Strategies to Support English Language Learners in the Mathematics Classroom

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PROFESSIONAL LEARNING
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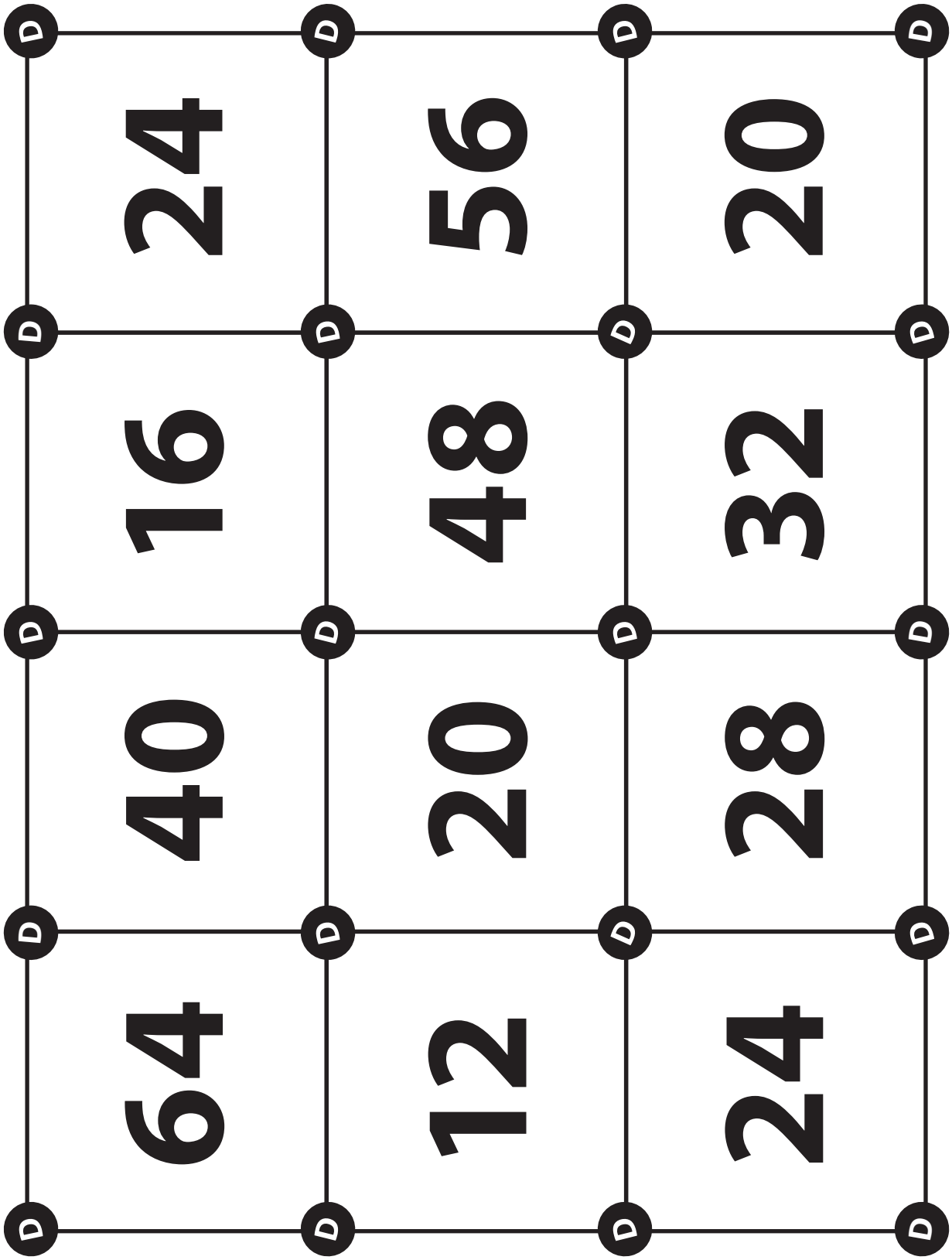
Do the Ds



Cube 1: DD, DD, DD, DDD, DDD, DDD

Cube 2: 3, 4, 5, 6, 7, 8

How many different ways can you make 40¢ with quarters, dimes and nickels?

*This is a framework.

A Question or a Problem

"What do I know?"

"What am I trying to figure out?"

Proving/Explaining

Tinkering

"Let me try…"

"I think I know where I can start…"

Aha!

"I think this will work!"

"I understand what to do next!"

"I got it!"

Stumped!

"I don't get it!"

"Do I understand the question?"

"Argh! I want to give up!"

Models/Tools

"Can I do this mentally?"

"Do I need to draw it out or use a model?"

"Do I need some other tool to show my thinking?"

Systematic Tinkering

"Now that I've seen a pattern, let me keep trying… "

Pattern Sniffing/ Observations

"Hmmm… I notice…"

"I wonder if…"

C. Charney and J. Maxfield

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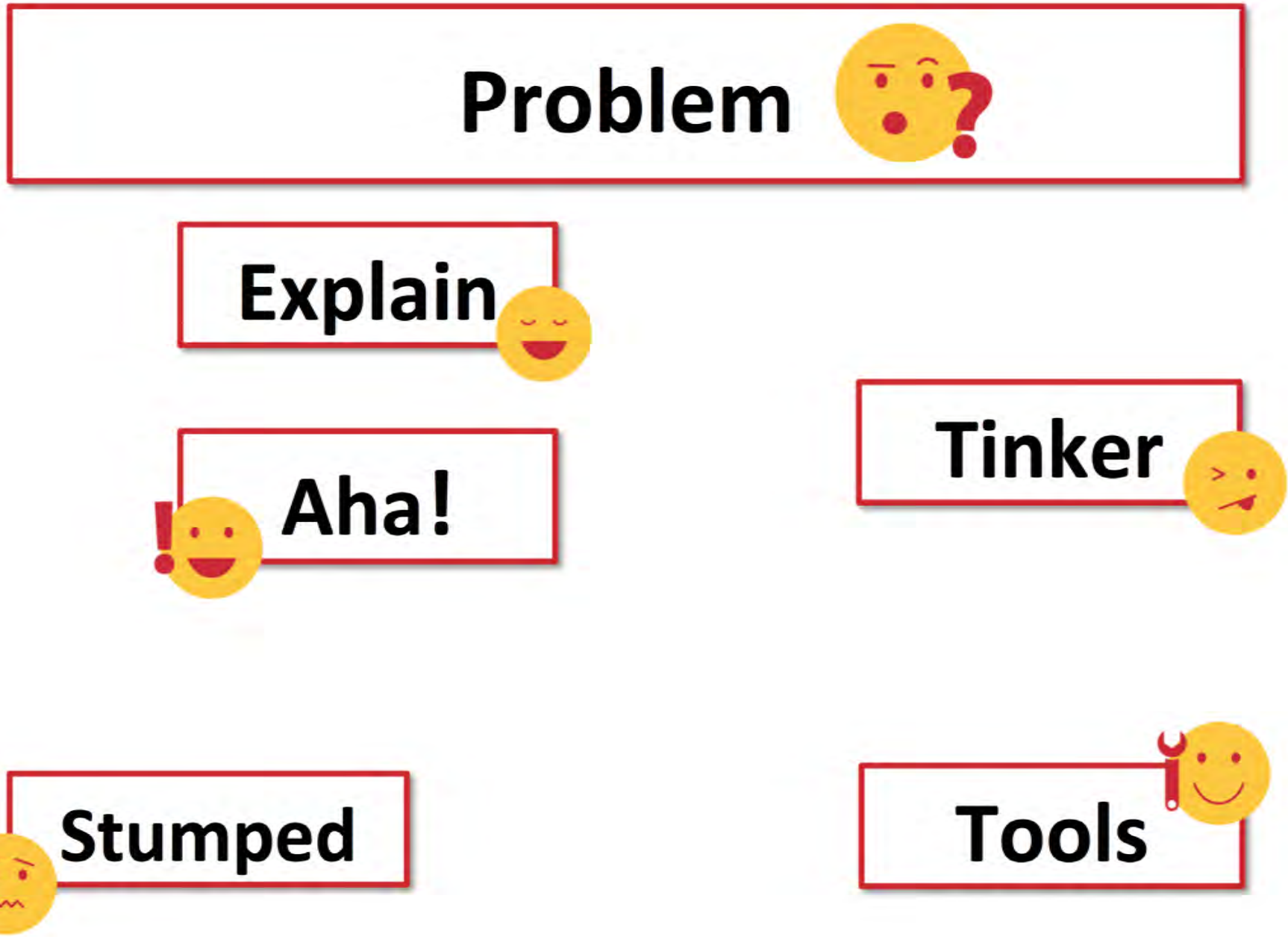
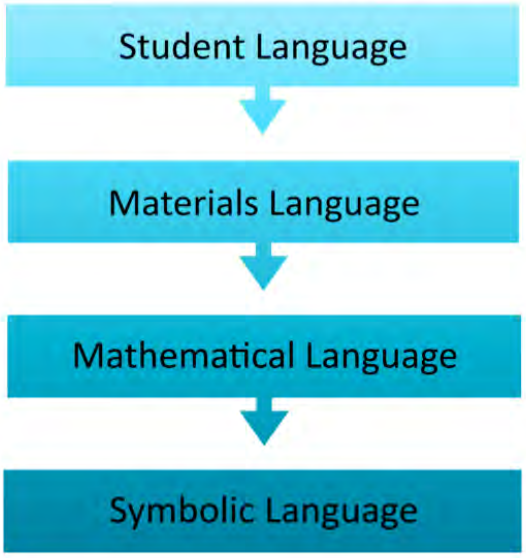


C. Charney and J. Maxfield

Language Ranging from Words to Symbols



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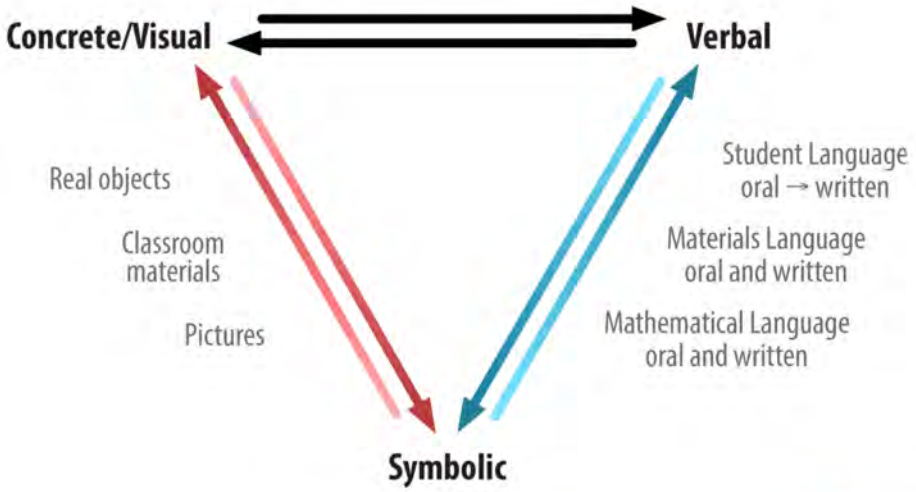
ORIGO's Teaching Model*



*Adapted from Ed Rathmell and Joseph Payne.

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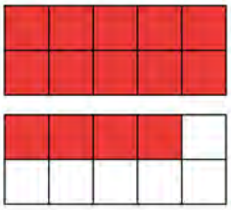
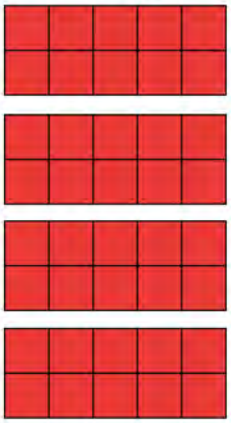
Language Stages

Addition	
Student Language	
Materials Language	
Mathematical Langauge	
Symbolic Language	

Student Language	
Materials Language	
Mathematical Langauge	
Symbolic Language	

Some	Sum
	$4 + 5 = 9$

Mean	Mean
	$\frac{3 + 5 + 9}{3}$

14	40
Fourteen	Forty
	

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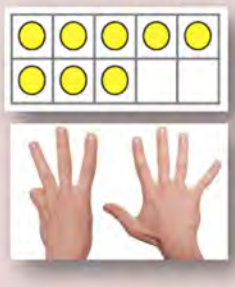
Clarifying Terms

Everyday	Math
	8  
Ate	Eight

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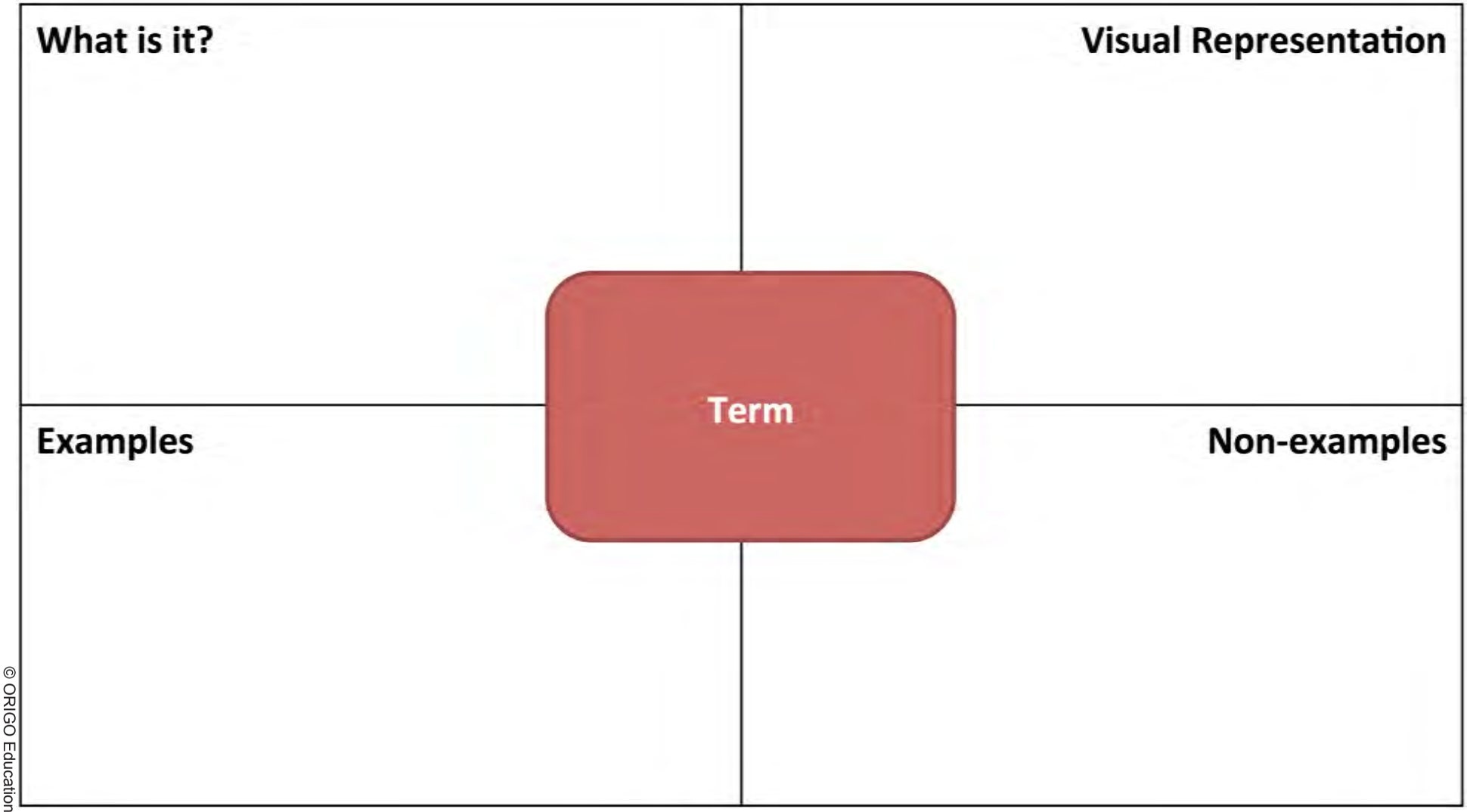
Frayer Model



Talk Moves

Talk Moves to Support Classroom Discussions	
Revoicing *"So you're saying…"*	• Repeat some or all of what the student has said, then ask the student to respond and verify whether or not the revoicing is correct. Revoicing can be used to clarify, amplify, or highlight an idea.
Repeating *"Can you repeat what she said in your own words?"*	• Ask a student to repeat or rephrase what another student said. • Restate important parts of complex idea in order to slow conversation down and dwell on important ideas.
Reasoning *"Do you agree or disagree, and why?"* *"Why does that make sense?"*	• After students have had time to process a classmate's claim, ask students to compare their own reasoning. • Allow students to engage with each other's ideas. • Student: "I respectfully disagree with that idea because…"; "This idea makes sense to me because…"
Adding On *"Would someone like to add on to this?"*	• Prompt students, inviting them to participate in the conversation or to clarify their own thinking. • Student: "I'd like to add on…"
Wait Time *"Take your time…"*	• Wait after asking a question before calling on a student. • Wait after a student has been called on to give the student time to organize his or her thoughts.
Turn-and-Talk *"Turn and talk to your neighbor…"*	• Circulate and listen to partner talk. Use this information to choose whom to call on. • Allow students to clarify and share ideas. • Allow students to orient themselves to each other's thinking.
Revise *"Has anyone's thinking changed?"* *"Would you like to revise your thinking?"*	• Allow students to revise their thinking as they have new insights. • Student: "I thought…But now I think…because…" "I'd like to revise my thinking".

Classroom Discussions: Using Math Talk to Help Students Learn, 2009

Intentional Talk: How to Structure and Lead Productive Mathematical Discussions, 2014

A road rally began at 8 a.m. The first car finished the race in 2 ½ hours. The last car crossed the finish line ¾ of an hour later. What time did the last car finish the race?

Talk Moves	ELL Support
☐ Revoicing	
☐ Repeating	
☐ Reasoning	
☐ Adding On	
☐ Wait Time	
☐ Turn-and-Talk	
☐ Revise	

Equitable Participation

Practices to Improve Equitable Participation

- Give time to think.
- Give time to practice.
- Randomly assign speakers to report out for a group.
- Encourage students to self-monitor their participation.
- Offer a "token to talk."
- Use the technique "one of three."

Chapin, Suzanne H., Nancy Canavan. Anderson, and Mary Catherine. O'Connor. *Classroom Discussions in Math: A Teacher's Guide for Using Talk Moves to Support the Common Core and More*. Sausalito, CA: Math Solutions Publications, 2013.

Sentence Frames

- Discussion support
- Contextualizes and gives meaning to vocabulary
- Gives structure for language skills
- Scaffolds to help students express their mathematical thinking in speaking and writing

Sentence Frames

Language Support

Beginning	A _____ has _____.
Intermediate/ Advanced	A _____ has _____, _____, and _____. My shape has _____, _____, and _____.

Preparing for a Module

Focus	Included Supports
Possible ELL Supports	
Notes	

Language Planning Document

Lesson Learning Target(s)	Language Goal(s)
Key Vocabulary:	
Additional Materials:	

Support	Purpose	Listening	Speaking	Reading	Writing

Sentence Frame(s)	Beginning	Intermediate	Advance

Works Cited

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