

Geometry

From *Big Ideas of Early Mathematics*

BIG
IDEAS



Spatial Relationships

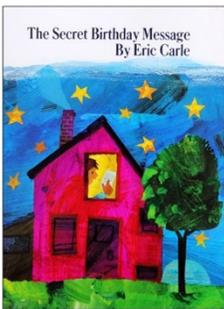
- Relationships between objects and places can be described with mathematical precision
- Our own experiences of space and two-dimensional representations of space reflect a specific point of view

Spatial relationships can be visualized and manipulated mentally

Shapes

- Shapes can be defined and classified by their attributes
- The flat faces of solid (three-dimensional) shapes are two-dimensional shapes
- Shapes can be combined and separated (composed and decomposed) to make new shapes

Idea:



Treasure Map: Using Eric Carle's book *The Secret Birthday Message* as a spring board, children create secret coded "treasure maps" using spatial terms for other children to follow. Read the story and allow the children to study the maps. Encourage children to use pictures and shapes. Children hide a "treasure" somewhere in the classroom and create their own map with directions for how to find the hidden treasure. Encourage the children to use geometric shapes to represent objects and furniture in the classroom. When the maps are finished, children give the map to another treasure hunter (Copley, 2010).



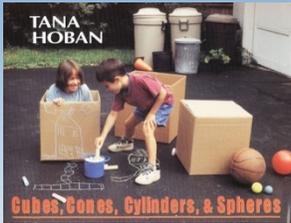
*Developing
foundational
mathematic skills
requires concrete
experiences that
are meaningful to
them.*



Opportunities that Encourage Geometric Understanding:				
BLOCK AREA	ART AREA	LITERACY EXPERIENCE	OUTDOOR EXPERIENCE	LARGE GROUP
Children predict and experiment with composite shapes as blocks are put together and taken apart to create new shapes.	<i>Object Prints-</i> Using familiar household or classroom items (Legos, marker cap, small block, potato masher) children make prints. A game can be made of asking other children to identify what was used to make that print and share their reasoning.	<i>Alphabet Symmetry-</i> Using a mirror, children try to find lines of symmetry in uppercase and lowercase letters.	<ol style="list-style-type: none"> 1. Take shape hunt walks to discover shapes in nature, on buildings and in the environment. 2. Create obstacle courses that provide opportunities for climbing over, under, through, next to, etc. 	<i>Body Shapes-</i> Children join with other children to form geometric shapes with their bodies.

SOCIAL STUDIES EXPERIENCE	SAND & WATER TABLE
Children make and read maps of familiar areas such as the classroom, school or their home. They can then verbally describe where parts or objects are when asked (the flag is next to the white board).	Provide different shapes for blowing bubbles (e.g. cherry tomato basket, tennis racket, fly swatter, or have children make different shape blowers using pipe cleaners). What is effect of the shape on the bubble?





Library Books with Geometrical Concepts:

Flat Stanley by Jeff Brown
Three Billy Goats Gruff
Cubes, Cones, Cylinders and Spheres by Tana Hoban
Goldilocks and the Three Bears
The Secret Birthday Message by Eric Carle
Picture Pie books by Ed Emberley
The Shape of Things by Dayle Ann Dodds
The Shape of Me and Other Stuff by Dr. Seuss

Not a Box by Antoinette Portis
Rosie's Walk by Pat Hutchins Macmillan
When a Line Bends, A Shape Begins by Rhonda Gowler Greene
Round Is a Mooncake by Roseanne Thong
The Greedy Triangle by Marilyn Burns
Grandfather Tang's Story by Ann Tompert
As the Crow Flies by Gail Hartman
Mouse Shapes by Ellen Stoll Walsh



Geometry Songs (includes songs that utilize positional terms):

"Going on a Bear Hunt"
 "Jack Be Nimble"
 "Hokey Pokey"
 "The Bear Went Over the Mountain"
 "Baby Beluga"

Geometric Vocabulary and Definitions:

spatial sense: a variety of spatial understandings- direction (Which way?), distance (How far?), location (Where?), and representation (What objects?)

location/position words: on, off, on top of, over, under, in, out, into, out of, top, bottom, above, below, in front of, in back of, behind, beside, by, next to, between, same/different side, upside down

movement words: up, down, forward, backward, around, through, to, from, toward, away from, sideways, across, back and forth, straight/curved path

distance words: near, far, close to, far from, shortest/longest path

transformation words: turn, flip, slide

