Nurturing Perseverance in Math Class

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Build Math Minds Summit

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With thinking comes struggle. Our goal is to build thinkers!
Struggle and perseverance are part of the process.

When do our students need perseverance in math class?

- When tasks are lengthy
- When tasks have multiple parts
- When tasks feel confusing
- When they realize their path won't lead them to the solution
- When they begin to feel anxious
- When they realize their answer is incorrect

Steps for Nurturing Perseverance

- Do our students know what perseverance means?
- Do our students know that we value perseverance?
- Do they have strategies for persevering?
- Do they have opportunities to test their skills at persevering?
- Do they have support as they develop perseverance?

Do our students know what perseverance means?

Read stories that show examples of perseverance to stimulate discussions.

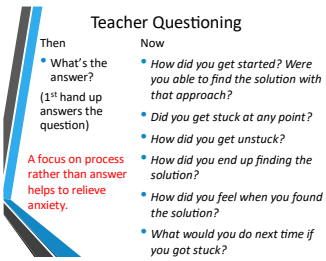
- *The Most Magnificent Thing* by Ashley Spires
- *Kunu's Basket* by Lee DeCora Francis
- *Wilma Unlimited* by Kathleen Krull
- *Side by Side -Lado a Lado* by Monica Brown
- *How to Solve a Problem: The Rise and Falls of a Rock-climbing Champion* by Ashima Shiraishi

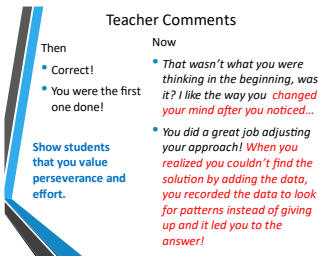
Make Connections to Mathematics

- When might you need to persevere in math class?
- What does it look like to persevere in math?
- Do I have strategies for when I need to persevere?
- Is it okay to feel confused or want to quit?
- What should I do when I want to quit?

Do our students know that we value perseverance?

Show that you value perseverance with your questions and comments.





Do our students have strategies for persevering?

Discuss how to persevere in math class.

Have students work in teams to brainstorm ways to get "unstuck" when solving math problems.

Strategies might include:

- Reread the problem (out loud) to see if you missed anything important.
- In your own words, tell a friend what the problem is about and what you are trying to find out.
- Use materials to model the problem.
- Draw a diagram of the problem.
- Think of another problem that is like this one. How did you solve that problem? Could that strategy work here?
- Make the data simpler or remove it completely. How would you solve it with simpler data?
- Ask a friend for an idea.

Have each team create a poster with their ideas.

Do a galley walk or display/share ideas.

Create a class anchor chart with some of the ideas.

Have students copy a few ideas they like into their math journal.

Discuss fear of failure

- Are students afraid to make mistakes?
- Will they persevere if they are afraid of making mistakes?
- How do we react to their mistakes?
- Do we have class discussions about making mistakes?
- *The Girl Who Never Made Mistakes* by Mark Pett and Gary Rubinstein
- Adopt a class mantra.

Create a classroom environment in which students believe…

- …it is okay to make mistakes (answer or approach).
- …wrong answers/methods can lead us to right answers/methods if we reflect on our mistakes.
- …collaboration gives us more ideas for moving through the task.

Do our classroom practices support these ideas?

Do our students have opportunities to test their skills at persevering?

Give students opportunities to practice perseverance with tasks that challenge them.

Try tasks from the following:

www.openmiddle.com
www.mathbythebook.com
https://nrich.maths.org/
www.mathinpractice.com
https://www.youcubed.org/

Do our students have support as they develop perseverance?

Where might students get support?

- Support from other students
- Support with materials
- Support from the teacher

Debriefing after tasks

Have students talk with partners, followed by a class discussion:

- *Did anyone get frustrated and want to quit? When?*

- *How did you get yourself going again?*
- *How did you feel when you found a solution?*
- *What advice would you give someone else who is getting started on this task?*

Teacher Resource Books by Sue O'Connell

Published by Heinemann (www.heinemann.com)

Math by the Book (**www.MathbytheBook.com**) by Sue O'Connell and colleagues
This K-5 series focuses on the teaching of mathematics through the context of a story. It is filled with lesson ideas, word problems, writing prompts, practice tasks, and many online printable resources to engage students in learning mathematics in a fun and meaningful way. There is a book for each grade level K-5 that features lessons that are launched through a highlighted piece of literature. At each grade level, 20 critical math concepts are explored through 20 correlated children's literature selections. Visit the website at www.MathbytheBook.com to view sample chapters, download literature lists, and learn more about the series.

Math in Practice **(**www.mathinpractice.com**)** by Sue O'Connell and colleagues
This series is filled with lesson ideas, instructional strategies, practice tasks, and many online printable resources to make teaching K-5 math more engaging and more meaningful. There is a book for each grade level K-5 that contains a wealth of grade-specific activities, as well as a *Guide for Teachers* filled with instructional strategies to support greater understanding of math concepts. A *Guide for Administrators* offers tips and strategies for math coaches/administrators. Visit the website at www.MathinPractice.com to view samplers, see videos, and learn more about the series.

Putting the Practices into Action - Implementing the Common Core Standards for Mathematical Practice K-8 by Sue O'Connell and John SanGiovanni
The Standards for Mathematical Practice are the heart and soul of the Common Core State Standards. This book explains each standard in teacher-friendly terms and highlights practical activities to make the standards come alive in classrooms. It contains PLC study group questions and online resources.

Mastering the Basic Math Facts for Addition and Subtraction
Mastering the Basic Math Facts for Multiplication and Division
by Sue O'Connell and John SanGiovanni
Through investigations, discussions, visual models, children's literature, and hands-on explorations, students explore the math operations, and through engaging, interactive practice achieve fluency with basic facts. Online resources are filled with customizable activities, templates, recording sheets, and teacher tools to simplify your planning and preparation. Over 450 pages of reproducible forms are included in English and Spanish.

The Math Process Standards Series by Sue O'Connell and colleagues
Each book in this series is a practical guide for helping students refine their skills in the highlighted math process (problem solving, communication, reasoning, representations, connections). You will find specific teaching strategies and tips to help all students strengthen their skills. Included with each book is a CD filled with teacher tools and customizable student activities to allow you to change names, data, or spacing for a quick way to differentiate instruction within your classroom.

Introduction to Problem Solving ***Introduction to Communication***
Introduction to Representation ***Introduction to Reasoning and Proof***
Introduction to Connections

All books in this series are available for Grades PK-2, Grades 3-5, and Grades 6-8.

For additional resources, visit www.qualityteacherdevelopment.com
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