

### Early Geometry Concepts: Making Connections to the Real World

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### Learning Goals

#### Participants will understand that...

 helping students achieve success with the correct developmental approach will allow for better mathematical understanding later on in life

#### Participants will know...

- Geometry Concepts
  - Directional and Positional Language, 3D and 2D Concepts

#### Participants will be able to...

 begin monitoring how their instruction impacts the mathematical development of their early childhood students





### EARLY GEOMETRY CONCEPTS

#### Geometry

- What is geometry to young learners?
- Spatial Language
- 3D Concepts
- 2D Concepts



### Geometry is...

- the **exploration** of space, size, and position.
- the manipulation of mental pictures, often called visual thinking.



### For young learners, geometry is

# **eye-motor coordination** – the ability to coordinate vision and body movement.





### For young learners, geometry is

**figure-ground perception** – the ability to distinguish foreground from background.





### For young learners, geometry is position-in-space perception – the ability to recognize how an object in space is related to themselves and how an object has changed positions.





For young learners, geometry is perception of spatial relationships – the ability to recognize the relationships between two or more objects in relation to themselves.



### For young learners, geometry is visual discrimination – the ability to identify similarities and differences in an objects characteristics.





### For young learners, geometry is

**visual memory** – the ability to recall objects and the characteristics of objects that are no longer visible.





Benton visual retention test



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### Spatial Understanding

Refers to an individual's spatial sense and their **awareness of their surroundings** in relation to people and objects.



### **Positional Language**





### **Directional Language**









little blue and little yellow





# Tabletop Obstacle Course

- Build an obstacle course with the materials at your table.
- Use positional and directional language to describe the pathway through the course.





### This understanding leads to...





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### **Three-Dimensional Objects**

#### Their everyday world!



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### **Three-Dimensional Objects**



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### **3D Objects for Young Learners**

- Cube
- Cylinder
- Cone
- Pyramid
- Prism
- Sphere





# Attributes of 3D Objects

- Flat Surface or Face
- Edge
- Corner or Vertex
- Apex
- Curved or Rounded
  Surface





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## Analytical Approach to 3D

Emphasizes the **attributes** of the object.

- Does it roll, stack, or both?
- Same number of faces, edges, corners?





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### Holistic Approach to 3D



Involves building **families** of objects with geometric similarity



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### **2D Shapes for Young Learners**



2D shapes come <u>from</u> 3D objects!

# **2D Shapes for Young Learners**

Attributes:

- No thickness
- Are flat
- Corners
- Sides



### 3D to 2D Understanding



### **Attribute Recognition**





### This Understanding Leads to...









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### **Thank You**



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