
Subject: Mathematics

Level: Standard Three

Strand: Number

Topic: Number Relationships

At the end of this worksheet, you will be able to:

- Describe and create number patterns involving the four rules.
- Explore algebraic thinking as it relates to number pattern.

Key Points: -

- Algebraic Thinking involves recognizing patterns and making a general statement.
- To create number pattern involving the four rules, you continuously perform the mathematical operation on the preceding number.
 - e.g. 3, 6, 9 ... (add 3 to the preceding number)
 - e.g. 105, 100, 95... (Subtract 5 from the preceding number)
 - e.g. 1, 3, 9, 27... (Multiply the preceding number by 3)
 - e.g. 100, 50, 25.... (Divide the preceding number by 2)

- Odd numbers are numbers that cannot be divided by 2 without leaving a remainder. When an even number is added to an Odd number, the result is still an odd number.

- E.g. $5 + 4 = 9$, i.e. **Odd Number** + **Even number** = **Odd**

Number.

However when an Odd number is added to an Odd number, the result is Even.

- E.g. $5 + 7 = 12$, i.e. **Odd Number** + **Odd Number** = **Even**

Number.

- Even numbers can be divided by 2 without leaving a remainder. If an even number is added to an even number, the result is even.

- E.g. $6 + 4 = 10$, i.e. **Even Number** + **Even Number** = **Even**

Number.

However, if an odd number is added to an even number, the result is odd.

○ E.g. $6 + 5 = 11$, i.e. **Even Number + Odd Number = Odd**

Number.

- To describe the pattern, you need to carefully observe the relationship between every consecutive number. If the pattern is the same for all consecutive numbers, then this is the pattern rule.
 - E.g. 2, 4, 6, 8..... The relationship between 2 and 4 can be $2 + 2$ or 2×2 equals four. Looking at the next consecutive numbers 4 and 6, the relationship can be $4 + 2$ or 2×3 equals six. The next consecutive numbers are 6 and 8. The relationship can therefore be $6 + 2$ or 2×4 equals 8. The pattern is appears to be “add two to the preceding number. Additionally, the pattern can be two multiplied the number’s ordinate position (first, second etc.).

ACTIVITY 1

1. Write the numbers that come next in the following:

a. 1, 3, 5, 7, 9, _____, _____, _____,

b. 24, 34, 44, 54, _____, _____, _____,

c. 93, 87, _____, _____, 69, 63, _____,

2. Jake uses an addition rule to make this pattern: **3, 7, 11, 15, 19...**

Write another pattern using the same rule.

3. Examine the number pattern below.

10, 18, 26, 34, 42, _____, _____, _____

a. Write the next three numbers in the pattern.

b. Explain the rule that forms the pattern.

4. Fill in the blanks.

a. 18 is 3 times as many as _____.

b. 72 is 6 times as many as _____.

c. 55 is 11 times as many as 5 _____.

ACTIVITY 2

1. Choose the correct response to make the statements true.

- a. If \square is an **Odd** number, then $\square + 2$ is: odd or even.
- b. \square is an **Odd** number, therefore \square plus 3 is: odd or even.
- c. \square and \triangle are both odd numbers, so the sum of \square and \triangle is: odd or even.

2. Janice uses a rule to make a number pattern. Her rule is to **multiply the preceding number by 2**. Write a number pattern using this rule.

3. Solve each of the following problems.

- a) Harvey has **9 goldfish** in his fish tank. He also has **8 times as many** hamsters. How many hamsters does he have?
- b) There are **5 dogs** in the neighborhood. There are **4 times as many** cats as dogs. How many cats are in the neighborhood?

ANSWER KEY

ACTIVITY 1

1. a. 11, 13, 15
b. 64, 74, 84
c. 81, 75 and 57

2. 2, 6, 10, 14, 18...; or any other pattern using skip counting by 4.

3. a) 50, 58, 66
b) Add the preceding number by 8

4. a. 6
b. 12
c. 5

ACTIVITY 2

1. a. Odd
b. Even
c. Even

2. 4, 8, 16, 32 or any pattern multiplying each number by 2.

3. a. 72 hamsters.
b. 20 cats