Approach: Independent Level: Year 4 and year 8 Focus: Varied algebra items.
Resources: None.

## Questions/instructions

1. Write a rule for each number pattern using $\square$ and $\bigcirc$, then complete them. The first two are done for you.


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1. 

| - 1 2 3 4 5 6 <br> 7       <br> $\square$ 7 14 21 28 35 42 <br> 49       |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |

2. 

|  |  |  |  |  |  | $\times 4$ (or equivalent) |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |  |  |
| $\square$ | 1 | 5 | 9 | 13 | 17 | 21 | 25 |  |  |  |


| 3. $\quad$ $=10$ $-6($ or equivalent $)$  $8(\bullet)$   <br>  1 2 3 4 5 6 <br> 7       <br>  4 14 24 34 44 54 |
| :--- |

4. $\square=(\bigcirc \times .5)+7($ or equivalent $)$

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\square$ | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 | 10.5 |

Use the machine to finish putting numbers in the spaces on the card.

|  | Numbe in | Number out |  |  |
| :---: | :---: | :---: | :---: | :---: |
| 5. | 2 | 9 | $39(\bullet)$ | 67 (•) |
| 6. -3 | 7 | 34 | 30 (•) | 64 (•) |
| 7. | 12 | 59 | $28(\bullet)$ | $62(\bullet)$ |
| 8. | 3 | 14 | 23 (•) | $58(\bullet)$ |
| 9. | 10 | 49 | - | $52(\bullet)$ |



| Squares | 1 | 2 | 3 | 4 | 5 | 6 |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Matches | $\mathbf{4}$ | $\mathbf{7}$ | $\mathbf{1 0}$ | $\mathbf{1 3}$ | $\mathbf{1 6}$ | $\mathbf{1 9}$ | $23(\bullet)$ | $60(\bullet)$ |

11.Predict the number of matches needed to make 20 squares. 61 • $22(\bullet)$

12.How many squares are in the 5th building?
$25 \quad 15(\bullet) \quad 42(\bullet)$
13. How many squares are in the 10th building in this pattern?
14.Lee delivers newspapers. Let $x$ represent the number of newspapers that Lee delivers each day.
Which statement represents the total number of newspapers that
Lee delivers in 5 days?
(A) $5 \times x$
A 35 (21) 69 (66)
B $5+x$
C $x \div 5$
D $(x+x) \times 5$
15.The cost to rent a motorbike is given by the following formula:
Cost $=(\$ 3 \times$ number of hours $)+\$ 2$
Fill in this table:
Time in Hours Cost in \$

| 1 | 5 |
| :--- | :---: |
| 4 | $M$ |
| 5 | 17 |


| both correct | • $48(47)$ |
| ---: | :--- |
| one correct | • $16(11)$ |

16. Write $>$ or $=$ or $<$ to make this statement true:
$456 \div 8=456 \times \frac{1}{8} \quad=\quad$ - $18(\bullet)$
17.Here is a number sentence:
$3 \times \square<14$
Which number could go in
the to make the sentence true?
(A) 4
A 52 (37)
B 5
C 12
D 13
17. Which number sentence is true?

A $321<123$
B $321<321$
(C) $321>123$

C 47 (33) •
D $321=123$

19 Fill in the empty spaces on the grid to finish the pattern.

year 4 year 8
Number correct: 628 (20)
$0 \quad 10$ (25)

59 (7) •
418 (13)
$3 \quad 10$ (9)
215 (14)
110 (12)
18 (13)
-

20. Which is true?

A $16<15$
B $16>17$
C $17<16$
(D) $17>16$

D 56 (43)
21.It costs $\$ 3$ for every hour to rent a
bike.
Fill in this table:
Time in Hours Cost in \$

| 1 | 3 |
| :---: | :---: |
| 4 | 12 |
| $\mathbf{5}$ | 15 |

 bike.

5
-

| both correct | $40(\bullet)$ |
| ---: | :--- |
| one correct | $19(\bullet)$ |

## Commentary

This collection of items included some used previously in 1997 and others new in 2001. On five trend items, year 4 students in 2001 performed substantially better than the 1997 students. Year 8 students performed similarly in 1997 and 2001 on the two year 8 trend items.

