

CHAPTER

5

Addition and Subtraction of Whole Numbers

Vocabulary:

estimate
front end estimation
rounding
compensation
compatible numbers
inverse operations
addendum
subtrahend
identity property
commutative
associative

Chapter Outcomes:

- Solve problems using whole numbers involving the four operations.
- Demonstrate an understanding of algorithms, mental strategies and estimation strategies.



Gardeners use mathematics to create gardens that are both beautiful and functional every day. When planting crops such as watermelons, it requires the gardener to map out the space and calculate how many plants will be able to grow in the space. Gardeners also use addition and subtraction in the harvesting and sale of their produce.

Getting Ready for Chapter 5

Solve the problems below.

1.
$$\begin{array}{r} 45 \\ + 27 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 403 \\ - 278 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 64 \\ - 36 \\ \hline \end{array}$$

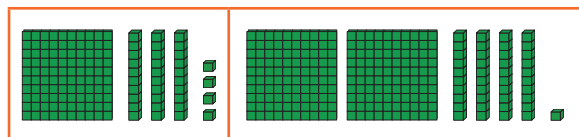
4.
$$\begin{array}{r} 3000 \\ + 631 \\ \hline \end{array}$$

5. What is the sum of 24, 801 and 2 197?
6. Felicia is reading a 145 page book. She has read 78 pages. How many pages does Felicia have left to read?
7. What is the difference between 109 and 598?

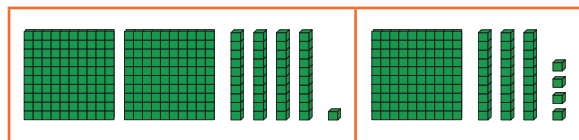
Addition Properties

Teaching Point 1:

Commutative Property of Addition: Add numbers in any order. The sum will be the same.

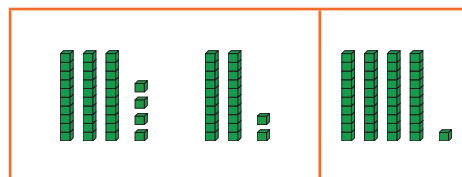


$$134 + 241 = 375$$

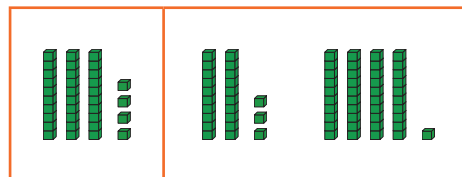


$$241 + 134 = 375$$

Associative Property of Addition: Add any pair of numbers first. The sum will be the same.

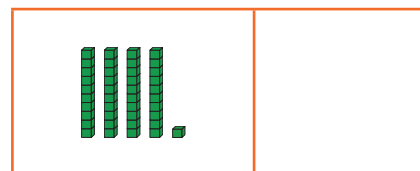


$$(34 + 23) + 41 = 98$$



$$34 + (23 + 41) = 98$$

Identity (Zero) Property of Addition: Add zero to any number the answer is that number.



$$41 + 0 = 41$$

Activity 1:

Complete each number sentence. Write the property used.

1. $23 + 45 = \underline{\quad} + 23$
2. $129 + \underline{\quad} = 129$
3. $21 + (87 + 63) = (\underline{\quad} + \underline{\quad}) + 63$
4. $65 + \underline{\quad} + 43 = 65 + 43$
5. $(\underline{\quad} + 0) + 200 = 175 + 200$

6. $67 + 25 = 25 + \underline{\hspace{1cm}}$
7. $12 + (59 + 73) = (73 + \underline{\hspace{1cm}}) + 59$

8. Miss James' class has 18 boys and 17 girls. Mr. Mark's class has 17 girls and 18 boys. Which class has more children? Tell which property was used?
9. Use the table below to answer the question.

Clothing Store	
Blouse	\$80
Skirt	\$79
Dress	\$150

Jenna wants to buy a blouse, a skirt and a dress. Show two ways she can add the prices to find the total cost. Then find the total.

10. Which shows the Commutative Property of Addition?
- a) $26 + 73 = 73 + 26$
- b) $26 + 0 = 26$
- c) $20 + (6 + 73) = (20 + 6) + 73$
- d) $26 + 73 = 26 + 70 + 3$

Add and Subtract Mentally

Teaching Point 1:

Use **compatible numbers** to add.

$$45 + 55 + 251 = ?$$

$$\begin{array}{c} \downarrow \\ 100 \end{array} + 251 = 351$$

Compatible numbers can be added together easily to make target numbers.

Use **compensation** to add.

$$\text{Find } 337 + 106.$$

$$\text{Think } 340 + 106 = 446$$

$\downarrow$ $\downarrow$
 3 more than The final answer is 3
 337 is 340 less than 446.

$$337 + 106 = 443$$

Use **compensation** to subtract.

$$\text{Find } 268 - 190.$$

$$\text{Think } 268 - 200 = 68$$

$\downarrow$ $\downarrow$
 10 more than The final answer is 10
 190 is 200. more than 68.

$$268 - 190 = 78$$

Activity 1:

Add or subtract mentally.

1. $67 + 18 + 33 =$ 2. $246 - 127 =$

3. $237 + 195 + 5 =$ 4. $49 + 87 =$

5. $468 - 190 =$ 6. $306 + 199 =$

7. $2\,004 + 56 =$ 8. $401 - 99 =$

9. $353 - 198 =$ 10. $86 - 48 =$

11.
$$\begin{array}{r} 299 \\ 101 \\ 47 \\ + 3 \\ \hline \end{array}$$

12.
$$\begin{array}{r} 273 \\ 100 \\ + 7 \\ \hline \end{array}$$

13.
$$\begin{array}{r} 403 \\ 22 \\ + 278 \\ \hline \end{array}$$

14.
$$\begin{array}{r} 64 \\ 149 \\ + 236 \\ \hline \end{array}$$

15.
$$\begin{array}{r} 982 \\ - 56 \\ \hline \end{array}$$

16.
$$\begin{array}{r} 7\,932 \\ - 4\,623 \\ \hline \end{array}$$

17. $6\,627 + 3\,303 =$ 18. $222 + 728 =$

Solve the problems mentally.

Ice cream

Cake

Pizza



\$225

\$135

\$119

19. Mummy bought a tub of ice-cream and a cake for the party. If she gave the cashier \$400, how much change should she receive?
20. Mr. Ali bought a pizza. How much change did he receive if he paid the cashier \$200?

Estimate Sums and Differences

Teaching Point 1:

Estimate the sum of 4 789 and 1 258.

- Use **front end estimation**. Add the **leading digits**. Write zeros for the other digits.

$$\begin{array}{r} 4\,789 \rightarrow 4\,000 \\ + 1\,258 \rightarrow + 1\,000 \\ \hline 5\,000 \end{array}$$

- Use **rounding**.

Round to **hundreds**.

$$\begin{array}{r} 4\,789 \rightarrow 4\,800 \\ + 1\,258 \rightarrow + 1\,300 \\ \hline 6\,100 \end{array}$$

Round to **thousands**

$$\begin{array}{r} 4\,789 \rightarrow 5\,000 \\ + 1\,258 \rightarrow + 1\,000 \\ \hline 6\,000 \end{array}$$

Estimate the difference between 4 789 and 1 258.

- Use **front end estimation**. Subtract the **leading digits**. Write zeros for the other digits.

$$\begin{array}{r} 4\,789 \rightarrow 4\,000 \\ - 1\,258 \rightarrow - 1\,000 \\ \hline 3\,000 \end{array}$$

- Use **rounding**.

Round to **hundreds**.

$$\begin{array}{r} 4\,789 \rightarrow 4\,800 \\ - 1\,258 \rightarrow - 1\,300 \\ \hline 3\,500 \end{array}$$

Round to **thousands**

$$\begin{array}{r} 4\,789 \rightarrow 5\,000 \\ - 1\,258 \rightarrow - 1\,000 \\ \hline 4\,000 \end{array}$$

Activity 1:

Round to the nearest ten to estimate the sums and differences.

1. $1\,292 + 48 =$ 2. $3\,246 - 57 =$
3. $87 + 2\,495 =$ 4. $49 + 127 =$
5. $468 - 210 =$ 6. $3\,306 + 1\,199 =$
7. $2\,004 + 56 =$ 8. $401 - 99 =$

Round to the nearest hundred to estimate the sums and differences.

9. $353 - 198 =$ 10. $6\,186 - 548 =$
11. $4\,760 - 1\,987 =$ 12. $7\,273 - 609 =$
13. $139 + 732 + 1\,256 =$
14. $3\,109 + 269 + 1\,348 =$
15. $222 + 4\,239 + 821 =$
16. $299 + 101 + 1\,647 =$
17.
$$\begin{array}{r} 403 \\ 722 \\ + 278 \\ \hline \end{array}$$
 18.
$$\begin{array}{r} 7\,932 \\ - 4\,623 \\ \hline \end{array}$$

Round to the nearest thousand to estimate the sums and differences.

19.
$$\begin{array}{r} 5\,982 \\ + 3\,056 \\ \hline \end{array}$$
 20.
$$\begin{array}{r} 7\,932 \\ - 4\,623 \\ \hline \end{array}$$

21. $3\,198 - 1\,464 =$ 22. $2\,222 - 1\,828 =$
23. $5\,462 + 2\,107 =$ 24. $3\,799 + 3\,934 =$

25. $4\,187 - 1\,245 =$ 26. $2\,467 - 1\,801 =$

27. $3\,728 + 1\,298 + 2\,153 =$

28. $5\,326 + 1\,530 + 2\,476 =$

Use front end estimation to estimate the sums and differences.

29.
$$\begin{array}{r} 1\,452 \\ + 7\,017 \\ \hline \end{array}$$

30.
$$\begin{array}{r} 2\,456 \\ - 423 \\ \hline \end{array}$$

31. $4\,176 - 2\,328 =$ 32. $3\,876 + 813 =$

33. $3\,128 + 999 + 4\,329 =$

34. $673 + 1\,745 + 2\,932 =$

35. $7\,128 + 457 + 1\,571 =$

Estimate to solve the problems below.

36. Mrs. Williams has \$9 000. She wants to buy a stove for \$2 599 and a washing machine for \$5 189. Estimate whether Mrs. Williams has enough money.
37. About much money did I spend if I bought a pair of shoes for \$567, a shirt for \$195 and a suit for \$1 798?
38. Mr. Bertie has \$1000 and wants to buy a cell phone that costs \$805 and a cell phone case that costs \$150. Will he have enough money to purchase both items?
39. Jamal has \$250. He wants to spend \$63 on a ball, \$45 on sneakers and \$120 on sports clothes. Does he have enough money?

40. On Monday Mr. Ali sold 547 oranges, on Wednesday he sold 389 oranges and on Friday he sold 703 oranges. About how many oranges did he sell on the three days?

Add and Subtract Whole Numbers

Teaching Point 1:

Find the sum of 4 789 and 1 258.

1. Estimate the sum: **Round** to thousands.

$$\begin{array}{r} 4\,789 \rightarrow 5\,000 \\ + 1\,258 \rightarrow + 1\,000 \\ \hline 6\,000 \end{array}$$

2. Use a place value chart to line up the numbers.

3. Start from the ones place. Add from right to left, regrouping when necessary.

	Ten Thousands	Thousands	Hundreds	Tens	Ones
		4	7	8	9
+		1	2	5	8
		6	0	4	7

4. Check your answer against your estimate. The sum 6 047 is close to the estimate 6 047. So, the answer is reasonable.

Find the difference between 4 789 and 298.

1. Estimate the sum: Round to hundreds.

$$\begin{array}{r} 4\,789 \rightarrow 4\,800 \\ - 298 \rightarrow - 300 \\ \hline 4\,500 \end{array}$$

2. Use a place value chart to line up the numbers.

3. Start from the ones place. Subtract from right to left, regrouping when necessary.

	Ten Thousands	Thousands	Hundreds	Tens	Ones
		4	7	8	9
-			2	9	8
		4	4	9	1

4. Check your answer against your estimate. The difference 4 471 is close to the estimate 4 500. So, the answer is reasonable.

Activity 1:

Estimate. Then find each sum.

1.
$$\begin{array}{r} 230 \\ 46 \\ + 179 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 83 \\ 598 \\ + 617 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 3\,403 \\ 568 \\ + 99 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 3\,982 \\ + 56 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 2\,111 \\ 7\,470 \\ + 839 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 6\,098 \\ 1\,852 \\ + 157 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 3\,657 \\ 2\,243 \\ + 1\,259 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 7\,256 \\ + 1\,689 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 2\,098 \\ 4\,173 \\ + 1\,932 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 2\,348 \\ 3\,635 \\ + 2\,465 \\ \hline \end{array}$$

11. $457 + 1\,256 =$ 12. $5\,426 + 3\,210 =$

13. $8\,943 + 268 =$ 14. $1\,628 + 4\,596 =$

15. Find the sum of 123,498 and 2 980.

16. Which number is 478 more than 3 109?

17. Mario collected 345 empty bottles on Monday. He collected 580 on Tuesday and 298 on Wednesday. How many bottles did he collect in total?

Activity 2:

Estimate. Then find the difference.

1.
$$\begin{array}{r} 982 \\ - 56 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 702 \\ - 48 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 1\,560 \\ - 813 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 5\,000 \\ - 4\,068 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 6\,112 \\ - 3\,006 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 9\,657 \\ - 6\,987 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 8\,090 \\ - 4\,614 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 5\,508 \\ - 3\,999 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 1\,760 \\ - 1\,056 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 8\,002 \\ - 5\,679 \\ \hline \end{array}$$

11. $5\,176 - 4\,378 =$ 12. $\$3\,450 - \$567 =$

13. $\$4\,692 - \$893 =$ 14. $6\,003 - 5\,147 =$

15. $7\,000 - 42 =$ 16. $3\,310 - 1\,789 =$

17. Calculate the difference between 2 678 and 1 099.

18. Take 587 from 1 000.

19. Which number is 379 less than 2 741?

20. Compare 1 245 with 1 254. By how much is the larger number greater than the smaller number?

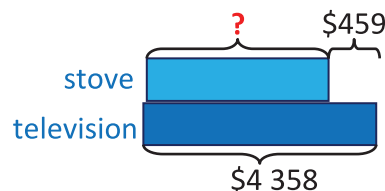
21. By how much does 1 752 km exceed 1 450 km?

Real World Problems: Add and Subtract

Teaching Point 1:

A television costs \$4 358. It costs \$459 more than a stove.

a) How much does the stove cost?



Cost of stove: $\$4\,358 - \$459 = \$3\,899$

Use the **inverse operation** to check:

$\$3\,899 + \$459 = \$4\,358$

b) What is the total cost of both items?

Total cost: $\$3\,899 + \$4\,358 = \$8\,257$

Use the **inverse operation** to check:

$\$8\,257 - \$4\,358 = \$3\,899$

Addition and subtraction undo each other. They are **inverse operations**.

Activity 1:

Solve. Use the inverse operation to check your answers.

1. A school has 740 girls. It has 255 more boys than girls. How many children attend the school?
2. A poultry farm has 1 006 chickens and ducks. 856 of them are chickens. How many fewer ducks there are than chickens?
3. During the year 2016 a used car salesman imported 1 200 cars. If 987 of the cars were sold, how many of the vehicles were not sold?
4. 1 256 passengers took the ferry to go to Tobago. 756 of them were children and the rest were adults.
 - a) What is the total number of adults on the ferry?
 - b) If there were 190 more men than women, how many women were on the ferry?
5. Alex had \$450. He spent \$199 on a game and \$138 on a ball. How much money did he have left?
6. A caterer organised a wedding reception. The caterer is listing the costs of items.

Item	Price
Tables and chairs	\$650
Decoration	\$375
Food	\$_____
Drinks	\$1 898

The total cost is \$5 976. How much did the food cost?
7. The cafeteria had 400 paper bags. They used 254 at recess so, they bought 150 more. Then they used some more bags at lunch time. Now they have 86 bags left. How many bags did they use at lunch time?
8. Daddy drove 1 363 km in his new car in January. He drove 2 934 km in February and 3 780 km in March. He must service the car at the 9 000 km mark. How many more kilometres can he drive?
9. Two suitcases together cost a total of \$608. What is the cost of the cheaper suitcase if the other one costs \$498?
10. The total height of three boys is 420 cm. If the heights of first two boys are 120 cm and 145 cm respectively, what is the height of the third boy?
11. After spending \$785 in the grocery and \$327 paying utility bills, mother was left with \$2 795 of her fortnightly earnings. How much was mother's fortnightly earnings?
12. A bakery produced 430 loaves of bread on Thursday, 580 on Friday and

645 on Saturday. If 1 500 loaves were sold during the 3 days, how many loaves were left over?

- 13.** A plane flies 2 342 kilometres on Monday. On Tuesday, it flies 586 more kilometres than on Monday. What is the total number of kilometres the plane flies on Monday and Tuesday?
- 14.** There were 6 491 visitors to the zoo in the year 2015. In 2016 there were 1 873 more visitors than the year before. What is the total number of visitors for both years?

Chapter Review

Find each unknown.

- 1.** $276 + 489 = \square + 276$
- 2.** $45 + (60 + 55) = (\underline{\quad} + \underline{\quad}) + 60$
- 3.** $51 + \square + 84 = 51 + 84$

Use compatible numbers to add mentally.

- 4.** $60 + 140 + 2\,800 =$
- 5.** $506 + 349 + 194 =$
- 6.** Samantha had \$235. She earned \$265. How much money does she have now?

Use compensation to add or subtract mentally.

- 7.** $1\,298 + 502 =$
- 8.** $6\,857 - 1\,003 =$
- 9.** $4\,529 + 3\,472 =$
- 10.** $\$655 - \$295 =$

Add or subtract. Estimate to check your answers.

$$\begin{array}{r} 11. \quad 2\,403 \\ \quad 1\,722 \\ + 3\,278 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 7\,002 \\ \quad - 4\,183 \\ \hline \end{array}$$

$$\begin{array}{r} 13. \quad 3\,980 \\ \quad - 594 \\ \hline \end{array}$$

$$\begin{array}{r} 14. \quad 480 \\ \quad 7\,502 \\ + 2\,786 \\ \hline \end{array}$$

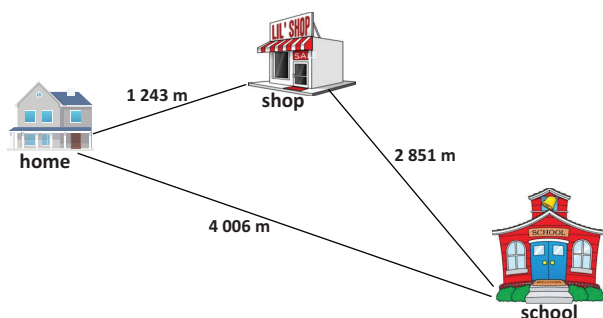
Add or subtract. Use the inverse operation to check.

- 15.** $1\,353 + 698 =$ **16.** $3\,006 + 1\,548 =$

Solve each problem.

- 17.** A farmer collected 256 eggs on Monday. On Tuesday he collected 62 fewer eggs than on Monday. How many eggs did he collect on both days?
- 18.** Two trucks carried a total load of 2 341 oranges. The first truck carried 958 oranges. How many more oranges does the second truck carry than the first truck?
- 19.** A school buys P.E. equipment for \$1 240 and pays \$98 less for Art and Craft supplies. How much money did the school spend in total?

20. Jim walked from his home to school in the morning. In the afternoon he walked from the school to the shop and then to his home.



- a) When did Jim walk the longest distance?
- b) How many metres did Jim walk that day?
21. In a test match, India scored 288 runs in the first innings, while the West Indies scored 356 runs. In the second innings, India scored 382 runs and won the game by 2 runs. What was the West Indies' score for the 2nd innings?



22. Father bought a printer for \$679, a computer for \$3 789 and a tablet. The three items cost \$5 831. What was the cost of the tablet?
23. Miss Peters class went on a field trip to the zoo, 38 km away. Mr. Johnson class drove 12 km to the Caroni Swamp.
- a) How much further did Miss Peters class travel than Mr. Johnson's class?

- b) Explain how you used mental mathematics to determine the difference.

24. Mark buys a notebook for \$15, a box of pencils for \$26, and a story book for \$45. Use mental mathematics to find out how much he spent in all.
25. A primary school has an enrollment of 653 students. If there are 387 boys, how many girls attend the school?
26. The total cost of two dresses is \$598. What is the cost of the cheaper dress if the other one costs \$399?
27. The sum of three numbers is 2 875. If the first and the last numbers are 857 and 783, what is the second number?
28. The difference between two numbers is 54. If one number is 756, what is the other number?
29. There are 2 775 children attending a show. The number of adults attending the show is 689 less than the children.
- a) How many adults are attending the show?
- b) How many people are there altogether?
30. A store orders 2 000 shirts for sale. Of them 850 are size L, 260 are size M, and the rest of the shirts are size S.
- a) How many Size L and Size M shirts are there altogether?
- b) How many Size S shirts are there?