General Topic: Whole Numbers up to Millions

Lesson Overview:

Students learn to read, write, compare, and order **numbers up to the millions** place value, as well as perform basic operations with them.

Key Concepts and Subtopics:

- Place value up to millions

🔹 What is Place Value?

Place value tells us the **value of a digit** depending on its position in a number.

🔹 Place Value Chart (up to Millions)

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
1,000,000	100,000	10,000	1,000	100	10	1

🔹 Example

Number: **4,572,389**

- **4** → 4,000,000 (Four Million)
- **5** → 500,000 (Five Hundred Thousand)
- **7** → 70,000 (Seventy Thousand)
- **2** → 2,000 (Two Thousand)
- **3** → 300 (Three Hundred)
- **8** → 80 (Eighty)
- **9** → 9 (Nine Ones)

👉 Together: **Four million, five hundred seventy-two thousand, three hundred eighty-nine**

- Comparing and ordering numbers

🔹 Comparing Numbers

When we compare numbers, we check **which is bigger, smaller, or equal.**
We use the symbols:

- > means greater than (bigger)
- < means less than (smaller)
- = means equal

👉 **Example:**

- 6,432 > 6,321 (because 6,432 is bigger)
- 45,120 < 45,210 (because 120 is smaller than 210)
- 500,000 = 500,000

🔹 Ordering Numbers

- **Ascending order** → from **smallest to biggest** (low → high)
- **Descending order** → from **biggest to smallest** (high → low)

👉 **Example:**

Arrange 23,501; 23,150; 23,410 in:

- **Ascending order:** 23,150, 23,410, 23,501
- **Descending order:** 23,501, 23,410, 23,150

- Rounding off numbers

🔹 What is Rounding?

Rounding means making a number **simpler** but keeping its value **close to the original.**

🔹 Rules in Rounding

1. **Look at the digit to the right** of the place value you are rounding.
2. If the digit is **5 or more → add 1** to the rounding place.
3. If the digit is **4 or less → keep it the same.**
4. Replace the digits to the right with **zero (0).**

🔹 Examples

- Round **3,846** to the **nearest hundred:**
  - Look at tens place (4).
  - **4** is **less than 5**, so **hundreds digit stays 8.**
  - Answer: **3,800**
- Round **7,592** to the **nearest thousand:**
  - Look at hundreds place (5).
  - 5 is **5 or more**, so add 1 to 7 → 8.
  - Answer: **8,000**

- Addition, subtraction, multiplication, and division with large numbers

🔹 1. Addition (➕)

Add numbers starting from the **ones place**, carry over if needed.

👉 Example:

45,678 + 32,945 = **78,623**

🔹 2. Subtraction (➖)

Subtract starting from the **ones place**, borrow if needed.

👉 Example:

98,402 – 56,789 = **41,613**

🔹 3. Multiplication (✖️)

Multiply numbers using **long multiplication** (step by step).

👉 Example:

325 × 46 =

- 325 × 6 = 1,950
- 325 × 40 = 13,000
- Add = **14,950**

🔹 4. Division (➗)

Use **long division** to divide step by step.

👉 Example:

8,568 ÷ 12 = **714**

Real-Life Example:

Calculating the total population of several cities combined.

Remember This!

- *Always align numbers according to their place value when performing operations.*

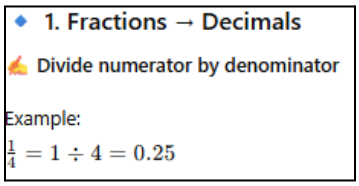
General Topic: *Fractions, Decimals, Percentages*

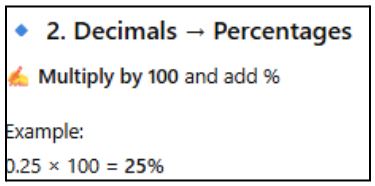
Lesson Overview:

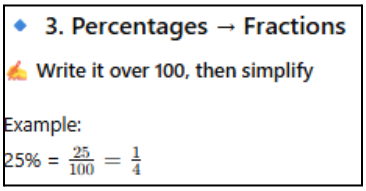
Focuses on the relationship between **fractions**, **decimals**, and **percentages**, and applying these concepts in problem-solving.

Key Concepts and Subtopics:

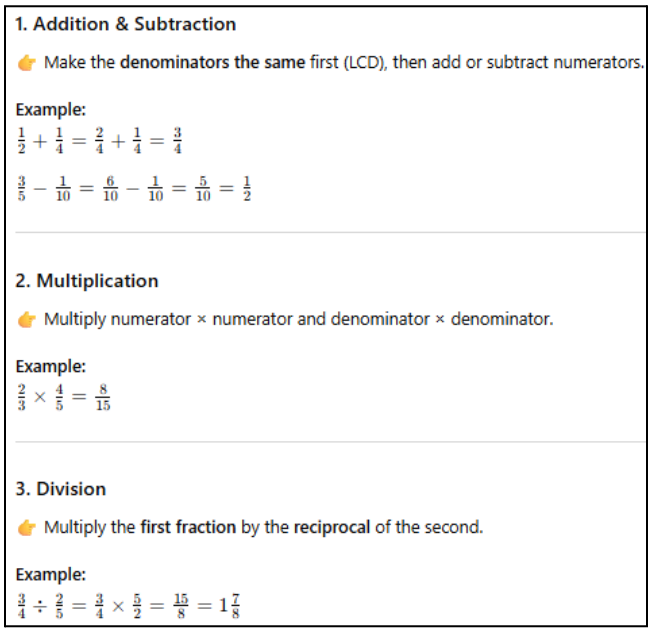
- Converting between fractions, decimals, and percentages

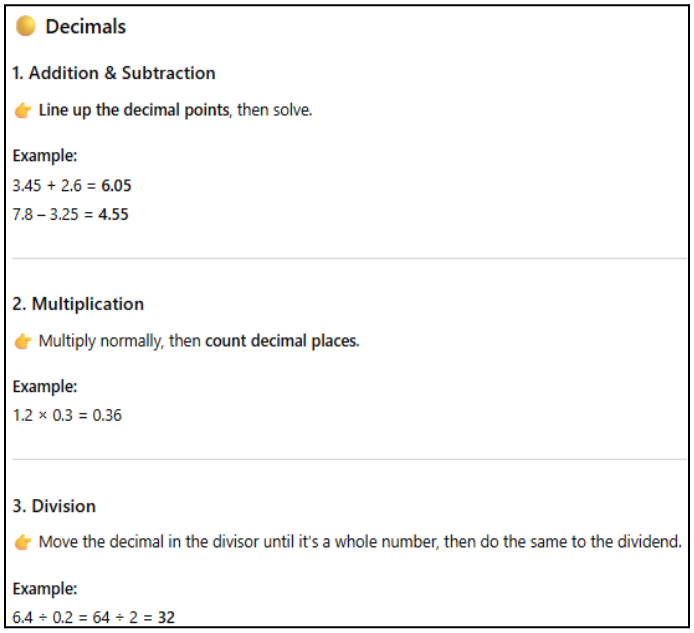




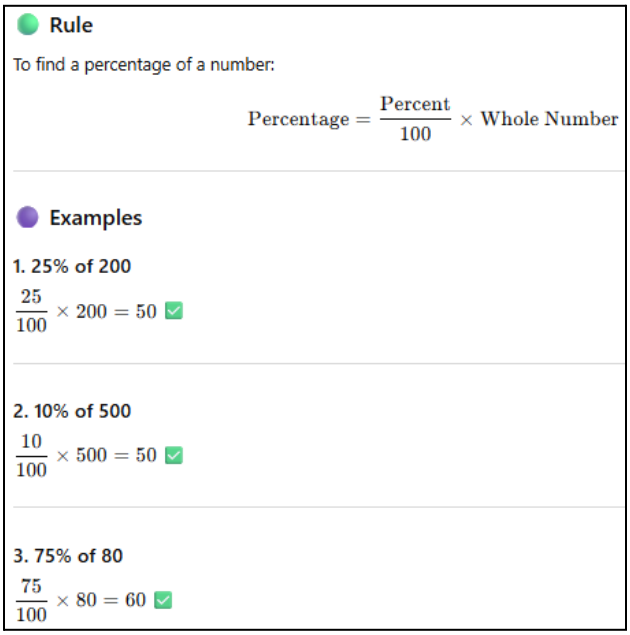


- Adding, subtracting, multiplying, and dividing fractions and decimals





- Finding percentages of numbers



- Solving real-world problems involving discounts, taxes, and interest

Real-Life Example:

Calculating the percentage discount on a sale item.

Remember This!

- *Percent means "per hundred," so 50% = 50 out of 100 = 0.5.*

General Topic: Ratio and Proportion

Lesson Overview:

Teaches how to compare quantities and determine equivalent **ratios and proportions** in practical contexts.

Key Concepts and Subtopics:

- Writing ratios in different forms

1. Discounts (Sale Price)

👉 Formula:

$$\text{Discount} = \frac{\text{Rate}}{100} \times \text{Original Price}$$

$$\text{Sale Price} = \text{Original Price} - \text{Discount}$$

Example:

A bag costs ₱1,000. It has a 20% discount.

Discount = 20% of 1,000 = ₱200

Sale Price = 1,000 – 200 = **₱800** ✅

2. Taxes (Extra payment added)

👉 Formula:

$$\text{Tax} = \frac{\text{Rate}}{100} \times \text{Price}$$

$$\text{Total Price} = \text{Price} + \text{Tax}$$

Example:

A meal costs ₱500. VAT is 12%.

Tax = 12% of 500 = ₱60

Total Price = 500 + 60 = **₱560** ✅

3. Simple Interest (Money earned in savings/loans)

👉 Formula:

$$I = P \times R \times T$$

Where:

- P = Principal (starting money)
- R = Rate (in decimal)
- T = Time (in years)

Example:

You save ₱5,000 in a bank at 10% per year. How much interest after 2 years?

$I = 5,000 \times 0.10 \times 2 = ₱1,000$

So total money = 5,000 + 1,000 = **₱6,000** ✅

- Simplifying ratios

What does it mean?

👉 To **simplify a ratio**, divide both numbers by their **greatest common factor (GCF)**. (Just like simplifying fractions!)

Example 1

Ratio: 6:9

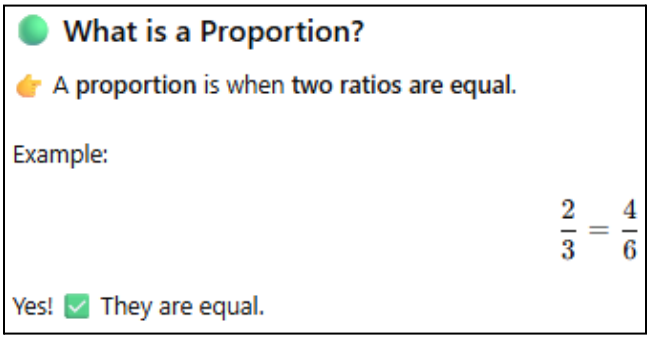
- Find GCF of 6 and 9 → 3
- Divide both by 3 → $\frac{6}{3} : \frac{9}{3} = 2 : 3$ ✅

Example 2

Ratio: 12:16

- GCF of 12 and 16 = 4
- $\frac{12}{4} : \frac{16}{4} = 3 : 4$ ✅

- Solving proportions



- Applying ratios and proportions to real-life problems

Real-Life Example:

Mixing paint in a 2:3 ratio of blue to yellow.

Remember This!

- *In a proportion, the cross-products are equal.*

General Topic: Geometry: Polygons, Circles, Solid Figures

Lesson Overview:

Explores the **properties and classifications** of 2D and 3D shapes.

Key Concepts and Subtopics:

- Types of polygons and their properties

What is a Polygon?

👉 A **polygon** is a **closed figure** made of **straight lines.**

- Has **sides** (lines)
- Has **vertices** (corners)
- Has **angles**

🚫 Not polygons: shapes with curves (like circles) or open shapes.

Types of Polygons (Based on Sides)

1. Triangle (3 sides) 🔺

- 3 sides, 3 angles
- Types: equilateral, isosceles, scalene

2. Quadrilateral (4 sides) ⬛

- Examples: square, rectangle, trapezoid
- Opposite sides can be parallel

3. Pentagon (5 sides) ⬟

- Example: shape of a star outline
- Regular pentagon = all sides equal

4. Hexagon (6 sides) ⬡

- Example: honeycomb cell
- Regular hexagon = all sides and angles equal

5. Octagon (8 sides) 🛑

- Example: stop sign

Properties of Regular Polygons

✔ All sides are equal
✔ All angles are equal
✔ Symmetrical

Fun Real-Life Examples

- Triangle → traffic yield sign
- Square → chessboard
- Rectangle → door
- Pentagon → Pentagon building (USA)
- Hexagon → beehive
- Octagon → stop sign

- Parts of a circle: radius, diameter, circumference

What is a Circle?

👉 A **circle** is a round shape where **all points are the same distance from the center.**

Parts of a Circle

1. Radius (r)

- A line from the **center to any point** on the circle.
- Half the diameter.
  - Example: If the diameter is 10 cm, radius = 5 cm.

2. Diameter (d)

- A line that **passes through the center** and touches both sides of the circle.
- **Longest chord** of a circle.
- Formula:

$$d = 2r$$

3. Circumference (C)

- The **distance around the circle** (its perimeter).
- Formula:

$$C = \pi d \quad \text{or} \quad C = 2\pi r$$

- Use $\pi \approx 3.14$.

Example: If r = 7 cm →

$$C = 2 \times 3.14 \times 7 = 43.96 \text{ cm}$$

- Types of solid figures: prisms, pyramids, spheres, cylinders, cones

1. Prisms

- Solid figure with **two identical flat faces** (bases) and **rectangular sides.**
- Named by the shape of the base.
  - Example: **Rectangular prism** (box, book)
  - Example: **Triangular prism** (tent)

2. Pyramids

- Solid figure with a **polygon base** and **triangular faces** that meet at one vertex (apex).
- Named by the shape of the base.
  - Example: **Square pyramid** (Egyptian pyramid)
  - Example: **Triangular pyramid** (toy pyramid, tents)

3. Sphere

- Perfectly round, **all points are the same distance from the center.**
- No edges, no vertices.
- Example: ball, orange, marble.

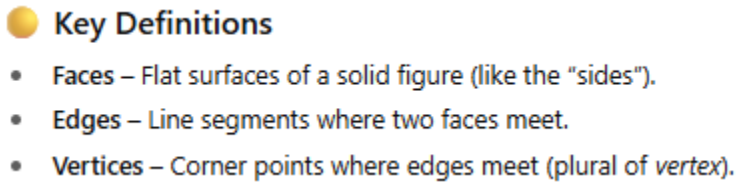
4. Cylinder

- Has **two parallel circular bases** connected by a curved surface.
- Example: can of soda, drum, water pipe.

5. Cone

- Has **one circular base** and a **curved surface** that meets at one vertex (tip).
- Example: ice cream cone, party hat, traffic cone.

- Identifying edges, vertices, and faces



Real-Life Example:

Identifying geometric shapes in buildings and everyday objects.

Remember This!

- *A polygon is a closed figure made of straight lines.*

General Topic: Measurement: Area, Perimeter, Volume, Time

Lesson Overview:

Covers how to **measure space** in two and three dimensions, as well as time calculations.

Key Concepts and Subtopics:

- Area and perimeter of rectangles, triangles, and circles

1. Rectangle

- **Perimeter (P):** Add all sides

$$P = 2 \times (L + W)$$

- **Area (A):**

$$A = L \times W$$

👉 Example: A 6 m × 4 m garden

- P = 2(6 + 4) = **20 m**
- A = 6 × 4 = **24 m²**

2. Triangle

- **Perimeter (P):** Add all three sides

$$P = a + b + c$$

- **Area (A):**

$$A = \frac{1}{2} \times b \times h$$

👉 Example: A triangle with base 10 cm and height 6 cm

- A = ½ × 10 × 6 = **30 cm²**

3. Circle

- **Perimeter (Circumference, C):**

$$C = 2\pi r$$

- **Area (A):**

$$A = \pi r^2$$

👉 Example: Circle with radius 7 cm

- C = 2 × 3.14 × 7 = **43.96 cm**
- A = 3.14 × 7² = **153.86 cm²**

- Volume of prisms and cylinders

What is Volume?

- **Volume** is the amount of space inside a 3D figure.
- Think of it as **how much water, sand, or objects can fit inside.**

Formula

1. Prism (Cube/Rectangular Prism)

$$V = \text{Length} \times \text{Width} \times \text{Height}$$

Example:

A box has dimensions **4 cm × 3 cm × 5 cm.**

$$V = 4 \times 3 \times 5 = 60\,\text{cm}^3$$

2. Triangular Prism

$$V = \frac{1}{2} \times \text{Base} \times \text{Height of Triangle} \times \text{Length}$$

Example:

Base = 6 cm, Height = 4 cm, Length = 10 cm

$$V = \frac{1}{2} \times 6 \times 4 \times 10 = 120\,\text{cm}^3$$

3. Cylinder

$$V = \pi r^2 h$$

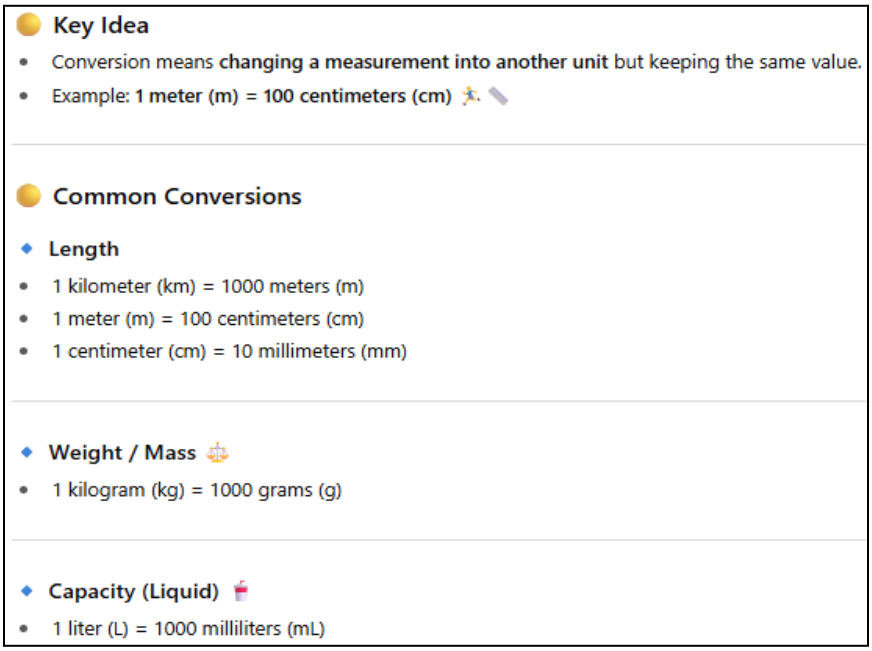
where r = radius, h = height

Example:

Radius = 3 cm, Height = 10 cm

$$V = 3.14 \times 3^2 \times 10 = 282.6\,\text{cm}^3$$

- Converting units of measurement



Key Idea

- Conversion means **changing a measurement into another unit** but keeping the same value.
- Example: **1 meter (m) = 100 centimeters (cm)**

Common Conversions

Length

- 1 kilometer (km) = 1000 meters (m)
- 1 meter (m) = 100 centimeters (cm)
- 1 centimeter (cm) = 10 millimeters (mm)

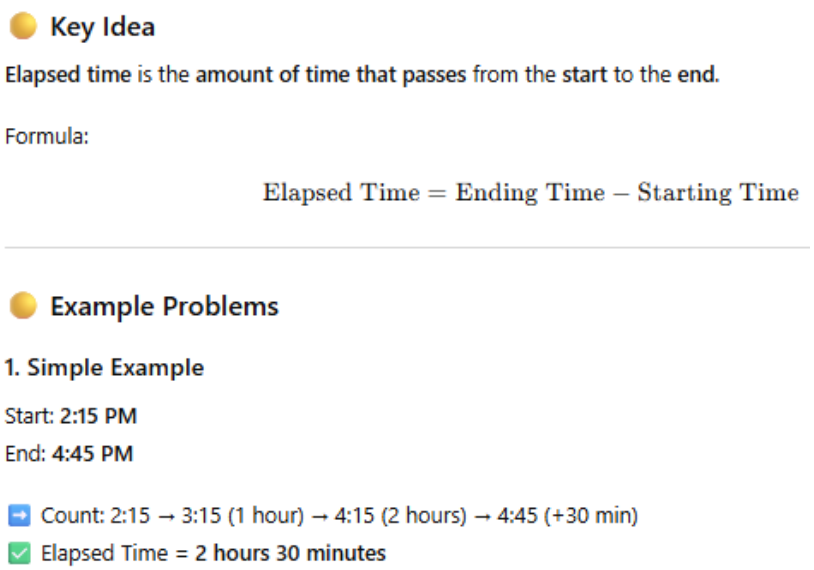
Weight / Mass

- 1 kilogram (kg) = 1000 grams (g)

Capacity (Liquid)

- 1 liter (L) = 1000 milliliters (mL)

- Calculating elapsed time



Key Idea

Elapsed time is the **amount of time that passes** from the **start** to the **end.**

Formula:

$$\text{Elapsed Time} = \text{Ending Time} - \text{Starting Time}$$

Example Problems

1. Simple Example

Start: **2:15 PM**

End: **4:45 PM**

➡️ Count: 2:15 → 3:15 (1 hour) → 4:15 (2 hours) → 4:45 (+30 min)

✅ Elapsed Time = **2 hours 30 minutes**

Real-Life Example:

Finding the area of a garden and the volume of a water tank.

Remember This!

- *Perimeter is the total distance around a shape; area is the surface covered.*

General Topic: Data Interpretation: Bar Graphs, Line Graphs, Probability

Lesson Overview:

Teaches how to **read, interpret, and create various graphs**, as well as **understand the basics of probability**.

Key Concepts and Subtopics:

- Reading and interpreting bar graphs and line graphs

  - **Bar Graphs**: Use bars to compare quantities.
  - **Line Graphs**: Show changes over time.

  Example (Bar Graph):

  Number of books read in a month:

  - Anna: 5 📘
  - Ben: 8 📗
  - Carla: 4 📕

  👉 Ben read the most books.

- Creating graphs from given data

  Steps:

  1. Collect data 📋
  2. Choose the right graph (bar, line, pictograph)
  3. Label the axes (x = categories, y = numbers)
  4. Plot and draw 📊

  Example:

  Rainfall for 4 days: 10mm, 20mm, 15mm, 25mm → create a bar graph.

- Understanding probability as a measure of likelihood

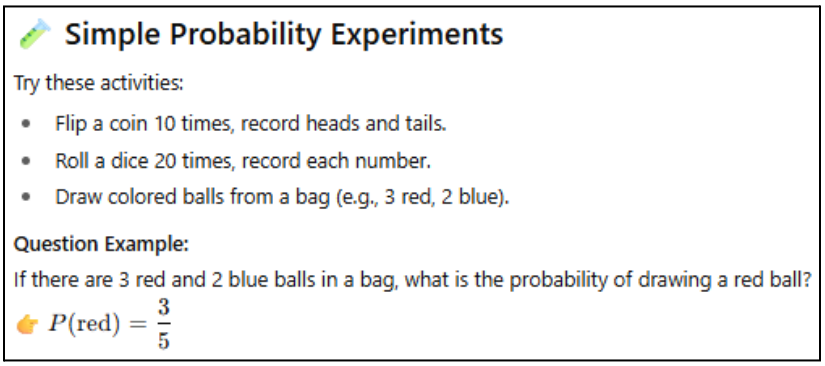
  - **Probability** = chance of something happening
  - Formula:

  $$P(\text{event}) = \frac{\text{Number of favorable outcomes}}{\text{Total outcomes}}$$

  Examples:

  - Tossing a coin: P(head) = 1/2
  - Rolling a die: P(rolling a 4) = 1/6

- Simple probability experiments



🧪 Simple Probability Experiments

Try these activities:

- Flip a coin 10 times, record heads and tails.
- Roll a dice 20 times, record each number.
- Draw colored balls from a bag (e.g., 3 red, 2 blue).

Question Example:

If there are 3 red and 2 blue balls in a bag, what is the probability of drawing a red ball?

👉 $P(\text{red}) = \frac{3}{5}$

Real-Life Example:

Predicting the chance of rain using weather data.

Remember This!

- *Probability ranges from 0 (impossible) to 1 (certain).*

General Topic: Patterns and Sequences

Lesson Overview:

Introduces identifying and extending number **patterns and sequences**.

Key Concepts and Subtopics:

- Recognizing arithmetic and geometric patterns

  - **Arithmetic Pattern**: add or subtract the same number each time.
    Example: 2, 4, 6, 8, 10, ... (+2 each time)
  - **Geometric Pattern**: multiply or divide the same number each time.
    Example: 3, 6, 12, 24, ... (×2 each time)

- Finding the rule in a sequence

  Steps:

  1. Look at how the numbers change.
  2. Check if it's addition, subtraction, multiplication, or division.
  3. Write the **rule**.

  Example:
  5, 10, 15, 20 → Rule: +5

- Continuing patterns

  - Once you know the rule, you can continue the sequence.

  Example:
  1, 2, 4, 8, 16 → Rule: ×2 → Next numbers: 32, 64, 128

Real-Life Example:

Predicting the next number in a sequence of bus arrival times.

Remember This!

- *Patterns often follow a fixed rule—look for it!*