

Geometry and Tactile Graphics for Students in Grades 3 to 8

Lesson 1: Basic Shapes and Angles Used in Geometry



University of South Carolina Upstate

Objectives

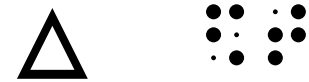
Participants will be able to:

1. Read and write the names of basic shapes in Nemeth Code within UEB Contexts.
2. Read and write problems containing geometric math expressions.
3. Read and write problems containing shapes to represent omitted material.

What Are Shapes?

- \therefore shape indicator
- A shape is a miniature picture of a geometric figure or another object.
- For regular polygons (e.g., square) begin with the \therefore followed by the number that represents the number of sides.
- For irregular polygons and other shapes (e.g., circle, angle), use the \therefore and the appropriate letter or symbol.

How to Write the Names of Commonly Used Shapes in STEM Courses



Spacing and Capitalization with Shape Symbols

- Put a space between the shape symbol and its descriptor, regardless of how it looks in print.
- Disregard the italics when transcribing.

$\angle A$ ⠠⠠⠠⠠⠠⠠

$\circ P$ ⠠⠠⠠⠠⠠⠠




- If a shape is followed by letters, each letter is individually capitalized.

$\triangle ABC$ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

$\square LMNO$ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

Signs of Comparisons Used in Geometry

Put a space between
shape symbols
and a sign of comparison

	\sim	is similar to
	\cong	is congruent to
	$\not\cong$	is not congruent to

$$\triangle XYZ \sim \triangle ABC$$



$$\angle C \cong \angle D$$



$$\angle 1 \not\cong \angle 2$$



Activity 1A

Interline the following.

⠠⠠⠠⠠⠠⠠⠠⠠

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

Activity 1A: Answer Key

1. □

⠠⠠⠠⠠⠠⠠

2. $\triangle LMN$

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

3. $\angle 4 \cong \angle 5$

⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

Activity 1B

Transcribe the following.

1. $\circ K$

2. $\square PQRS$

3. $\triangle JKL \sim \triangle MNO$

Activity 1B: Answer Key

1. $\circ K$

⠠⠠⠠⠠ ⠠⠠ ⠠⠠

2. $\square PQRS$

⠠⠠⠠⠠ ⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

3. $\triangle JKL \sim \triangle MNO$

⠠⠠⠠⠠⠠⠠ ⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠ ⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

Measure of an Angle

The letter m in front of an angle notation means “the measure of”. No English Letter Indicator is required.

⠠⠠⠠⠠⠠ ° degree

$$m\angle 2 = 30^\circ$$

⠠⠠⠠⠠⠠ ⠠⠠⠠⠠ ⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠

$$m\angle DEF = 90^\circ$$

⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠ ⠠⠠⠠⠠⠠⠠⠠⠠⠠

Signs of Operation Used in Geometry

Do not put a space between measures of angles and a sign of operation.

$$m\angle 1 + m\angle 2 = 90^\circ$$

$$m\angle AOB + m\angle BOC = m\angle AOC$$

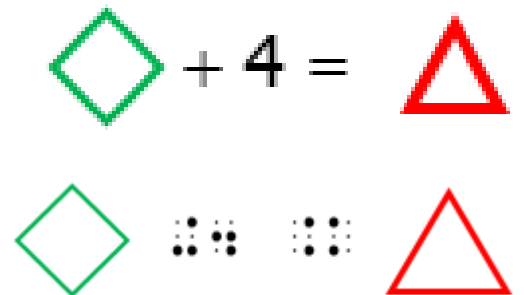
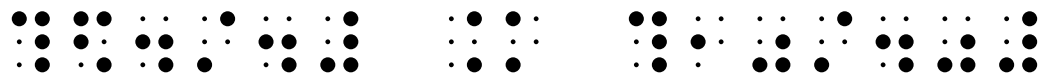
$$m\angle AOB + m\angle BOC = m\angle AOC$$

Shape Symbols that Represent Omissions

- When shapes represent omitted material, use the Nemeth shape indicator when students are in 4th grade and up.
- For students in Kindergarten through 3rd grade, make a tactile graphic for the shape.

$$7 \times \bigcirc = 35$$

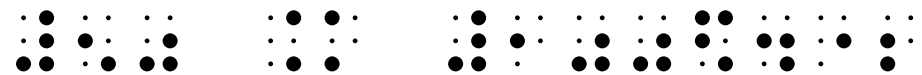
$$\frac{\square}{4} = \frac{10}{40}$$



Use of the Multipurpose Indicator with a Regular Polygon

- If a regular polygon (e.g., square ⠠⠠) represents a missing sign of operation and is followed by a number, use the multipurpose indicator ⠨.
- Place the multipurpose indicator between the shape and the number.

$$50 = 100 \square 2$$



$$y - 7 \square 5 = 67$$



Activity 1C

Transcribe the following.

1. $m\angle PQR = 30^\circ$

2. $m\angle 4 + m\angle 7 = 180^\circ$

3. $39 \leq 195 \square 5$

Activity 1D

Transcribe the following sentences.

9. $\triangle DEF$ is congruent to $\triangle PQR$.

10. If $\angle A$ and $\angle C$ are supplementary angles, then
 $m\angle A + m\angle C = 180^\circ$.

