



Manipulatives as a Tool

FROM
CONCRETE
TO
VISUAL/REPRESENTATIONAL
TO
ABSTRACT

Pattern Blocks
Color Tiles
Tangrams
Cuisenaire Rods
Snap Cubes
Geoboards

Grade 2 Math Tasks

GRADE 2 MATHEMATICS TASKS

AUTHORS' VISION FOR IMPLEMENTATION

OVERVIEW AND DISCOVERY TIME FOR EACH MANIPULATIVE:

- Teacher distributes manipulatives to partner pairs.
- Partner pairs work together for 10 minutes to discover attributes of manipulative and make a list of the attributes
- Teacher asks partner pairs to share attributes with the whole class – teacher lists attributes on an overhead transparency
- Students work in partner pairs for 10 minutes to make discoveries with the manipulatives and make a list of the discoveries
- Teacher asks partner pairs to share discoveries with the whole class – teacher lists discoveries on an overhead transparency
- Student add to the list during any of the instructional tasks

PROCESS FOR EACH INSTRUCTIONAL TASK:

- Teacher prepares materials as listed on each task for the entire class
- Teacher places instructional task transparency on the overhead and discusses the entire task with the class before they begin working.
- Teacher places assessment transparency on the overhead before students begin working on the tasks so that students will know what questions they will answer during and after completion of the task.
- Teacher distributes 1 copy of the task and assessment to each pair/group of students.
- Students complete task.
- Teacher places assessment transparency on the overhead and debriefs the task as a class.

PATTERN BLOCK EXPLORATION

Set of blocks in six color-coded shapes

- Green triangles
- Orange squares
- Blue parallelograms
- Tan rhombuses
- Red trapezoids
- Yellow hexagons

Relationships Among the Measures

- Side measures 1-inch except longer side of trapezoid is 2-inches
- Angles measures are divisors of 360 - 120° , 90° , 60° , and 30° except the tan rhombus which has two measures of 150° (which relates to the other angles - 150° is the sum of 90° and 60°)

Proportional Relationships Among the Figures

- Yellow block can be covered by two red blocks, or three blue blocks, or six green blocks

Visual Image for Understanding of Fractions Algorithms

- If a yellow block can represent the unit then -
 - a red block represents $\frac{1}{2}$
 - a blue block represents $\frac{1}{3}$
 - a green block represents $\frac{1}{6}$

PATTERN BLOCKS AS A TOOL

To explore spatial relations

To communicate mathematically

To explore mathematical concepts

- Congruence
 - Similarity
 - Symmetry
 - Area
 - Perimeter
 - Patterns
- Functions
- Graphing

**To encourage independent and
group work**

Pattern Blocks Task #1 Assessment

- How are your antwalks the same? How are they different?
- Look around the room at the other antwalks. Find the shortest antwalk path. Why do you think this is the shortest path?
- Look around the room at the other antwalks. Find the longest antwalk path. Why do you think this is the longest path?
- What is the length of the shortest path? What is the length of the longest path?
- How are the shorter paths different from the longer paths?
- Which antwalk do you think an ant should use most often to train for the Ant Olympics? Why?
- What 10 Pattern Blocks would you select if you wanted to make the longest training path possible? Why did you choose those blocks? How would you arrange those blocks? What would the length of your antwalk be?
- What 10 Pattern Blocks would you select if you wanted to make the longest training path possible? Why did you choose those blocks? How would you arrange those blocks? What would the length of your antwalk be?

TEKS 2.1	Use concrete models to compare and order whole numbers (through 999), read the numbers, and record the numbers and symbols
TEKS 2.7A	Identify attributes of any shape or solid
TEKS 2.7B	Use attributes to describe how two shapes or two solids are alike or different
TEKS 2.7C	Cut geometric shapes apart and identify the new shapes made
TEKS 2.9A	Identify concrete models that approximate standard units of length, capacity and weight
TEKS 2.9B	Measure length, capacity, and weight using concrete models that approximate standard units
TEKS 2.14	Reason and support his or her thinking using objects, words, pictures, numbers, and technology