

## **Let's Get Learning!**

*Using adult learning activities to increase teachers' knowledge of content, development & pedagogy in math*

Presentation at NCTM Annual Meeting, Denver, CO, 19 April 2013

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### **Why use adult learning activities in professional development sessions?**

- Solving real problems activates discipline-related thinking.
- Discipline-related thinking helps one GET big ideas and their connections.
- Content provides framework for understanding development and pedagogy.

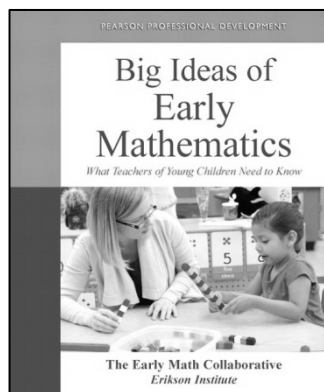
### **An effective adult learning activity ...**

- is based on a central and coherent concept of the discipline being explored;
- poses a puzzle or problem;
- is interesting or complicated enough to capture and retain adult attention;
- clearly focuses thinking on the relevant content or ideas;
- is easy to implement in an adult PD setting;
- may have more than one solution or route to solution.

... hmm ...

Look for our book –  
*Big Ideas of  
Early Mathematics:  
What Teachers of  
Young Children  
Need to Know.*

Available in June  
from Pearson.

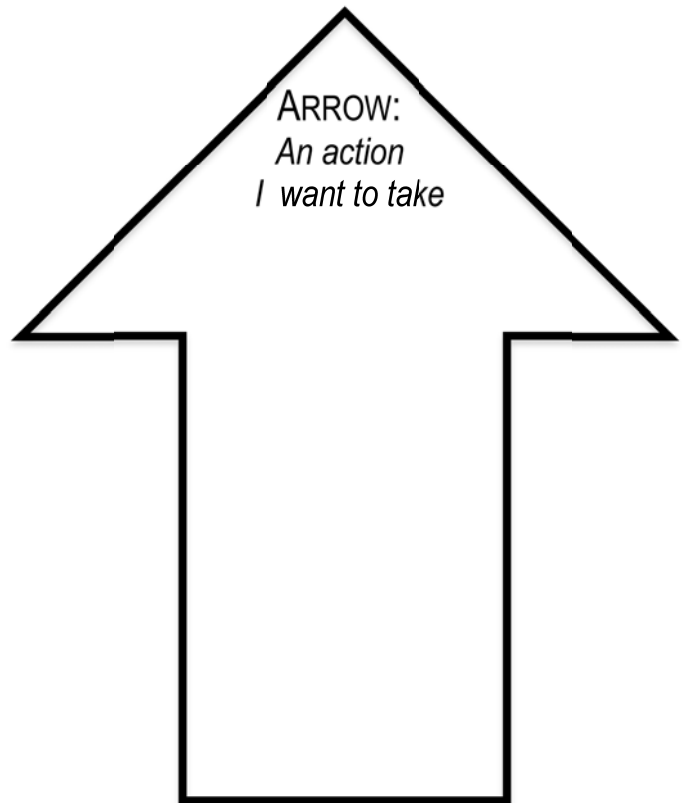
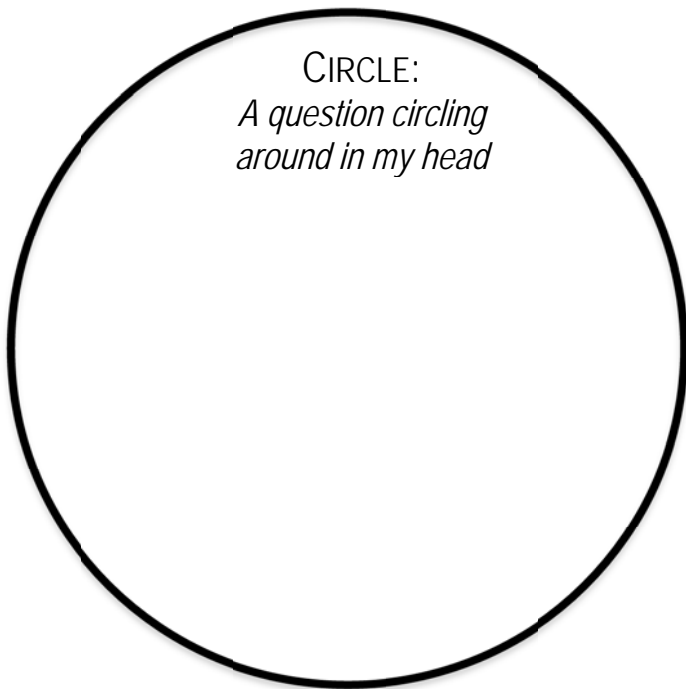
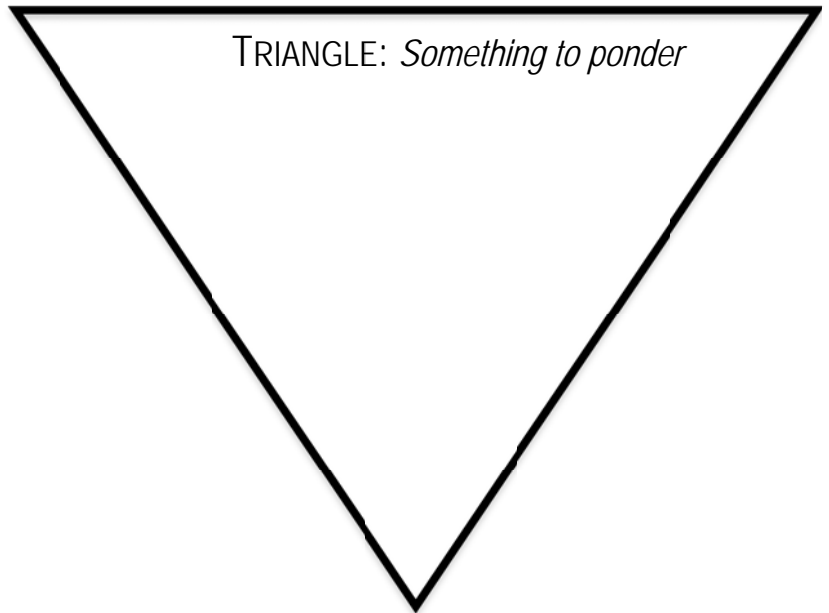
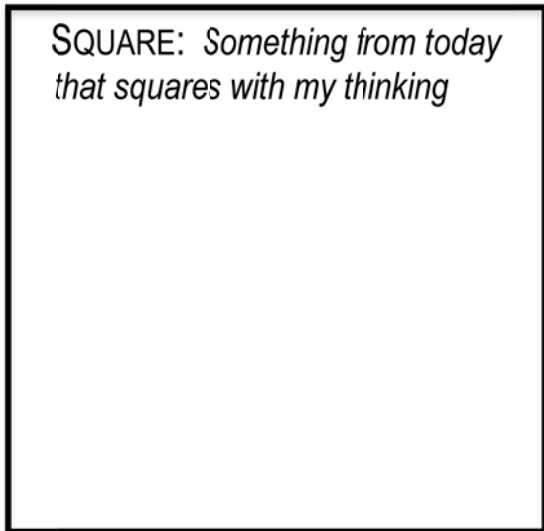


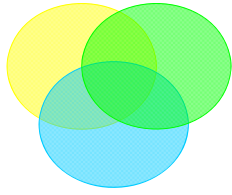
notes & ideas

Questions or comments? Feel free to contact us: [lginet@erikson.edu](mailto:lginet@erikson.edu) or [djohnson@erikson.edu](mailto:djohnson@erikson.edu)  
Check out our web-site: <http://earlymath.erikson.edu>

**Let's Get Learning!**

THOUGHTS & NOTES





## Let's Get Learning!

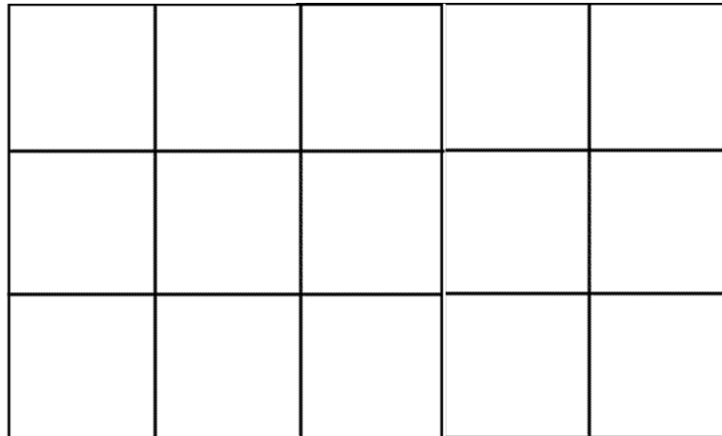
Using adult learning activities  
to increase teachers' knowledge of  
content, development & pedagogy in math  
& other disciplines

Lisa Ginet & Donna Johnson

April 19, 2013

NCTM Annual Meeting – Denver

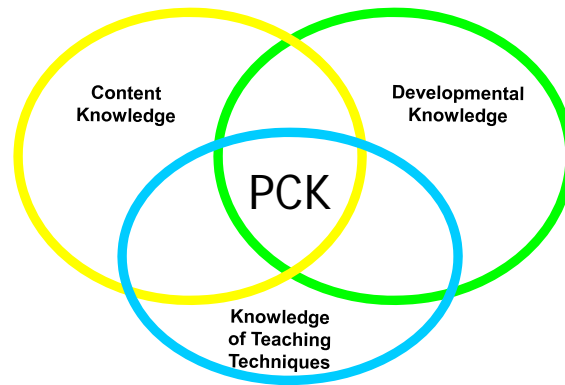
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*How many squares can you find  
in this picture?*

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## Pedagogical Content Knowledge



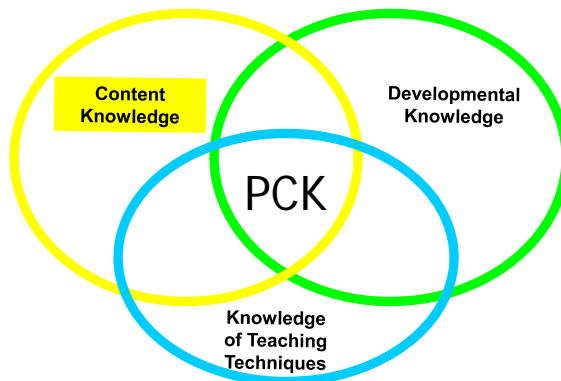
## Example Adult Learning Activity

SORT & RE-SORT

## Big Ideas of Sets

Topic	Big Ideas	Examples
<b>Sets &amp; Sorting</b>  	<ul style="list-style-type: none"> <li>•Attributes can be used to sort collections into sets.</li> <li>•The same collection can be sorted in different ways.</li> <li>•Sets can be compared and ordered.</li> </ul>	<ul style="list-style-type: none"> <li>•Color, size, shape, type of object, etc.</li> <li>•Red bears vs. blue bears; big bears vs. little bears</li> <li>•<i>There are more red bears than blue bears. (compare); small bears, medium bears, large bears (order)</i></li> </ul>

## Pedagogical Content Knowledge

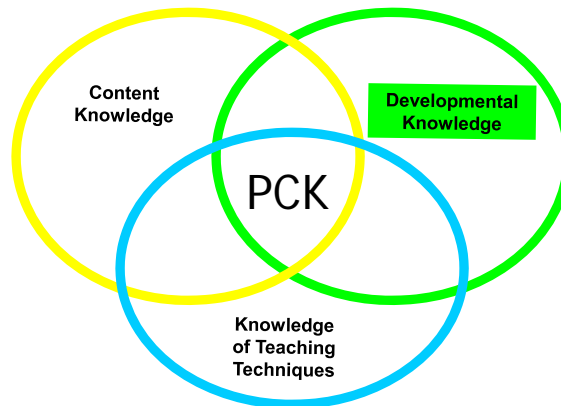


## Video Clip: *Focus on the Child* “Sorting Rocks”

### Learning Path

- At all ages, children classify intuitively.
- By 2 weeks of age, infants distinguish between objects they suck and those they do not.
- By 2 years, toddlers form sets with objects that are similar.
- At age 3, most children follow verbal rules for sorting.
- In preschool, children can sort objects according to a given attribute and form categories (although they may switch attributes during the sorting).
- Not until age 5 or 6 do children sort consistently by a single attribute and re-classify by different attributes.

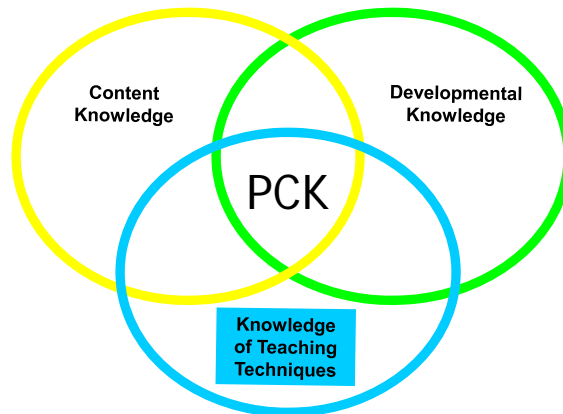
## Pedagogical Content Knowledge



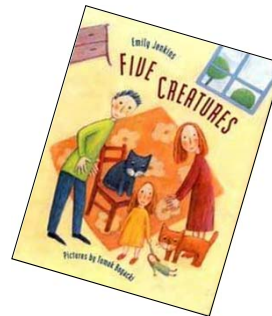
## Teaching Implications

- **Attribute** recognition precedes organization (match...sort...pattern).
- Number of **attributes** is a difficulty factor.
- **Attribute** is key concept in all of math.
  - What kind of shape is it?
    - Geometric thinking: definition & classification
  - What kind of big is it?
    - What & how do we measure?
  - What kind of thing are we counting?
    - What is the unit?
    - What is the set?

# Pedagogical Content Knowledge



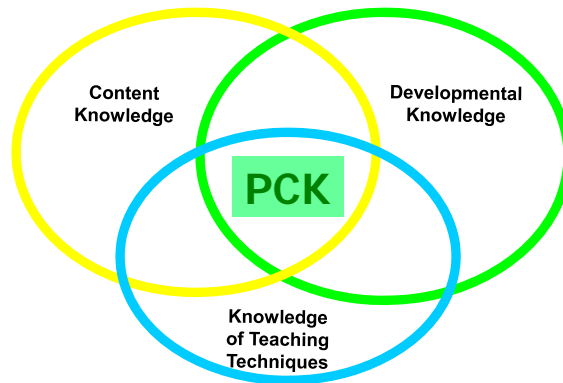
## Activity for Children: “People Sort”



Video Clip: Research Lesson



## Pedagogical Content Knowledge



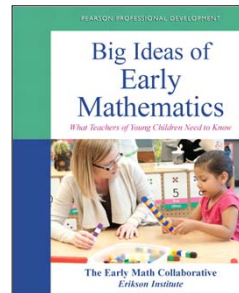
## Good Adult Learning Activities....

- are based on a central and coherent concept of the discipline being explored;
- pose a puzzle or problem;
- are interesting/complicated enough to capture and retain adult attention;
- clearly focus thinking on the relevant content/ideas;
- are easy to implement in an adult PD setting;
- & may have more than one solution or route to solution.

Take-Away Messages  
Content is complicated.  
Teachers need to be learners.

THANK YOU!

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djohnson@erikson.edu



Check out our book!

Available in June from Pearson

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