



Embedding Assessment into Instruction: Advancing Mathematics Learning and Teaching

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Thank You...



Professional Development (PD)

- Positive correlation between PD* and increased student achievement.
- Teachers active in PD* are leaders in school communities.

*growth in content as well as teaching skills and behaviors

What do you expect from this presentation?

Assessment...

...as an Open and Coherent Process

Assessment as a Means of ...

Enhancing Mathematics Learning

Promoting Equity

Providing Valid Inferences about
Mathematics Learning and Teaching

Embedding Assessment into Instruction

What will you get from this presentation?

A frank and honest discussion about Assessment and its Role
in the Teaching and Learning of Mathematics.

An opportunity to engage in a field-tested Learning Experience
that Embeds Assessment into Instruction using a Problem
Solving Educational Orientation

Assessment...

...is the process of gathering evidence about a student's knowledge of, ability to use, and disposition toward mathematics and of making inferences from that evidence for a variety of purposes.

NCTM (1995). *Assessment Standards for School Mathematics*.

Assessment in the Mathematics Classroom

When students assess their own understanding and become proactive learners, central to the learning process, they advance their ownership of understanding.

National Council of Teachers of Mathematics

Content Standards

Number Sense and Operations

Algebra

Geometry

Measurement

Data Analysis and Probability

National Council of Teachers of Mathematics

Process Standards

Representation

Reasoning and Proof

Communication

Connections

Problem Solving

What is Problem Solving?



Problem or Exercise?

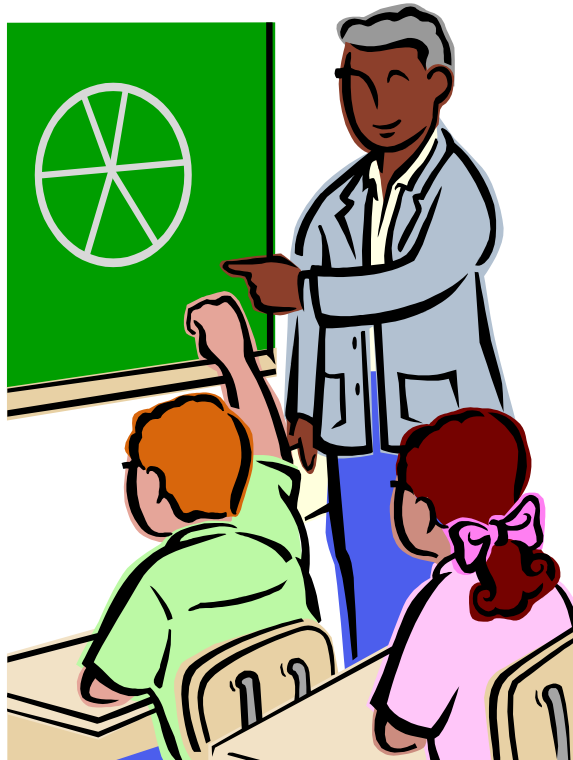
PROBLEM	EXERCISE
UNFAMILIAR	FAMILIAR
NO KNOWN STRATEGY FOR THE SOLUTION	STRATEGY FOR SOLUTION IS KNOWN

What is Problem Solving?

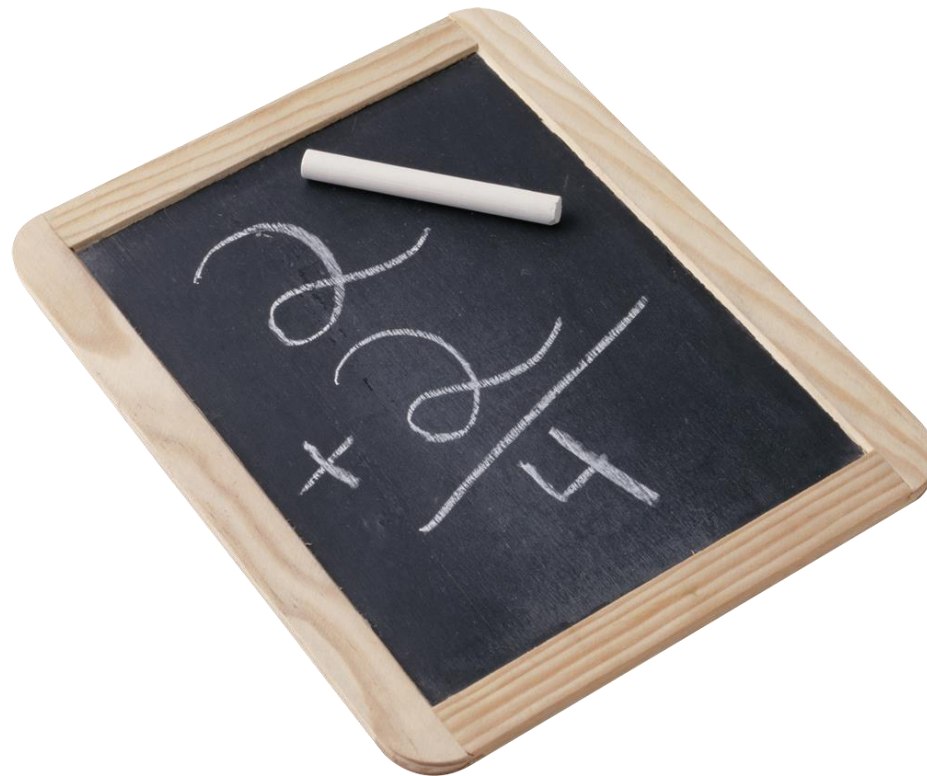
The set of necessary actions to work from the problem state to the solution state to accomplish a **task**.



How many teachers give their students problems to solve?



What Problem Solving Framework do you use?



Problem Solving Frameworks

POLYA	SCHOENFELD
UNDERSTAND THE PROBLEM	RESOURCES
DEVISE A PLAN	HEURISTICS
CARRY OUT THE PLAN	CONTROL
CHECK YOUR WORK	BELIEF SYSTEMS

Problem Solving is not Content it
is a Process...
...but the Process can be taught.



How do I Embed Assessment Into Instruction?

Implement a Problem Solving Educational Orientation

- Provide students with a Problem Solving Framework...
- ...with the expectation that they demonstrate their ability to navigate the Problem Solving Process.



How do we Embed Assessment into a Problem Solving Educational Orientation?

What are ways to assess Problem Solving efforts?

Expect students to demonstrate that they are able to navigate the Problem Solving Process.

- How do I know you understand the problem?
- How do I know you have a plan for its solution?
- How do I know you able to carry out the plan?
- How do I know you checked your work?

Theory into Practice

Introduce problems to be solved.

Make judgments about whether...

...Assessment is Embedded in the Learning Experience.

...the 5 Process Standards were addressed and provided evidence about Students' mathematical knowledge and skills and dispositions.

In our most theoretical moods we may be nearest our most practical applications.

-A.N.Whitehead

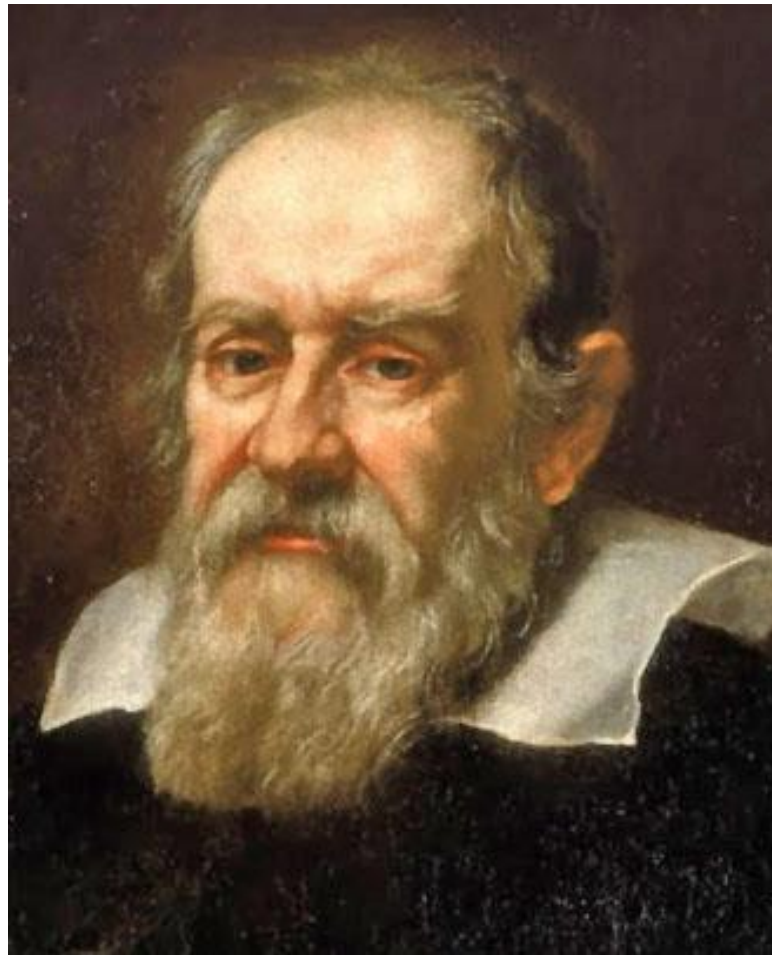
Classify the Shape Problem

Given: $A(0, -5)$; $B(4, 3)$; $C(-1, 0)$

Problem: Classify the Geometric Shape formed by these three points.

Mathematics is the language in which God has written the universe. Galileo Galilei

Italian astronomer & physicist (1564 - 1642)



Questions, Concerns, Feedback

Thanks for sharing your thoughts.

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