Primary-Term 1

EQAO
Multiple Choice &
Open Response
Questions

$(a + b)^2 = a^2 + 2ab + b^2$
This resource contains EQAO Multiple Choice (MC) and Open Response (OR) questions from the assessment years 2009-2010, 2010-2011 and 2011-2012. All questions from these past assessments were aligned with either Term 1 or Term 2, according to the HWDSB Delivery Plan.

**In the table of contents, the following items are highlighted:**

- Strand
- Knowledge/Skills Category – Knowledge/Understanding, Thinking/Problem Solving, Application
- EQAO Assessment Year
- Section of Mathematics Assessment Booklet (1 or 2)
- Correct answer

EQAO testing is an educational reality for students and teachers in HWDSB, so this resource is meant to help teachers prepare students for that reality. In conjunction with other Math resources (Nelson, Pearson, Leaps and Bounds, Guides to Effective Instruction, etc.), this document can be incorporated into the teaching and learning of mathematics.

**Making Student Thinking Visible**

When looking at multiple choice questions, the authors of *Beyond the Bubble* say that teachers may assume that if a student marks a correct answer, that student understands the corresponding skill or concept. However, a correct answer can often mask fragile knowledge or misconceptions. The inverse situation can also be true. If a student marks an incorrect answer, that student may be in need of further instruction, or perhaps the student may have just misread the problem. Both “correct” and “incorrect” answers reveal little about what a student truly does or does not understand.

When asked to justify their answer, students must communicate their ideas in order to make their thinking visible. This process helps them “show how they know.”

This insight into a student’s thinking provides teachers with valuable insight, uncovering understanding and misconceptions, which in turn allows teachers to make more effective instructional decisions as they consider what each of their students need next.

**The Three-Part Lesson**

Multiple choice and open response questions can be included in all three parts of a Three-Part Math Lesson.

During the “Getting Started,” a multiple choice question could be used to activate prior knowledge from a previous lesson.

Either type of question could be used effectively during the “Working On It” portion as a task done by small groups, partners or independently.

During the “Reflect and Connect,” teachers could use a multiple choice question as an exit card to gain further insight into the understanding of individual students and the entire class. This additional insight informs their next instructional move for the whole class and allows for differentiated instruction for individual students.
**Links To Assessment**

Student responses from both multiple choice and open response questions can be used as assessment for, as and of learning. An important part of using Multiple Choice and Open Response questions, involves teachers engaging in solving the question in a variety of ways prior to the lesson. This enables teachers to anticipate student thinking and the multiple ways students may choose to solve the question. As well, this lets teachers anticipate and plan the possible questions they could ask to stimulate student thinking and deepen student understanding. In addition this provides teachers an opportunity to explore what tools and strategies students may access to solve a problem. When teachers anticipate student responses, success criteria can be aligned and used as the basis of providing students with descriptive feedback.

*The Third Teacher* monograph affirms that, “As we validate student thinking at all points of the continuum of learning, we build self-efficacy.” In addition, it states “As we assess student work, we need to shift our focus from the answer being the point of discussion to the processes and strategies.” When student-teacher dialogue is centered on student solutions and interpretations, it supports the idea that concepts and strategies are connected to one another and that there are multiple ways to view a problem.

**Questioning**

Through questioning students’ ideas, teachers gain more insight into their thinking. Questioning and dialogue, between teacher and student as well as between student and student, also helps to deepen student understanding.

Probing Questions/Prompts:
- How do you know that?
- Tell me more about this.
- Explain how your answer makes sense.
- What did you do to check your answer?
- Re-state the question in your own words.
- Are there any words in the question that you don’t understand?
- How can a picture help you solve this problem?
- How could you use a picture to help you solve the problem?
- What do you know about ________________?
- What is the problem asking you?
- What is this problem asking you to do?
- What strategies can you use to solve this problem?
- What’s a second way you can show your thinking?
- What have you learned before that could help you solve this problem?

**Links to the Achievement Chart**

Each of the multiple choice and open response questions is linked to the achievement chart.

EQAO categorizes multiple choice questions into three types:
- Knowledge/Understanding
- Thinking/Problem Solving
- Application

Open response questions are categorized into two types:
- Thinking/Problem Solving
- Application
**Knowledge/Understanding** questions require students to demonstrate specific content (Knowledge) and the comprehension of its meaning and significance (Understanding). Students are required to select and sequence a variety of tools to solve a problem, demonstrate a critical thinking process to answer a question, and make a plan when answering **Thinking/Problem Solving** questions. EQAO classifies **Application** questions as those which require students to select the appropriate “tool” to get the necessary information and “fit” it to the problem.

**“Show Your Work” and “Justify Your Thinking”**

According to EQAO, both prompts require students to produce more than just an answer, providing a window into their thinking. **Show your work** is used as a prompt when calculations are required. **Justify your thinking** is used to provide students with a more open-ended way of showing their thinking. This thinking could include calculations.

**References:**


# EQAO Multiple Choice and Open Response Questions Term 1

## Number Sense and Numeration

<table>
<thead>
<tr>
<th>Page</th>
<th>Knowledge/Skill Category</th>
<th>Assessment Year</th>
<th>Section</th>
<th>Correct Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Thinking/Problem Solving</td>
<td>2011-2012</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>9</td>
<td>Thinking/Problem Solving</td>
<td>2011-2012</td>
<td>2</td>
<td>a</td>
</tr>
<tr>
<td>10</td>
<td>Application</td>
<td>2011-2012</td>
<td>2</td>
<td>c</td>
</tr>
<tr>
<td>11</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>12</td>
<td>Thinking/Problem Solving</td>
<td>2010-2011</td>
<td>1*</td>
<td>c</td>
</tr>
<tr>
<td>13</td>
<td>Application</td>
<td>2011-2012</td>
<td>1*</td>
<td>b</td>
</tr>
<tr>
<td>14</td>
<td>Application</td>
<td>2010-2011</td>
<td>1*</td>
<td>c</td>
</tr>
<tr>
<td>15</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>16</td>
<td>Application</td>
<td>2010-2011</td>
<td>1*</td>
<td>c</td>
</tr>
<tr>
<td>17</td>
<td>Application</td>
<td>2010-2011</td>
<td>1*</td>
<td>d</td>
</tr>
<tr>
<td>18</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>1*</td>
<td>b</td>
</tr>
<tr>
<td>19</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>20</td>
<td>Application</td>
<td>2009-2010</td>
<td>1*</td>
<td>c</td>
</tr>
<tr>
<td>21</td>
<td>Application</td>
<td>2009-2010</td>
<td>1</td>
<td>b</td>
</tr>
<tr>
<td>22</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>23</td>
<td>Application</td>
<td>2009-2010</td>
<td>1*</td>
<td>a</td>
</tr>
<tr>
<td>24</td>
<td>Application</td>
<td>2011-2012</td>
<td>1*</td>
<td>d</td>
</tr>
<tr>
<td>25</td>
<td>Thinking/Problem Solving</td>
<td>2011-2012</td>
<td>2</td>
<td>OR</td>
</tr>
<tr>
<td>26</td>
<td>Application</td>
<td>2011-2012</td>
<td>1</td>
<td>OR</td>
</tr>
<tr>
<td>27</td>
<td>Thinking/Problem Solving</td>
<td>2010-2011</td>
<td>1</td>
<td>OR</td>
</tr>
<tr>
<td>28</td>
<td>Application</td>
<td>2010-2011</td>
<td>1</td>
<td>OR</td>
</tr>
<tr>
<td>29</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>1</td>
<td>OR</td>
</tr>
</tbody>
</table>

1*=Section 1; no manipulatives provided  OR=Open Response
## Measurement

<table>
<thead>
<tr>
<th>Page</th>
<th>Knowledge/Skill Category</th>
<th>Assessment Year</th>
<th>Section</th>
<th>Correct Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>1</td>
<td>d</td>
</tr>
<tr>
<td>31</td>
<td>Application</td>
<td>2011-2012</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>32</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>33</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>2</td>
<td>c</td>
</tr>
<tr>
<td>34</td>
<td>Application</td>
<td>2011-2012</td>
<td>2</td>
<td>c</td>
</tr>
<tr>
<td>35</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>2</td>
<td>a</td>
</tr>
<tr>
<td>36</td>
<td>Thinking/Problem Solving</td>
<td>2010-2011</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>37</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>38</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>2</td>
<td>a</td>
</tr>
<tr>
<td>39</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>40</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>41</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>1</td>
<td>a</td>
</tr>
<tr>
<td>42</td>
<td>Application</td>
<td>2009-2010</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>43</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>44</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>1</td>
<td>d</td>
</tr>
<tr>
<td>45</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>1</td>
<td>a</td>
</tr>
<tr>
<td>46</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>47</td>
<td>Application</td>
<td>2009-2010</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>48</td>
<td>Thinking/Problem Solving</td>
<td>2011-2012</td>
<td>2</td>
<td>OR</td>
</tr>
<tr>
<td>49</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>1</td>
<td>OR</td>
</tr>
</tbody>
</table>

## Patterning and Algebra

<table>
<thead>
<tr>
<th>Page</th>
<th>Knowledge/Skill Category</th>
<th>Assessment Year</th>
<th>Section</th>
<th>Correct Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Application</td>
<td>2010-2011</td>
<td>1*</td>
<td>d</td>
</tr>
<tr>
<td>51</td>
<td>Thinking/Problem Solving</td>
<td>2010-2011</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>52</td>
<td>Application</td>
<td>2011-2012</td>
<td>1*</td>
<td>a</td>
</tr>
<tr>
<td>53</td>
<td>Thinking/Problem Solving</td>
<td>2011-2012</td>
<td>1*</td>
<td>c</td>
</tr>
<tr>
<td>54</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>Page</td>
<td>Knowledge/Skill Category</td>
<td>Assessment Year</td>
<td>Section</td>
<td>Correct Answer</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------</td>
<td>-----------------</td>
<td>---------</td>
<td>----------------</td>
</tr>
<tr>
<td>55</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>1</td>
<td>b</td>
</tr>
<tr>
<td>56</td>
<td>Application</td>
<td>2011-2012</td>
<td>1*</td>
<td>b</td>
</tr>
<tr>
<td>57</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>58</td>
<td>Application</td>
<td>2010-2011</td>
<td>2</td>
<td>c</td>
</tr>
<tr>
<td>59</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>60</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>1</td>
<td>b</td>
</tr>
<tr>
<td>61</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>1</td>
<td>d</td>
</tr>
<tr>
<td>62</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>1*</td>
<td>d</td>
</tr>
<tr>
<td>63</td>
<td>Application</td>
<td>2009-2010</td>
<td>2</td>
<td>a</td>
</tr>
<tr>
<td>64</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>65</td>
<td>Application</td>
<td>2009-2010</td>
<td>1*</td>
<td>b</td>
</tr>
<tr>
<td>66</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>67</td>
<td>Application</td>
<td>2011-2012</td>
<td>1</td>
<td>OR</td>
</tr>
<tr>
<td>68</td>
<td>Application</td>
<td>2010-2011</td>
<td>2</td>
<td>OR</td>
</tr>
<tr>
<td>69</td>
<td>Application</td>
<td>2009-2010</td>
<td>2</td>
<td>OR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page</th>
<th>Knowledge/Skill Category</th>
<th>Assessment Year</th>
<th>Section</th>
<th>Correct Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>Knowledge/Understanding</td>
<td>2011-2012</td>
<td>2</td>
<td>d</td>
</tr>
<tr>
<td>71</td>
<td>Application</td>
<td>2010-2011</td>
<td>2</td>
<td>b</td>
</tr>
<tr>
<td>72</td>
<td>Knowledge/Understanding</td>
<td>2010-2011</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>73</td>
<td>Knowledge/Understanding</td>
<td>2009-2010</td>
<td>2</td>
<td>a</td>
</tr>
<tr>
<td>74</td>
<td>Application</td>
<td>2009-2010</td>
<td>1</td>
<td>c</td>
</tr>
<tr>
<td>75</td>
<td>Thinking/Problem Solving</td>
<td>2011-2012</td>
<td>1</td>
<td>OR</td>
</tr>
<tr>
<td>76</td>
<td>Application</td>
<td>2011-2012</td>
<td>2</td>
<td>OR</td>
</tr>
<tr>
<td>77</td>
<td>Thinking/Problem Solving</td>
<td>2010-2011</td>
<td>2</td>
<td>OR</td>
</tr>
<tr>
<td>78</td>
<td>Thinking/Problem Solving</td>
<td>2009-2010</td>
<td>2</td>
<td>OR</td>
</tr>
</tbody>
</table>

1*=Section 1; no manipulatives provided   OR=Open Response
Popsicle sticks are packaged in boxes of 500.

Meagan needs 100 popsicle sticks to build 1 tower. She has 2 boxes of popsicle sticks.

How many towers can she build using all of the popsicle sticks?

- 5
- 10
- 100
- 200

Show how you know
4. Look at the set of base-ten blocks pictured below.

Which of the following sets of base-ten blocks combines with this set to represent 581?

Show how you know

Strand: Number Sense and Numeration
Knowledge/Skill Category: Thinking/Problem Solving
2 Omar buys a box of pencil crayons for $1.05 and a box of markers for $3.27.

Which set of coins shows exactly how much Omar needs to buy both items?

- [ ]
- [ ]
- [ ]
- [ ]
- [ ]

Show how you know
Which set of numbers is listed in order from smallest to largest?

- 479, 794, 749
- 974, 794, 749
- 479, 749, 794
- 974, 749, 794

Show how you know
3 Tim has 4 bags with 6 marbles in each bag. Vicki has 5 bags with 2 marbles in each bag.

How many more marbles does Tim have than Vicki?

- 24
- 20
- 14
- 10

Show how you know
Steve has 48 stickers and Sam has 34 stickers.

Which is closest to the number of stickers they have altogether?

- 90
- 80
- 70
- 50

Show how you know
4 Which of the following has the same value as $38 + 29$?

- $40 + 30$
- $30 + 20 + 7$
- $30 + 20 + 17$
- $40 + 20 + 8 + 9$

Show how you know
Wilbur has 57 pattern blocks.

Which number is closest to the number of pattern blocks Wilbur has?

- 50
- 60
- 70
- 100

Show how you know
6 Ozzy has 5 dollars in quarters.

How many quarters does he have?

- 4
- 5
- 20
- 25

Show how you know
Charlotte buys a book with the coins below.

Mrs. Reuben buys 3 of the same book.

How much money does Mrs. Reuben spend?

- $1.68
- $1.78
- $2.47
- $2.67

Show how you know
Steve is buying the school supplies shown below.

If Steve pays with a dollar, about how much change should he receive?

- 10¢
- 20¢
- 70¢
- 80¢

Show how you know
Which of the following represents the number 246?

Show how you know
3 Which number line is labelled correctly?

○

100 150 175 200 250 300

○

100 175 200 250 300

○

100 125 175 200 225 300

○

100 125 175 200 225 300

Show how you know

Strand: Number Sense and Numeration
Knowledge/Skill Category: Application
Emily spends the money shown below on a beach ball and a toy car.

Beach Ball

Toy Car

How much does she spend on these two items?

- $7.13
- $8.23
- $8.43
- $9.23

Show how you know
Susan has the coins below. She needs $8.00 to buy a book.

Which of the following sets of coins does Susan need to make a total of $8.00?

-  
-  
-  
-  
-  

Show how you know
4. An elementary school has a total of 635 students. There are 362 girls. How many boys are there?

- 273
- 333
- 373
- 997

Show how you know
1 Look at the pattern below.

92, 90, 88, __, 84, 82, __

Which numbers are missing from this pattern?

- 87, 81
- 87, 80
- 86, 81
- 86, 80

Show how you know
There are 3 bins of books in a classroom. The number of books in each bin is shown in the picture below.

![Bins with numbers: 23, 37, 56]

Kyle takes all the books out of the bins and puts them into piles of 10. How many piles of 10 can Kyle make with all the books?
Justify your answer.

Kyle can make ________ piles of 10 books.

Strand: Number Sense and Numeration
Knowledge/Skill Category: Thinking/Problem Solving
Abdul has the 7 coins shown below.

Cindy has fewer than 7 coins.
Sanjeet has more than 7 coins.

Cindy and Sanjeet have the same amount of money as Abdul.

Use the chart below to show the coins that Cindy and Sanjeet could have.

<table>
<thead>
<tr>
<th>Cindy's coins (fewer than 7)</th>
<th>Sanjeet's coins (more than 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ratna makes a table to show the number of seeds she collects in 3 days.

<table>
<thead>
<tr>
<th>Day</th>
<th>Number of seeds collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>124</td>
</tr>
<tr>
<td>Tuesday</td>
<td>?</td>
</tr>
<tr>
<td>Wednesday</td>
<td>254</td>
</tr>
</tbody>
</table>

Ratna collects a total of 534 seeds.

How many seeds does she collect on Tuesday?

Show your work.

Ratna collects _____ seeds on Tuesday.
A frog jumps a distance of 25 cm on each jump.

If the frog jumps 6 times, how far does it travel?
Show your work.

The frog travels _________ cm.
Miro gives away the same number of stickers each day.

On Day 1 he has 98 stickers.

On Day 2 he has 93 stickers.

On what day will he have exactly 63 stickers?

Show your work.

Miro will have exactly 63 stickers on Day ________.
12 Which is the best estimate of the height from the floor to the doorknob on a classroom door?

- 1 cm
- 9 cm
- 10 cm
- 90 cm

Show how you know
15 Which list shows the lengths from shortest to longest?

- 2 m; 50 m; 300 cm
- 50 m; 300 cm; 2 m
- 300 cm; 50 m; 2 m
- 2 m; 300 cm; 50 m

Show how you know
18. Joel helps his mom for 1 hour.

For how many minutes does Joel help his mom?

- 24
- 30
- 60
- 100

Show how you know
3 Look at the time shown in the box below.

11:40

Which of the following clocks shows the same time as the time in the box?

- [ ]

- [ ]

- [ ]

- [ ]
17 Look at the square below.

What is the perimeter of this square?

- 6 cm
- 12 cm
- 24 cm
- 36 cm

Show how you know
18 Which is the most appropriate unit to measure the length of a school bus?

- metre
- kilogram
- kilometre
- centimetre
Each time Haden practises piano, he plays for 15 minutes.

How many times does he practise if he plays for a total of 2 hours?

- 4
- 8
- 15
- 30
Peter notices that the puddles outside are starting to freeze.

Which of the following could be the temperature outside?

- 20 °C
- 10 °C
- 5 °C
- 0 °C

Show how you know
24 Which of the following is a good estimate of the height of a classroom door?

- 2 m
- 4 cm
- 6 m
- 8 cm

Show how you know
21 Rasheed’s brother is 6 weeks old. How many days old is Rasheed’s brother?

- 6 days
- 30 days
- 42 days
- 72 days

Show how you know
Which clock shows 10:45?

- [ ]

- [ ]

- [ ]

- [ ]

Show how you know
15 Which thermometer shows 16 °C?

○

○

○

○
10. Which list shows the lengths from shortest to longest?
   
   - 1 m 50 cm; 140 cm; 1 m
   - 1 m; 1 m 50 cm; 140 cm
   - 140 cm; 1 m 50 cm; 1 m
   - 1 m; 140 cm; 1 m 50 cm
Luke’s baby sister is 36 days old. About how many weeks old is Luke’s sister?

○ 1
○ 5
○ 6
○ 7

Show how you know
Look at the clock below.

What time is shown on the clock?

- 10:15
- 3:50
- 3:10
- 2:50

Show how you know
Jeremy measures the lengths of some objects and records them in the table below.

<table>
<thead>
<tr>
<th>Objects Measured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>Eraser</td>
</tr>
<tr>
<td>Pencil</td>
</tr>
<tr>
<td>Desk</td>
</tr>
</tbody>
</table>

Which unit does Jeremy use to measure the objects?

- [ ] centimetre
- [ ] kilometre
- [ ] metre
- [ ] litre

Show how you know
23 How many minutes are in 1 hour?

- 7
- 24
- 30
- 60

Show how you know
Look at the shape below.

What is the perimeter of the shape?

- 16 cm
- 21 cm
- 23 cm
- 24 cm

Show how you know
Deepak reads for 30 minutes each night before bed.
After 2 weeks, has Deepak read for more than 6 hours?

Circle one: Yes  No

Justify your answer.
Lorenzo’s top shelf is 3 m high.

He can reach a height of 180 cm.

He stands on a box that is 95 cm tall.

Can Lorenzo now reach his top shelf?
Circle one: Yes  No

Justify your answer.
1. Gregory creates the pattern shown below.

2, 9, __, 23, 30, 37, ____, ____, 58

What three numbers are missing from the pattern?

- 15, 43, 49
- 15, 44, 51
- 16, 43, 57
- 16, 44, 51

Show how you know
17 Look at the shaded number pattern on the chart below.

<table>
<thead>
<tr>
<th></th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

Which of the following charts shows a pattern that uses the same rule?

- [ ] 
  | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
  | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
  | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

- [ ] 
  | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
  | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
  | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

- [ ] 
  | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
  | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
  | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

- [ ] 
  | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
  | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
  | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

Strand: Patterning and Algebra
Knowledge/Skill Category: Thinking/Problem Solving
4. The marbles in the bags on the scale below are all the same size and mass. The scale is balanced.

How many marbles are in the shaded bag?

- 13
- 17
- 52
- 91

Show how you know
6 Look at the growing pattern below.

3, __, __, __, 19

The pattern goes up by the same number each time.

What are the missing numbers?

○ 4, 5, 6
○ 6, 9, 12
○ 7, 11, 15
○ 8, 13, 18

Show how you know
Look at the number sentence below.

\[ 30 - 21 = 9 \]

Which of the following number sentences belongs to the same fact family?

- \[ 12 - 9 = 3 \]
- \[ 21 - 12 = 9 \]
- \[ 21 + 9 = 30 \]
- \[ 12 + 21 = 33 \]
Lily creates a number pattern. She starts at 95 and subtracts 5 each time.

Which of the following shows the first 4 numbers of Lily’s pattern?

- 95, 85, 75, 65
- 95, 90, 85, 80
- 95, 100, 105, 110
- 95, 105, 115, 125
What number makes the addition question below true?

\[ \square + 47 = 72 \]

- 35
- 25
- 24
- 19

Show how you know
A growing number pattern is shown below.

106, 109, 112, 115

What is the pattern rule?

- add 2
- add 3
- add 4
- add 5

Show how you know
Claire creates a growing pattern using pencils.

If the pattern continues in the same way, how many pencils will Claire need to make Shape 4, Shape 5 and Shape 6?

- 3, 5, 7
- 4, 5, 6
- 9, 11, 13
- 12, 15, 18

Strand: Patterning and Algebra
Knowledge/Skill Category: Application
19. Look at the pattern below.

5, 9, 13, 17, 21, 25

What is the rule for this pattern?
- add 3
- add 4
- add 5
- add 6

Show how you know
Each row in the table below shows an addition fact and a subtraction fact from the same fact family.

<table>
<thead>
<tr>
<th>Addition facts</th>
<th>Subtraction facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2 + 3 = 5$</td>
<td>$5 - 3 = 2$</td>
</tr>
<tr>
<td>$?$</td>
<td>$13 - 9 = 4$</td>
</tr>
<tr>
<td>$4 + 6 = 10$</td>
<td>$?$</td>
</tr>
</tbody>
</table>

Which two facts complete the table?

- $13 - 4 = 9$ and $6 + 4 = 10$
- $4 + 9 = 13$ and $10 - 6 = 4$
- $13 - 4 = 9$ and $10 - 6 = 4$
- $4 + 9 = 13$ and $6 + 4 = 10$

Show how you know
Marty solves the following question.

\[ 65 - 28 = 37 \]

Which number sentence would help Marty check his answer?

- \[ 65 + 28 = 93 \]
- \[ 37 - 28 = 9 \]
- \[ 93 - 65 = 28 \]
- \[ 37 + 28 = 65 \]
2 Look at the following pattern.

9, 12, 15, 18, …

If this pattern continues, what will the next three numbers be?

- 20, 22, 24
- 20, 23, 26
- 21, 23, 25
- 21, 24, 27

Show how you know
Look at the number sentence below.

23 + 18 = [__________]

Which of the following could be put in the box to make the number sentence true?

- 20 + 1 + 20
- 20 + 3 + 20
- 20 + 2 + 20
- 20 + 4 + 20

Show how you know
Horatio uses toothpicks to create the pattern below.

![Pattern Diagram]

What number pattern describes the number of toothpicks that Horatio uses?

- 4, 8, 12, 16
- 4, 7, 10, 13
- 1, 4, 7, 10
- 1, 2, 3, 4

Show how you know
Which number completes the following number sentence?

\[24 - \square = 17 + 3\]

- 3
- 4
- 6
- 7

Show how you know
32. Look at the pattern marked on the number line below.

```
0  6  12  18  24  30  36
```

Which of the following patterns uses the same pattern rule?

- ○ 3, 6, 9, 12
- ○ 3, 9, 15, 21
- ○ 6, 11, 16, 21
- ○ 6, 12, 24, 48

Show how you know
Jane has a book with 11 chapters.

She reads chapter 1 on the first day of April. Three days later, she reads chapter 2.

<table>
<thead>
<tr>
<th>S</th>
<th>M</th>
<th>T</th>
<th>W</th>
<th>T</th>
<th>F</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>28</td>
<td>29</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Will Jane finish the book by April 30th if she continues to read one chapter every three days?

Circle one: Yes No

Explain your answer.
Yari wants to collect 83 marbles.

He already has 27 marbles and buys 8 more each week.

How many weeks does it take for Yari to have a total of 83 marbles?

Show your work.

It takes ___________ weeks for Yari to have 83 marbles.
27 Juanita shades a growing number pattern on the chart below.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
</tr>
<tr>
<td>31</td>
<td>32</td>
<td>33</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>36</td>
<td>37</td>
<td>38</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>41</td>
<td>42</td>
<td>43</td>
<td>44</td>
<td>45</td>
</tr>
<tr>
<td>46</td>
<td>47</td>
<td>48</td>
<td>49</td>
<td>50</td>
</tr>
</tbody>
</table>

Complete the chart using Juanita’s pattern rule.

What is Juanita’s pattern rule?

Pattern rule: ________________________________.

Complete the number pattern below using Juanita’s pattern rule.

11, __, __, __, __
1. Look at the graph below.

![Bar graph of students who walk to school by grade]

Which table matches the data shown in the graph?

- Table 1:
  - Grade 1: 20
  - Grade 2: 10
  - Grade 3: 25
  - Grade 4: 15

- Table 2:
  - Grade 1: 20
  - Grade 2: 25
  - Grade 3: 15
  - Grade 4: 10

Show how you know
Samuel asks his friends to choose their favourite sport. The results are shown in the chart below.

### Favourite Sport

<table>
<thead>
<tr>
<th>Sport</th>
<th>Number of friends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soccer</td>
<td>★★★★★★☆☆</td>
</tr>
<tr>
<td>Hockey</td>
<td>★★★</td>
</tr>
<tr>
<td>Softball</td>
<td>★★</td>
</tr>
</tbody>
</table>

Which pictograph matches the information in the chart?

- [ ] Favourite Sport
  
<table>
<thead>
<tr>
<th>Soccer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★★★★</td>
<td>☆☆</td>
</tr>
</tbody>
</table>

  **Key**
  
  Each ★ represents 2 friends.

- [ ] Favourite Sport
  
<table>
<thead>
<tr>
<th>Soccer</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>★★★★★</td>
<td></td>
</tr>
</tbody>
</table>

  **Key**
  
  Each ★ represents 4 friends.

Show how you know

---

Strand: Data Management and Probability
Knowledge/Skill Category: Application
The children in a Grade 3 class record the number of books they read each month for 7 months.

<table>
<thead>
<tr>
<th>Month</th>
<th>Number of books read</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>25</td>
</tr>
<tr>
<td>October</td>
<td>20</td>
</tr>
<tr>
<td>November</td>
<td>40</td>
</tr>
<tr>
<td>December</td>
<td>15</td>
</tr>
<tr>
<td>January</td>
<td>20</td>
</tr>
<tr>
<td>February</td>
<td>20</td>
</tr>
<tr>
<td>March</td>
<td>15</td>
</tr>
</tbody>
</table>

What is the mode of this set of data?

- 40
- 25
- 20
- 15

Show how you know
The pictograph below shows the number of pails of strawberries some children pick.

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of pails of strawberries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quyen</td>
<td>![Quyen's pictograph]</td>
</tr>
<tr>
<td>Lee</td>
<td>![Lee's pictograph]</td>
</tr>
<tr>
<td>Jordan</td>
<td>![Jordan's pictograph]</td>
</tr>
<tr>
<td>Doug</td>
<td>![Doug's pictograph]</td>
</tr>
</tbody>
</table>

Key:
Each 🍓 represents 3 pails of strawberries.

Who picks exactly 15 pails of strawberries?
- Quyen
- Lee
- Jordan
- Doug
The pictograph below shows the eye colour of the students in a group.

### Student Eye Colour

<table>
<thead>
<tr>
<th>Colour</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>![Blue Eye Pictograms]</td>
</tr>
<tr>
<td>Brown</td>
<td>![Brown Eye Pictograms]</td>
</tr>
<tr>
<td>Hazel</td>
<td>![Hazel Eye Pictograms]</td>
</tr>
<tr>
<td>Green</td>
<td>![Green Eye Pictograms]</td>
</tr>
</tbody>
</table>

**Key**

Each ![Eye Pictogram] represents 4 students.

What is the total number of students in this group?

- 9
- 10
- 36
- 40

Show how you know
The tally chart below shows data from a survey of Grade 3 students about their favourite number from one to six.

<table>
<thead>
<tr>
<th>Favourite Number</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Students</td>
<td>ⅤⅤ</td>
<td>Ⅰ</td>
<td>ⅤⅤ</td>
<td></td>
<td>ⅤⅤ</td>
<td>ⅤⅤ</td>
</tr>
</tbody>
</table>

There are 40 students who answer the survey. The tallies for 4 and 6 have not been filled in.

Fill in the tallies for 4 and 6 so that the only mode of the data is 4.

Explain your answer.
The pictograph below shows the number of students who participated in some Earth Day activities.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant a tree</td>
<td></td>
</tr>
<tr>
<td>Pull weeds</td>
<td></td>
</tr>
<tr>
<td>Make posters</td>
<td></td>
</tr>
</tbody>
</table>

**Key**
Each tree represents 10 students.

Use the data from the pictograph to make a bar graph. Be sure to include labels and titles.

Complete the scale provided.
There are 62 students in Grade 3 at Greentree School. The students are divided into 3 groups.

The graph below shows the number of students in each group. Part of the scale is missing and so is the bar for Group A.

![Bar Graph]

Complete the scale on the graph.
Find how many of the 62 students are in Group A.
Show your work.

Draw a bar on the graph to show the number of students in Group A.

Group A has _________ students.
Lily and Seth each roll a number cube 20 times. The cube is numbered 1 through 6. The results of the rolls are shown below.

Lily's Graph

Seth's Graph

Lily says the mode of her data is 2, and Seth says the mode of his data is 3.

Who is correct?

Circle one:  Lily  Seth

Justify your answer. Write about Lily, and write about Seth.