Resource: Released Questions

Assessment of Reading, Writing and Mathematics

Primary Division

November 2023

Mathematics

3

In This Resource:

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This resource is provided to support educators with the mathematics component of the EQAO Assessment of Reading, Writing and Mathematics, Primary Division. Each mathematics question on the assessment is mapped to a category of knowledge and skills and an overall and a specific expectation in *The Ontario Curriculum, Grades 1–8: Mathematics* (2020). This resource includes the definitions of the categories of knowledge and skills as well as examples of adapted assessment questions. Detailed information about each question, including the overall expectation and category of knowledge and skills to which the question is mapped, and the correct answer, are provided. For more information about the assessment design, refer to the *Framework* at www.eqao.com.

DETAILS OF THE ASSESSMENT

The EQAO Assessment of Reading, Writing and Mathematics, Primary Division, is an online assessment completed by students at the end of Grade 3. The mathematics component of the assessment uses a multi-stage computer adaptive testing model that adapts to the individual student's performance as the student progresses through the stages of the assessment (e.g., based on a student's performance in Stage 1, the student will be routed to a set of questions that is overall easier or more difficult in Stage 2). Though students are routed to different question sets, outcomes are put on the same scale, and overall levels of achievement are comparable.

The mathematics component assesses the knowledge and skills that are defined in the expectations found in *The Ontario Curriculum, Grades 1–8: Mathematics* (2020). The questions assess students' knowledge and skills in these strands:

- Number
- Algebra
- Data
- Spatial Sense
- Financial Literacy

Although the assessment does not measure the content in the Social-Emotional Learning (SEL) Skills in Mathematics and the Mathematical Processes strand, students may be required to apply mathematical processes while completing the assessment.

Each question on the assessment is mapped to an overall and a specific curriculum expectation. Each question is also mapped to one of these categories of knowledge and skills:

- Knowledge and Understanding (**KU**)
- Application (**AP**)
- Thinking (**TH**)

Questions in the mathematics component do not assess the Communication category of knowledge and skills.

During each stage of the assessment, students complete questions mapped to each of the three categories of knowledge and skills assessed. The category assigned to each question assumes that students have been taught the knowledge and skills outlined in the Grade 3 mathematics curriculum, as the EQAO assessment is completed near the end of Grade 3.

Regardless of how students are routed as they progress through the stages of the assessment, students complete the same number of questions from each of the various strands assessed, as the assessment follows a blueprint. The blueprint, which can be found in the *Framework,* defines how many questions a student will complete from each strand. This makes the assessment comparable from year to year. (For more information, see www.eqao.com.)

RESULTS REPORTED

The EQAO Assessment of Reading, Writing and Mathematics, Primary Division, is a standards-referenced large-scale assessment based on the expectations and standards (levels of achievement) for student proficiency in *The Ontario Curriculum.* EQAO reports an overall level of achievement in mathematics for each student. EQAO does not provide scores by strand or by category of knowledge and skills at the student level, as each student does not complete enough questions mapped to each strand or skill to report on each accurately. However, through the EQAO secure reporting tool, the agency provides reports by strand and skill at the school, board and provincial levels for schools and boards to use for improvement planning.

DEFINITIONS OF THE CATEGORIES OF KNOWLEDGE AND SKILLS

EQAO has adapted the definitions of the three categories below from the achievement chart for mathematics found in the Ontario mathematics curriculum. This section outlines the definitions EQAO uses to determine the category for each question on the assessment. An example is provided for each category.

Knowledge and Understanding

A question is mapped to Knowledge and Understanding if in order to answer the question students must demonstrate only

- subject-specific content (knowledge) and/or
- comprehension of its meaning and significance (understanding).

These questions assess basic knowledge and/or understanding of concepts.

Example

Which pattern shows adding 5 each time?

A 9, 14, 19, 24, 29, …

B 9, 13, 17, 21, 25, …

C 37, 32, 27, 22, 17, …

D 37, 33, 29, 25, 21, …

Correct answer: **A**

Students need to look at the options and determine if the numbers are increasing by 5 each time. Students are provided with the tool ("adding 5 each time") to use.

Application

A question is mapped to Application if in order to answer the question students must either

- select the appropriate tool or
- get the necessary information and "fit" it to the problem.

The category that a question is mapped to may change from Knowledge and Understanding to Application if a context is added or if a tool required to answer the question is not provided.

Example

This pattern is increasing by the same amount each time.

19, 24, 29, 34, 39, …

What are the next two numbers in this pattern?

A 41, 43

B 44, 49

C 44, 54

D 49, 59

Correct answer: **B**

The pattern rule ("adding 5 each time") is not given, so students are required to determine it and then use it to determine the missing numbers.

Thinking

A question is mapped to Thinking if in order to answer the question students must either

- select and sequence a variety of tools or
- demonstrate a critical thinking process (e.g., reasoning).

Students may need to make a plan to answer these questions.

Example

Ivy writes the first five numbers of her pattern.

25, 27, 29, 31, 33, …

Her pattern continues to increase by the same amount each time.

Sunil writes the first five numbers of his pattern.

1, 8, 15, 22, 29, …

His pattern continues to increase by the same amount each time.

What number is in both of their patterns?

A 35

B 36

C 37

D 43

Correct answer: **D**

This question requires a plan. The pattern rules are not given, so students must first determine them and then extend the patterns. After that, students must identify a number common to both patterns. If there is no common number, students will need to extend one or both patterns further.

IMPACT OF ANSWER OPTIONS

When two questions are similar in content, the answer options can affect the category of knowledge and skills to which the question is mapped. Consider these two versions.

Version 1

What is 79 + 22?

A 91

B 101

C 191

D 911

Correct answer: **B**

Students need to answer the question to determine which option is correct. They do not have to select a tool, as the tool (the addition symbol ["+"]) is provided. The category that this question is mapped to is **Knowledge and Understanding.**

Version 2

Which of these expressions represents the answer to 79 + 22?

A 70 + 20 + 11

B 70 + 20 + 1

C 90 + 2

D 90 + 7

Correct answer: **A**

For version 2, the answer options have changed the category, as students need to consider the expressions and determine which one represents the same value. Students may determine that 79 is 70 + 9 and that 22 is 20 + 2 and then that 9 + 2 is 11. The category that this question is mapped to is **Application** based on the answer options provided.

SUGGESTED USES FOR THIS RESOURCE

Here is a suggested list of how the example questions can be used in the classroom:

Use questions without including the answer options. Students can answer the question and then discuss the steps required and other possible answers, including those arrived at through common errors or misconceptions. Discuss whether there are multiple methods that can be used to answer the question. Students can then compare their answer to the given options.

Use technology in the classroom to have students record answers instantly, which will allow for discussion of correct answers and the common errors or misconceptions associated with the incorrect options. The discussion can lead to a deeper understanding of concepts and assist students in correcting their own misconceptions.

Use questions as part of a pre- and post-assessment on a topic to show students their improved understanding within a unit.

Use questions when spiralling as a method to revisit topics.

Encourage students to use manipulatives, and model how to use them effectively. For example, fraction strips or towers can be used with questions mapped to expectations in the Number or Data strand.

QUESTIONS

These questions were adapted from the mathematics component of the primary-division EQAO assessment for use in the classroom. This section provides the overall expectation and the category of knowledge and skills for each question.

B. NUMBER

B1. Number Sense

demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life

1 KU What is the value of the 8 in the number 826?

A 8

B 80

C 800

2 AP Rafiq and his friends share a pizza. They only eat two fourths of it.

Choose the **TWO** fractions that are equivalent to two fourths.

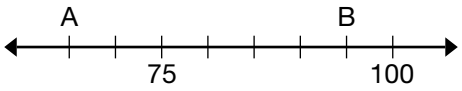
A one half

B two halves

C two eighths

D four eighths

3 TH What numbers are represented by the letters A and B on this number line?



A 60 and 90

B 65 and 90

C 65 and 95

D 70 and 95

B2. Operations

use knowledge of numbers and operations to solve mathematical problems encountered in everyday life

4 KU Which two numbers when multiplied together equal 30?

A 3 and 0

B 5 and 3

C 10 and 2

D 10 and 3

5 AP Kai has 138 blocks, and Luka has 184 blocks.

How many blocks do they have **in total**?

A 46 blocks

B 222 blocks

C 312 blocks

D 322 blocks

6 TH What two numbers make this subtraction problem correct?

$$\begin{array}{r} 7\square\hexagon \\ -\ 2\ 5\ 6 \\ \hline 4\ 7\ 4 \end{array}$$

A $\boxed{2}\langle 2\rangle$

B $\boxed{2}\langle 0\rangle$

C $\boxed{3}\langle 0\rangle$

D $\boxed{4}\langle 2\rangle$

C. ALGEBRA

C1. Patterns and Relationships

identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

7 KU What two attributes change in this repeating pattern?

A shape and size

B colour and size

C size and orientation

D shape and orientation

8 AP A pattern starts at 55 and decreases by the same amount each time.

55, 52, ___, 46, ___, ...

What are the missing numbers?

A 49, 43

B 49, 44

C 50, 44

D 51, 45

9 TH Amit creates a pattern. He starts at 2 and counts forward by 3s.

Mia creates a pattern. She starts at 5 and counts forward by 4s.

Which two numbers are in Amit's and Mia's patterns?

A 9 and 17

B 13 and 21

C 17 and 29

D 20 and 29

C2. Equations and Inequalities

demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts

10 Which expression is equal to 250?
KU

A 100 + 50

B 150 + 150

C 300 – 50

D 500 – 150

11 Choose the **TWO** expressions that are equivalent to 8 + 2.
AP

A 4 x 2

B 5 + 4

C 20 ÷ 2

D 23 – 13

12 What number goes into the box to make these expressions equivalent?
TH

50 + 30 + 10 = 45 + 15 + ☐

A 30

B 45

C 60

D 90

C3. Coding

solve problems and create computational representations of mathematical situations using coding concepts and skills

13 KU This code has five steps. Two steps of the code are missing.

start, _____, calculations, _____, end

What are the missing steps in the code?

A input values, display answer

B display answer, calculations

C calculations, input values

D start, calculations

14 AP This code will determine a new number.

start
  input **number**
  add **15** and subtract **6** from **number**
  display **number**
end

What number will be displayed if the input number is 3?

A 9

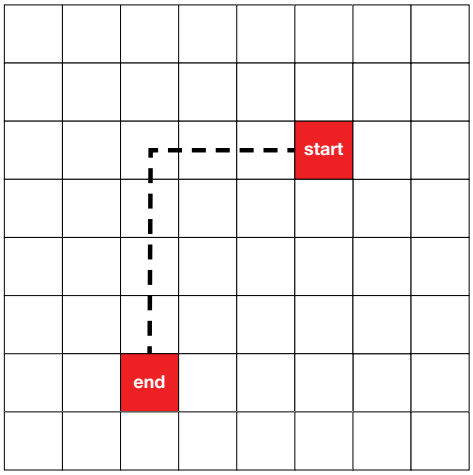
B 12

C 18

D 21

15 TH A robot is standing on the start block facing in the direction it is about to move. The code will move the robot from the start block to the end block.

Use the coding pieces to complete the code.



CODING PIECES

left

right

2

3

4

CODING SPACE

start

move ⬚ spaces forward

make a quarter turn ⬚

move ⬚ spaces forward

end

C4. Mathematical Modelling

Currently there are no EQAO questions mapped to this overall expectation. There are no specific expectations for this overall expectation.

D. DATA

D1. Data Literacy

manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life

16 **KU** This pictograph shows information about recycled items.

Recycled Items

Type	Number of items recycled
Paper	
Plastic	
Glass	

Key
Each  represents 4 items.

How many paper items have been recycled?

A 5

B 14

C 20

D 24

17 **AP** This table shows the number of markers three students have.

Student	Numbers of markers
Tanisha	6
Blake	2
Mateo	4

What is the **mean** number of markers?

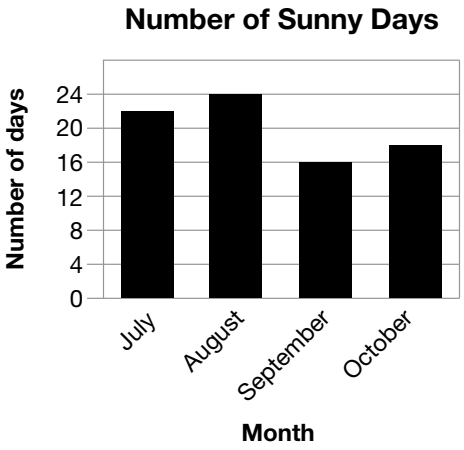
A 2 markers

B 4 markers

C 6 markers

D 12 markers

18TH This bar graph shows the number of sunny days in four different months.



How many more sunny days are there in total in July and August than in October?

A 18 days

B 26 days

C 28 days

D 46 days

D2. Probability

describe the likelihood that events will happen, and use that information to make predictions

19 **KU** A coin with heads on one side and tails on the other side is tossed 5 times.

Choose the likelihood of the coin landing on tails 5 times in a row.

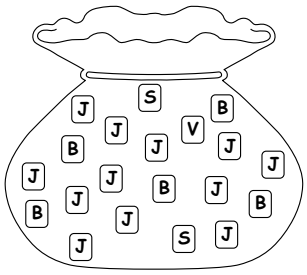
A certain

B impossible

C likely

D unlikely

20 **AP** One tile is chosen from this bag without looking.



Which statement is true?

A It is likely that a tile with J on it will be chosen.

B It is likely that a tile with B on it will be chosen.

C It is certain that a tile with J on it will be chosen.

D It is impossible that a tile with V on it will be chosen.

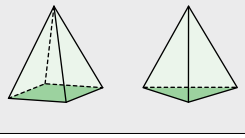
E. SPATIAL SENSE

E1. Geometric and Spatial Reasoning

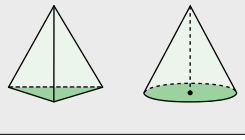
describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them

21 Choose the **TWO** pairs of objects that are
KU congruent.

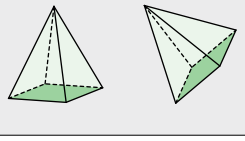
A



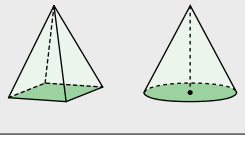
B



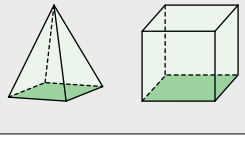
C



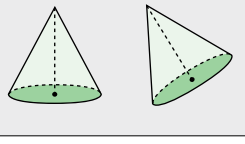
D



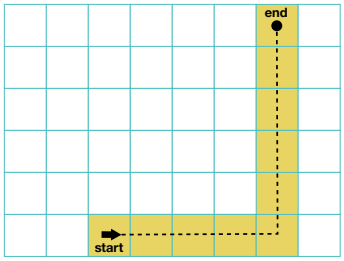
E



F



22 Which option describes the movement of the
AP arrow from the **start** square to the **end** square?



A Move forward 4 squares, make a quarter-turn clockwise, and move forward 4 squares.

B Move forward 4 squares, make a quarter-turn counterclockwise, and move forward 5 squares.

C Move forward 5 squares, make a quarter-turn clockwise, and move forward 5 squares.

D Move forward 5 squares, make a quarter-turn counterclockwise, and move forward 6 squares.

23 How many faces, edges and vertices does a
TH trapezoid-based prism have?

A 5 faces, 9 edges and 6 vertices

B 6 faces, 10 edges and 6 vertices

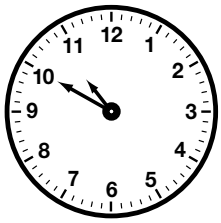
C 6 faces, 12 edges and 8 vertices

D 7 faces, 12 edges and 7 vertices

E2. Measurement

compare, estimate, and determine measurements in various contexts

24 KU Which digital clock shows the same time as this analog clock?



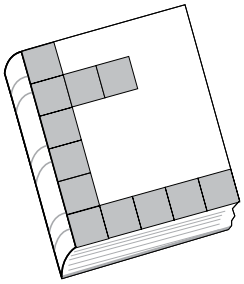
A 

B 

C 

D 

25 AP Riley starts to cover the front of this book with square tiles. All the tiles are the same size.



How many **more** tiles are needed to cover the front of this book, with no gaps or overlaps?

A 12 tiles

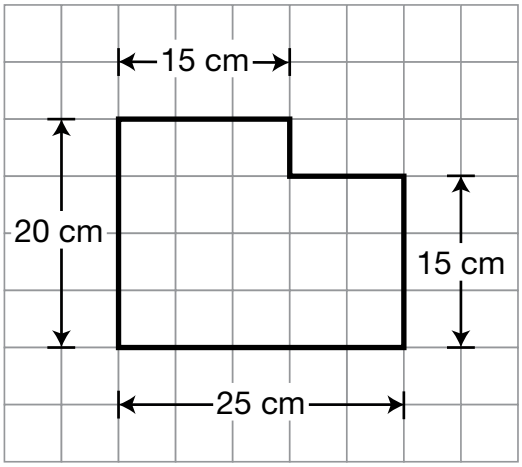
B 16 tiles

C 18 tiles

D 30 tiles

26 What is the perimeter of this shape?

TH



A 75 cm

B 80 cm

C 85 cm

D 90 cm

F. FINANCIAL LITERACY

F1. Money and Finances

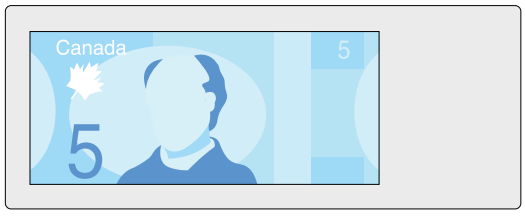
demonstrate an understanding of the value and use of Canadian currency

27 KU A teacher buys paint that costs $11. He pays with a $20 bill.

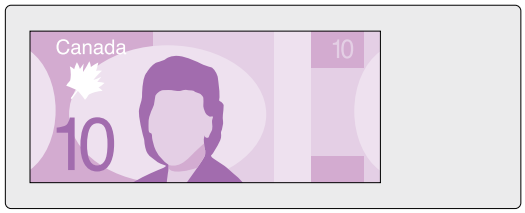
Choose the option that is the **best** estimate of the change he should receive.

A

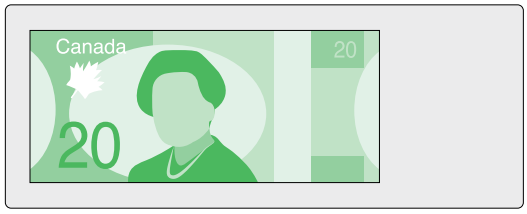
B



C



D

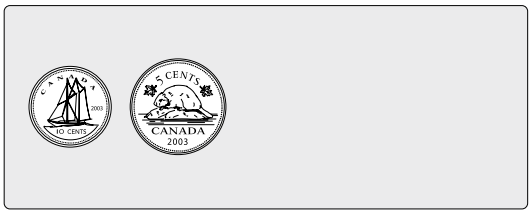


28 AP Hana buys an item that costs 55¢. She pays with 75¢.

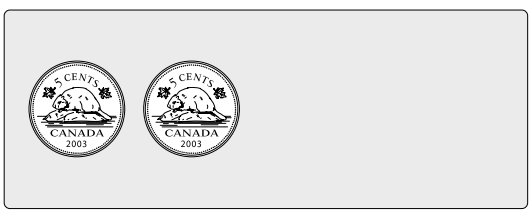
Which option shows the change she should get back?

A

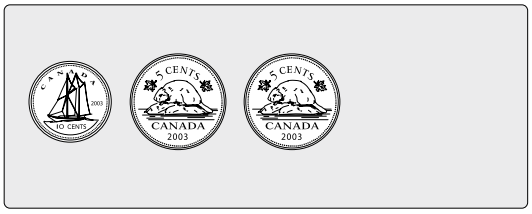
B



C



D

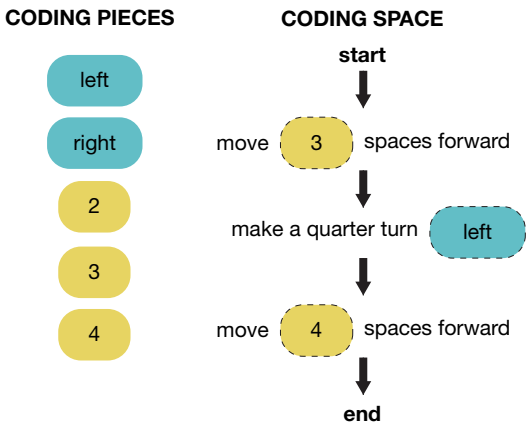


DETAILS OF THE QUESTIONS

QUESTION NUMBER	OVERALL EXPECTATION	COGNITIVE SKILL	KEY
1	B1	KU	C
2	B1	AP	A, D
3	B1	TH	C
4	B2	KU	D
5	B2	AP	D
6	B2	TH	C
7	C1	KU	C
8	C1	AP	A
9	C1	TH	C
10	C2	KU	C
11	C2	AP	C, D
12	C2	TH	A
13	C3	KU	A
14	C3	AP	B
15	C3	TH	*
16	D1	KU	C
17	D1	AP	B
18	D1	TH	C
19	D2	KU	D
20	D2	AP	A
21	E1	KU	C, F
22	E1	AP	B
23	E1	TH	C
24	E2	KU	B
25	E2	AP	C
26	E2	TH	D
27	F1	KU	C
28	F1	AP	D

LEGEND
Cognitive Skill KU—Knowledge and Understanding AP—Application TH—Thinking

*** Solution for question 15**



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