

GRADE 7

Mathematics



COMPLETE GRADE 7 MATH CURRICULUM



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WHY DYNAMIC MATH?

Dynamic Math workbooks are written by teachers directly for each province. This ensures that you are getting the exact same material that is being taught in the classroom. Our teachers also produce engaging online content to further support and enhance learning.



Suite 207 8501 162nd Street
Surrey, BC V4N 1B2



604.592.9309



sales-inquiries@dynamic-classroom.ca



www.dynamic-classroom.ca

Contributing Author: Alan R. Taylor, Ed.D.

Dear Teachers,

Dynamic Math is a company founded by teachers, and so we understand just how difficult your job can be.

This is why we have set out to help you by providing a complete curriculum-based math book so that you don't have to spend time searching for the right resource. Our efforts provide the means for you to get right to teaching, helping your students succeed in math.

Additionally, we provide resources such as extra worksheets and tests, with answer keys. These additional options are available with a minimum purchase, and since our books are up to 70% less than traditional textbooks, this provides you with a very affordable option to implement the Dynamic Math program in your school.

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With books that are 100% aligned to the curriculum for each province, you can be confident that the right resource is at your fingertips.

Our math books provide students with all the instructions and exercises right at their desk, while our digital flipbook and other resources provide teachers with a quick and easy way to project any of the content to a screen or smartboard.

This provides a truly interactive way to go through the material in the classroom and ensures that students are following along.

Combined with Dynamic Math optional videos, we are convinced that teachers, their students, and their families will confidently work through the learning requirements each year, in both the classroom and at home.

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There are several skills that are important when working in mathematics. If you use these skills when you work on math questions, it will help you to think about how to get to the answers.

These skills are:

1. Communicating

Communicating is the process of expressing mathematical ideas and your understanding of them orally, visually, and in writing. To communicate, you use numbers, symbols, pictures, graphs, diagrams, and words to show that you know what is being said or asked. You are expected to be able to express, describe, explain, and apply mathematical ideas in several different ways.

2. Representing

Representing involves different ways of showing mathematical ideas. To represent, you use drawings, physical models, equations, charts, and graphs to help make things clearer so that you can answer the question.

3. Connecting

Connecting involves relating mathematical concepts to each other. You should also be able to connect mathematical ideas to the real world.

4. Reasoning

Reasoning involves understanding the relationships that apply to numbers, shapes, or operations. Reasoning could be considered to be organized thinking.

Unit 9 gives more details about each of these skills and gives you examples and questions to help you build your skills in these areas.

UNIT 1

OPERATIONS WITH DECIMALS AND PERCENT

1.1 Prime and Composite Numbers

1.2 Divisibility of Numbers

1.3 Addition and Subtraction of Decimals

1.4 Multiplication of Decimals

1.5 Division of Decimals

1.6 Percent

If you need additional help, there are more resources available at math-help.ca/more.

1.1 Prime and Composite Numbers

A **prime number** is an integer greater than 1 that has no other positive integer factors other than 1 and itself.

Examples: 2, 3, 5, and 7 are prime numbers since their only factors are 1 and themselves (For example, the only factors of 3 are 1 and 3). However, 6 is not prime since it has two different sets of integer factors: 1 and 6 or 2 and 3.

A **factor** of a number is a divisor of that number (it divides evenly into it)

Examples:

(i) List all factors of 10

- 1, 2, 5, and 10 are all factors of 10 since they all divide evenly into 10.
- Of these factors, only 2 and 5 are prime factors.

(ii) Show the following numbers as products of prime factors

- $12 = 2 \times 2 \times 3$
- $50 = 2 \times 5 \times 5$

A **multiple** of a number is the product of that number times another whole number greater than 0.

Example: Multiples of 5 are $(5 \times 1) = 5$; $(5 \times 2) = 10$; $(5 \times 3) = 15$; $(5 \times 4) = 20$; etc.

A **composite number** is not a prime number and can be factored in more than one way. All numbers that are not prime are composite (with the exception of 1).

Example: 15 is a composite number since it can be factored as 15×1 or 5×3 .

Examples with Solutions

1. Which of the following numbers are not prime?

1, 3, 4, 5, 7, 9, 11, 15

1 is not prime since it is not greater than 1.

4, 9, and 15 are not prime. They are composite, since they have more than one pair of factors.

For example, 9 can be factored as 9×1 or 3×3 .

2. List all factors of 20.

Factor 20 as follows $2 \times 2 \times 5$

The set of all factors consists of all numbers that divide evenly into 20.

The numbers are 1 plus all combinations of 2, 2, and 5 shown in step 1.

Answer: 1, 2, 4, 5, 10, 20

3. List all multiples of 7 less than 40.

Multiples of 7 consist of numbers that are the product of 7 times 1, 2, 3, 4, ..., etc.

We want multiples of 7 less than 40.

$7 \times 1, 7 \times 2, 7 \times 3, 7 \times 4, 7 \times 5$. (7×6 is 42, which is larger than 40.)

Answer: 7, 14, 21, 28, 35

4. Show 90 as a product of prime factors.

Factor 90 until all factors are broken down into prime factors.

$$90 = 9 \times 10 = 3 \times 3 \times 2 \times 5$$

Exercises 1.1

1. Identify whether or not each number is prime. Then give a reason for it.

<u>Number</u>	<u>Yes/No</u>	<u>Reason</u>
a. 22		
b. 31		
c. 77		
d. 57		
e. 43		
f. 51		

2. List all factors of each number. Then list the prime factors only.

<u>Number</u>	<u>All Factors</u>	<u>Prime Factors Only</u>
a. 30		
b. 100		
c. 75		
d. 90		
e. 135		
f. 38		

3. List all multiples of the following numbers that meet each condition.

<u>Number</u>	<u>Multiples of the Number</u>
a. all multiples of 11 that are greater than 40 and less than 100	
b. all multiples of 5 between 11 and 41	
c. all multiples of 9 less than 100	
d. all multiples of 20 less than 200	
e. all multiples of 13 less than 100 that are odd numbers.	

4. Write each number as a product of prime factors.

Number	Product of Primes	Number	Product of Primes
a. 30		f. 1000	
b. 12		g. 90	
c. 26		h. 216	
d. 36		i. 196	
e. 250		j. 242	

Extra for Experts

- List all factors which are common to both 9 and 30.
- List all factors which are common to 10, 14, and 70.
- List all numbers less than 100 that are multiples of both 15 and 10.
- List all numbers less than 50 that are multiples of both 3 and 5.
- I am a multiple of both 9 and 15. I am less than 200 and more than 150. Who am I?

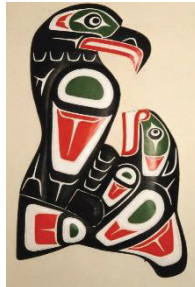
10. I am a multiple of 3, 5, and 10. I am less than 100. Who am I?

11. I am a multiple of 3, 5, and 7 and am between 300 and 400. Who am I?

12. I am a number less than 50. If I am a multiple of both 2 and 14, who am I?

ABORIGINAL APPLICATIONS

THE EAGLE



Eagle and Salmon
BT Collection

The Eagle is a powerful symbol of courage and strength. Since it soars so high, Aboriginal people felt it was closest to the creator. It sees and hears all and its feathers are powerful tools for healing used in various ceremonies. To receive a gift of an eagle feather is considered a great honour. It represents stability, strength, and commitment.

A gift of an Eagle Feather is a great honor. It is a mark of distinction, one that could indicate that a rite of passage has been earned. The Eagle Feather represents the norms, responsibilities and behaviors that are all a part of the conditioning, learning and commitment to a spirit. In this way life is honored and becomes whole.

Math Applications

1. On its annual journey, from the north to the southern areas of British Columbia in pursuit of spawning salmon, an eagle travelled the following distances each day: 230.4, 125.6, 100.1, and 95.7 kilometres. How many kilometres in total did it travel?
2. Another eagle travelled a distance of 422.4 km on its annual journey. It took three days to complete the journey. If it travelled 111.2 km on the first day and 144.6 km on the second day, how far did it travel on the third day?

Answers

1. $230.4 + 125.6 + 100.1 + 95.7 = 551.8$
The eagle travelled 551.8 km on the 4-day trip.

2. $422.4 - (111.2 + 144.6) = 166.6$
The eagle travelled 166.6 km on the third day.

ANSWERS TO EXERCISES AND UNIT TESTS

UNIT 1 ANSWERS

Exercises 1.1 (page 3)

1. a) No; Factors are 1, 2, 11, and 22. **b)** Yes; Only factors are 1 and 31. **c)** No; Factors are 1, 77, 7, and 11. **d)** No; Factors are 1, 57, 3 and 19. **e)** Yes; Only factors are 1 and 43. **f)** No; Factors are 1, 51, 3 and 17.

2. All factors Prime factors

a)	1, 2, 3, 5, 6, 10, 15, 30	2, 3, 5
b)	1, 2, 4, 5, 10, 20, 25, 50, 100	2, 5
c)	1, 3, 5, 15, 25, 75	3, 5
d)	1, 2, 3, 5, 6, 9, 10, 15, 30, 18, 45, 90	2, 3, 5
e)	1,3,5,9,15,27,45,135	3,5
f)	1,2,19,38	2,19

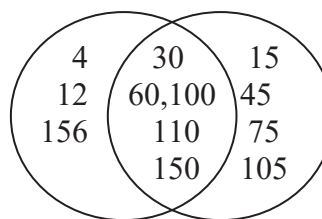
3. a) 44, 55, 66, 77, 88, 99 **b)** 15, 20, 25, 30, 35, 40 **c)** 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99 **d)** 20, 40, 60, 80, 100, 120, 140, 160, 180 **e)** 13, 39, 65, 91 **4. a)** $2 \times 3 \times 5$ **b)** $2 \times 2 \times 3$ **c)** 2×13 **d)** $2 \times 2 \times 3 \times 3$ **e)** $2 \times 5 \times 5 \times 5$ **f)** $2 \times 2 \times 2 \times 5 \times 5 \times 5$ **g)** $3 \times 3 \times 2 \times 5$ **h)** $2 \times 2 \times 2 \times 3 \times 3 \times 3$ **i)** $2 \times 2 \times 7 \times 7$ **j)** $2 \times 11 \times 11$ **5.** 1, 3 **6.** 1, 2 **7.** 30, 60, 90 **8.** 15, 30, 45 **9.** 180 **10.** 30, 60, 90 **11.** 315 **12.** 14, 28, 42

Exercises 1.2 (page 12)

1. 44, 112, 1012, 3700 **2.** 15, 35, 60, 205, 1080 **3.** 44, 320, 244 **4.** 33, 72, 135, 513 **5.** 50, 750, 2130 **6.** True **7.** False **8.** True **9.** True **10.** False **11.** 231, 234, 237, 240 **12.** 115, 120, 125, 130, 135, 140, 145, 150 **13.** 102, 108, 114 **14.**

	Yes	No
Divisible by 3	129, 612, 642, 705, 828	712, 908, 1016
Divisible by 4	612, 712, 828, 908, 1016	129, 642, 705
Divisible by both 3 and 4	612, 828	

15.



16. 12, 24, 36, 48 **17.** 30, 60, 90, 120

18. 5 or 0 **19.** 4 **20.** 2, 5, 8 **21.** 6 **22.** 0, 5

Exercises 1.3 (page 19)

1. a) 162 **b)** 376 **c)** 227 **d)** 4053 **2. a)** 23, greater than **b)** 87, less than **c)** 2984, greater than **d)** 27, less than **3. a)** 31.3 **b)** 233.3 **c)** 3102.82 **d)** 2829.05 **e)** 124.7 **f)** 259.33 **g)** 14.8 **h)** 269.33 **i)** 41.03 **j)** 9042.15 **k)** 453.01 **l)** 71.871 **4. a)** 19.1 **b)** 129.01 **c)** 2084.92 **d)** 3225.013 **e)** 1144.1 **f)** 1097.944 **g)** 41.15 **h)** 427.43 **i)** 34.36 **j)** 2.91 **k)** 95.24 **l)** 2784.92 **5.** \$66.50 **6.** 4.8 m **7.** \$40.25 **8.** \$70.95 **9.** 401.9 km **10.** 222.31 kg **11.** \$113.82 **12.** 6.73 m **13.** 4.1 m **14.** \$18.36 **15. a)** 7 **b)** 3 **16.** 80.4 and 65.2

Exercises 1.4 (page 24)

1. a) 945 **b)** 200 **c)** 1000 **d)** 2210 **2. a)** 187.5 **b)** 100.8 **c)** 3662.64 **d)** 24 828 **3. a)** 84.9 **b)** 173.02 **c)** 116.61 **d)** 100.232 **e)** 130.231 **f)** 1126.5 **g)** 42.813 **h)** 16 412.3 **i)** 21.606 **j)** 100.835 **k)** 260.48 **l)** 16.443 **4.** 301 km **5.** 21.4 m **6.** \$6.45 **7.** \$43.75 **8.** 18.24 kg **9.** 12.1 kg **10.** 102.6 kg **11.** 2.5 **12.** \$8.50 **13.** 650 g **14.** \$2.70 **15.** \$16.70

Exercises 1.5 (page 28)

1. a) 7 **b)** 11 **c)** 13 **d)** 3 **2. a)** 21.5 **b)** 52 **c)** 3.6 **d)** 5.6 **e)** 2.5 **f)** 4.2 **g)** 5.6 **h)** 74 **i)** 70.4 **j)** 24.5 **k)** 55.5 **l)** 80.2 **3.** 2.225 **4.** 334.156 25 **5.** 140.3 g **6.** 40 **7.** 27.3 cm **8.** \$10.50 **9.** 0.625 kg **10.** 8 L **11.** 38.79 kg **12.** \$53.15 **13.** \$29.75 **14.** 6 and 7 **15.** 19 **16.** 5.6 **17.** 2.3

Exercises 1.6a (page 33)

1. a) $\frac{16}{100}$ **b)** $\frac{37}{100}$ **c)** $\frac{4}{100}$ **d)** $\frac{98}{100}$ **e)** $\frac{3}{100}$



Dynamic Math Resources

Dynamic Classroom has created resources that align with the provincial curriculum for Grades 3 to 12. The following resources are available in British Columbia.

Math Workbooks

ELEMENTARY	HIGH SCHOOL
Grade 3 Mathematics	Grade 8 Mathematics
Grade 4 Mathematics	Grade 9 Mathematics
Grade 5 Mathematics	Grade 10 Foundations and Pre-Calculus
Grade 6 Mathematics	Grade 11 Pre-Calculus
Grade 7 Mathematics	Grade 12 Pre-Calculus

Orders can be placed online at www.dynamicmath.ca.

Video Subscriptions

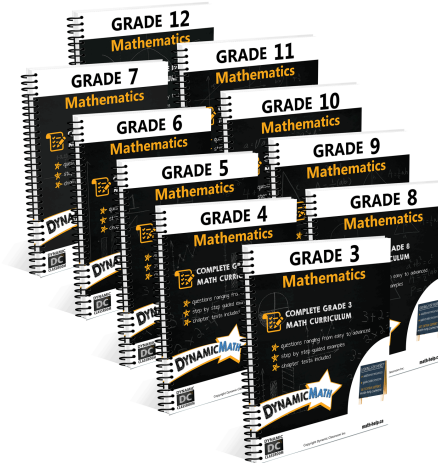
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	6 Months - \$49.95
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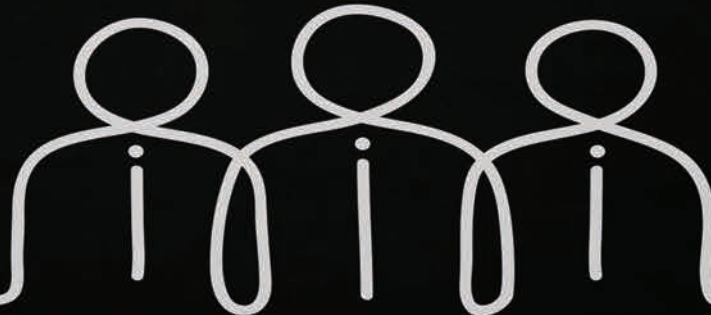
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My son would never have passed grade 10 without Dynamic Math. Thank you!

My daughter loves your math books because she can work through them on her own. We'll definitely be buying the next grade in the fall.

I was so happy to finally find a math workbook that was exactly what my son was doing in class.



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