



# Growth Mindset Gives Every Student a “Math Brain”

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# What is YOUR mindset?

- People have a certain amount of intelligence and there isn't a way to change it.
- We can improve our basic abilities and personality.
- You can learn new things and improve your intelligence.
- People have particular talents. You can't acquire talent for things like: music, writing, art, athletics.
- Studying, working hard and practicing new skills are all ways to develop new talents and abilities.

# Growth vs Fixed Mindset

- Research by Carol Dweck, Jo Boaler, Cathy Seeley, Sarah Mercer and Steven Ryan, Malcolm Ocean and many more.
- Growth Mindset people believe they can learn and develop their intelligence through dedication and hard work.
- Fixed Mindset people believe that intelligence is static.

# Growth vs Fixed Mindset

Fixed Mindset	Growth Mindset
I can't grow my brain.	I can grow my brain.
I want to be the best!	I want to get better.
Mistakes mean I am a failure.	My perseverance brings me success.
I ignore comments on my work.	Comments lead me to my next steps.
I give up if it doesn't work.	I never give up. I try new strategies.

# Growth vs Fixed Mindset

Fixed Mindset	Growth Mindset
Avoids challenges	Embraces challenges
Gives up easily when obstacles come up	Persists despite obstacles
Sees effort as fruitless	Sees effort as a path to mastery
Ignores useful feedback	Learns from criticism
Threatened by others' success	Is inspired by others' success

# The “Math Brain”

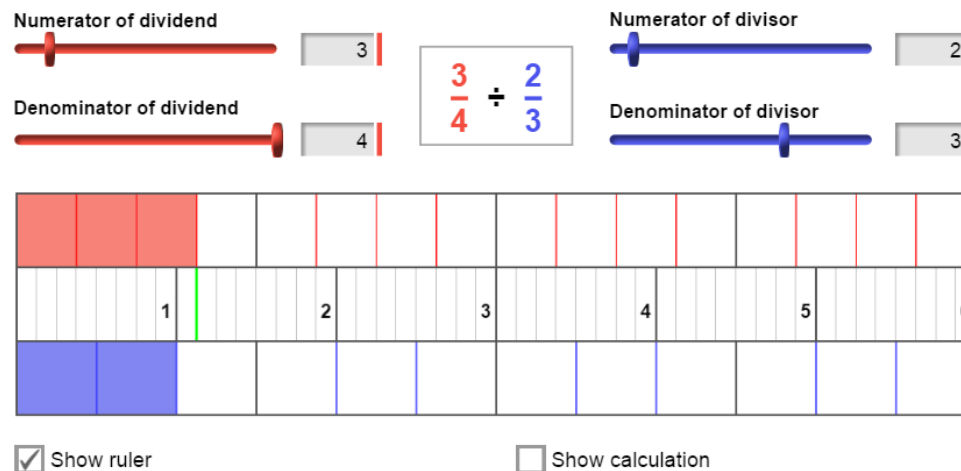
- Is there such a thing?
- Research says that everyone is a math person and that students can reach any level in math.
- Brains can change/grow the hippocampus in 3 weeks. Just think of what can happen in the course of a school year!

# Getting to a Growth Mindset in the Math Classroom

- Educate students, teachers, parents, administrators on how the brain works.
- Give teachers, parents, administrators and most importantly students, strategies to apply a growth mindset.
- Allow for mistakes and failure.
- Give the opportunity for feedback and self-evaluation.

# Getting to a Growth Mindset in the Math Classroom

- Always ask the question, “Does that answer make sense?”
- Learning conceptually and not procedurally helps the learning go to long-term memory.



# Getting to a Growth Mindset in the Math Classroom

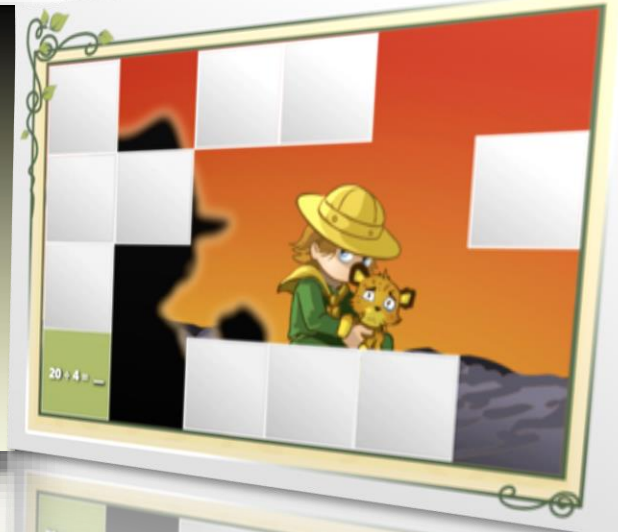
- Always ask the question, “Does that answer make sense?”
- Learning conceptually and not procedurally helps the learning go to long-term memory.
- Emphasize LEARNING and IMPROVING.
- Teachers and parents don’t need all of the answers to help children succeed.
- Play with the math. It gives the gift of ownership!

# Opportunities for a Growth Mindset in Math Class





- Adaptive and individualized instruction
- Intuitive and powerful reporting for educators
- Game-based so kids keep coming back for more
- 100% online access anytime, anywhere



- Specific math facts targeted
- Multiple strategies are employed
  - Fact families, array models, open sentences, etc.
- Picture Puzzles identify "game-ready" facts



## Student Features

# Reward & Recognition



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## Student Features

# Reward & Recognition



- [www.ReflexMath.com](http://www.ReflexMath.com)

# Opportunities for a Growth Mindset in Math Class



## World's largest library of math & science simulations

Gizmos are interactive math and science simulations for grades 3-12. Over 400 Gizmos aligned to the latest standards help educators bring powerful new learning experiences to the classroom.



# Practical Advice

- Recognize that we are all a mixture of fixed and growth mindsets.
- Use appropriate language to praise.
  - *I know you have the ability, so I have set the bar high.*
  - *As you learn this, mistakes are expected. Your mistakes help me support you.*
  - *Add the word “YET” to that sentence.*
  - *When you feel math is hard, that’s your brain growing!*
  - *What step can you try next?*
  - *Of course it’s tough. If it were easy, would you be learning anything from it?*
  - *You worked hard on that. Looks like that paid off!*

# Practical Advice

- Recognize that we are all a mixture of fixed and growth mindsets.
- Use appropriate language to praise.
- Allow students to reflect on their performance.
  - Give 2 words that describe how you feel about your achievement on this assessment/project/assignment.
  - Do you think your grade matches your effort level? Why/why not?

# Practical Advice

- Recognize that we are all a mixture of fixed and growth mindsets.
- Use appropriate language to praise.
- Allow students to reflect on their performance.
- Set up positive norms in math class
  - Everyone can learn math to the highest levels
  - Mistakes are valuable
  - Questions are really important
  - Use your creativity to ask, “Does this make sense?”
  - Math is about learning. What did you learn today?

# Practical Advice

- Recognize that we are all a mixture of fixed and growth mindsets.
- Use appropriate language to praise.
- Allow students to reflect on their performance.
- Set up positive norms in math class
- Begin lessons with a real-world question.
  - This is not the “word problems” in the textbook!
  - Are the students struggling with how to solve the task (Rich Math Task)?

# Practical Advice

- Recognize that we are all a mixture of fixed and growth mindsets.
- Use appropriate language to praise.
- Allow students to reflect on their performance.
- Set up positive norms in math class
- Begin lessons with a real-world question.
- Allow the extra time for students to struggle and ask questions.
  - Avoid saying “Yes/Correct” or “No/Incorrect”. Both answers cut a student off from further thinking.
  - Instead, ask “Why do you think that?” or “How did you come up with that?”

# Practical Advice

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- Use appropriate language to praise.
- Allow students to reflect on their performance.
- Set up positive norms in math class
- Begin lessons with a real-world question.
- Allow the extra time for students to struggle and ask questions.
- Teachers – talk less!
  - “Teachers ask more than 200 questions per hour”  
– Dr. Paul DeWitt

I can learn  
anything I  
want to.

When I'm  
frustrated, I  
will persevere.

Mistakes help  
me to learn.

My effort and  
attitude make all  
the difference.

I can always try  
a new strategy.



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If you are not challenged, you do not make mistakes. If you do not make mistakes, you do not grow.

# Thank you!



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