



## ANALOGIES

*Thinking strategies to enhance skills of analysis, creativity, and problem solving.*

**MATHEMATICAL ANALYSIS**

**Brief Description of the Lesson:** The students will complete numeric and symbolic analogies.

**SOL:POS Objective:** *(List number and specific objective.)*

Program of Studies: Problem Solving/Applications

- use strategies (e.g., build a model, make a chart or table, make a list, make a graph, use a pattern, work backward) and appropriate materials to solve routine and non-routine problems
- solve problems using a plan
- identify information needed and not needed to solve problems
- share and explain thinking about how a problem is solved

**Instructional Strategy:**

Identifying Similarities and differences- Students explore mathematical concepts through analogies.

**Materials:** **Analogies** handout, **Analogies** handout key, **My Analogies** handout

**Enduring Understanding:**

- Analogies help us discover mathematical relationships.
- Analogies are one form of higher level thinking.
- Analogies help us visualize.

**Introduction/Essential Questions:** *(What influences your reaction to an issue or a problem?)*

- How are analogies important for understanding mathematical concepts?
- How do analogies help us better explain ideas?
- How do analogies force you to make connections?

**Teach and Explore Strategy:** *(Steps in teaching the process and exploring applications)*

Prior to teaching this lesson, be sure to have taught or reviewed the introductory thinking process lesson. Help focus students' thinking by reminding them of the metacognitive component of this lesson.

- **Rationale:** An analogy is made from sets of words or concepts that have a particular relationship. Analogies stimulate critical and creative thinking and can be used in all content and skill areas. Analogies assess a student's ability to make connections and identify relationships among concepts.
- **Introduce analogies:** In math, analogies can be verbal, numeric or symbolic. Each analogy is a relationship phrase and the completed analogy makes connections between all the elements/attributes of the concept.
- Explain to students how to read an analogy using the words \_\_\_\_\_ is to \_\_\_\_\_ as



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Thinking  
strategies  
to enhance skills  
of analysis,  
creativity,  
and problem  
solving.

- \_\_\_\_\_ is to \_\_\_\_\_ and the symbolism \_\_\_\_\_:\_\_\_\_\_::\_\_\_\_\_:\_\_\_\_\_.
- **Guided Practice:** Complete the *Analogies* handout. Complete some of the analogies together as a whole group to help students see all the various relationships and how they are connected in the analogy. Allow students to work on some of the analogies on their own. The teacher answer key only suggests possible answers. Students can defend their connections and complete analogies with their own thinking.
  - **Practice:** Students should create their own analogies using the **My Analogies** handout.
  - **Closure:** Allow students to share some of the analogies they created. Discuss how numeric and symbolic analogies are different from verbal analogies.

**Assessment Evidence:** (Discussion, teacher observation, completed product, student reflection...)

- Teacher observations
- Completed products and sharing
- Student discussion and questioning

**Metacognition:**

- How can the process of determining the relationship help you solve the analogy?
- What thinking is involved in making connections?
- How can you develop your spatial intelligence for symbolic analogies?
- What properties do numeric analogies illustrate? Why?

**Extensions:**

- Provide additional analogy practice from other resources.
  - Prufrock Press *Advancing Through Analogies*
  - Prufrock Press *Analogies for Beginners*
  - Prufrock Press *Analogies for the 21st Century*
  - Prufrock Press *Analogy Roundup*
  - Prufrock Press *Attribute Block - Analogies: Thinking Activities*
  - Prufrock Press *Attribute Block - Sequences: Thinking Activities*
  - Prufrock Press *Thinking Through Analogies*
  - Prufrock Press *First Time Analogies*

# Analogies

Student Name: \_\_\_\_\_

Answers may vary-sample answers given.

area is to  $l \times w$  as circumference is to  $C = d$

congruent is to as similar is to  $\approx$

8 is to octagon as 6 is to hexagon

4 25 is to  $200 \div 2$  as 2 25 is to  $150 \div 3$



is to



as



is to

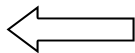


$(3+2)8$  is to  $80 \div 2$  as  $[(6-4)+8]6$  is to  $30 \times 2$

$4/2$  :  $4 \div 2$  ::  $6/3$  :  $6 \div 3$



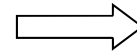
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3  $30 \div 10 + 1$  :  $1000 \div 100$  :: 4 50 :  $100 \quad 4 \div 2$

square : rectangle :: rhombus : parallelogram

XXV : 25 :: LXIII : 63

# Analogies

Student Name: \_\_\_\_\_

Discover the relationship. Complete the analogy.

area is to  $l \times w$  as circumference is to

congruent is to as similar is to

8 is to octagon as is to hexagon

4 25 is to  $200 \div 2$  as is to  $150 \div 3$



is to



as

is to



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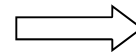


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3  $30 \div 10$  : : 4 50 : 100  $4 \div 2$   
+1

square : :: rhombus : parallelogram

XXV : 25 :: LXIII :

Process Lesson: Analogies