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LDOE: Acceleration in Mathematics

Classroom Strategies to Scaffold Learning

Asynchronous Professional Learning Series

– Equity — Access — Excellence –

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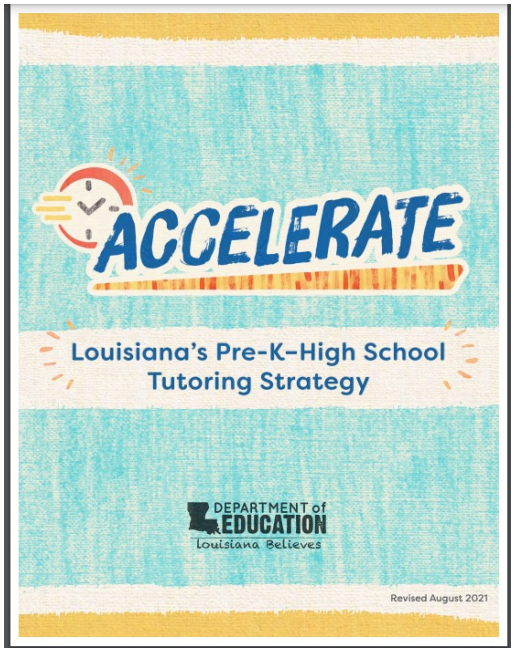
Accelerate Initiative: Vision

All students can achieve high expectations regardless of their background, family income, or zip code.



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Learning Outcomes

Through today's asynchronous learning, participants will:

- Solidify an understanding of what scaffolding is and the role it plays in acceleration.
- Gain an understanding of four strategies that can be used in any mathematics classroom:
  - Number talks
  - Visual aids (organizers, concept developers, manipulatives)
  - Error detection and correction
  - Collaborative placemats

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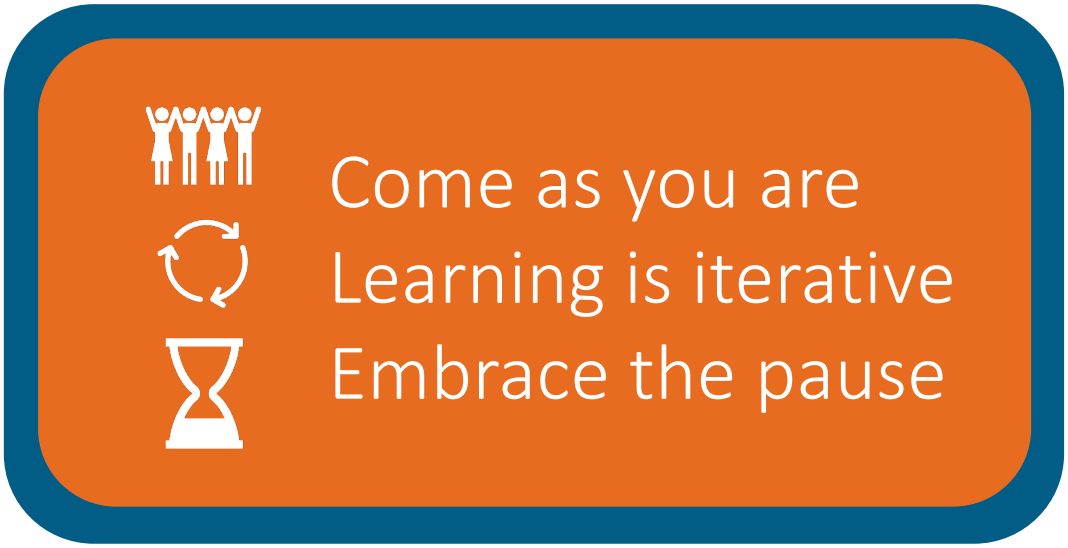
Community Agreements



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Scaffolding

What is it? Why is it so important?

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How did you learn to ride a bike?

Image credits: Photo by Pavel Danilyuk from Pexels

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Scaffolding

Scaffolding refers to breaking up concepts so that they can be learned more easily.

By implementing scaffolding, teachers can improve the likeliness that students will grasp new materials and retain what they have learned.

"Scaffolding in Education" by Becton Loveless; Education Corner

Image credits: Photo by SevenStorm JUHASZIMRUS from Pexels

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Scaffolding as it relates to acceleration

When students' unfinished learning does not prevent them from engaging with grade-level content, integrate scaffolds for students in real-time based on needs.

This helps motivate them and allows them to believe in themselves.

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Why Scaffold?

"Acceleration lends itself beautifully to ongoing, transparent formative assessment that yields timely, detailed feedback from teachers and peers."

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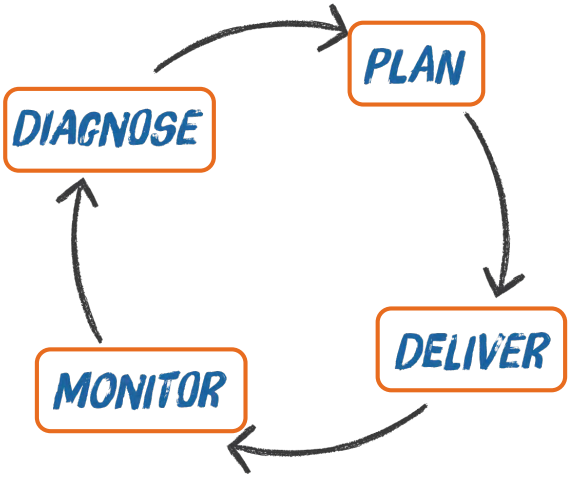
"Strong, attentive instruction, with embedded formative assessment, thus enables teachers to respond to student needs in real-time, and in the context of grade level standards, rather than defaulting to wholesale remediation."



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Strategies

Four strategies you can use tomorrow.

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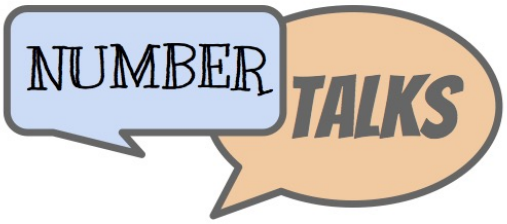
Number Talks



mentally solve
75-39

80 – 40 = 40
40 – 5 = 35
35 + 1 = 36

70 – 30 = 40
+5 – 9 = -4
40 – 4 = 36

39 + 1 = 40
40 + 30 = 70
70 + 5 = 75
1 + 30 + 5 = 36

75 – 30 = 45
45 – 5 = 40
40 – 4 = 36

Borrow a 1 from the 7.
15 – 9 = 6 (ones digit)
6 – 3 = 3 (tens digit)
36

75 – 40 = 35
35 + 1 = 36

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Number Talks:

Formative Re-engaging Lesson:
Interpreting Multiplication Part I

How can engaging in number talks help scaffold accelerated instruction to my students.

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Link to Acceleration

How can engaging in number talks help scaffold accelerated instruction to my students

This allows all students to contribute. Some may use a "basic" strategy and others at a higher level and we can discuss both.

I can see how students are thinking.

This is both scaffolding and formative assessment itself, isn't it?

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Visual aids

1. Advance Organizers

Image credit: https://www.pexels.com/photo/adult-blur-books-close-up-261909/

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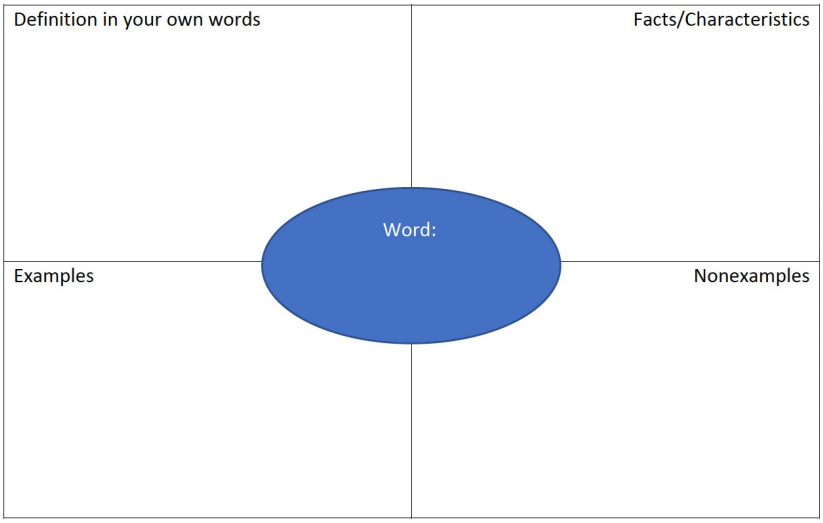
Visual aids

1. Advance Organizers
   - Frayer Model



Frayer, D., Frederick, W.C., & Klausmeier, H.J. (1969). A schema for testing the level of cognitive mastery. Madison, WI: Wisconsin Center for Education Research

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Visual aids

1. Advance Organizers
   - Frayer Model
   - KWL

K-W-L Chart

Learning Target: _____

Know	Want to know	Learned

Ogle, D.M. (1986, February). K-W-L: A Teaching Model That Develops Active Reading of Expository Text. The Reading Teacher, 39(6), 564–570.

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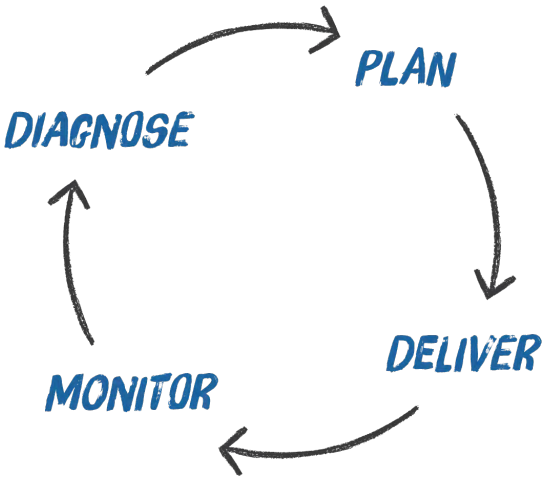
Pause and Reflect

How can one of these tools help our students with unfinished learning?

How can we, as teachers, intentionally plan for their use?



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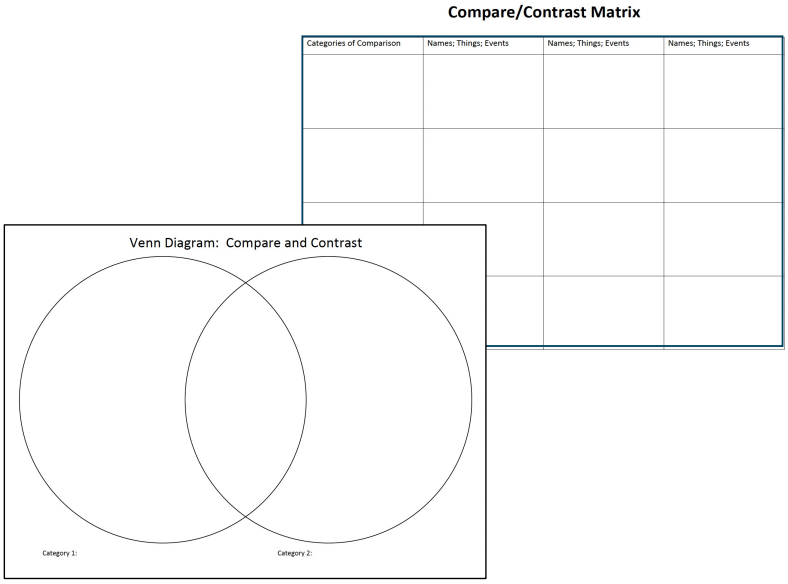
Visual aids

1. Advance Organizers
   - Frayer Model
   - KWL
2. Concept Developers
   - Compare/Contrast



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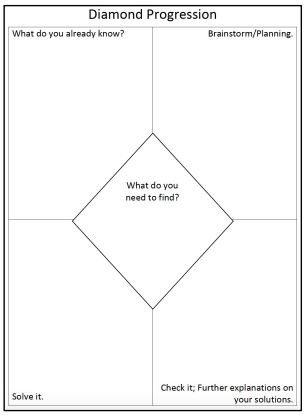
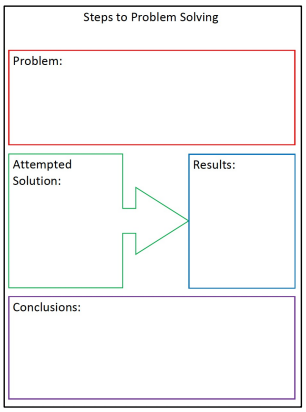
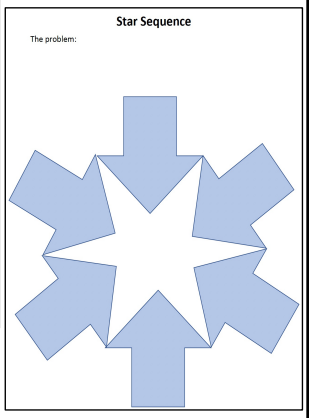
Visual aids

1. Advance Organizers
   - Frayer Model
   - KWL
2. Concept Developers
   - Compare/Contrast
   - Sequencing and Evaluating







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Pause and Reflect

"Mathematics is a subject that allows for precise thinking, but when that precise thinking is combined with creativity, openness, visualization, and flexibility, the mathematics comes alive."

What do you believe it is about these "visual concept developers" that can help mathematics come alive?

How does mathematics "coming to life" relate to our acceleration in math program?

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Visual aids

1. Advance Organizers
   - Frayer Model
   - KWL
2. Concept Developers
   - Compare/Contrast
   - Sequencing and Evaluating
3. Manipulatives

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Pause and Reflect

What are some reasons why teachers don't use manipulatives more?

What is the only reason that we need to use them?

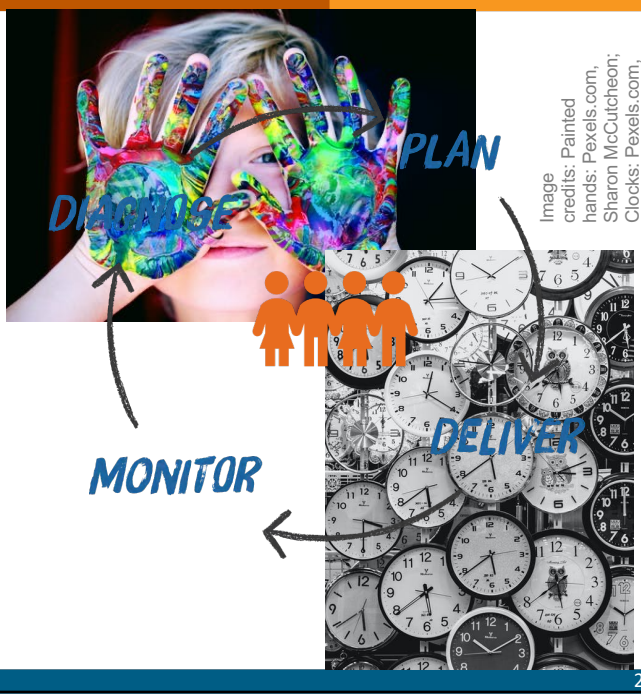

Image credits: Painted hands: Pexels.com, Sharon McCutcheon; Clocks: Pexels.com, Andrey Grushnikov

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Visual aids

1. Advance Organizers
   - Frayer Model
   - KWL
2. Concept Developers
   - Compare/Contrast
   - Sequencing and Evaluating
3. Manipulatives
4. Error Detection and Correction

My favorite No ←  → Re-engaging Lessons

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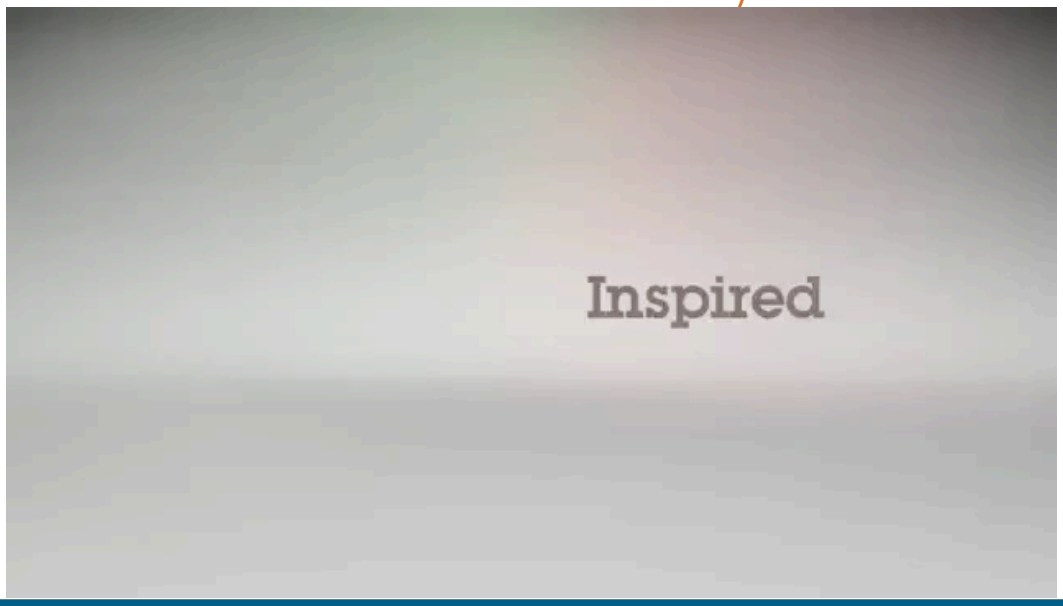
Error Detection and Correction – My Favorite No



Teachers

Students

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Pause and Reflect

Teachers:

- Everyone makes mistakes (culture building)
- "The
con
dail
- Rec
ther
- High
were correct and not).

"Creates more of a dialog between me and them."

Students:

- Able to show their strategy without fear of admitting they were wrong.

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ork,
d

right –
learn from mistakes

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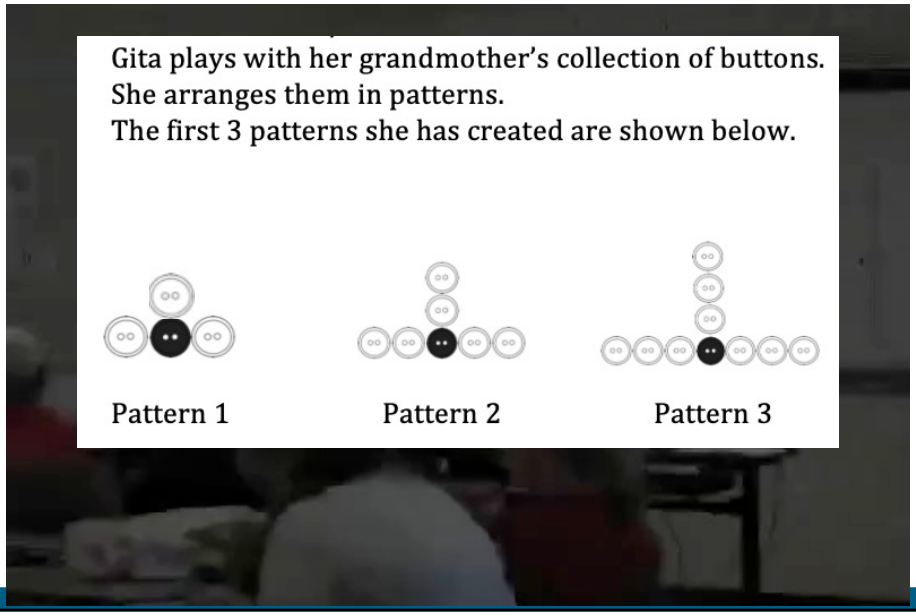
Error Detection and Correction



How is this teacher scaffolding the learning for his students?
How can this help us in the acceleration process?

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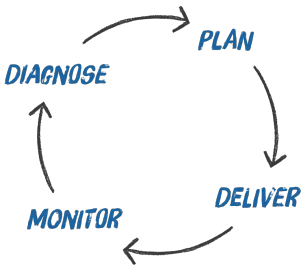
Pause and Reflect

How is this teacher scaffolding the learning for his students?

- Getting the students to see other strategies and make connections between the two.
- Discourse; Being allowed to notice things and ask about things from the lesson.

How can this help us in the acceleration process?

- We often get stuck in the deliver step of the cycle, not using what we have delivered to help us move forward.
- Monitoring the questions they ask on one lesson can help us diagnose and plan for future misconceptions.



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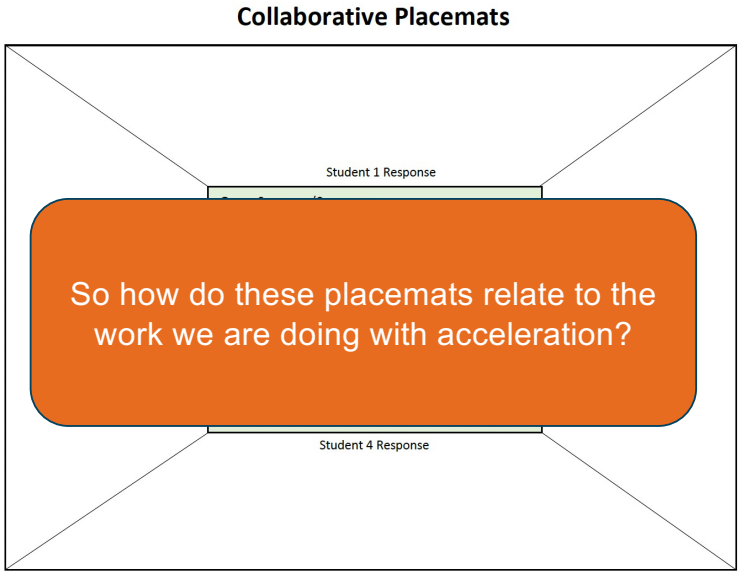
Collaborative Placemats

- This is a great way to activate students' prior knowledge and to see what students already know.
- It encourages participation from every student, and everyone's ideas are discussed and valued.
- Students are challenged to think critically and support their ideas.



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Summary

A note of closing from some of our oldest friends

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Making strategic decisions

What a child can do today with assistance, she will be able to do by herself tomorrow. ~Vygotsky

The essence of creativity is figuring out how to use what you already know in order to go beyond what you already think. ~Bruner

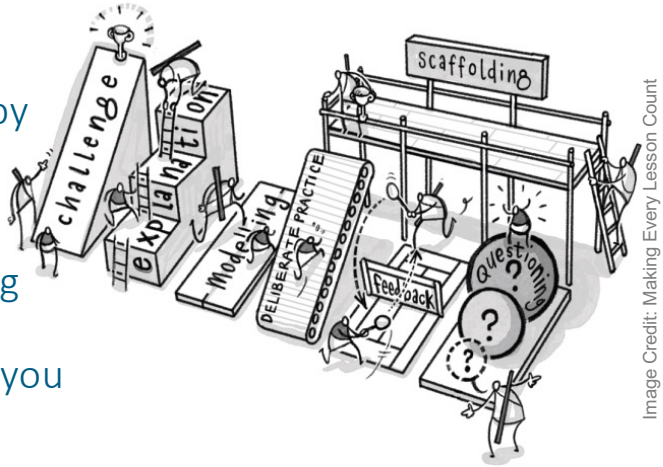

Image Credit: Making Every Lesson Count

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Additional Support/Resources

Louisiana Believes

- Accelerate https://www.louisianabelieves.com/academics/accelerate
- Accelerate Math https://www.louisianabelieves.com/docs/default-source/accelerate/accelerate-math.pdf?sfvrsn=433c6618_14
- K-12 Math Planning Resources https://www.louisianabelieves.com/resources/library/k-12-math-year-long-planning

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Slide 15: Frayer, D., Frederick, W.C., & Klausmeier, H.J. (1969). A schema for testing the level of cognitive mastery. Madison, WI: Wisconsin Center for Education Research.

Slide 16: Ogle, D.M. (1986, February). K-W-L: A Teaching Model That Develops Active Reading of Expository Text. The Reading Teacher, 39(6), 564–570.

Slide 20: Boaler, J. O. (2015). *Mathematical mindsets: Unleashing students' potential through creative math, inspiring messages and innovative teaching*. Jossey-Bass, Inc., U S.

Slide 21: Research on use of manipulatives. Heddens; Picciotto, 1998; Sebesta and Martin, 2004.

Slide 24: Teaching Channel. *My Favorite No: Learning from Mistakes*. The Teaching Channel. Available via https://learn.teachingchannel.com/video/class-warm-up-routine.

Slide 26: Inside Mathematics. *5th & 6th Grade Math – Multiple Representations of Numeric Patterning*. Charles A. Dana Center at The University of Texas at Austin. Available via https://www.insidemathematics.org/classroom-videos/public-lessons/5th-6th-grade-math-multiple-representations-of-numerical-patterning/numeric-pattern-introduction-part-a

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Questions? Comments? Want to know more?

Contact

STEM@la.gov

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