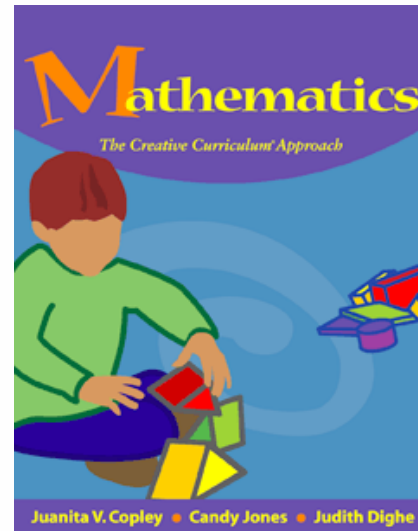


Connecting Mathematics and Democratic Citizenship I

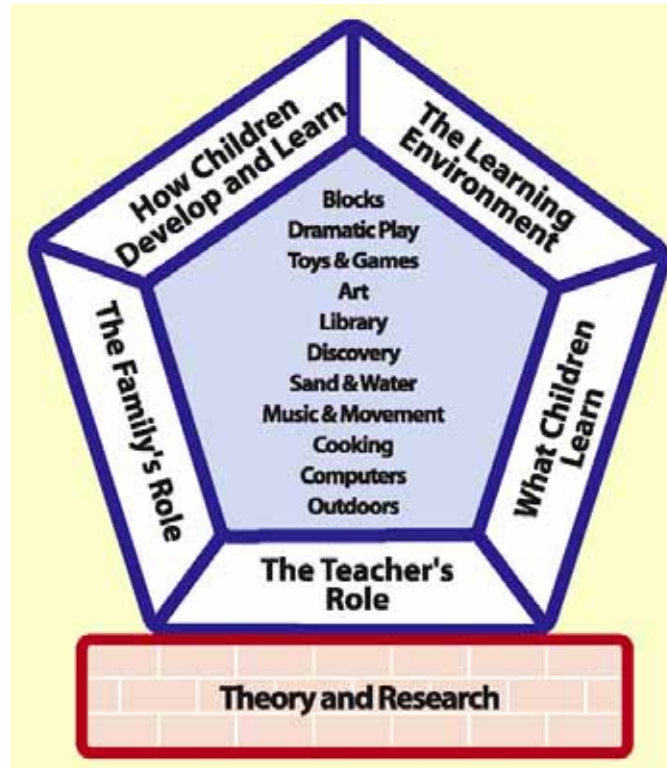


Hilary Parrish
Editorial Director, Teaching Strategies

Memories of Math

- Close your eyes. Think back to your childhood days or “school days” and recall your experiences with math. What do you remember? What feelings do you associate with math?
- Turn to a neighbor and share your experiences.
- Do you think your personal experiences with math influence your teaching practices? In what ways?

The Creative Curriculum[®] for Preschool



Curriculum Principles

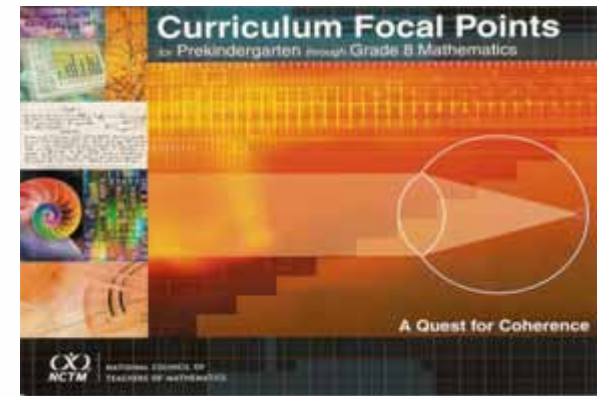
- Mathematics curriculum includes content and process skills.
- Children should be at the center of the curriculum.
- The environment is an essential part of the mathematics curriculum.
- Teachers have to plan how and when instruction will take place.



Curriculum Focal Points for Prekindergarten Mathematics

Focal Points

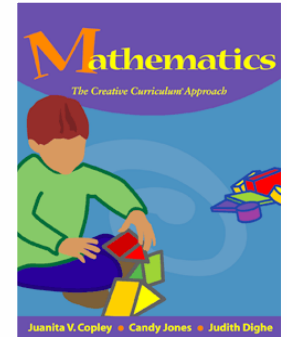
- Number and Operations
- Geometry
- Measurement



Connections

- Data Analysis
- Number and Operations
- Algebra (patterns)

Number and Operations



1. Counting

- Number sequence
- One-to-one correspondence
- Last number named when counting a set of objects tells *how many*

2. Quantity (sense of number)



- *Subitizing*

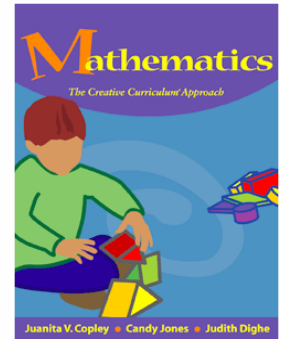
Number and Operations

3. Comparisons

4. Order

First, Second, Third...

5. Numerals

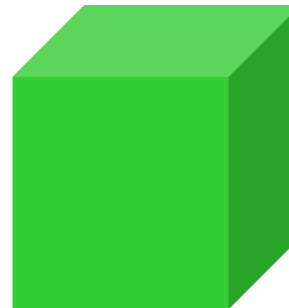
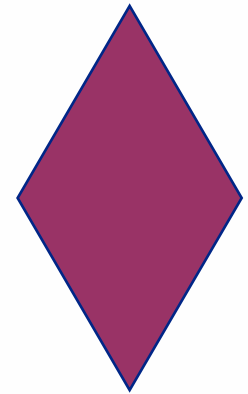
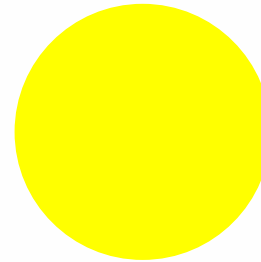
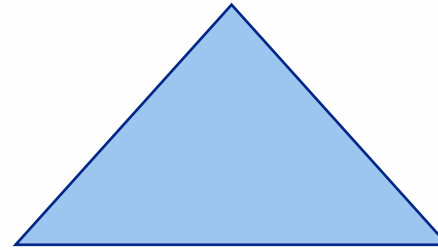


Number and Operations

6. Combining Operations (Adding)
How many in all
7. Separating Operations (Subtracting)
Are left
8. Sharing Operations (Dividing)
Sharing
9. Set-Making Operations (Multiplying)

Geometry

1. Shape
 - 3 Dimensional
 - 2 Dimensional
 - Geometric names

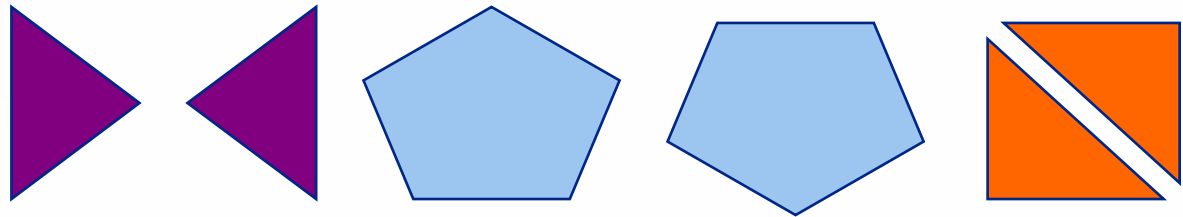


Geometry

2. Space

near, under, by, on top of, right, left

3. Transformations



4. Visualization

Geometry

Describe the 3-D shapes using 2 dimensional shape names and words such as faces, points, and sides

Using the straws provides create shapes by transforming the straws and visualizing the shape first

Measurement

1. Recognition of Measurement Attributes

- Length
- Capacity
- Weight
- Area
- Time



2. Comparing and Ordering

Measurement

3. Measurement Behaviors and Processes

Conservation

●●●● four dots

●● ●● four dots

Transitivity

length A _____

length B _____

length C _____

Unit

Measurement

Using the straws provided:

Can you use them to measure anything?

Can you compare them with each other?

Can you use them to explain transitivity?

Algebra (Patterns and Change)

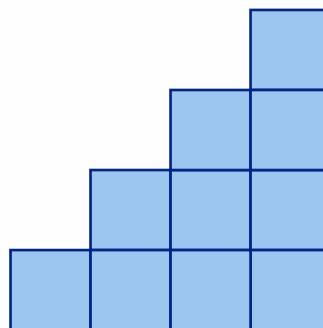
1. Patterns

- Repeating patterns



- Growing patterns

2. Change



Algebra (Patterns and Change

Exploring Patterns in our area

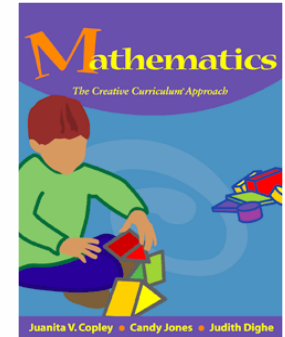
Take a five walk around the conference center and list all the patterns you observed

Draw the patterns you see.

Are they repeating pattern or a growing pattern?

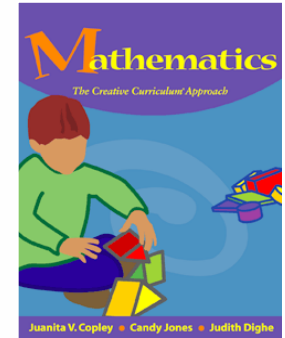
Data Analysis

1. Sorting and Classifying
2. Representing Data
3. Describing Data



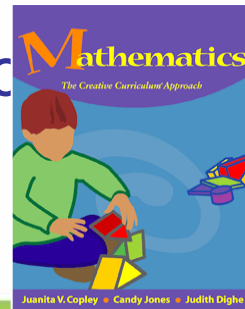
Mathematics Process Skills

- Problem Solving
- Reasoning
- Communication
- Connections
- Representation



Planning Your Mathematics Program

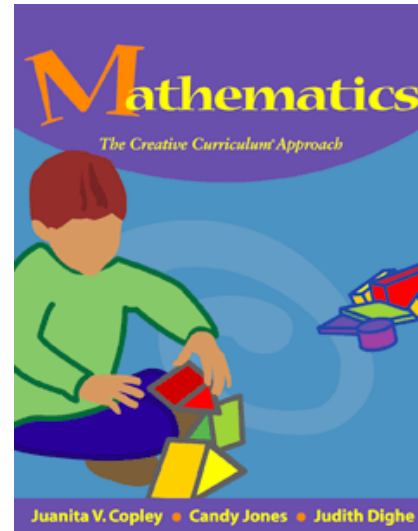
- Talk in small groups about how mathematics can lead to democratic citizen
- What skills are the children exploring when they learn math?
- How will these skills lead to democ



Mathematics in Action!



Connecting Mathematics and Democratic Citizenship II



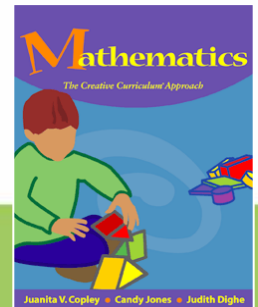
Hilary Parrish
Editorial Director, Teaching Strategies

Mathematics Learning in Interest Areas

- Toys & Games
- Blocks
- Dramatic Play
- Art
- Library
- Discovery
- Sand & Water
- Music & Movement
- Cooking
- Computers
- Outdoors

Mathematics Learning in Interest Areas

- Linking mathematics and play
- Materials and books to add to interest areas
- Using the interest area to teach mathematics skills
- Observing children's progress



Math in the Dramatic Play Area

Measuring spoons and cups

Cookbooks, clocks, calendars

Timer, emergency telephone numbers

Phone books, coupons, bowls

Pots & pans, muffin tins, price tags, and

Cash register with money

Model Activities

- Goals and Objectives
- Other Concepts
- Materials and Preparation
- Guiding Children's Learning
- Closing

Straw Shapes

Goal(s) & Objectives

Objectives

22. Observes objects and events with curiosity; 26. Applies knowledge or experience to a new context

Other Concepts

- Identifies basic geometric shapes and their properties
- Describes, classifies, and sorts basic geometric shapes
- Uses comparative words related to size

Materials and Preparation

- Geometric shapes
- Drinking straws
- Pipe cleaners (optional)
- Sandwich-size baggies
- Writing materials (math journals or clip boards)

Cut the straws into 3-inch, 5-inch, and 7-inch lengths and place numerous pieces in a baggie. Prepare one baggie for every two children.

Guiding Children's Learning

Lead a discussion about various geometric shapes. Call attention to the attributes of each.

Have the children form pairs. Give each pair a bag of straws. Explain that they are to work together and use the straws to make as many different shapes as they can. Model the activity, thinking aloud as you work. If children have difficulty keeping the shapes together, provide pipe cleaners and demonstrate how to thread them through the straws and connect the ends.

As children work, move about to observe, provide assistance, and ask open-ended questions such as these:

If you took away this straw, would it still be a rectangle? Why or why not?

Can you make a triangle with one really long side?

You made a very large rectangle. How many straws did it take to make it?

After a reasonable time period, stop the work. Demonstrate how the children can document their work by drawing the shapes they made. Then give each pair of children writing materials. Provide assistance as needed.

Model Activities

- **Developmental Progression**

Developmental Progression

Simple	Have children show shoes with a particular attribute.
	Have children explore a collection of shoes freely and share what they discover.
Complex	Have children identify or describe one characteristic of the shoes and then sort the collection into two groups (e.g., those that have the characteristic and those that do not have the characteristic). Ask the children to recall the sorting rule.
	After shoes have been sorted by one characteristic, have the children establish a new sorting rule and then resort the shoes.
	Have the children sort shoes into groups with subgroups (e.g., sort shoes with laces into running shoes with laces and not running shoes with laces)

- **Meeting the Needs of Diverse Learners**

Model Activities

Going Beyond

Table:
Group Size, Interest Area, Time

Individual	Small Groups	Large Group	Interest Area	Single Day	Multi-Day	Time
•	•	•	Library	•		15–20 minutes

Small Group Experiences

Using the materials provided, please conduct the activity.

Discuss what math components are explored and what process skills you used.

In your group think of an extension activity related to the math component and/or process skill

Questions and Comments

