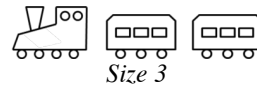
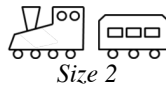

Toy Trains

This problem gives you the chance to:

- find and use a number pattern
 - find an algebraic expression for a number pattern
-

Brenda's toy shop sells toy trains.

A *size 1* set is just an engine, a *size 2* has an engine and 1 carriage, a *size 3* has an engine and 2 carriages and so on.



The engine has 8 wheels, 4 on each side, and each carriage has 6 wheels, 3 on each side.

The table shows the number of wheels on each size of train set.

Size of train set	1	2	3	4	5
Number of wheels	8	14			

1. Fill in the table to show how many wheels sets 3, 4 and 5 have.
2. The biggest set in the shop is size 12.

How many wheels does the size 12 set contain?
Show how you figured it out.

3. Mick says his train set has 42 wheels.

Can Mick be correct?
Explain how you know.

4. The factory where the trains are made needs a rule for the number of wheels in any size set so that it can use this in its computer.

Write an algebraic expression for the number of wheels in a size n set.

2009 Rubrics Grade 7

Toy Trains	Rubric													
<p>The core elements of performance required by this task are:</p> <ul style="list-style-type: none"> • finding and using a number pattern • finding an algebraic expression for a number pattern <p>Based on these, credit for specific aspects of performance should be assigned as follows</p>	points	section points												
<p>1. Gives correct answers:</p> <table border="1"> <tr> <td>Size of train set</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Number of wheels</td> <td>8</td> <td>14</td> <td>20</td> <td>26</td> <td>32</td> </tr> </table> <p><i>Partial credit</i> One error</p>	Size of train set	1	2	3	4	5	Number of wheels	8	14	20	26	32	2 (1)	2
Size of train set	1	2	3	4	5									
Number of wheels	8	14	20	26	32									
<p>2. Gives correct answer: 74 Shows correct work such as: $8 + 11 \times 6$ or continues table.</p>	1 1	2												
<p>3. Gives correct answer: No Gives correct explanation such as: $42 - 8 = 34$ is the number of wheels for the carriages and this does not divide by 6. Accept: set 7 has 44 wheels and set 6 has 38 wheels.</p>	1 1	2												
<p>4. Gives correct answer such as: $6n + 2$ or equivalent</p>	1	1												
Total Points		7												