$$\begin{array}{r} 52 \\ +\ 34 \\ \hline \end{array} \qquad \begin{array}{r} 99 \\ -\ 54 \\ \hline \end{array}$$

Name: _____

Foundational Numeracy

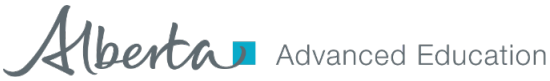
Module 2: Adding and Subtracting Whole Numbers

Facilitator Guide

V 1.20 - July 2020

Developed for Alberta's Community Adult Learning Program

Funded by Alberta Advanced Education



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Attn: Curriculum Development

Contents

Introduction to the Module

In this module, you will work on basic math related to whole number arithmetic. Numeracy is important and is part of our complex world. Whether it is calculating a budget or paying bills, arithmetic skills are critical. Enjoy this module!

Important

When you see an object like the one below, you can either use the camera on your phone or tablet, or you can click on the link to play the video of the math example.

Want to watch a video of this lesson?

https://youtu.be/QtwiGWi5a7E

Note: The facilitator guide mirrors the Learner Guide with a couple of key differences.

- Facilitator notes throughout the module in boxes like this. Include teaching strategies and common errors
- Student practice doesn't have this bubble. Instructor led
  The instructor can teach the concept or the learner can watch the video.

Specific Learning Outcomes

The table below displays the skills and knowledge that you will explore in this module. This is your opportunity to evaluate your own skills to see if you can do these things. At the end of this module, you will be invited to re-evaluate your skills to measure the progress you have made.

In this module I will learn how to …	I can't do this	I can do this with help	I can do this!
1. Add one-digit numbers			
2. Add two-digit numbers			
3. Estimate sums and adding multi-digit numbers			
4. Subtract one-digit numbers			
5. Subtract two-digit numbers without borrowing			
6. Subtract two-digit numbers with borrowing			
7. Estimate and subtract multi-digit numbers			

Essential Skills

The essential skills used in this module are the following:

Reading: Understanding materials written in sentences or paragraphs

Numeracy: Using and understanding numbers

Writing: Writing on paper or typing on a computer

Vocabulary: Gaining related vocabulary

Unit 1: Addition

Keywords

Adding/ Addition	To join something to something else to increase the size, number, or amount. In an equation, this is indicated by the "+" sign.
Carry	To transfer a digit from one column of digits to another column of digits
Equation	A statement that the values of two mathematical expressions are equal (indicated by the "=" sign)
Operation	A single math task. Adding is an operation, and so are subtracting, multiplying, and dividing
Sum	The answer to an adding equation; also known as the **total**
Total	The answer to an adding equation; also known as the **sum**

Lesson 1.1: Basic Addition Facts

Teaching Strategy

Knowing basic addition facts is crucial to developing good arithmetic skills. Understanding that numbers can be added in any order and understanding rules of adding odd and even numbers assist leaners to know if answers will be odd or even.

Learners will see Intro Video as shown below.

Introductory Video:

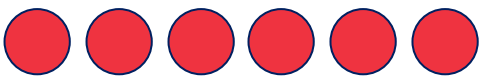
SCAN ME

Want to watch a video of this lesson?

https://youtu.be/AuX7nPBqDts

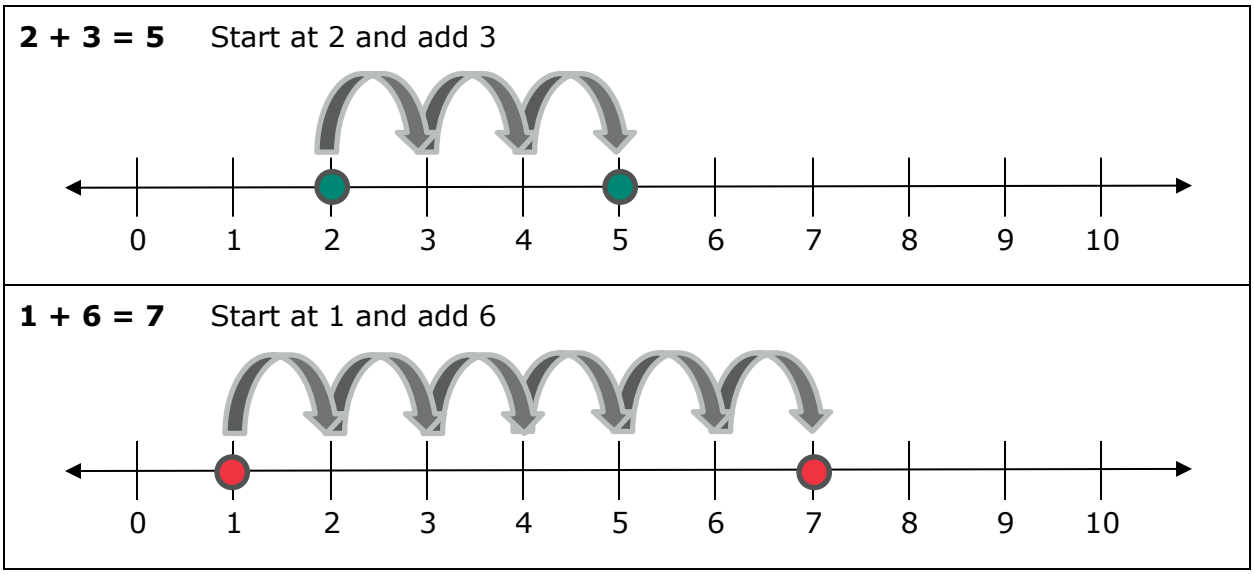
Adding is like counting objects. We can count anything such as the number of cars in a parking lot, the amount of nickels you have in a jar, etc. This is called finding the sum or total.

Examples: We can just count the number of objects. Or we can add. The result is the same.

2 + 3 = 5		+	
1 + 6 = 7		+	

Another method of counting is to use a number line.

The first number tells you where to start and the second number tells you how far to move to the right.



Addition Facts

We can add only two digits at a time. Even if we are adding up columns of more than two numbers. We can also add numbers in any order.

Example: 2 + 3 = 5 and 3 + 2 = 5

Instructor led

Student Example 1

Adding two even numbers:

2 + 6 =

Scan me

Want to watch a video of this lesson?

https://youtu.be/SFRTTUtAjg4

Watch video from 3:35

Student Example 2

Adding two odd numbers:

1 + 3 =

Student Example 3

Adding one even number and one odd number:

4 + 3 =

Exercise 1.1

Fill in the blanks with all the ways you can add two digits to get the required result. Don't reverse the order as we can add the numbers in any order to get the desired result.

1. __0__ + __1__ = 1

2. __0__ + __2__ = 2
   __1__ + __1__ = 2

3. _____ + _____ = 3
   _____ + _____ = 3

4. _____ + _____ = 4
   _____ + _____ = 4
   _____ + _____ = 4

5. _____ + _____ = 5
   _____ + _____ = 5
   _____ + _____ = 5

6. _____ + _____ = 6
   _____ + _____ = 6
   _____ + _____ = 6
   _____ + _____ = 6

7. _____ + _____ = 7
   _____ + _____ = 7
   _____ + _____ = 7
   _____ + _____ = 7

8. _____ + _____ = 8
   _____ + _____ = 8
   _____ + _____ = 8
   _____ + _____ = 8
   _____ + _____ = 8

9. _____ + _____ = 9
   _____ + _____ = 9
   _____ + _____ = 9
   _____ + _____ = 9
   _____ + _____ = 9

10. _____ + _____ = 10
    _____ + _____ = 10
    _____ + _____ = 10
    _____ + _____ = 10
    _____ + _____ = 10

11. __2__ + __9__ = 11

_____ + _____ = 11

_____ + _____ = 11

_____ + _____ = 11

12. __3__ + __9__ = 12

_____ + _____ = 12

_____ + _____ = 12

_____ + _____ = 12

13. _____ + _____ = 13

_____ + _____ = 13

_____ + _____ = 13

14. _____ + _____ = 14

_____ + _____ = 14

_____ + _____ = 14

15. _____ + _____ = 15

_____ + _____ = 15

16. _____ + _____ = 16

_____ + _____ = 16

17. _____ + _____ = 17

18. _____ + _____ = 18

Addition Facts Continued

Teaching Strategy

Have the learner complete the chart with the numbers they know and don't need to think about. Once they have filled in the facts that they know have them put an X through them as they know these and won't need to practice. As they are working on addition facts, have them cross off the facts that they have learned. Perhaps have them use a different coloured pen so they can see their progress from the first time they filled it in and that they can see their progress.

Practicing your addition facts will help you to become much better at arithmetic. Practice daily until you remember the facts.

Fill in the chart below with the addition facts you already know leave the ones blank that you have to think about. Keep this with you as you continue to learn your addition facts. You can colour the ones you know as you don't need to practice those ones.

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

Lesson 1.2: Adding One-Digit Numbers

When adding single-digit numbers together, they can be in a column or in a row. Remember numbers can be added in any order.

Exercise 1.2

No Carries

1. $\begin{array}{r} 5 \\ +\ 2 \\ \hline \end{array}$

2. $\begin{array}{r} 3 \\ +\ 3 \\ \hline \end{array}$

3. $\begin{array}{r} 7 \\ +\ 2 \\ \hline \end{array}$

4. $\begin{array}{r} 4 \\ +\ 1 \\ \hline \end{array}$

5. 1 + 2 =

6. 5 + 1 =

7. 2 + 6 =

8. 4 + 3 =

9. $\begin{array}{r} 5 \\ +\ 4 \\ \hline \end{array}$

10. $\begin{array}{r} 1 \\ +\ 5 \\ \hline \end{array}$

11. $\begin{array}{r} 3 \\ +\ 2 \\ \hline \end{array}$

12. $\begin{array}{r} 6 \\ +\ 3 \\ \hline \end{array}$

13. 2 + 2 =

14. 3 + 4 =

15. 3 + 1 =

16. 4 + 2 =

17. $\begin{array}{r} 2 \\ +\ 5 \\ \hline \end{array}$

18. $\begin{array}{r} 3 \\ +\ 5 \\ \hline \end{array}$

19. $\begin{array}{r} 5 \\ +\ 4 \\ \hline \end{array}$

20. $\begin{array}{r} 1 \\ +\ 6 \\ \hline \end{array}$

21. 6 + 2 =

22. 4 + 5 =

23. 2 + 4 =

24. 3 + 6 =

25. $\begin{array}{r} 1 \\ +\ 8 \\ \hline \end{array}$

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

27. $\begin{array}{r} 5 \\ +\ 3 \\ \hline \end{array}$

28. $\begin{array}{r} 2 \\ +\ 7 \\ \hline \end{array}$

Carries

29. 5 + 5

30. 7 + 4

31. 5 + 8

32. 8 + 7

33. 9 + 5 =

34. 8 + 3 =

35. 6 + 6 =

36. 5 + 9 =

37. 7 + 9

38. 5 + 6

39. 8 + 8

40. 4 + 9

41. 3 + 8 =

42. 7 + 8 =

43. 9 + 5 =

44. 2 + 8 =

45. 6 + 6

46. 6 + 8

47. 9 + 7

48. 5 + 9

49. 7 + 6

50. 7 + 7

51. 3 + 8

52. 9 + 9

53. 9 + 8

54. 6 + 4

55. 7 + 8

56. 8 + 9

57. 2 + 9

58. 5 + 7

59. 3 + 8

60. 6 + 7

Lesson 1.3: Adding One-Digit Numbers, Part 2

When adding 3 or 4 one-digit numbers, try to add the digits you know the sum of first and then add the next digit or digits. This will make adding the numbers quicker.

Exercise 1.3

1. 4 3 + 2	2. 6 0 + 3	3. 4 2 + 2	4. 4 6 + 3
5. 7 3 + 4	6. 8 2 + 8	7. 4 3 + 5	8. 3 8 + 4
9. 2 8 + 4	10. 7 5 + 3	11. 2 8 + 9	12. 0 8 + 2
13. 7 5 + 5	14. 9 8 + 2	15. 4 5 + 6	16. 6 1 + 9
17. 6 6 + 6	18. 3 8 + 7	19. 9 3 + 5	20. 8 6 + 2
21. 8 3 + 9	22. 4 3 + 9	23. 4 6 + 5	24. 4 8 + 4

25.
$$\begin{array}{r} 6 \\ 5 \\ 2 \\ +\ 1 \end{array}$$

26.
$$\begin{array}{r} 4 \\ 5 \\ 1 \\ +\ 0 \end{array}$$

27.
$$\begin{array}{r} 7 \\ 1 \\ 6 \\ +\ 3 \end{array}$$

28.
$$\begin{array}{r} 0 \\ 6 \\ 2 \\ +\ 4 \end{array}$$

29.
$$\begin{array}{r} 9 \\ 1 \\ 6 \\ +\ 3 \end{array}$$

30.
$$\begin{array}{r} 2 \\ 5 \\ 8 \\ +\ 3 \end{array}$$

Lesson 1.4: Adding Two-Digit Numbers

Teaching Strategy

When adding two-digit numbers ensure learners are putting in column form. Ensure the same place values are lined up. Ones place over ones place, tens place over tens place, etc. When carrying remember to carry the number and place above the next digits to the left to be added. Students often forget to include the carried number.

Learners will see Intro Video as shown below.

Introductory Video:

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/mAvuom42NyY

When adding two-digit numbers put in columns so the place values are under the same place values. Add the ones, then the tens, then the hundreds, and on.

Student Example 1

Instructor led

Add: 35 + 6

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/G1cNKc3PD74

Student Example 2

Instructor led

Add: 35 + 27

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/8mcTsyV56jI

Exercise 1.4

1. 16 + 4	2. 18 + 5	3. 22 + 7	4. 14 + 9
5. 14 + 8	6. 19 + 9	7. 16 + 7	8. 17 + 7
9. 25 + 7	10. 36 + 7	11. 25 + 8	12. 27 + 9
13. 23 + 16	14. 52 + 34	15. 41 + 54	16. 34 + 55
17. 62 + 29	18. 25 + 55	19. 77 + 14	20. 27 + 39
21. 33 + 47	22. 53 + 35	23. 49 + 44	24. 36 + 64
25. 73 + 28	26. 45 + 35	27. 65 + 57	28. 67 + 47
29. 89 + 31	30. 64 + 83	31. 99 + 22	32. 55 + 77

33. 88 + 44	34. 65 + 36	35. 26 + 84	36. 66 + 58
37. 72 + 87	38. 56 + 47	39. 78 + 42	40. 55 + 86
41. 76 + 96	42. 93 + 27	43. 69 + 48	44. 97 + 36
45. 33 22 + 42	46. 21 41 + 11	47. 36 24 + 35	48. 48 42 + 37
49. 63 55 + 24	50. 73 38 + 27	51. 96 53 + 26	52. 84 56 + 45
53. 23 69 + 48	54. 57 69 + 74	55. 85 49 + 63	56. 57 68 + 75
57. 88 75 + 96	58. 76 57 + 48	59. 84 56 + 95	60. 96 57 + 79

Lesson 1.5: Adding with Estimating

Learning Objectives

- Add two or more numbers with estimating and regrouping

Teaching Strategy

Estimating is an important skill especially when problem solving. We want estimates to be done quickly so that learners don't waste precious time doing the wrong operations. People who understand estimating solve problems more efficiently.

Estimating Sums

To estimate an answer means to use rounded numbers in a calculation to get an idea of what the size of the actual answer should be.

Rule for Estimating Sums

1. Use front end rounding. Round each number to the place of the **left-most digit**, the numbers behind become zeros.
2. Add these rounded numbers.

Example 1

Add: 468 + 936 + 687

468	→ 500	The given numbers rounded to the left-most digit.
936	→ 900	
+ 687	→ + 700	
	2 100 ←	The estimated sum.

```
  468
  936
+ 687
2 091
```

← The actual sum is close to the estimated sum.

Example 2

24 642	→ 20 000	The given numbers rounded to the left-most digit.
445	→ 400	
9 261	→ 9 000	
+ 16 792	→ + 20 000	
	49 400	

```
  2 2  2 1
 24 642
    445
  9 261
+ 16 792
 51 140
```

← The actual sum is close to the estimated sum.

Student Example 1

Instructor led

Estimate:

4 909 + 3 217

Want to watch a video of this lesson?
https://youtu.be/FmaLJJdMQdE

Student Example 2

Instructor led

Add:

37 + 725

Want to watch a video of this lesson?
https://youtu.be/N6OVX23Hvvk

Student Example 3

Instructor led

Add:

249 + 383

Want to watch a video of this lesson?
https://youtu.be/8TD6iDzt4oQ

Exercise 1.5

Solve the following. Use front-end rounding for the estimates.

	Estimate	Actual
1. 43 + 6	4 0 + 6	4 3 + 6
2. 57 + 8		
3. 61 + 28		
4. 32 + 45		
5. 33 + 66		
6. 37 + 34	4 0 + 3 0	3 7 + 3 4

	Estimate	Actual
7. 45 + 55		
8. 36 + 79		
9. 87 + 34		
10. 95 + 28		
11. 652 + 43	7 0 0 + 4 0	6 5 2 + 4 3
12. 88 + 489	5 0 0 + 9 0	4 8 9 + 8 8
13. 27 + 484		

	Estimate	Actual
14. 886 + 52		
15. 44 + 327		
16. 764+ 977	8 0 0 + 1 0 0 0	7 6 4 + 9 7 7
17. 240 + 264		
18. 666 + 753		
19. 925 + 489		
20. 726 + 877		

	Estimate	Actual
21. 2 499 + 889	2 0 0 0 + 9 0 0	2 4 9 9 + 8 8 9
22. 5 247 + 3 866		
23. 5 467 + 2 567		
24. 7 850 + 5 056		
25. 59 475 + 4 808		
26. 8 108 + 22 646		
27. 7 518 + 79 874		

	Estimate	Actual
28. 65 + 47 + 36	7 0 5 0 + 4 0	6 5 4 7 + 3 6
29. 96 + 83 + 14	1 0 0 8 0 + 1 0	9 6 8 3 + 1 4
30. 267 + 477 + 83		
31. 205+ 93 + 366		
32. 817 + 375 + 449	8 0 0 4 0 0 + 4 0 0	8 1 7 3 7 5 + 4 4 9
33. 375 + 629 +772		
34. 3 267 + 885 + 266		

	Estimate	Actual
35. 6 452 + 8 506 + 217	6 0 0 0 9 0 0 0 + 2 0 0	6 4 5 2 8 5 0 6 + 2 1 7
36. 7 442 + 5 808 + 782		
37. 5 499 + 8 889 + 7 721		
38. 25 180 + 12 264 + 3 341		

39. The distance from Edmonton to Red Deer is 154 kilometres. From Red Deer to Calgary, the distance is 146 kilometres. From Calgary to Lethbridge, the distance is 213 kilometres. How many kilometres apart are Edmonton and Lethbridge?

40. At the grocery store, Jamal buys oranges ($8), milk ($14), beef ($18), light bulbs ($16), and diapers ($57). How much does he spend altogether?

Unit 2: Subtraction

Keywords

Borrow	In subtraction, to take 1 from a digit of the first number (*minuend*) in order to add a 10 to the digit to the right of it.	$\begin{array}{r} {}^{8}\not{9}^{1}48 \\ -263 \\ \hline 685 \end{array}$
Difference	The *answer* or *result* of the subtraction. For example, 12 – 10 = ***2***	
Inverse	Inverse operations is also called the opposite operations. Addition and subtraction are opposite operations. For example, 4 + 6 = 10 (addition) and 10 – 6 = 4 (subtraction)	
Minus	Means to subtract. We say "seven minus four" which means 7 – 4	
Subtraction	The process of taking one number or amount away from another	

Lesson 2.1: Basic Subtraction Facts

Teaching Strategy

Flash cards can be used to assist the learner in developing basic subtraction facts. You can also have them use the addition fact sheet for subtraction, as subtraction is the opposite of addition.

Learners will see Intro Video as shown below.

Introductory Video:

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/yBT7bsrFTnI

Addition and subtraction are opposite operations. We add two numbers to get the sum or total. We subtract two numbers to find the difference.

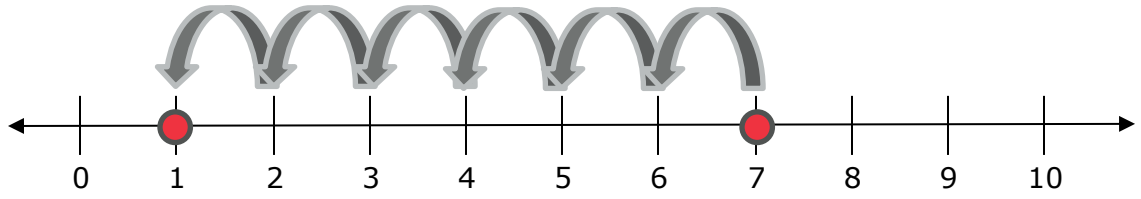
Order wasn't important when adding. **Order is important when subtracting. The largest number must always be first when subtracting whole numbers.**

This exercise is to practice your subtraction facts. We sometimes use backwards adding

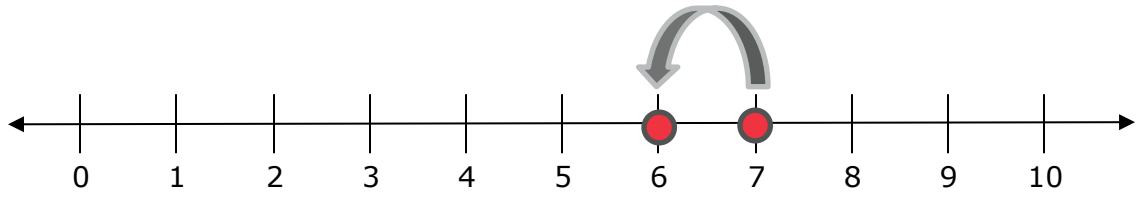
7 – 5 we might think ***what*** + 5 = 7 ***2*** + 5 = 7 so 7 – 5 = ***2***

Example:

7 – 6 = 1 Start at 7 and subtract 6



7 – 1 = 6 Start at 7 and subtract 1



Instructor led

Student Example 1

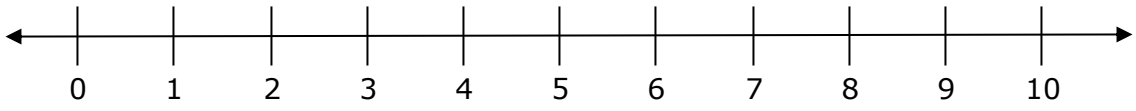
SCAN ME

Want to watch a video of this lesson?

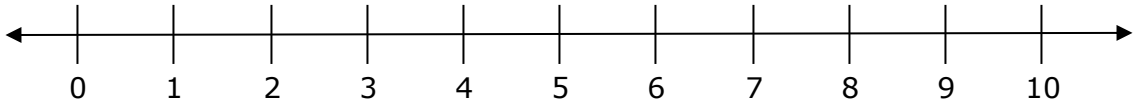
https://youtu.be/incKJchBCLo

Video for example 1 and 2

5 – 3 = 2



5 – 2 = 3



Student Example 2

7 – 4 =

Exercise 2.1

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

2. $\begin{array}{r} 4 \\ -\ 1 \\ \hline \end{array}$

3. $\begin{array}{r} 6 \\ -\ 1 \\ \hline \end{array}$

4. $\begin{array}{r} 8 \\ -\ 1 \\ \hline \end{array}$

5. $5 - 2 =$

6. $7 - 3 =$

7. $8 - 5 =$

8. $5 - 3 =$

9. $\begin{array}{r} 4 \\ -\ 3 \\ \hline \end{array}$

10. $\begin{array}{r} 6 \\ -\ 2 \\ \hline \end{array}$

11. $\begin{array}{r} 9 \\ -\ 7 \\ \hline \end{array}$

12. $\begin{array}{r} 6 \\ -\ 5 \\ \hline \end{array}$

13. $9 - 3 =$

14. $8 - 4 =$

15. $7 - 2 =$

16. $6 - 3 =$

17. $\begin{array}{r} 5 \\ -\ 4 \\ \hline \end{array}$

18. $\begin{array}{r} 8 \\ -\ 4 \\ \hline \end{array}$

19. $\begin{array}{r} 8 \\ -\ 3 \\ \hline \end{array}$

20. $\begin{array}{r} 6 \\ -\ 5 \\ \hline \end{array}$

21. $3 - 3 =$

22. $4 - 2 =$

23. $7 - 1 =$

24. $9 - 9 =$

25. $\begin{array}{r} 6 \\ -\ 2 \\ \hline \end{array}$

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

27. $\begin{array}{r} 8 \\ -\ 3 \\ \hline \end{array}$

28. $\begin{array}{r} 4 \\ -\ 1 \\ \hline \end{array}$

29. $\begin{array}{r} 9 \\ -\ 4 \\ \hline \end{array}$

30. $\begin{array}{r} 8 \\ -\ 6 \\ \hline \end{array}$

31. $\begin{array}{r} 9 \\ -\ 3 \\ \hline \end{array}$

32. $\begin{array}{r} 8 \\ -\ 7 \\ \hline \end{array}$

33. $\begin{array}{r} 7 \\ -\ 3 \\ \hline \end{array}$

34. $\begin{array}{r} 7 \\ -\ 2 \\ \hline \end{array}$

35. $\begin{array}{r} 5 \\ -\ 4 \\ \hline \end{array}$

36. $\begin{array}{r} 6 \\ -\ 6 \\ \hline \end{array}$

37. $\begin{array}{r} 1 \\ -\ 0 \\ \hline \end{array}$

38. $\begin{array}{r} 8 \\ -\ 1 \\ \hline \end{array}$

39. $\begin{array}{r} 7 \\ -\ 6 \\ \hline \end{array}$

40. $\begin{array}{r} 5 \\ -\ 2 \\ \hline \end{array}$

Lesson 2.2: Subtracting Without Borrowing

Teaching Strategy

When teaching subtracting have the learners line up the ones (units places). Then the tens, etc. Learners may want to use lined paper turned sideways as the lines will provide columns which allow the places to be lined up easier. Ensure learners understand the largest number must be listed first.

Learner will see Intro Video as shown below.

Introductory Video:

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/Y6M89-6106I

Watch video to 2:00

When subtracting make sure place values are lined up. If the numbers are beside each other put in column form.

Example

Solve: 86 – 52

86 **Arrange in columns. The larger number is always on top**
– 52 **First subtract the Ones column:** 6 – 2 = 4
34 **Then subtract the Tens column:** 8 – 5 = 3

Student Example

Instructor led

Subtract: 65 – 23

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/slIX9EDcHgE

Exercise 2.2

1. $\begin{array}{r} 28 \\ -\ 5 \\ \hline \end{array}$

2. $\begin{array}{r} 34 \\ -\ 14 \\ \hline \end{array}$

3. $\begin{array}{r} 25 \\ -\ 23 \\ \hline \end{array}$

4. $\begin{array}{r} 39 \\ -\ 14 \\ \hline \end{array}$

5. $62 - 20 =$

6. $44 - 33 =$

7. $32 - 11 =$

8. $67 - 43 =$

9. $\begin{array}{r} 74 \\ -\ 34 \\ \hline \end{array}$

10. $\begin{array}{r} 68 \\ -\ 56 \\ \hline \end{array}$

11. $\begin{array}{r} 99 \\ -\ 54 \\ \hline \end{array}$

12. $\begin{array}{r} 76 \\ -\ 34 \\ \hline \end{array}$

13. $77 - 55 =$

14. $89 - 14 =$

15. $65 - 32 =$

16. $49 - 35 =$

17. $62 - 21 =$

18. $99 - 76 =$

19. $70 - 70 =$

20. $38 - 18 =$

21. $279 - 127 =$

22. $436 - 215 =$

23. $657 - 433 =$

24. $815 - 202 =$

25. $\begin{array}{r} 980 \\ -\ 630 \\ \hline \end{array}$

26. $\begin{array}{r} 777 \\ -\ 362 \\ \hline \end{array}$

27. $\begin{array}{r} 958 \\ -\ 531 \\ \hline \end{array}$

28. $\begin{array}{r} 439 \\ -\ 333 \\ \hline \end{array}$

29. $\begin{array}{r} 2\,685 \\ -\ 1\,274 \\ \hline \end{array}$

30. $\begin{array}{r} 7\,795 \\ -\ 4\,582 \\ \hline \end{array}$

31. $\begin{array}{r} 8\,273 \\ -\ 6\,261 \\ \hline \end{array}$

32. $\begin{array}{r} 5\,007 \\ -\ 3\,004 \\ \hline \end{array}$

Lesson 2.3: Subtracting With Borrowing

Teaching Strategy

When teaching subtracting have the learners line up the ones (units places). Then the tens. etc. Learners may want to use lined paper turned sideways as the lines will provide columns which allow the places to be lined up easier. Ensure learners understand the largest number must be listed first.

Learners will see Intro Video as shown below.

Introductory Video:

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/Y6M89-6106I

Watch video from 2:00

When subtracting make sure place values are lined up. If the numbers are beside each other put in column form.

Example 1	Solve: 71 – 32 $\begin{array}{r} {}^{6}\not{7}^{1}1 \\ -\ 3\ 2 \\ \hline 3\ 9 \end{array}$ **Ones column:** 1 – 2, can't do it! Borrow 1 from the hundreds column (it is reduced from 7 to 6) and increase the tens column from 1 to 11. Now subtract: 11 – 2 = 9 **Tens column:** 6 – 3 = 3 (Remember, the 7 was borrowed from, so it is now 6!)
Example 2	**Borrowing more than once** Sometimes it is necessary to borrow more than once in order to find the difference. Solve: 637 – 549 $\begin{array}{r} 6\ {}^{2}\not{3}^{1}7 \\ -5\ 4\ 9 \\ \hline \end{array}$ **Ones column:** We cannot take 9 from 7, so we borrow from the tens column to get 17. Now we can subtract 9 from 17. $\begin{array}{r} {}^{5}6\ {}^{12}\not{3}^{1}7 \\ -5\ 4\ 9 \\ \hline 8\ 8 \end{array}$ **Tens column:** We cannot subtract 4 tens from 2 tens, so we borrow again. Borrow 1 from the hundreds column to make 12 in the tens column and complete the subtraction to find the difference.
Example 3	Solve: 7 000 – 542 $\begin{array}{r} {}^{6}\not{7}^{1}\ {}^{9}0^{1}\ {}^{9}0^{1}0 \\ -\ 5\ 4\ 2 \\ \hline 6\ 4\ 5\ 8 \end{array}$ → Difference We cannot borrow from zero so we must borrow from 7 000.

Student Example 1

Instructor led

Subtract: 83 – 25

SCAN ME

Want to watch a video of this lesson?
https://youtu.be/egjDLFX9VHg

Student Example 2

Instructor led

Subtract: 312 – 189

SCAN ME

Want to watch a video of this lesson?
https://youtu.be/QD86addRZEw

Student Example 3

Instructor led

Subtract: 389 002 – 76 151

SCAN ME

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https://youtu.be/buyK1y4rV3E

Exercise 2.3

1. 15 − 7

2. 34 − 8

3. 25 − 16

4. 32 − 17

5. 62 – 27 =

6. 41 – 33 =

7. 33 – 14 =

8. 72 – 45 =

9. 70 − 36

10. 85 − 56

11. 92 − 74

12. 83 − 39

13. 77 – 59 =

14. 31 – 14 =

15. 65 – 38 =

16. 45 – 37 =

17. 62
– 28

18. 92
– 76

19. 80
– 73

20. 48
– 19

21. 385 – 127 =

22. 627 – 245 =

23. 727 – 464 =

24. 815 – 246 =

25. 802
– 760

26. 408
– 285

27. 900
– 569

28. 500
– 168

29. 3 485– 1 374

30. 6 375 – 3 283

31. 9 073 – 5 295

32. 5 000 – 3 087

33. 7 000
– 4 999

34. 6 000
– 3 034

35. 8 040
– 3 857

36. 5 002
– 4 269

Lesson 2.4: Subtraction with Estimating

Teaching Strategy

The only new thing learners are doing in this lesson are estimating. Estimating is the same for subtraction as it was for addition. Front end round and subtract the estimated numbers.

Rule for Estimating Differences

1. Use front end rounding. Round each number to the place of the **left-most digit**.
2. Subtract these rounded numbers.

Example 1 Subtract: 896 – 685

896	→	900	← The given numbers rounded to the left-
– 685	→	– 700	← most digit.
		200	← The estimated difference.

896	
– 685	
211	← The actual difference is close to the estimated difference.

Student Example 1

Instructor led

Estimate using front end rounding:

6 325 – 1 578

SCAN ME

Want to watch a video of this lesson?

https://youtu.be/s0cUAaT1HIU

Student Example 2

Estimate using front end rounding:

8 000 – 3 362

Exercise 2.4

Solve the following. Put in columns and use front-end rounding for the estimates. Then complete the calculations.

	Estimate	Actual
1. 28 – 6	3 0 – 6	2 8 – 6
2. 65 – 4		
3. 34 – 9		
4. 72 – 5		
5. 49 – 36	5 0 – 4 0	4 9 – 3 6
6. 87 – 31		

	Estimate	Actual
7. 22 – 18		
8. 65 – 37		
9. 72 – 48		
10. 30 – 19		
11. 62 – 27		
12. 80 – 42		
13. 50 – 37		

	Estimate	Actual
14. 90 – 59		
15. 849 – 25	8 0 0 – 3 0	8 4 9 – 2 5
16. 961 – 41		
17. 455 – 37		
18. 327 – 63		
19. 911 – 88		
20. 459 – 264	5 0 0 – 3 0 0	4 5 9 – 2 6 4

	Estimate	Actual
21. 918 – 627		
22. 836 – 399		
23. 607 – 352		
24. 720 – 408		
25. 900 – 325		
26. 1 299 – 587	1 0 0 0 – 6 0 0	1 2 9 9 – 5 8 7
27. 5 637 – 674		

	Estimate	Actual
28. 4 239 – 747		
29. 6 300 – 532		
30. 4 000 – 967		
31. 4 614 – 2 837	5 0 0 0 – 3 0 0 0	4 6 1 4 – 2 8 3 7
32. 6 007 – 1 706		
33. 4 713 – 2 192		
34. 6 000 – 4 974		

	Estimate	Actual
35. 24 753 – 7 182	2 0 0 0 0 – 7 0 0 0	2 4 7 5 3 – 7 1 8 2
36. 35 963 – 7 275		
37. 74 003 – 9 456		
38. 20 000 – 16 694		

39. Jamal had $1 253 in his bank account. He spent $739 on a new bicycle. How much is left in his bank account.

40. Jessica's salary increased by $2 550 this year. If her new salary is $37 400, how much was her old salary?

Lesson 2.5: Addition and Subtraction Word Problems

Learning Objectives

- Solve application problems using addition and subtraction

Teaching Strategy

Problem-solving is the most difficult thing we do in math. Learns must become familiar with terms that refer to the operation to use. A strategy to use is to make flash cards and ask learners to determine the operation. Write the operation on the back. Teach learners the steps in problem solving and ensure that learners estimate first. Normally an estimation takes seconds and will allow the learner to see if the answer is reasonable before spending time doing the actual calculation. Always ask the learner if the answer is reasonable. This takes practice for the learner. Also ensure the learners write a sentence for their answer as this will also assist them in determining if their answer makes sense.

Keywords

Addition	Subtraction	Equals
plus	less	is
more	subtract	the same as
more than	subtracted from	equals
added to	difference	equals to
increased by	less than	yields
sum	fewer	results in
total	decreased by	are
sum of	loss of	
increase of	minus	
gain of	take away	
add		

Steps for Solving Word Problems

1. Read the problem carefully to ensure that you understand what is being asked. You may need to read the problem several times.
2. Decide what to do to solve the problem.
3. Write a number sentence to show how you would arrive at the answer.
4. Estimate using front end rounding, to determine if the answer is reasonable. If it is, calculate. If not, choose another operation and estimate again.
5. Calculate.
6. Write the final answer in a clear, concise sentence using the appropriate units.

Example 1: Addition

Sarah earned $56 on Monday, $34 on Tuesday, and $112 on Wednesday. How much were her combined earnings?

Solution:

Number sentence	Estimate	Calculation	Answer in sentence form
56 + 34 + 112	60 30 + 100 190	56 34 + 112 202	Sarah's combined earnings were $202.

Example 2: Subtraction

Last year, it snowed only 857 millimetres in Edmonton, but it snowed 2 648 millimetres in Montreal. How much less did it snow in Edmonton?

Solution:

Number sentence	Estimate	Calculation	Answer in sentence form
2 648 – 857	3 000 – 900 2 100	2 648 – 857 1 791	It snowed 1 791 mm less in Edmonton.

Student Example 1

Instructor led

Aya recycled 277 kilograms of paper and 134 kilograms of aluminum. What is the total kilograms of paper and aluminum that she recycled?

SCAN ME

Want to watch a video of this lesson?
https://youtu.be/W3zji0qh658

Student Example 2

Instructor led

A farmer grows five hundred thirty-one tomatoes. In three days he sells one hundred seventy-six tomatoes. How many does he have left at the end of three days?

SCAN ME

Want to watch a video of this lesson?
https://youtu.be/QY8vv7eVVJE

Exercise 2.5

Complete the following word problems. Remember to write your answers in sentence form.

1. In Edmonton, the temperature is 3 degrees at night. During the day, the temperature is 18 degrees higher. What is the daytime temperature?

2. This morning, you drove 223 kilometres. In the afternoon you drove another 198 kilometres. How many kilometres have you driven so far.

3. Heather buys 12 metres of plastic edging for her yard. She puts 7 metres of edging around a tree. How much edging does she have left?

4. Mona was born in 1983. How old will she be on her birthday in 2020?

5. A few years ago, Red Deer's population was 62 887. Lethbridge's population was 34 637. How many people live in the two cities combined?

6. You are planning a trip to the mountains. Starting from Edmonton, you must drive 156 km to Red Deer, then 143 km to Calgary, then 103 km to Canmore. What is the total driving distance?

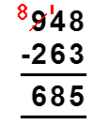
7. At the Edmonton Oilers hockey game on Wednesday night 15 283 people attended. Halfway through the third period, the Oilers were losing badly and 1 836 fans left the game. How many fans were still present?

8. Ben ordered 12 000 nails for a house construction project. So far, he has used 7 413 nails. How many nails are left?

9. Lori is going to buy groceries and has $140 with her. On the way to the grocery store, she spends $15 on cookies and $12 for parking. How much money does she have left for groceries?

10. On a long weekend you decide to take your family on a trip to Jasper. The distance from Edmonton to Jasper is 364 km. You leave Edmonton at 7:00 a.m. and at 9:30 a.m. you have traveled 188 km. How much farther do you need to go to get to Jasper?

Glossary for this Module

Adding/ Addition	To join something to something else to increase the size, number, or amount. In an equation, this is indicated by the "+" sign.
Borrow	In subtraction, to take 1 from a digit of the first number (*minuend*) in order to add a 10 to the digit to the right of it. 
Carry	To transfer a digit from one column of digits to another column of digits
Difference	The *answer* or *result* of the subtraction. For example, 12 – 10 = ***2***
Equation	A statement that the values of two mathematical expressions are equal (indicated by the "=" sign)
Inverse	Inverse operations is also called the opposite operations. Addition and subtraction are opposite operations. For example, 4 + 6 = 10 (addition) and 10 – 6 = 4 (subtraction)
Minus	Means to subtract. We say "seven minus four" which means 7 – 4
Operation	A single math task. Adding is an operation, and so are subtracting, multiplying, and dividing
Subtraction	The process of taking one number or amount away from another
Sum	The answer to an adding equation; also known as the **total**
Total	The answer to an adding equation; also known as the **sum**

Answer Key

Unit 1: Addition

Exercise 1.1

3. 0 + 3
   1 + 2

4. 0 + 4
   1 + 3
   2 + 2

5. 0 + 5
   1 + 4
   2 + 3

6. 0 + 6
   1 + 5
   2 + 4
   3 + 3

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

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

9. 0 + 9
   1 + 8
   2 + 7
   3 + 6
   4 + 5

10. 1 + 9
    2 + 8
    3 + 7
    4 + 6
    5 + 5

11. 2 + 9
    3 + 8
    4 + 7
    5 + 6

12. 3 + 9
    4 + 8
    5 + 7
    6 + 6

13. 4 + 9
    5 + 8
    6 + 7

14. 5 + 9
    6 + 8
    7 + 7

15. 6 + 9
    7 + 8

16. 7 + 9
    8 + 8

17. 8 + 9

18. 9 + 9

Exercise 1.2

1. 7	2. 6	3. 9	4. 5	5. 3	6. 6
7. 8	8. 7	9. 9	10. 6	11. 5	12. 9
13. 4	14. 7	15. 4	16. 6	17. 7	18. 8
19. 9	20. 7	21. 8	22. 9	23. 6	24. 9
25. 9	26. 8	27. 8	28. 9	29. 10	30. 11
31. 13	32. 15	33. 14	34. 11	35. 12	36. 14
37. 16	38. 11	39. 16	40. 13	41. 11	42. 15
43. 14	44. 10	45. 12	46. 14	47. 16	48. 14
49. 13	50. 14	51. 11	52. 18	53. 17	54. 10
55. 15	56. 17	57. 11	58. 12	59. 11	60. 13

Exercise 1.3

1. 9	2. 9	3. 8	4. 13	5. 14	6. 18
7. 12	8. 15	9. 14	10. 15	11. 19	12. 10
13. 17	14. 19	15. 15	16. 16	17. 18	18. 18
19. 17	20. 16	21. 20	22. 16	23. 15	24. 16
25. 14	26. 10	27. 17	28. 12	29. 19	30. 18

Exercise 1.4

1. 20	2. 23	3. 29	4. 23	5. 22	6. 28
7. 23	8. 24	9. 32	10. 43	11. 33	12. 36
13. 39	14. 86	15. 95	16. 89	17. 91	18. 80
19. 91	20. 66	21. 80	22. 88	23. 92	24. 100
25. 101	26. 80	27. 122	28. 114	29. 120	30. 147
31. 121	32. 132	33. 132	34. 101	35. 130	36. 124
37. 159	38. 103	39. 120	40. 141	41. 172	42. 120
43. 117	44. 133	45. 97	46. 73	47. 95	48. 127
49. 142	50. 138	51. 175	52. 185	53. 140	54. 200
55. 197	56. 200	57. 259	58. 181	59. 235	60. 232

Exercise 1.5

	Estimate	Actual
1.	46	49
3.	90	89
5.	90	99
7.	100	100
9.	120	121
11.	740	695
13.	530	511
15.	340	371
17.	500	504
19.	1 400	1 414
21.	2 900	3 388

	Estimate	Actual
2.	68	65
4.	80	77
6.	70	71
8.	120	115
10.	130	123
12.	590	577
14.	950	938
16.	1 800	1 741
18.	1 500	1 419
20.	1 600	1 603
22.	9 000	9 113

	Estimate	Actual
23.	8 000	8 034
25.	65 000	64 283
27.	88 000	87 392
29.	190	193
31.	690	664
33.	1 800	1 776
35.	15 200	15 175
37.	22 000	22 109

	Estimate	Actual
24.	13 000	12 906
26.	28 000	30 754
28.	150	148
30.	880	827
32.	1 600	1 641
34.	4 200	4 418
36.	13 800	14 032
38.	43 000	40 785

39. Edmonton and Lethbridge are 513 kilometres apart.

40. Jamal spends $113 at the grocery store.

Unit 2: Subtraction

Exercise 2.1

1. 2	2. 3	3. 5	4. 7	5. 3
6. 4	7. 3	8. 2	9. 1	10. 4
11. 2	12. 1	13. 6	14. 4	15. 5
16. 3	17. 1	18. 4	19. 5	20. 1
21. 0	22. 2	23. 6	24. 1	25. 4
26. 0	27. 5	28. 3	29. 5	30. 2
31. 6	32. 1	33. 4	34. 5	35. 1
36. 0	37. 1	38. 7	39. 1	40. 3

Exercise 2.2

1. 23	2. 20	3. 2	4. 25	5. 42
6. 11	7. 21	8. 24	9. 40	10. 12
11. 45	12. 42	13. 22	14. 75	15. 33
16. 14	17. 41	18. 23	19. 0	20. 20
21. 152	22. 221	23. 214	24. 613	25. 350
26. 415	27. 427	28. 106	29. 4 111	30. 3 213
31. 4 012	32. 2 003			

Exercise 2.3

1. 8	2. 26	3. 9	4. 15	5. 35
6. 8	7. 19	8. 27	9. 34	10. 29
11. 18	12. 44	13. 18	14. 17	15. 27
16. 8	17. 34	18. 16	19. 7	20. 29
21. 258	22. 382	23. 263	24. 569	25. 42
26. 123	27. 331	28. 332	29. 2 111	30. 3 092
31. 3 778	32. 1 913	33. 2 001	34. 2 966	35. 4 183
36. 733				

Exercise 2.4

	Estimate	Actual
1.	24	22
3.	21	25
5.	10	13
7.	0	4
9.	20	24
11.	30	35
13.	10	13
15.	770	824
17.	460	418
19.	810	823
21.	300	291
23.	200	255
25.	600	575
27.	5 300	4 963
29.	5 500	5 768
31.	2 000	1 777
33.	3 000	2 521
35.	13 000	17 571
37.	61 000	64 547

	Estimate	Actual
2.	66	61
4.	65	67
6.	60	56
8.	30	28
10.	10	11
12.	40	38
14.	30	31
16.	960	920
18.	240	264
20.	200	195
22.	400	437
24.	300	312
26.	400	712
28.	3 300	3 492
30.	3 000	3 033
32.	4 000	4 301
34.	1 000	1 026
36.	33 000	28 688
38.	0	3 306

39. Jamal has $514 left in his bank account.

40. Jessica's old salary was $34 850.

Exercise 2.5

1. The daytime temperature is 21 degrees.
2. You have driven 421 kilometres so far.
3. Heather has 5 metres of edging left.
4. Mona will be 37 years old.
5. There are 97 524 people in both cities.
6. The total driving distance is 402 km.
7. There are 13 447 fans are still there.
8. Ben has 4 587 nails left.
9. Lori has $113 left for groceries.
10. You need to travel another 176 kilometres.