



Grade 6 Assessment of Reading, Writing and Mathematics, 2004–2005

Student Booklet: Mathematics

Scoring Guide

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
U	Any other answer <ul style="list-style-type: none"> • Mary • inappropriate/inaccurate comparisons
A	Application of knowledge and skills shows understanding of concept of rate and ratio. Selects Sarah and shows an appropriate comparison; <ul style="list-style-type: none"> • calculates words per minute (23 vs. 21.75, may or may not be rounded) • relates words typed on a common time (40 minutes)

Question 9 **Code A**

Sarah types 115 words in 5 minutes. Mary types 174 words in 8 minutes.

* Who types faster?

Show your work.

$$\begin{array}{r} \text{Sarah } 23 \\ 5 \overline{)115} \\ \underline{10} \\ 15 \\ \underline{15} \\ 0 \end{array}$$

$$\begin{array}{r} \text{Mary } 21 \\ 8 \overline{)174} \\ \underline{16} \\ 14 \\ \underline{16} \\ 60 \end{array}$$

Sarah types faster.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
U	Any other answer
A	Application of knowledge and skills shows understanding of the relationship between grams and kilograms. Answers 20 bags with appropriate work shown

Question 10 **Code A**

Jessica wants to pour 5 kg of sugar into smaller bags.

* If each bag holds 250 grams, how many bags does she need?

Show your work.

$$\begin{array}{r} 5000 \\ \div 250 \\ \hline 20 \end{array}$$

Jessica needs 20 bags.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of evaluating data shows limited effectiveness due to demonstration of misunderstanding of concepts measures of central tendency or misuse of procedures.
20	Application of knowledge and skills of evaluating data shows some effectiveness due to demonstration of some understanding of the measures of central tendency.
30	Application of knowledge and skills of evaluating data shows considerable effectiveness due to demonstration of an understanding of the concept of median with possible minor errors/omissions in the application of the procedure.
40	Application of knowledge and skills of evaluating data shows a high degree of effectiveness due to a thorough understanding of two of the measures of central tendency involved and providing an accurate response (median 80 and 79). Any errors/omissions in the application of procedures do not detract from a thorough understanding.

Question 11 **Code 10**

Jaspreet is wondering why she made the honour roll but her friend Cynthia did not. She knows that an overall percentage of 80 or higher makes the honour roll. She is not sure if the school uses the mean, median or mode to calculate the percentage.

Jaspreet's Marks
70 73 73 83 78 93 87 85 80.

Cynthia's Marks
87 75 76 84 78 94 70 84 79


* Determine whether the school uses the mean, median or mode to calculate the overall percentage.

Show your work.

Jaspreet's has 5 marks higher than 80. (4 marks lower)

Cynthia's has 4 marks higher than 80. (5 marks lower)

The school uses mean to calculate the overall percentage.



Rationale:
Limited understanding.

Question 11 **Code 20**

Jaspreet is wondering why she made the honour roll but her friend Cynthia did not. She knows that an overall percentage of 80 or higher makes the honour roll. She is not sure if the school uses the mean, median or mode to calculate the percentage.

Jaspreet's Marks
70 73 73 83 78 93 87 85 80


Cynthia's Marks
87 75 76 84 78 94 70 84 79

* Determine whether the school uses the mean, median or mode to calculate the overall percentage.

Show your work.

$\begin{array}{r} 487 \\ 75 \\ 76 \\ 94 \\ 78 \\ 94 \\ 70 \\ 84 \\ + 79 \\ \hline 727 \end{array}$	$\begin{array}{r} 80.7 \\ 97270 \\ - 7270 \\ \hline 0080 \\ - 03 \\ \hline 07 \end{array}$	$\begin{array}{r} 370 \\ 73 \\ 73 \\ 83 \\ 78 \\ 93 \\ 87 \\ 85 \\ + 80 \\ \hline 722 \end{array}$
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The school uses mean to calculate the overall percentage.



Rationale:
Some understanding of mean.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of evaluating data shows limited effectiveness due to demonstration of misunderstanding of concepts measures of central tendency or misuse of procedures.
20	Application of knowledge and skills of evaluating data shows some effectiveness due to demonstration of some understanding of the measures of central tendency.
30	Application of knowledge and skills of evaluating data shows considerable effectiveness due to demonstration of an understanding of the concept of median with possible minor errors/omissions in the application of the procedure.
40	Application of knowledge and skills of evaluating data shows a high degree of effectiveness due to a thorough understanding of two of the measures of central tendency involved and providing an accurate response (median 80 and 79). Any errors/omissions in the application of procedures do not detract from a thorough understanding.

Question 11 **Code 30**

Jaspreet is wondering why she made the honour roll but her friend Cynthia did not. She knows that an overall percentage of 80 or higher makes the honour roll. She is not sure if the school uses the mean, median or mode to calculate the percentage.

Jaspreet's Marks
 70 73 73 85 78 93 87 85 80

Cynthia's Marks
 87 75 76 84 78 94 70 84 79

* Determine whether the school uses the mean, median or mode to calculate the overall percentage.

Show your work.

Jaspreet
 70, 73, 73, 78, 80, 83, 85, 87, 93

Cynthia
 70, 75, 76, 78, 79, 84, 84, 87, 94

Median

The school uses the median to calculate the overall percentage.

Rationale:
 Only median completed.

Question 11 **Code 40**

Jaspreet is wondering why she made the honour roll but her friend Cynthia did not. She knows that an overall percentage of 80 or higher makes the honour roll. She is not sure if the school uses the mean, median or mode to calculate the percentage.

Jaspreet's Marks
 70 73 73 83 78 93 87 85 80

Cynthia's Marks
 87 75 76 84 78 94 70 84 79

* Determine whether the school uses the mean, median or mode to calculate the overall percentage.

Show your work.

mean = 70 Jaspreet

$$\begin{array}{r} 80 \cdot 2 \\ 70 \\ \hline 160 \\ 160 \div 9 = 17 \cdot 7 \\ \hline 153 \\ \hline 7 \end{array}$$

mean = 80.7 Cynthia

$$\begin{array}{r} 80 \cdot 7 \\ 80 \\ \hline 6448 \\ 6448 \div 80 = 80 \cdot 7 \\ \hline 6456 \\ \hline 8 \end{array}$$

median = 80
 70, 73, 73, 78, 80, 83, 85, 87, 93

median = 79
 70, 75, 76, 78, 79, 84, 84, 87, 94

The school uses median to calculate the overall percentage.

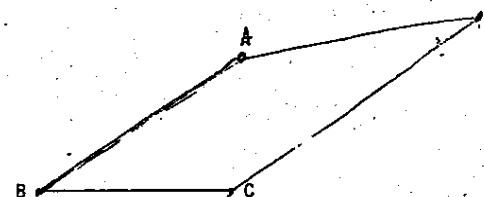
Rationale:
 Two measures of central tendency completed accurately.

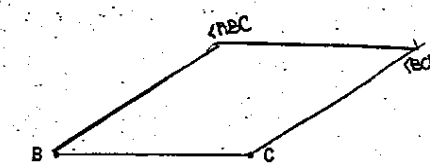
Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows limited effectiveness by providing a construction that demonstrates a misunderstanding of concepts or misuse of procedures.
20	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows some effectiveness by providing a construction with errors/omissions in the application of the procedures.
30	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows considerable effectiveness by providing a construction with minor errors in the application of the procedures.
40	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows a high degree of effectiveness by providing an accurate construction (any errors do not detract from the demonstration of a thorough understanding).

Question 12	Code 10
<p>Follow the instructions below to create a polygon. You will need a protractor and a ruler. Start with the line BC below.</p> <ol style="list-style-type: none"> 1) At Point B, use a protractor to create an angle of 30° with sides measuring 5 cm each. 2) Label it $\angle ABC$. 3) At Point C, create an angle of 150° and label it $\angle BCD$. 4) Connect Point D to Point A, with a 5 cm line to complete the polygon. 	
<p>What is the name of this type of polygon? <u>Trapezoid</u></p>	
<p>Rationale: Errors in use of tools. No angles accurate, no lines accurate</p>	

Question 12	Code 20
<p>Follow the instructions below to create a polygon. You will need a protractor and a ruler. Start with the line BC below.</p> <ol style="list-style-type: none"> 1) At Point B, use a protractor to create an angle of 30° with sides measuring 5 cm each. 2) Label it $\angle ABC$. 3) At Point C, create an angle of 150° and label it $\angle BCD$. 4) Connect Point D to Point A, with a 5 cm line to complete the polygon. 	
<p>What is the name of this type of polygon? <u>Triangle</u></p>	
<p>Rationale: Inconsistent use of protractor.</p>	

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows limited effectiveness by providing a construction that demonstrates a misunderstanding of concepts or misuse of procedures.
20	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows some effectiveness by providing a construction with errors/omissions in the application of the procedures.
30	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows considerable effectiveness by providing a construction with minor errors in the application of the procedures.
40	Application of knowledge and skills of constructing 2D shapes using specific measures of angles and sides shows a high degree of effectiveness by providing an accurate construction (any errors do not detract from the demonstration of a thorough understanding).


Question 12	Code 30
<p>Follow the instructions below to create a polygon. You will need a protractor and a ruler. Start with the line BC below.</p> <ol style="list-style-type: none"> At Point B, use a protractor to create an angle of 30° with sides measuring 5 cm each. Label it $\angle ABC$. At Point C, create an angle of 150° and label it $\angle BCD$. Connect Point D to Point A with a 5 cm line to complete the polygon. 	
 <p>What is the name of this type of polygon? <u>Rhombus</u> (spelling is probably wrong) (parallelogram)</p>	
<p>Rationale: Minor error in use of ruler.</p>	

Question 12	Code 40
<p>Follow the instructions below to create a polygon. You will need a protractor and a ruler. Start with the line BC below.</p> <ol style="list-style-type: none"> At Point B, use a protractor to create an angle of 30° with sides measuring 5 cm each. Label it $\angle ABC$. At Point C, create an angle of 150° and label it $\angle BCD$. Connect Point D to Point A with a 5 cm line to complete the polygon. 	
 <p>What is the name of this type of polygon? <u>A parallelogram</u></p>	
<p>Rationale: Labeling is not considered.</p>	

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Problem solving process shows a limited degree of effectiveness due to minimal evidence of a solution process, too much emphasis placed on unimportant elements.
20	Problem solving process shows some degree of effectiveness due to a solution process that is incomplete, identification of some of the important elements.
30	Problem solving process shows a considerable degree of effectiveness due to a solution process that is nearly complete, identification of most of the important elements and provides a considerable understanding of the relationships between important elements of the problem.
40	Problem solving process shows a high degree of effectiveness due to a complete solution process, identification of all important elements and appropriate conclusions.

Question 13 **Code 10**

Sharon works at the local gym. She must buy number stickers to label the lockers in the change rooms. Stickers are sold as individual digits. There are 79 lockers, which will be labelled 1 to 79.



* How many stickers of each digit should she buy?


Show your work.

① - 18	8 - 7
② - 18	9 - 7
③	
↓	
⑦ 18	

Rationale:
Minimal evidence of a solution process.

Question 13 **Code 20**

Sharon works at the local gym. She must buy number stickers to label the lockers in the change rooms. Stickers are sold as individual digits. There are 79 lockers, which will be labelled 1 to 79.



* How many stickers of each digit should she buy?

Show your work.

0 10, 20, 30, 40, 50, 60, 70

1 1, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 31, 41, 51, 61, 71

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

Rationale:
Process shows some degree of effectiveness but it is incomplete.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Problem solving process shows a limited degree of effectiveness due to minimal evidence of a solution process, too much emphasis placed on unimportant elements.
20	Problem solving process shows some degree of effectiveness due to a solution process that is incomplete, identification of some of the important elements.
30	Problem solving process shows a considerable degree of effectiveness due to a solution process that is nearly complete, identification of most of the important elements and provides a considerable understanding of the relationships between important elements of the problem.
40	Problem solving process shows a high degree of effectiveness due to a complete solution process, identification of all important elements and appropriate conclusions.

Question 13 **Code 30**

Sharon works at the local gym. She must buy number stickers to label the lockers in the change rooms. Stickers are sold as individual digits. There are 79 lockers, which will be labelled 1 to 79.

* How many stickers of each digit should she buy?

Show your work.

0's

1's

2's

3's

4's

5's

6's

7's

8's

9's

10's

11's

12's

13's

14's

15's

16's

17's

18's

19's

To label locker 19 Sharon buys two stickers 1 and 9.

Rationale:
 Nearly completed process (did not count all of the 10s).

Question 13 **Code 40**

Sharon works at the local gym. She must buy number stickers to label the lockers in the change rooms. Stickers are sold as individual digits. There are 79 lockers, which will be labelled 1 to 79.

* How many stickers of each digit should she buy?

Show your work.

1		= 18
2		= 18
3		= 18
4		= 18
5		= 18
6		= 18
7		= 18
8		= 7
9		= 7
0		= 7

18-1's 78's

18-2's 79's

18-3's 70's

18-4's

18-5's

18-6's

18-7's

Rationale:
 Minor error only for 8 and 9.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of estimating money amounts shows limited effectiveness due to a misunderstanding of concepts or a misuse of procedures.
20	Application of knowledge and skills of estimating money amounts shows some effectiveness by rounding the sales prior to totaling. Errors/omissions in the application of procedures.
30	Application of knowledge and skills of estimating money amounts shows considerable effectiveness by rounding most of the sales appropriately to 100 or 1000 prior to totaling. Minor errors/omissions in the application of procedures.
40	Application of knowledge and skills of estimating money amounts shows a high degree of effectiveness by rounding consistently and appropriately to either 100 or 1000 prior to totaling and providing an accurate response. Any errors/omissions in the application of procedures do not detract from a thorough understanding.

Question 30	Code 10
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A department store's sales for one week are listed below.

Clothing	\$3240.00
Cosmetics	\$900.00
Hardware	\$2521.00
Appliances	\$583.00
Other	\$1011.00

* Estimate the total sales for the week.

Explain your estimation strategy.

\$3240.00	
\$900.00	
\$2521.00	
\$1011.00	
\$7672.00	

I added all the sales then estimated to the nearest 1000

My estimate is \$8000.00

Rationale:
 Misunderstanding the concept of estimating.

Question 30	Code 20
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A department store's sales for one week are listed below.

Clothing	\$3240.00
Cosmetics	\$900.00
Hardware	\$2521.00
Appliances	\$583.00
Other	\$1011.00

* Estimate the total sales for the week.

Explain your estimation strategy.

23240	
900	
2520	
580	
1010	
8250	

I rounded off the sales. Then I add the rounded prices.

My estimate is 8250

Rationale:
 Some effectiveness in rounding.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of estimating money amounts shows limited effectiveness due to a misunderstanding of concepts or a misuse of procedures.
20	Application of knowledge and skills of estimating money amounts shows some effectiveness by rounding the sales prior to totaling. Errors/omissions in the application of procedures.
30	Application of knowledge and skills of estimating money amounts shows considerable effectiveness by rounding most of the sales appropriately to 100 or 1000 prior to totaling. Minor errors/omissions in the application of procedures.
40	Application of knowledge and skills of estimating money amounts shows a high degree of effectiveness by rounding consistently and appropriately to either 100 or 1000 prior to totaling and providing an accurate response. Any errors/omissions in the application of procedures do not detract from a thorough understanding.

Question 30 **Code 30**

A department store's sales for one week are listed below.

Clothing	\$3240.00
Cosmetics	\$900.00
Hardware	\$2521.00
Appliances	\$583.00
Other	\$1011.00

* Estimate the total sales for the week.

Explain your estimation strategy.

I round to the nearest thousand dollar.

clothing = \$3000.00 \$3000.00
 cosmetics = \$900.00 \$900.00
 Hardware = \$3000.00 \$3000.00
 Appliances \$600.00 \$600.00
 Other \$1000.00 \$1000.00

\$8500.00

My estimate is \$8500.00.

Rationale:
 Inconsistent rounding (using both 100's and 1000's)

Question 30 **Code 40**

A department store's sales for one week are listed below.

Clothing	\$3240.00
Cosmetics	\$900.00
Hardware	\$2521.00
Appliances	\$583.00
Other	\$1011.00

* Estimate the total sales for the week.

Explain your estimation strategy.

I raised \$3240.00 to \$3000.00
 I raised \$900.00 to \$1000.00
 I raised \$2521.00 to \$3000.00
 I raised \$583.00 to \$1000.00
 I lowered \$1011.00 to \$1000.00

\$9000.00

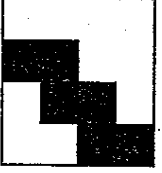

My estimate is \$9000.00.

Rationale:
 All rounded accurately to thousands.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows limited effectiveness by demonstrating a misunderstanding of the concept of fractions.
20	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows some effectiveness by recognizing the fraction(s) shaded with errors/omissions in one diagram.
30	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows considerable effectiveness by recognizing equivalence of $\frac{3}{8}$ to the fraction shaded in one diagram with minor errors or justification omitted for other diagram.
40	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows a high degree of effectiveness by recognizing and justifying equivalence of $\frac{3}{8}$ to the fraction shaded in each diagram.

Question 31 **Code 10**

Connor states that, for both diagrams, the shaded parts represent $\frac{3}{8}$ of the whole figure.

* Is Connor correct?



Justify your answer.

Connor is not correct.
 The first graph has 6 shaded parts
 and the second has $\frac{3}{12}$ or $\frac{1}{4}$

Rationale:
 Misunderstanding of fraction concepts

Question 31 **Code 20**

Connor states that, for both diagrams, the shaded parts represent $\frac{3}{8}$ of the whole figure.

* Is Connor correct?

Justify your answer.

The first diagram is divided into 16 parts
 The second one is divided into 12 parts
 Shaded (no: 1) = $\frac{6}{16} = \frac{3}{8}$
 Shaded (no: 2) $\frac{3}{12} = \frac{1}{4}$
 He is wrong, because second one is $\frac{1}{4}$

Rationale:
 Error in denominator, $\frac{3}{12}$, for diagram 2.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
10	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows limited effectiveness by demonstrating a misunderstanding of the concept of fractions.
20	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows some effectiveness by recognizing the fraction(s) shaded with errors/omissions in one diagram.
30	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows considerable effectiveness by recognizing equivalence of $\frac{3}{8}$ to the fraction shaded in one diagram with minor errors or justification omitted for other diagram.
40	Application of knowledge and skills of comparing fractions to $\frac{3}{8}$ shows a high degree of effectiveness by recognizing and justifying equivalence of $\frac{3}{8}$ to the fraction shaded in each diagram.

Question 31 **Code 30**

Connor states that, for both diagrams, the shaded parts represent $\frac{3}{8}$ of the whole figure.

Fig. A

$\frac{6}{16}$

Fig. B

$\frac{3}{8}$

* Is Connor correct?

Justify your answer.

Yes, because the fraction for Fig. A is $\frac{6}{16}$, which is $\frac{3}{8}$ when put in simplest form.

$$\frac{6 \div 2}{16 \div 2} = \frac{3}{8}$$

Rationale:
Omission of justification for the second diagram

Question 31 **Code 40**

Connor states that, for both diagrams, the shaded parts represent $\frac{3}{8}$ of the whole figure.

* Is Connor correct?

Justify your answer. Yes, Connor is correct. I know this because there is eight groups in each and three of each group is shaded.

Rationale:
Combines parts to make equal size sections.

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
U	Any other answer
A	Demonstration of understanding of concept of congruent triangles. Selects only triangle ABC and triangle GHJ

Question 32 **Code A**

Lindsay is cutting triangles to use in making some paper crafts. She notices that some of the triangles are exactly the same.

* Find the congruent triangles.

Justify your answer.

ABC and GHJ

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
U	Any other answer
A	Answers 2, 4, 6, 8

Question 33

Code A

A. J. notices a pattern in the vertical posts and horizontal boards in his fence. He counts the number of vertical posts, then subtracts one and multiplies by two to find the number of horizontal boards.

* Fill in the table below to show the number of horizontal boards.

Number of Vertical Posts	Number of Horizontal Boards
2	2
3	4
4	6
5	8

Code	Description
B	Blank – nothing written or drawn in response
I	Illegible, Irrelevant, Off Topic
U	Any other answer <ul style="list-style-type: none"> • answers yes • chooses any other day than day 4 to explain
A	Demonstration of understanding of concepts to interpret data accurately. Indicates Gary is wrong and refers to Day 4 with accurate reasoning.

Question 34 **Code A**

Gary and Chris record the number of cars that pass their houses over 5 days. The results are shown below.

Number of Cars Passing Gary's and Chris' Houses

Day	Gary (Number of Cars)	Chris (Number of Cars)
1	10	5
2	20	5
3	16	6
4	15	10
5	12	4

Gary says that each day the number of cars that pass his house is at least two times the number of cars that pass Chris' house.
 Is Gary correct?

Explain your answer:

No, Day 4 Chris has alot more than half of Gary.