Productive Math Mindsets - Everywhere!

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Essential Question(s)

- How can I support productive mindsets in the mathematics classroom?

Summary

"I'm not a math person." Not anymore! "Growth mindset" is more than a buzz-phrase—it shapes instructional choices. This session explores what growth mindset is and how it can support reluctant math learners. The math achievement gap - and the math anxiety and frustration with that - is very real for teachers and students. To help with that, the root cause of why students disengage from learning math needs to be examined and addressed. In this session, we will dig into incremental (growth) mindset, how that applies specifically to learning math, and structures and strategies to help grow more resilient math students - whether in person or virtually.

Learning Goals

- Participants will analyze characteristics of a growth mindset in math classrooms.
- Participants will identify growth mindset learning strategies in their curriculum.

Attachments

- Handout-Productive-Math-Mindsets.docx
- Handout-Productive-Math-Mindsets.pdf
- Presenter-Slides-Productive-Math-Mindset.pptx
- Student-Profile-Discussion-Guide-Productive-Math-Mindsets.docx
- Student-Profile-Discussion-Guide-Productive-Math-Mindsets.pdf

Materials

- Presenter Slides (attached)
- Student Profile Discussion Guide (attached)
- Handout (attached; 1 per participant)

Engage

Teacher's Note

Make sure that all participants have a digital or physical copy of the attached **Handout** for use throughout the presentation.

Begin the presentation on **slide 4.** Introduce the book *Mathematical Mindsets* by Jo Boaler. Explain that in this book, the author writes seven components, or "mindset messages," that help build a resilient growth mindset in math learning. Read the seven messages:

1. All students can learn math to the highest levels.
2. Mistakes are valuable.
3. Questions are important.
4. Math is about creativity and making sense.
5. Math is about connections and communicating.
6. Value depth over speed.
7. Math class is about learning, not performing.

Share with participants that they should keep these in mind for the next activity.

Explore

Go through **slides 5-8**, explaining that each slide shows an example of a student you might meet in your classes. For each slide:

1. Read aloud the student's characteristics.
2. Ask participants to picture one of their own students that meets this description.
3. Ask participants to think about what strategies they already use with this type of learner, and what mindset messages would help this student grow.
4. Ask participants to visit the Mentimeter (Menti.com) with the attached code and select the mindsets that they feel this learner needs support with.
5. Review the results.

Refer to the **Student Profile Discussion Guide** for elaboration on responses that come in through Menti.com.

Explain

Explain to participants that they will now dive deeper into each of the seven components of a productive math mindset.

Show the chart on **slide 9** to participants. For each mindset message, talk about how to reinforce that component in the classroom, and any struggles that may arise for educators and students. Remind participants that they have this chart in their handout.

Extend

Display **slide 10.** Explain that below each mindset message, participants will find an activity or strategy that can support students' growth.

Tell participants to pick one or two activities to read through while thinking of ways it supports the mindset message above it. Participants will have 10 minutes to explore the resources, then they will share what they have learned.

Presenter's Note

Participants need to be able to access the links on this slide.

Start the 10-minute timer on **slide 11.**

Embedded video

https://youtube.com/watch?v=9gy-1Z2Sa-c

Evaluate

Once time is up, move to **slide 12**. Go over the reflection questions and have participants share their answers, thoughts, and opinions.

Reflection Questions:

- Based on your exploration of the activities, which one would you be most likely to incorporate into your classroom to support the growth mindset of your students?
- Why did you pick this activity?
  Enter your answers in the chat box.

Resources

Boaler, J. (2015). *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*. John Wiley & Sons.

Brzezinski, T. (n.d.). Polygons: Exterior Angles - REVAMPED. GeoGebra. https://www.geogebra.org/m/mKzJCf5p

Desmos. (n.d.). Click Battle. https://teacher.desmos.com/activitybuilder/custom/59233ca25ebd6c10d1af9c05?collections=featured-collections%2C5e72d28669f1f80f4025bcc1

K20 Center. (2020, Sept. 16). Card Sort. Instructional Strategies. https://learn.k20center.ou.edu/strategy/147

K20 Center. (2019, Aug. 21). K20 10 minute timer [Video]. https://www.youtube.com/watch?v=9gy-1Z2Sa-c&ab_channel=K20Center

K20 Center. (2020, Sept. 16). My Favorite Mistake. Instructional Strategies. https://learn.k20center.ou.edu/strategy/115

K20 Center. (2021, March 19). Walking The Line: The Math Spectrum. 5E Lesson. https://learn.k20center.ou.edu/lesson/431?rev=1475

NCTM Illuminations. (n.d.). Brain Teasers: Nine Digit Fraction. https://illuminations.nctm.org/BrainTeasers.aspx?id=4714