These Questions Can Be Used at Various Times Throughout the Year

This resource comprises five booklets. Each booklet is a compilation of all the questions in a particular strand released between 2012 and 2016. The multiple-choice questions appear first, followed by open-response. The questions are sorted according to the overall expectations in *The Ontario Curriculum, Grades 1–8: Mathematics* to which each is mapped. Detailed information about the questions, such as the year of release, the overall expectation and the category of knowledge and skills the question is mapped to, is listed after them. This detailed information also includes the answer key for each multiple-choice question. The scoring guides (with the item-specific rubric and student samples at each code) for each open-response question follow.
How to Use This Resource

Overall and specific expectations in the primary- and junior-division mathematics curriculum are organized into the five strands. For the sake of consistency, EQAO has also organized this resource by strand. EQAO reports an overall score for each student but does not provide scores by strand, as there are not a sufficient number of assessment questions mapped to each strand to report accurately at that level. The overall difficulty of all the questions on the assessment remains approximately the same from year to year; however, the overall difficulty of questions by strand may vary from year to year.

Details of the Assessment

EQAO assessments are comparable from year to year, as they share a common structure. The blueprint, which can be found in the Framework, defines how the questions are spread throughout the curriculum. (For more information, see www.eqao.com.) EQAO releases only half of the assessment each year (and has done so since 2013), so the released questions from a particular year do not cover the full blueprint. The blueprint specifies the number and types of questions (multiple-choice or open-response) that are mapped to a particular group of expectations. Each group of expectations can consist of one or more overall expectations, which themselves include specific expectations. Although EQAO releases only the overall expectation, each question is mapped to a specific expectation. The specific expectations vary from year to year; however, some of them involve knowledge or skills that may be assessed every year, or different parts of the expectation can be assessed on a yearly basis.
How to Use This Resource (continued)

When specific expectations are repeated, the categories of knowledge and skills the questions are mapped to can change. In the blueprint, some expectations and parts of others are set in italics, which indicates that the italicized element cannot be assessed on a large-scale assessment. EQAO’s aim is for each specific expectation (excluding the ones set completely in italics) to have at least one question mapped to it every five years.

Each question is also mapped to a category of knowledge and skills. EQAO maps multiple-choice questions to the Knowledge and Understanding, Application and Thinking categories. Open-response questions are mapped to either Application or Thinking. EQAO does not map any questions to the category Communication, but teachers can evaluate this skill through any open-response questions where students need to show their work or justify their answer.

EQAO’s Definitions of the Categories of Knowledge and Skills

EQAO has adapted the definitions of the categories of knowledge and skills from the achievement chart found in The Ontario Curriculum. These definitions assist EQAO in mapping questions.

A question is mapped to the category of Knowledge and Understanding if students must demonstrate only subject-specific content (knowledge) or comprehension of its meaning and significance (understanding), or both, in order to answer the question. These questions assess basic knowledge or understanding of concepts.

A question is mapped to the category Application if students must select the appropriate tool or get the necessary information and “fit” it to the problem. A question may change from Knowledge and Understanding to Application if context is added.

Questions that require students either to select and sequence a variety of tools or to demonstrate a critical thinking process (e.g., reasoning) are mapped to the category Thinking. Consider whether students need to make a plan to answer the question. Thinking questions require students to select more than one tool and sequence them (e.g., add first then subtract) or use reasoning to determine the answer. There may be more than one way to answer these questions.

Questions where students need to select one tool and use it repeatedly (without any sequencing of tools) are usually mapped to the category Application. However, the selection of a tool, its use more than once and the addition or subtraction of the results requires a plan. Questions requiring such a plan are generally mapped to the category Thinking.

The category and specific expectation each question is mapped to is confirmed by many Ontario educators, including the question writer, review committees and an expert reviewer. In the classroom, these questions can be mapped to a category based on the knowledge and skills the students currently have. If students have never been taught a specific skill, the question could be mapped to Application or even Thinking; however, after they are taught the skill, it could be mapped to Knowledge and Understanding or Application.

As the EQAO assessment is written near the end of the school year, it assumes that students have been taught the knowledge and skills outlined in the curriculum for the year.
How to Use This Resource (continued)

Here are some examples to help distinguish the different categories of knowledge and skills questions are mapped to.

Example 1:
When two multiple-choice questions are the same, the answer options can determine the category of knowledge and skills the question is mapped to.

**VERSION 1**
Which of these is equivalent to 8%?

- a 80
- b 8
- c 0.8
- d 0.08

To answer this question, students need to determine which value is equivalent to 8%. By the end of Grade 6, students should know this answer or be able to calculate it quickly. The category that the question is mapped to is Knowledge and Understanding.

(correct answer: d)

**VERSION 2**
Which of these is equivalent to 8%?

- a $\frac{2}{25}$
- b $\frac{2}{20}$
- c $\frac{1}{8}$
- d $\frac{8}{10}$

For version 2, the answer options have changed the category, as students need to determine which fraction is equivalent to 8%. One approach is to change 8% to a fraction and then compare $\frac{8}{100}$ to the given fractions to determine which one is equivalent. The students can also change the fractions in the options to percentages and see which one is equivalent to 8%. As students are required to select a tool to answer this question, it is mapped to the category Application.

(correct answer: a)
How to Use This Resource (continued)

Example 2:
When the answer options are similar, the question can be changed to influence the category of knowledge and skills.

**VERSION 1**
The first term of a pattern is 28 672. The pattern rule is “divide by 4 to get the next term.”
What is the 5th term?

- a 28
- b 112
- c 448
- d 7168

**VERSION 2**
A pattern is shown below. Each term increases by the same amount.

\[4, 41, 78, 115, 152, \ldots\]

What is the 9th term in the pattern?

- a 226
- b 263
- c 300
- d 337

**VERSION 3**
The terms of a pattern are made using toothpicks. Term 1 and Term 5 are not shown.

![Diagram of toothpicks]

Determine the total number of toothpicks used in Term 1 to Term 5 of this pattern.
Justify your answer.

The total number of toothpicks used in Term 1 to Term 5 of this pattern is _____.

**VERSION 1**
This question is mapped to the category Knowledge and Understanding. Students start with the first term and apply the given pattern rule to determine the 5th term.
(Correct answer: b)

**VERSION 2**
This question does not provide students with the pattern rule. They must first figure out the constant that the terms are increasing by and then apply it to determine the 9th term. Therefore, this question is mapped to Application, as the tool is not given.
(Correct answer: c)

**VERSION 3**
This is an open-response question. It is mapped to the category Thinking, as students must make a plan. They must first figure out the pattern and then determine both Term 1 and Term 5. After that, students must determine the number of toothpicks in each term and add them together.
Refer to question 19 in the Patterning and Algebra strand booklet for samples of student responses with annotations.
How to Use This Resource (continued)

Example 3:

Multiple-choice and open-response questions can be mapped to the category **Thinking**.

**VERSION 1**

These polygons have been ordered from smallest to largest based on a geometric property.

Which property has been used to order the polygons?

a) number of sides  
b) number of acute angles  
c) number of lines of symmetry  
d) number of pairs of parallel sides

(correct answer: c)

**VERSION 2**

Complete the chart.

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of acute angles</th>
<th>Number of obtuse angles</th>
<th>Number of lines of symmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectangle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right trapezoid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Isosceles trapezoid</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the grid, draw and name a quadrilateral that has 2 obtuse angles and no lines of symmetry.

Name of quadrilateral:  

**VERSION 2**

This open-response question is also mapped to the category **Thinking**. Students need to use reasoning or make a plan to answer the second part. Students must consider which quadrilateral has the given properties and then draw it. They may consider each type of quadrilateral and determine its properties, or they may try to draw one with the given properties.

Refer to question 14 in the Geometry and Spatial Sense strand booklet for samples of student responses with annotations.
Junior Division

Grade 6

Multiple-Choice and Open-Response Questions

INSTRUCTIONS

Answering Multiple-Choice Questions

Like this: ● Not like this: ✗ ✓ ✂ ❌

• Use a pencil only.
• Fill only one circle for each question.
• Fill the circle completely.
• Cleanly erase any answer you wish to change.

Answering Open-Response Questions

• Write on the space provided in this booklet.
1. What unit of measure is the most appropriate to estimate the thickness of a dime?
   - cm
   - dam
   - m
   - mm

2. A fire truck has a ladder measuring 3 units in length.
   Which unit would be most appropriate to measure the ladder?
   - kilometre
   - decimetre
   - decametre
   - centimetre

3. How many grams are in 1.5 kg?
   - 1500 g
   - 150 g
   - 15 g
   - 1.5 g

4. How many millilitres are there in 0.56 litres?
   - 5.6 mL
   - 56 mL
   - 560 mL
   - 5600 mL

5. How many millilitres are in 82 L?
   - 0.082 mL
   - 0.82 mL
   - 8200 mL
   - 82 000 mL

6. Each beaker of water below has a capacity of 2 L.
   Which beaker appears to have about 500 mL of water in it?
7. Isla can run 800 metres in 10 minutes.
   At this rate, how many kilometres can she run in 50 minutes?
   - 4
   - 16
   - 4000
   - 8000

8. It takes 1 work day to repair 100 m of road.
   At this rate, about how many work days will it take to repair 20 km of road?
   - 500
   - 200
   - 5
   - 2

9. Two triangles each have an area of 48 cm².
   Which could be their dimensions?
   - Triangle | Base | Height
   - 1 | 8 cm | 12 cm
   - 2 | 16 cm | 6 cm
   - Triangle | Base | Height
   - 1 | 8 cm | 6 cm
   - 2 | 12 cm | 4 cm
   - Triangle | Base | Height
   - 1 | 3 cm | 16 cm
   - 2 | 24 cm | 2 cm
   - Triangle | Base | Height
   - 1 | 3 cm | 8 cm
   - 2 | 6 cm | 4 cm
10 A triangle will be constructed using the base shown on the grid below.

Which point can be used to complete the triangle so that its area is $8 \text{ units}^2$?

- Point M
- Point P
- Point Q
- Point R

11 Which of the following shows a rectangle and a triangle that have the same area?

- (Rectangle: $8 \times 8 \text{ cm}$, Triangle: $5 \times 10 \text{ cm}$)
- (Rectangle: $8 \times 8 \text{ cm}$, Triangle: $6 \times 12 \text{ cm}$)
- (Rectangle: $4 \times 10 \text{ cm}$, Triangle: $12 \times 8 \text{ cm}$)
- (Rectangle: $4 \times 10 \text{ cm}$, Triangle: $6 \times 12 \text{ cm}$)
12. Which of the following has an area of 25 cm² and a perimeter of 25 cm?

- A square with side length 5 cm.
- A rectangle with dimensions 2.5 cm x 10 cm.
- A rectangle with dimensions 10 cm x 2 cm.
- A parallelogram with dimensions 7 cm x 5 cm.

13. A parallelogram is shown below.

Which rectangle has the same area as this parallelogram?

- A rectangle with dimensions 5 cm x 6 cm.
- A rectangle with dimensions 4 cm x 12 cm.
- A rectangle with dimensions 5 cm x 12 cm.
- A rectangle with dimensions 6 cm x 12 cm.
14 The parallelogram below will be cut into two congruent triangles.

\[ \text{6 cm} \quad \text{5 cm} \quad \text{14 cm} \]

What is the area of one of the triangles?

- 35 cm\(^2\)
- 42 cm\(^2\)
- 70 cm\(^2\)
- 84 cm\(^2\)

15 What is the total area of the shaded region in this diagram?

\[ \text{8 cm} \quad \text{6 cm} \]

- 14 cm\(^2\)
- 22 cm\(^2\)
- 24 cm\(^2\)
- 48 cm\(^2\)

16 Sanjit makes a parallelogram. He starts with a rectangle and adds 2 congruent triangles as shown below.

\[ \text{8 cm} \quad \text{20 cm} \]

The parallelogram has an area of 190 cm\(^2\).

What is the area of each of the triangles?

- 15 cm\(^2\)
- 30 cm\(^2\)
- 160 cm\(^2\)
- 175 cm\(^2\)

17 Consider the rhombus below.

\[ \text{3.4 cm} \quad \text{2 cm} \quad \text{3.4 cm} \]

What is the area of the rhombus?

- 5.4 cm\(^2\)
- 6.8 cm\(^2\)
- 11.6 cm\(^2\)
- 13.6 cm\(^2\)
18. The area of one face of a cube is 4 cm\(^2\).

What is the surface area of the cube?

- 10 cm\(^2\)
- 12 cm\(^2\)
- 20 cm\(^2\)
- 24 cm\(^2\)

19. This rectangular prism has a volume of 192 cm\(^3\).

What is its height?

- 4 cm
- 8 cm
- 24 cm
- 48 cm

20. The diagram below shows a shoebox without a lid.

A student covers the outside of the shoebox with construction paper.

If the student does not cover the lid, what is the surface area that is covered?

- 982.25 cm\(^2\)
- 1433.50 cm\(^2\)
- 1964.50 cm\(^2\)
- 5044.50 cm\(^2\)

21. Two rectangular prisms are shown below.

How much larger is the volume of Prism M than that of Prism T?

- 5000 cm\(^3\)
- 7000 cm\(^3\)
- 12 000 cm\(^3\)
- 17 000 cm\(^3\)
A store has 11.2 kg of potatoes. Maria buys 572 g of potatoes from the store and Colin buys 1.42 kg of potatoes from the store.

After these two purchases, how many grams of potatoes does the store have left?
Show your work.

The store has _________ grams of potatoes left.
On the grid below, construct a parallelogram and a triangle using the darker lines. Each shape must have an area of 36 units$^2$.

Justify your answer with calculations showing that each shape has an area of 36 units$^2$. 

1 unit$^2$
The container of popcorn pictured below is in the shape of a rectangular prism.

What is the smallest amount of paper needed to make this container?

Show your work.

The smallest amount of paper needed to make this container is ________________cm².
## Detailed Information About the Questions

### Measurement

#### Multiple-Choice Questions

<table>
<thead>
<tr>
<th>QUESTION NUMBER</th>
<th>YEAR QUESTION RELEASED</th>
<th>OVERALL EXPECTATION</th>
<th>COGNITIVE SKILL</th>
<th>KEY</th>
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<td>KU</td>
<td>d</td>
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<td>KU</td>
<td>a</td>
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#### Open-Response Questions

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<th>COGNITIVE SKILL</th>
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</tr>
<tr>
<td>24</td>
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### Legend

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<tr>
<th>Cognitive Skill</th>
<th>Description</th>
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<tr>
<td>KU</td>
<td>Knowledge and Understanding</td>
</tr>
<tr>
<td>AP</td>
<td>Application</td>
</tr>
<tr>
<td>TH</td>
<td>Thinking</td>
</tr>
</tbody>
</table>

*This is the number of the overall expectation in the Measurement strand that the question is mapped to. The overall expectations are numbered according to the order in which they appear in The Ontario Curriculum.
Item-specific rubrics and sample student responses with annotations

QUESTIONS 22 TO 24
### Question 22

<table>
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<th>Code</th>
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| I    | • Illegible: cannot be read; completely crossed out/erased; not written in English  
• Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, “?”,” “!”,” “I don’t know”)  
• Off topic: no relationship of written work to the question |
| 10   | Thinking process to determine how many grams of potatoes the store has left shows limited effectiveness due to  
• minimal evidence of a solution process  
• limited identification of important elements of the problem  
• too much emphasis on unimportant elements of the problem  
• no conclusions presented  
• conclusion presented without supporting evidence |
| 20   | Thinking process to determine how many grams of potatoes the store has left shows some effectiveness due to  
• an incomplete solution process  
• identification of some of the important elements of the problem  
• some understanding of the relationships between important elements of the problem  
• simple conclusions with little supporting evidence |
| 30   | Thinking process to determine how many grams of potatoes the store has left shows considerable effectiveness due to  
• a solution process that is nearly complete  
• identification of most of the important elements of the problem  
• a considerable understanding of the relationships between important elements of the problem  
• appropriate conclusions with supporting evidence |
| 40   | Thinking process to determine how many grams of potatoes the store has left shows a high degree of effectiveness due to  
• a complete solution process  
• identification of all important elements of the problem  
• a thorough understanding of the relationships between all of the important elements of the problem  
• appropriate conclusions with thorough and insightful supporting evidence |
A store has 11.2 kg of potatoes. Maria buys 572 g of potatoes from the store and Collin buys 1.42 kg of potatoes from the store.

After these two purchases, how many grams of potatoes does the store have left?

Show your work.

\[
\begin{array}{c}
11.249 \\
572.9 \\
\hline
6.71 \\
-1.42 \\
\hline
5.31
\end{array}
\]

The store has \(531\) grams of potatoes left.

Annotation:
Response demonstrates too much emphasis on unimportant elements of the problem; inaccurate calculations are shown for all steps with incorrect conversion from kilograms to grams shown in conclusion.
A store has 11.2 kg of potatoes. Maria buys 572 g of potatoes from the store and Colin buys 1.42 kg of potatoes from the store.

After these two purchases, how many grams of potatoes does the store have left?

Show your work.

110.2 g
11.2
\[572\ g = 5.72\ kg\]
\[\underline{\text{9.78}}\]
\[\underline{\text{5.72}}\]
\[4.06\ kg\ or\ potatoes\ left\]

The store has \underline{\text{4.06 kilograms}}\ of potatoes left.

Annotation:
Response demonstrates identification of some of the important elements of the problem; accurate calculations are shown for all steps but conversion from grams to kilograms is incorrect (572 g converted to 5.72 kg instead of 0.572 kg) and answer (4.06) is in kilograms instead of grams.
A store has 11.2 kg of potatoes. Maria buys 572 g of potatoes from the store and Colin buys 1.42 kg of potatoes from the store.

After these two purchases, how many grams of potatoes does the store have left? Show your work.

\[
\begin{align*}
572 \div 1000 &= 0.572 \text{ kg} \\
\frac{1.42 \text{ kg}}{0.572 \text{ kg}} &= \frac{1.992}{9.208} \\
\text{The store has } 9.208 \text{ kg of potatoes left.}
\end{align*}
\]

The store has ________ grams of potatoes left.

**Annotation:**
Response demonstrates identification of most of the important elements of the problem; accurate conversions and calculations are shown for all steps but answer (9.208) is in kilograms instead of grams.
A store has 11.2 kg of potatoes. Maria buys 572 g of potatoes from the store and Colin buys 1.42 kg of potatoes from the store.

After these two purchases, how many grams of potatoes does the store have left?
Show your work.

\[
\begin{align*}
11.2 \text{ kg} & = 11200 \text{ g} \\
1.42 \text{ kg} & = 1420 \text{ g} \\
572 \text{ g} &
\end{align*}
\]

\[
\begin{array}{c}
\begin{array}{c}
572 \\
1420 \\
\hline
1992 \\
\end{array}
\end{array}
\]

\[
\begin{align*}
\text{After both Maria and Colin purchase the potatoes, the store will still have } & \text{9208 g left.} \\
\text{The store has } & \text{9208 grams of potatoes left.}
\end{align*}
\]

Annotation:
Response demonstrates a thorough understanding of the relationships between all of the important elements of the problem; accurate conversions and calculations are shown for all steps and answer (9208) is in grams.
### Question 23

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>B</td>
<td>• Blank: nothing written or drawn in response to the question</td>
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| I    | • Illegible: cannot be read; completely crossed out/erased; not written in English  
• Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, “?”, “!”; “I don’t know”)  
• Off topic: no relationship of written work to the question |
| 10   | Application of knowledge and skills to construct a parallelogram and triangle, each with an area of 36 units squared shows limited effectiveness due to  
• misunderstanding of concepts  
• incorrect selection or misuse of procedures |
| 20   | Application of knowledge and skills to construct a parallelogram and triangle, each with an area of 36 units squared shows some effectiveness due to  
• partial understanding of the concepts  
• errors and/or omissions in the application of the procedures |
| 30   | Application of knowledge and skills to construct a parallelogram and triangle, each with an area of 36 units squared shows considerable effectiveness due to  
• an understanding of most of the concepts  
• minor errors and/or omissions in the application of the procedures |
| 40   | Application of knowledge and skills to construct a parallelogram and triangle, each with an area of 36 units squared shows a high degree of effectiveness due to  
• a thorough understanding of the concepts  
• an accurate application of the procedures (any minor errors and/or omissions do not detract from the demonstration of a thorough understanding |
On the grid below, construct a parallelogram and a triangle using the darker lines. Each shape must have an area of 36 units².

<table>
<thead>
<tr>
<th>Parallelogram</th>
<th>Triangle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 unit²

Justify your answer with calculations showing that each shape has an area of 36 units².

I know this because I divided $36 \text{ cm}^2$ by 4 and got 9.

Annotation:
Response demonstrates a misunderstanding of concepts; neither shape shown has an area of 36 units² and calculation shown does not match either shape.
**Code 20**

On the grid below, construct a parallelogram and a triangle using the darker lines. Each shape must have an area of 36 units².

<table>
<thead>
<tr>
<th>Parallelogram</th>
<th>Triangle</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 unit²

Justify your answer with calculations showing that each shape has an area of 36 units².

\[
\begin{align*}
\text{Base} \times \text{height} & = 36 \text{ units}^2 \\
9 \times 4 & = 36 \text{ units}^2 \\
\text{Base} \times \text{height} & = 36 \text{ units}^2 \\
6 \times 6 & = 36 \text{ units}^2
\end{align*}
\]

**Annotation:**
Response demonstrates a partial understanding of the concepts; shows an accurate construction of a parallelogram with an area of 36 units² and shows a correct calculation for the area of the parallelogram, but the triangle shown does not have an area of 36 units² and the calculation shown does not match this triangle.
Code 30

On the grid below, construct a parallelogram and a triangle using the darker lines. Each shape must have an area of 36 units$^2$.

<table>
<thead>
<tr>
<th>Parallelogram</th>
<th>Triangle</th>
</tr>
</thead>
</table>

Justify your answer with calculations showing that each shape has an area of 36 units$^2$.

**Parallelogram**

THIS IS THE SAME AS THE ONE UP THERE

\[ 3 \times 12 = 36 \text{ cm}^2 \]

**Triangle**

THIS MODEL IS THE SAME AS THE ONE UP THERE

I'm going to number the squares again.

\[ = 36 \text{ cm}^2 \]

**Annotation:**

Response demonstrates an understanding of most of the concepts; shows accurate constructions of a parallelogram and a triangle with areas of 36 units$^2$ but shows counting to justify areas, instead of calculations.
Question 23

Code 40

On the grid below, construct a parallelogram and a triangle using the darker lines. Each shape must have an area of 36 units².

<table>
<thead>
<tr>
<th>Parallelogram</th>
<th>Triangle</th>
</tr>
</thead>
<tbody>
<tr>
<td>h = 4 cm</td>
<td>h = 8 cm</td>
</tr>
<tr>
<td>b = 9 cm</td>
<td>b = 9 cm</td>
</tr>
</tbody>
</table>

Justify your answer with calculations showing that each shape has an area of 36 units².

\[
A = \text{B} \times \text{h} = 36 \text{cm}^2
\]
\[
= 9 \text{cm} \times 4 \text{cm}
\]
\[
= 36 \text{cm}^2
\]

\[
A = \frac{(\text{B} \times \text{h})}{2} = 36 \text{cm}^2
\]
\[
= \frac{9 \text{cm} \times 8 \text{cm}}{2}
\]
\[
= 72 \text{cm}^2 \div 2
\]
\[
= 36 \text{cm}^2
\]

Annotation:
Response demonstrates a thorough understanding of the concepts; shows accurate constructions of a parallelogram (rectangle) and a triangle with areas of 36 units² and shows correct calculations for their areas.
### Question 24

<table>
<thead>
<tr>
<th>Code</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>• Blank: nothing written or drawn in response to the question</td>
</tr>
</tbody>
</table>
| I    | • Illegible: cannot be read; completely crossed out/erased; not written in English  
  • Irrelevant content: does not attempt assigned question (e.g., comment on the task, drawings, “?””, “!””, “I don’t know”)  
  • Off topic: no relationship of written work to the question |
| 10   | Application of knowledge and skills to determine the smallest amount of paper needed to make the container of popcorn shows limited effectiveness due to  
  • misunderstanding of concepts  
  • incorrect selection or misuse of procedures |
| 20   | Application of knowledge and skills to determine the smallest amount of paper needed to make the container of popcorn shows some effectiveness due to  
  • partial understanding of the concepts  
  • errors and/or omissions in the application of the procedures |
| 30   | Application of knowledge and skills to determine the smallest amount of paper needed to make the container of popcorn shows considerable effectiveness due to  
  • an understanding of most of the concepts  
  • minor errors and/or omissions in the application of the procedures |
| 40   | Application of knowledge and skills to determine the smallest amount of paper needed to make the container of popcorn shows a high degree of effectiveness due to  
  • a thorough understanding of the concepts  
  • an accurate application of the procedures (any minor errors and/or omissions do not detract from the demonstration of a thorough understanding) |
The container of popcorn pictured below is in the shape of a rectangular prism.

What is the smallest amount of paper needed to make this container?

Show your work.

\[14\text{ cm} \times 2 = 28\text{ cm}\]
\[20\text{ cm} \times 2 = 40\text{ cm}\]
\[25 \times 4 = 100\text{ cm}\]

All together there is \(168\text{ cm}^2\) of paper

The smallest amount of paper needed to make this container is \(168\text{ cm}^2\).

Annotation:
Response demonstrates misuse of procedures; incorrectly multiplies dimensions by 2 or 4 with no area calculations of the faces but correctly adds based on error.
Code 20

The container of popcorn pictured below is in the shape of a rectangular prism.

What is the smallest amount of paper needed to make this container?
Show your work.

\[ 20\text{cm} \times 14\text{cm} = 280\text{cm}^2 \]

The smallest amount of paper needed to make this container is \(280\text{cm}^2\).

Annotation:
Response demonstrates omissions in the application of the procedures; accurately calculates the area of one face (280 cm\(^2\)) but omits calculating the area of the other four faces.
The container of popcorn pictured below is in the shape of a rectangular prism.

What is the smallest amount of paper needed to make this container?

Show your work.

\[
\begin{align*}
25 \times 20 &= 500 \text{ cm}^2 \\
25 \times 20 &= 500 \text{ cm}^2 \\
14 \times 25 &= 350 \text{ cm}^2 \\
14 \times 25 &= 350 \text{ cm}^2 \\
\hline
&= 1700 \text{ cm}^2
\end{align*}
\]

The smallest amount of paper needed is 1700 cm\(^2\).
I know because I found the surface area of each side then I added it all up to see how much paper it is to make the container.

The smallest amount of paper needed to make this container is \(1700\) cm\(^2\).

**Annotation:**
Response demonstrates a minor omissions in the application of the procedures; accurately calculates the area of two of the different faces (500 cm\(^2\), 350 cm\(^2\)) and adds the four values to find the total surface area (1700 cm\(^2\)) but omits the calculation for the bottom of the container.
The container of popcorn pictured below is in the shape of a rectangular prism.

What is the smallest amount of paper needed to make this container?

Show your work.

\[
\begin{align*}
1. & \quad 25 \times 20 = 500 \text{ cm}^2 \times 2 = 1000 \text{ cm}^2 \\
2. & \quad 14 \times 25 = 350 \times 2 = 700 \text{ cm}^2 \\
3. & \quad 14 \times 20 = 280 \text{ cm}^2 \\
\end{align*}
\]

The smallest amount of paper needed to make this container is \(1980\) cm\(^2\).

**Annotation:**
Response demonstrates an accurate application of the procedures; accurately calculates the area of the three different faces (500 cm\(^2\), 350 cm\(^2\), 280 cm\(^2\)), multiplies the areas of the faces on the sides by 2 (1000 cm\(^2\), 700 cm\(^2\)) and correctly adds the three values to find the total surface area (1980 cm\(^2\)).