

**Association of Mathematics Teachers  
Special Education Math Conference  
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Grades 3-4-5**

# **Performance Tasks for Success: Access for ALL Learners Using Visual Models**

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# What Have We Learned about Mathematics Education

- Students must learn basics, but knowing the basics alone is not enough.
- Learning mathematics with understanding is essential to enable students to solve new problems.
- Students learn mathematics primarily by doing mathematics rather than just listening and memorizing.

***What If?***

# Required Fluencies in K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2	Add/subtract within 20 (know single-digit sums from memory)
	2.NBT.5	Add/subtract within 100
3	3.OA.7	Multiply/divide within 100 (know single-digit products from memory)
	3.NBT.2	Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division
		Multi-digit decimal operations

# Why Problem Solving?

Problem solving is the cornerstone of doing mathematics.

A problem that you can't solve in less than a day is usually a problem that is similar to one that you have solved before.

But in real life, a problem is a situation that confronts you and you don't have an idea of where to even start.

If we want our students to be problem solvers and mathematically powerful, we must model perseverance and challenge students with non-routine problems.

# How to Teach Problem Solving?

Teachers should facilitate and support students in the process of attacking and reasoning about the problems.

The solution is not as important as the process of problem solving. Struggling to get started is a natural part of learning to problem-solve.

The educator (or parent) should be patient with the student's struggle. In fact, encouraging and supporting the struggle with some frustration is exactly what the student needs.

A good problem-solver tries, fails, reevaluates, and tries again.

# What is a Performance Task?

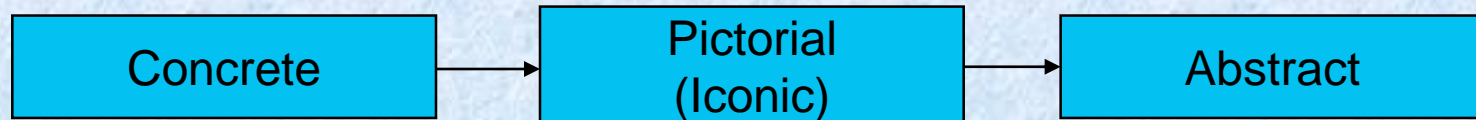
- A performance task is a goal-directed assessment exercise.
- It consists of an activity or assignment that is completed by the student and then judged by the teacher or other evaluator on the basis of specific performance criteria.

# External Representations

- **Pictorial** (solving problems using visuals such as diagrams, graphs, & pictures)
- **Numerical** (solving problems using numbers)
- **Verbal** (solving problems by writing answers in words)
- **Algebraic** (solving problems using symbolic notation)



# Learning Progression



## Thinking Skills:

- Classifying, Comparing, Sequencing
- Analyzing Parts and Whole
- Identifying Patterns and Relationships
- Induction (draw a general conclusion from clues)
- Deduction (infer various specifics or examples from generalizations)
- Spatial visualization (without concrete)

*Students with Special Needs benefit from a support system using instructional interventions in a model of prevention (RtI).*

# **The Common Core State Standards for Mathematics**

## ***Overview: 2 Components***

- ***Math Practices***
- ***Content Standards***

# Grouping the practice standards

Problem solving with precision

1. Make sense of problems and persevere in solving them
6. Attend to precision

2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others

Reasoning and Explaining

4. Model with mathematics
5. Use appropriate tools strategically

Modeling and using tools

7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Seeing structure and generalizing

# Let's Look at CCSS Resources

[www.ccsstoolbox.com](http://www.ccsstoolbox.com)

[www.insidemathematics.org](http://www.insidemathematics.org)

# **Inside Mathematics Tools for Educators**

[www.insidemathematics.org](http://www.insidemathematics.org)

## **Grade 3:**

- **Boxing the Plots**

## **Grade 4:**

- **A Pile of Oranges**

## **Grade 5:**

- **Cindy's Cats**

# NYC Performance Task Resources

<http://schools.nyc.gov/Academics/CommonCoreLibrary/TasksUnitsStudentWork/default.htm>

# Effective Strategies for Struggling Learners



Explicit Instruction  
(formal stair steps)



Self-determination skills,  
Independent self-directed  
learning



Peer-Assisted; Student Think-Alouds  
(Ramps)

# Other Technology Resources

- [www.illustrativemathematics.org](http://www.illustrativemathematics.org)
- [www.ccsstoolbox.com](http://www.ccsstoolbox.com)
- [www.njcore.org](http://www.njcore.org)
- <http://www.state.nj.us/education/modelcurriculum/math/>  
(Username: model Password: curriculum)
- [katm.org](http://katm.org)
- [www.parcconline.org](http://www.parcconline.org)
- <http://illuminations.nctm.org>
- [www.corestandards.org](http://www.corestandards.org)
- [www.teachersdomain.org](http://www.teachersdomain.org)



# Successes & Challenges

Q & A

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