the second year?

Jody subtracted to solve the problem.
She thought of 163 as 150 + 13.
To find 163 − 148, Jody subtracted 148 from 150 + 13.

163 = 150 + 13
150 - 148 = 2
2 + 13 = 15

So, 163 − 148 = 15.

It rained 15 more days during the second year.



Practice

1. Find each missing number. What patterns can you see?

a) $174 = 169 + \square$
$174 = 164 + \square$
$174 = 159 + \square$

b) $658 = 600 + \square$
$658 = 590 + \square$
$658 = 580 + \square$

c) $809 = 810 - \square$
$809 = 820 - \square$
$809 = 830 - \square$

2. **a)** The difference between two 3-digit numbers is 246.
What might the numbers be? Give 3 possible answers.

b) The sum of two 3-digit numbers is 246.
What might the numbers be? Give 3 possible answers.

3. Each sentence below is an answer to a story problem.
Write 1 addition story or 1 subtraction story for each sentence.

a) Boyle, Alberta, has 840 people.

b) There are 194 whooping cranes in the Wood Buffalo flock of the Northwest Territories.

c) A year has 365 days.

4. A Grade 3 class in Saskatoon planted tulips.
They planted 256 red tulips and 371 yellow tulips.

a) How many more yellow tulips than red tulips did they plant?

b) How many tulips did they plant altogether?

Explain how you solved these problems.

5. Grade 2 and Grade 3 children rode on a bus to a museum.
There were 19 Grade 2 children.
There were 25 Grade 3 children.
How many children were on the bus?

6. Prya and Jody collected donations for the Terry Fox Run.
Prya collected $82.
Jody collected $129.

a) Who collected more money? How much more did she collect?

b) Did you add or subtract? Explain.

7. A school in Whitehorse was collecting things to recycle.
Children brought in 277 cans and 95 bottles.
How many things did they bring?

8. Zane, Sunny, and Michelle are playing video games.
Zane's score is 456. Sunny's score is 285.
Michelle's score is 369.

a) How many points does Sunny need to tie Michelle?

b) How many points do Michelle and Sunny each need to tie Zane?

c) Make up your own problem about these scores. Solve your problem.

9. Write a story problem that can be solved by adding or subtracting two 3-digit numbers. Solve the problem.

Math Link

Some places have snow on the ground for most of the year. How many days in a year does each place not have snow on the ground?

Place	Number of Days
Alert, Nunavut	306
High Level, Alberta	212
Whitehorse, Yukon	165

Reflect

Describe a strategy for adding or subtracting 3-digit numbers.
Explain your strategy to a classmate.

LESSON 13

Strategies Toolkit

Explore

Savannah, Ken, and April made friendship bracelets.

Savannah used 3 fewer beads than Ken.
Ken used 2 more beads than April.
April used 22 beads. Five beads are left.
How many beads were in the bag?

Show *and* Share

Explain how you solved the problem.

Connect

It's Jump Rope for Heart Day!

Bessie jumped 9 fewer times than Francis.
Francis jumped 12 more times than Henry.
Henry jumped 52 times.
What was their total number of jumps?
Here is one way to solve this problem.

Strategies

- Make a chart.
- Use a model.
- Draw a picture.
- Solve a simpler problem.
- **Work backward.**
- Guess and test.
- Make an organized list.
- Use a pattern.

What do you know?

- Henry jumped 52 times.
- Francis jumped 12 more times than Henry.
- Bessie jumped 9 fewer times than Francis.

Think of a strategy to help you solve the problem.

- You can **work backward**.
  Start with the number of times Henry jumped.

- How many times did Henry jump?
- How many times did Francis jump?
- How many times did Bessie jump?
- How many times did they jump altogether?

How do you know your answer is correct?
How could you solve this problem another way?

Practice

Choose one of the **Strategies**

1. Kumail and Sasha are playing a game.
   Kumail has won 7 cards.
   Sasha has won 6 more cards than Kumail.
   There are 24 cards left.
   How many cards are there altogether?

2. Margaret uses nickels and dimes to buy a bookmark.
   It costs 65¢. Margaret paid with 8 coins.
   How many of each coin did she use?

3. At a garage sale, there are bicycles and tricycles. Altogether, there are 18 wheels.
   How many bicycles and tricycles are there?

Reflect

Think about one of these problems you solved.
Use words, pictures, or numbers to explain how you solved it.

Unit 3 Show What You Know

LESSON

1 2

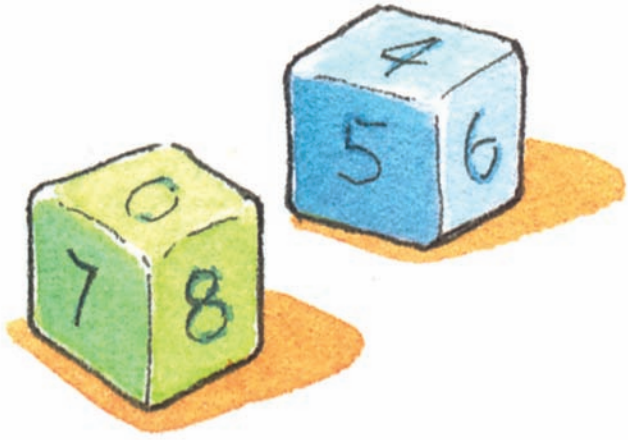
1. Add or subtract. Show your strategies.

a) 5 + 9 **b)** 17 − 8 **c)** 6 + 8 **d)** 18 − 9

2. Mia has 2 number cubes.
Each number cube has the numbers 0, 4, 5, 6, 7, and 8.

a) Mia rolls both number cubes and adds the numbers.
What sums might Mia get?

b) What differences might Mia get if she subtracts the numbers rolled?



3. A lacrosse team has 16 players.
Nine of them are girls.
How many of the players are boys?

3

4. Find each missing number.

a) 6 + ☐ = 15 **b)** ☐ + 7 = 14

c) 17 − ☐ = 9 **d)** ☐ − 8 = 7

5. The library had 12 books about the moon.
Penny borrowed some of them.
There are 4 books left.
Write and solve an equation to find how many books Penny borrowed.

4 8

6. Estimate each sum or difference. Explain your strategies.

a) 42 + 29 **b)** 53 − 17 **c)** 23 + 28 **d)** 85 − 49

4 5 8 9

7. Estimate. Then add or subtract.

a) 67 + 18 **b)** 72 − 69 **c)** 14 + 79 **d)** 53 − 28

5 7

8. Add.

a) 25 + 36 **b)** 247 + 19 **c)** 156 + 232 **d)** 349 + 267

LESSON

6 10

9. Use mental math to add or subtract.

a) 31 + 32 **b)** 97 − 35 **c)** 64 − 26 **d)** 75 + 19

10. Explain how to use mental math to solve.

a) 38 + 45 **b)** 50 − 18

7

11. The classroom floor was retiled.
It needed 476 red tiles and 385 yellow tiles.
How many tiles were needed altogether?

9 11

12. Subtract.

a) 78 − 23 **b)** 690 − 52 **c)** 385 − 256 **d)** 500 − 187

11

13. There were 750 children at summer camp.
After 1 week, 252 children went home.
How many children were left at the camp?

12

14. Jenny jumped 124 times on the trampoline. Shane jumped 73 times on the trampoline.

a) How many times did they jump altogether?

b) How many more times did Jenny jump than Shane?

15. Use numbers with 1, 2, or 3 digits.
Write an addition and a subtraction equation with each answer.

a) 326 **b)** 307
c) 608 **d)** 281

16. Use 3-digit numbers. Create a story problem with the answer 376.

UNIT 3 **Learning Goals**

- ☑ use strategies to recall basic addition and subtraction facts
- ☑ solve addition and subtraction equations
- ☑ estimate sums and differences for 2-digit numbers
- ☑ add and subtract 2-digit numbers mentally
- ☑ use personal strategies to add and subtract numbers with up to 3 digits
- ☑ write and solve addition and subtraction problems

Unit Problem

Plants in Our National Parks

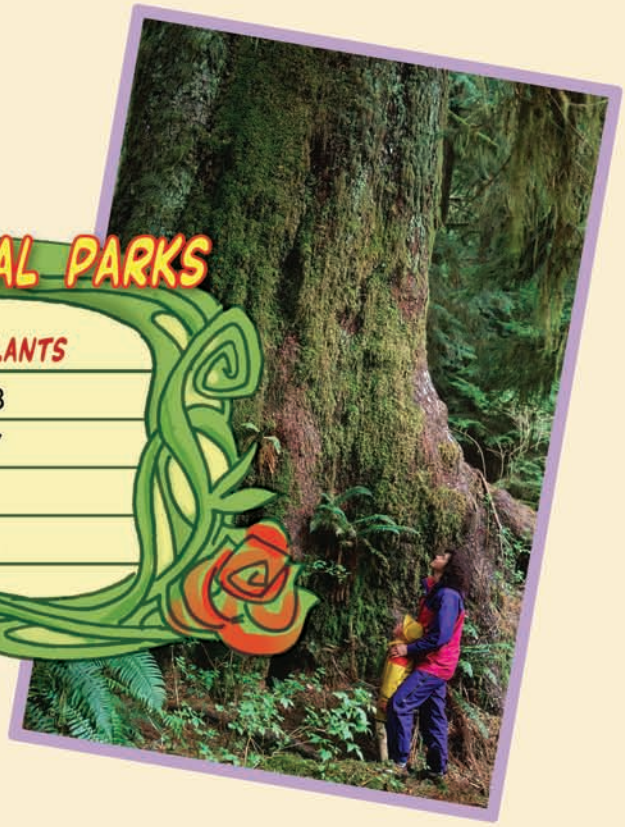
Native plants have been growing in national parks for hundreds of years.

NATIVE PLANTS IN NATIONAL PARKS

NATIONAL PARK	NUMBER OF TYPES OF PLANTS
Yoho, British Columbia	587
Ivvavik, Yukon	242
Banff, Alberta	846
Aulavik, Northwest Territories	154
Quttinirpaaq, Nunavut	134
Prince Albert, Saskatchewan	564
Riding Mountain, Manitoba	623

Source: Parks Canada, 2005

National parks also have plants that are not native to the parks.



NON-NATIVE PLANTS IN NATIONAL PARKS

NATIONAL PARK	NUMBER OF TYPES OF PLANTS
Yoho, British Columbia	58
Banff, Alberta	77
Aulavik, Northwest Territories	3
Prince Albert, Saskatchewan	88

Source: Parks Canada, 2005

Use the information in the charts.
Use words, numbers, and equations to show your thinking.

Part 1

Aulavik means "a place where people travel."

- For travellers at Aulavik, how many different types of plants might they see?
- Which park has more native plant types, Riding Mountain or Yoho?
  How many more?

Part 2

A botanist is a scientist who studies plants.

- Suppose a botanist discovered 35 more native types of plants in each park.
  How many native plant types would be in each park then?
  Make a chart to show your answers.

Part 3

- Choose a park from the second chart.
  Use any information you have about that park.
  Write an addition or subtraction story problem.
  Solve your problem.

Check List

Your work should show

- ☑ how you estimate, add, and subtract to find sums and differences
- ☑ that you can decide whether to add or subtract
- ☑ how you made up and solved your story problem
- ☑ a clear explanation of your work and ideas

Reflect on Your Learning

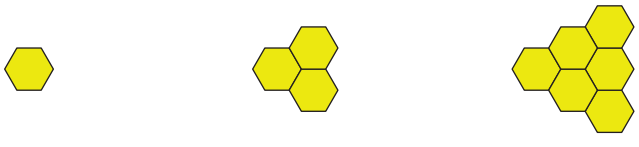
What are some important things you know about adding and subtracting?
Give at least 2 examples in your explanation.

Units 1-3 Cumulative Review

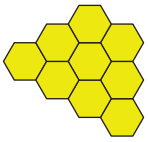
UNIT

1

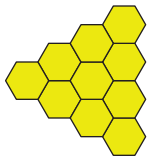
1. Which picture extends this pattern?
Explain why you think so.



a)



b)



2. **a)** Use grid paper. Make a pattern that starts with 2 ▢s, and adds 2 ▢s each time.

b) Make a different pattern that starts with 2 ▢s, and adds 4 ▢s each time.

c) How are your patterns the same? Different?

3. What is the pattern rule?
Copy the pattern to fill in the missing numbers.

a) 36, 38, ___, ___, 44, 46, ___

b) 22, 32, ___, 52, ___, ___, 82

4. Use grid paper.

a) Make a decreasing pattern.
Show the first 4 figures.

b) Write your pattern rule.

2

5. Draw a picture to show each number.
Then record the number in a place-value chart.

a) 75 **b)** 249 **c)** 503 **d)** 230

6. Copy each pair of numbers.
Use < or > to make each statement true.

a) 73 ☐ 730 **b)** 874 ☐ 851

c) 934 ☐ 936 **d)** 208 ☐ 199

7. Tim, PJ, and Carey have card collections.
Tim has 124 cards. PJ has 205 cards.
Carey has more cards than Tim, but fewer than PJ.
How many cards might Carey have?

8. Record your count each time.
a) Start at 137. Count on by 5s to 172.
b) Start at 972. Count back by 10s to 852.
c) Start at 234. Count on by 4s to 254.

9. Jamie started at 738. She started to count back by 5s.
Would she ever reach 635? Explain why you think so.

10. Maya has pennies, dimes, and loonies.
She has four dollars and thirty-seven cents altogether.
Show 3 different ways she could have that much money.

3

11. Find each missing number. Explain your strategy.
a) $9 + \square = 12$ **b)** $18 - \square = 9$ **c)** $\square + 5 = 13$

12. Add or subtract.
a) $368 + 292$ **b)** $409 + 567$ **c)** $734 - 576$
d) $801 - 699$ **e)** $310 + 259$ **f)** $499 - 218$

13. A shopkeeper had 738 balloons. She sold 579.
How many were left? Explain your strategy.

14. A school planted trees in the park.
The students planted 183 pine trees and 231 cedar trees.
a) How many more cedar trees than pine trees did they plant?
b) How many of both type of tree did they plant?

15. The answer is 427.
What could the question be?
Write a story problem that will give the answer 427.