Patterns
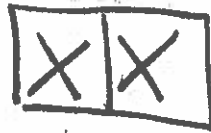# Practice Test   Grade 5

Lesson 1

1. Cole made this pattern with toothpicks.
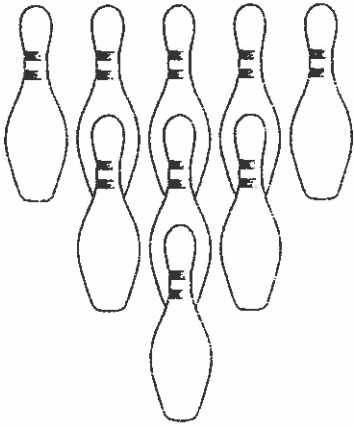

shape 1   shape 2   shape 3

a) How many squares can he make with 31 toothpicks? Use a sketch or a model.

b) How many toothpicks will he need to make 10 squares? Use a table.

Lesson 2

2. At the start of a game, each player had 8 tokens and 6 cards.

a) Make a table to show the number of tokens and the number of cards for 1 to 4 players.

b) Write pattern rules for the patterns in your table.

c) 56 tokens were given out at the start of the game. How many people were playing the game?

Lesson 3

3. Grace had 1750 mL of juice. She poured 250 mL for each of her friends. She created the following pattern to show how much juice she used:

1750, 1500, 1250, 1000, …

a) Why do the numbers in Grace's pattern decrease by 250?

b) What is Grace's pattern rule?

c) Grace poured all the juice. How many friends had a glass of juice?

4. Jacob set up bowling pins in a triangle, with one pin in the first row, three pins in the second row, five pins in the third row, and so on.

   a) Extend the pattern. How many bowling pins are in the eighth row?

   b) Use a pattern to show how many bowling pins there are, in total, in the eight rows. Write a number sentence to show the sum.

5. Write an expression for each situation.

   a) 22 more than a number

   b) 35 less than a number

   c) 13 less than a number

   d) 56 more than a number

6. A Canadian squirrel's tail is about 10 cm longer than a raccoon's tail. Write two expressions to describe how the lengths of the tails are related. Use addition in one expression and subtraction in the other expression.

7. Write a problem that can be solved using each equation below. Then use the equation to solve your problem.

   a) $24 + h = 96$

   b) $t - 12 = 33$

Practice   Teacher Answer Key

1.

Shape #	# Toothpicks	
1	6	+5
2	11	+5
3	16	+5
4	21	+5
5	26	+5
6	31	+5
7	36	+5
8	41	+5
9	46	+5
10	51	

Lesson 1

1. Cole made this pattern with toothpicks.

shape 1   shape 2   shape 3

a) How many squares can he make with 31 toothpicks? Use a sketch or a model. **6 shapes**

b) How many toothpicks will he need to make 10 squares? Use a table. **51 toothpicks**

Lesson 2

Shape 4   Shape 5   Shape 6

2. At the start of a game, each player had 8 tokens and 6 cards.

a) Make a table to show the number of tokens and the number of cards for 1 to 4 players.

b) Write pattern rules for the patterns in your table.

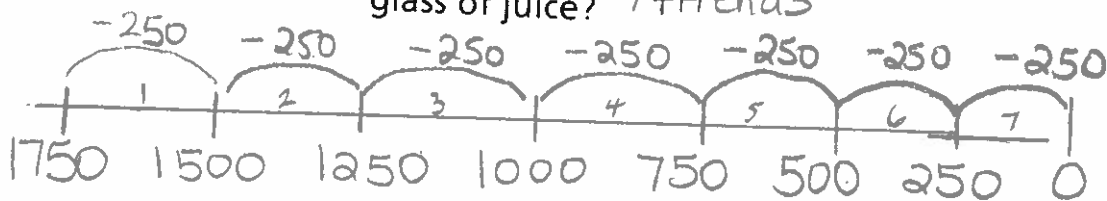c) 56 tokens were given out at the start of the game. How many people were playing the game? **7 people**

2.

Players	Tokens	Cards
1	8	6
2	16	12
3	24	18
4	32	24

b) Tokens; start with 8 add 8 each time Cards; start at 6 add 6 each time

Lesson 3

3. Grace had 1750 mL of juice. She poured 250 mL for each of her friends. She created the following pattern to show how much juice she used:
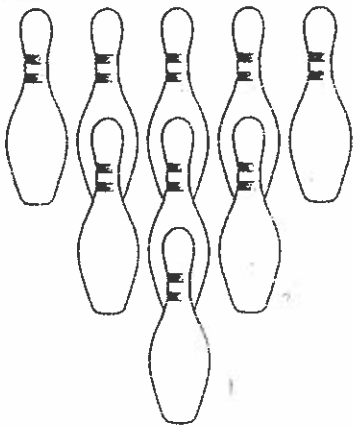
1750, 1500, 1250, 1000, …

a) Why do the numbers in Grace's pattern dècrease by 250? **Because she poured 250 mL each time**

b) What is Grace's pattern rule? **Start at 1750 and subtract 250 each time**

c) Grace poured all the juice. How many friends had a glass of juice? **7 friends**

-250 -250 -250 -250 -250 -250 -250
1750 1500 1250 1000 750 500 250 0

Grace subtracted by 250 seven times

4. Jacob set up bowling pins in a triangle, with one pin in the first row, three pins in the second row, five pins in the third row, and so on.

   a) Extend the pattern. How many bowling pins are in the eighth row?

   b) Use a pattern to show how many bowling pins there are, in total, in the eight rows. Write a number sentence to show the sum.

5. Write an expression for each situation.

   a) 22 more than a number $\quad n + 22$

   b) 35 less than a number $\quad y - 35$

   c) 13 less than a number $\quad z - 13$

   d) 56 more than a number $\quad 56 + m$

$r + 10$ (raccoon plus ten)

$S - 10$ (squirrel minus ten)

6. A Canadian squirrel's tail is about 10 cm longer than a raccoon's tail. Write two expressions to describe how the lengths of the tails are related. Use addition in one expression and subtraction in the other expression.

7. Write a problem that can be solved using each equation below. Then use the equation to solve your problem.

   a) $24 + h = 96$ $\qquad 96 - 24 = 72$ so $h = 72$

   b) $t - 12 = 33$ $\qquad 33 + 12 = 45$ so $t = 45$

4. Pairing Strategy

$15 + 1 = 16$
$13 + 3 = 16$
$11 + 5 = 16$
$9 + 7 = 16$

$16 + 16 + 16 + 16 = 64$ pins

a) There would be 15 pins in row 8

or

$1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = 64$ pins