

Welcome to Learning Lab # 10 of Erikson Early Math iNNOVATIONS!

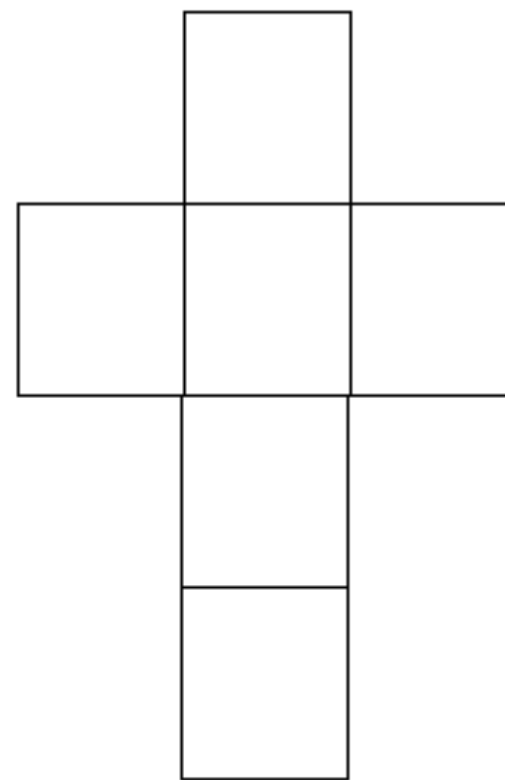
Greetings!

Solid Shape Sort

Creating a Net:

A Math Investigation for Adults

- We want to make boxes that are the same as these solids, but we do not have the designs we need. Please help!
- As a first step of our backwards design process, make a net of your solid shape.
- When you think you've done it, cut and fold to check.
- Here is a net for a cube:



Describing 3-D Shapes:

*More Math Investigation **for Adults***

- On an index card, write a mathematical description of your 3-D shape (without using its name).
- After cards are shuffled, you'll get a new one. Try to find the shape that it describes.
- After you've found your match, gather with others who have the same type of shape to compare.

A Big Idea about Shapes

The flat faces of solid (three-dimensional) shapes are two-dimensional shapes.

Video Analysis: “3-D Shapes in 2nd Grade”

Edges, Vertices, and Faces

Look at each skeleton of a 3-D shape that you made. How many edges, vertices, and faces does each 3-D shape have? Record the number on the data table.

Skeletons of 3-D Shapes Data Table

Type of Shape	Number of Edges	Number of Vertices (Corners)	Number of Faces (Sides)
cube			
triangular prism			
rectangular pyramid			
triangular pyramid			
rectangular prism			

This is the activity table that the students in the video are using.

Video Analysis

“3-D Shapes in 2nd Grade”

Teacher Practice (HIS-EM): Concept Development

High-Impact Strategies

- Teachers ask questions that focus students on the structure of the problem.
- Teachers draw students' attention to the Big Ideas.

Student Practice (Common Core)

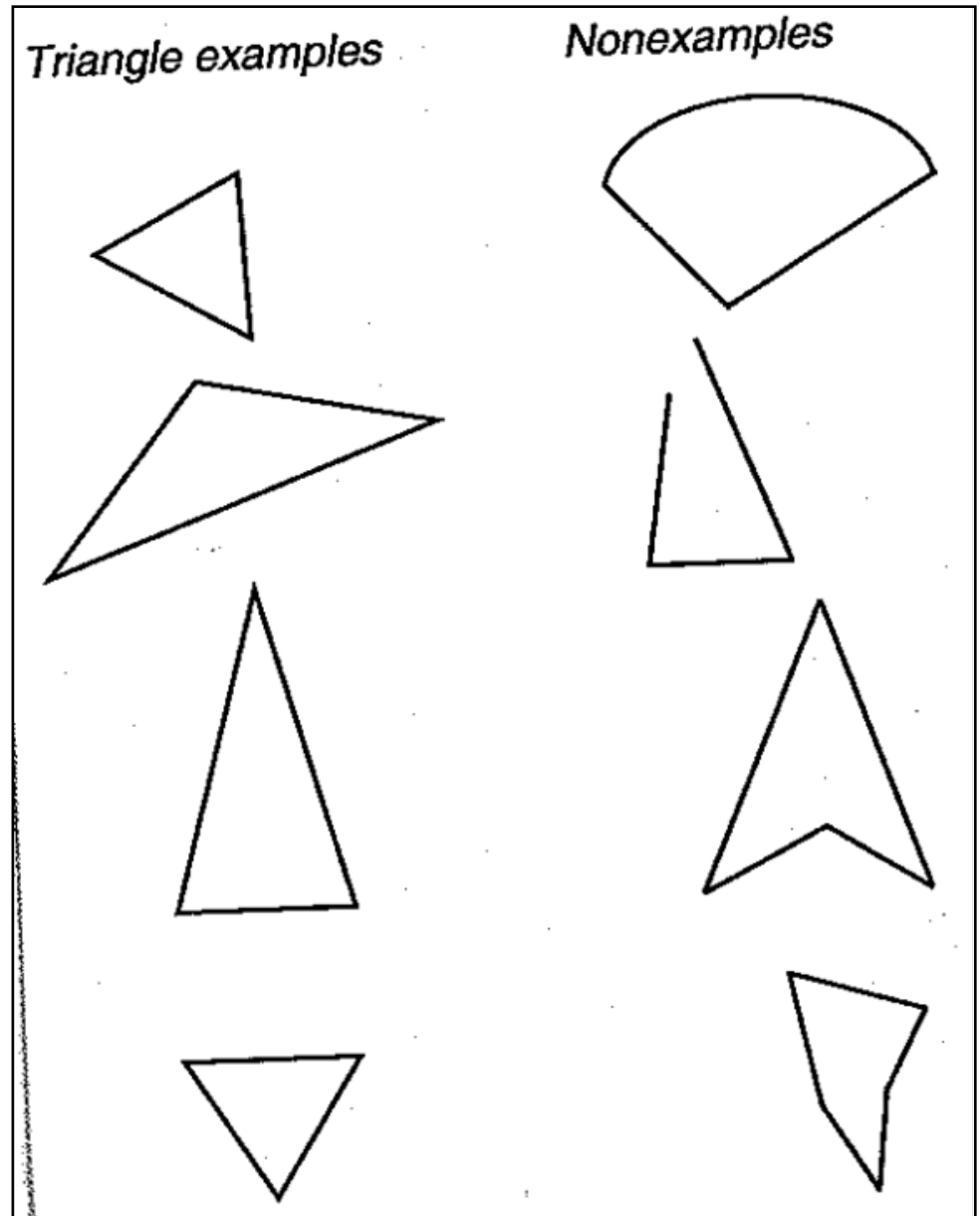
#7: Look for and make use of structure.

van Hiele's Levels of Geometric Thinking: Implications for Teaching

- The levels are sequential.
 - The thinking and understanding of prior levels are required for further development.
- The levels are not age dependent.
 - Geometric experience is the greatest single factor influencing advancement.
- The use of physical materials, drawings, and computer models are important at every level.
- When instruction is at a level higher than that of the students, learning will likely be temporary and superficial.

To give students a chance to **think** precisely about **shapes**, it is important to show a wide variety of **examples & non-examples**.

Triangle examples & non-examples
reprinted from Copley, J. *The Young
Child and Mathematics*, 2nd ed., p.107
(NAEYC & NCTM, 2010).



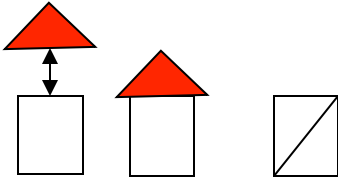
Triangle Talk in Three Classrooms

- Video clip: 5th grader & teacher
- Readers Theater: “What is a triangle?” (kindergarteners & teacher)
- Research Lesson video: “Feel for Shapes” (preschoolers & teacher)

A Big Idea about Shapes

Shapes can be defined and classified by their attributes.

Big Ideas of Shape

Topic	Big Ideas	Examples
<p>Defining & Analyzing Shapes</p> 	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • A rectangle must have two sets of parallel sides of equal length and four 90° angles; thus, a square is a special type of rectangle. • A baseball is a sphere and can be represented in a drawing as a circle. • Any rectangle can be divided into 2 triangles.

Getting Good Math out of Good Books

- Annotated bibliography to help you choose.
- Everyone gets two books.

