3rd Grade Math: Understanding Perimeter and Area

What Is Perimeter?

Perimeter is the distance around the outside of a shape. To find the perimeter, you add up the lengths of all the sides.

Key Features of Perimeter

1. **Measured in units**:
   The perimeter is measured in regular units like centimeters (cm), meters (m), inches (in), or feet (ft), depending on the shape you're measuring.
2. **Adding All Sides**:
   To find the perimeter of a shape, you simply add up the length of each side.
   For example, for a rectangle:

$$\text{Perimeter} = \text{Length} + \text{Width} + \text{Length} + \text{Width}$$

   You can also use:

$$\text{Perimeter} = 2 \times (\text{Length} + \text{Width})$$

Example 1: Finding the Perimeter of a Rectangle

Problem:

A rectangle has a length of 8 cm and a width of 5 cm. What is the perimeter?

Solution:

Add up all the sides:

$$\text{Perimeter} = 8\,\text{cm} + 5\,\text{cm} + 8\,\text{cm} + 5\,\text{cm} = 26\,\text{cm}$$

So, the perimeter is **26 cm**.

Example 2: Finding the Perimeter of a Square

Problem:

A square has sides of 6 inches. What is the perimeter?

Solution:

Since all sides of a square are the same, you can multiply one side by 4:

$$\text{Perimeter} = 4 \times 6\,\text{in} = 24\,\text{in}$$

So, the perimeter is **24 inches**.

What Is Area?

Area is the amount of space inside a shape. It tells us how many square units (like cm^2 or in^2) fit inside the shape.

Key Features of Area

1. **Measured in Square Units**:
   Area is measured in square units such as square centimeters (cm^2), square meters (m^2), or square inches (in^2).
2. **Formula for Rectangles and Squares**:
   To find the area of a **rectangle**:

   $$\text{Area} = \text{Length} \times \text{Width}$$

   For a **square**, the formula is:

   $$\text{Area} = \text{Side} \times \text{Side}$$

Example 3: Finding the Area of a Rectangle

Problem:

A rectangle has a length of 6 cm and a width of 4 cm. What is the area?

Solution:

Use the formula for area:

$$\text{Area} = \text{Length} \times \text{Width} = 6\,\text{cm} \times 4\,\text{cm} = 24\,\text{cm}^2$$

So, the area is **24 cm²**.

Example 4: Finding the Area of a Square

Problem:

A square has sides of 5 inches. What is the area?

Solution:

For a square, multiply one side by itself:

$$\text{Area} = 5\,\text{in} \times 5\,\text{in} = 25\,\text{square inches}(in^2)$$

So, the area is **25 in²**.

Perimeter vs. Area

- **Perimeter** measures the distance around a shape.
- **Area** measures the space inside a shape.

Example: A Garden

If you want to build a fence around a garden, you measure the **perimeter**. If you want to know how much space you have to plant flowers, you measure the **area**.

Practice Problems

1. A rectangle has a length of 7 cm and a width of 3 cm. Find both the perimeter and the area.
2. A square has sides of 4 inches. What is the perimeter and what is the area?
3. A rectangle has a perimeter of 20 inches, and its length is 6 inches. What is the width?

4. A garden is shaped like a rectangle with a length of 9 meters and a width of 5 meters. How much fencing is needed to go around the garden (perimeter)? How much area is available for planting flowers (area)?

Conclusion:

- **Perimeter** is the distance around a shape, and you find it by adding up all the sides.
- **Area** is the space inside a shape, and you calculate it by multiplying the length by the width (for rectangles and squares).
- Understanding **perimeter and area** helps in real-life situations, like fencing a yard or covering a floor with tiles.