

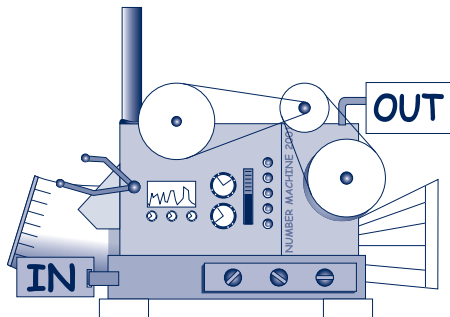
Approach: Independent  
 Focus: Basic algebra and patterns  
 Resources: Answer booklet

Year: 4 &amp; 8



## Questions / instructions:

This is a machine that changes numbers.



It multiplies the number you put in by 3, and then adds 2 more. So, if you put in 4, it puts out 14.

- If you put in a 5, what number will the machine put out? **17** 19 (20) 83 (75)
- If you put in a 10, what number will the machine put out? **32** 20 (18) 81 (74)

## YEAR 8 ONLY:

- If you got out a 41, what number was put in? **13** • 43 (32)
- If "X" is the number put into the machine, and "Y" is the number coming out, write down a formula which will give the value of "Y" whatever the value of "X".  
 $y = 3x + 2$   
 or equivalent • 22 (3)  
 • 5 (21)

## YEAR 4 ONLY:

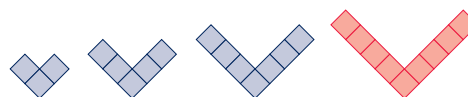
- Make the next triangle and write the number under it.



drawing and number correct 36 (28)  
 one correct, but other omitted 10 (12)

- Which number is equal to 3 tens plus 5 tens?  
 A 8  
**B 80** **B** 76 (67)  
 C 180  
 D 1800

- How many blocks will be needed to make the next shape in this pattern?



**9** 57 (52)

**YEAR 4 & 8:**  
 [question 5 for Year 8]

- The Jones Kids



What is the smallest number of children in the Jones family if each child has at least one brother and at least one sister?

**4** 23 (19) 37 (38)

**Total score:** **7** 3 (1) •  
**6** 5 (4) 7 (1)  
**5** 10 (8) 11 (7)  
**4** 17 (13) 17 (17)  
**3** 16 (18) 26 (28)  
**2** 22 (20) 21 (22)  
**1** 19 (21) 6 (7)  
**0** 9 (14) 12 (18)

[Note: Maximum score of 6 for year 8]

## Commentary:

Year 8 students were able to handle the calculations based on an algebraic system but had difficulty in generating the underlying equation. Year 4 students had trouble with most of the questions here. Progress was seen for both year 4 and year 8 from 2001 to 2005.