

The ELD Standards Framework: Elementary Mathematics

March 9, 2021

Zoom Meeting Protocols

>> Mute your mic upon entering the meeting.



>> Use the chat to ask questions and share ideas and resources.



>> A moderator will let the presenter know if anyone has a question.



Region 15 Comprehensive Center

- One of 19 federally-funded Regional Comprehensive Centers
- Provide capacity-building technical assistance to State Education Agencies
- Thought partners on this project



REGION 15
Arizona | Nevada
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Why have an ELD Standards Framework?

- The education of English learners is a **shared responsibility** of all educators.
- English learners must have access to **rigorous, standards-based** instruction.

Purpose

This webinar is part of a series designed for educators to learn how to use the ELD Standards Framework to enact best practices for English learners and other diverse learners.

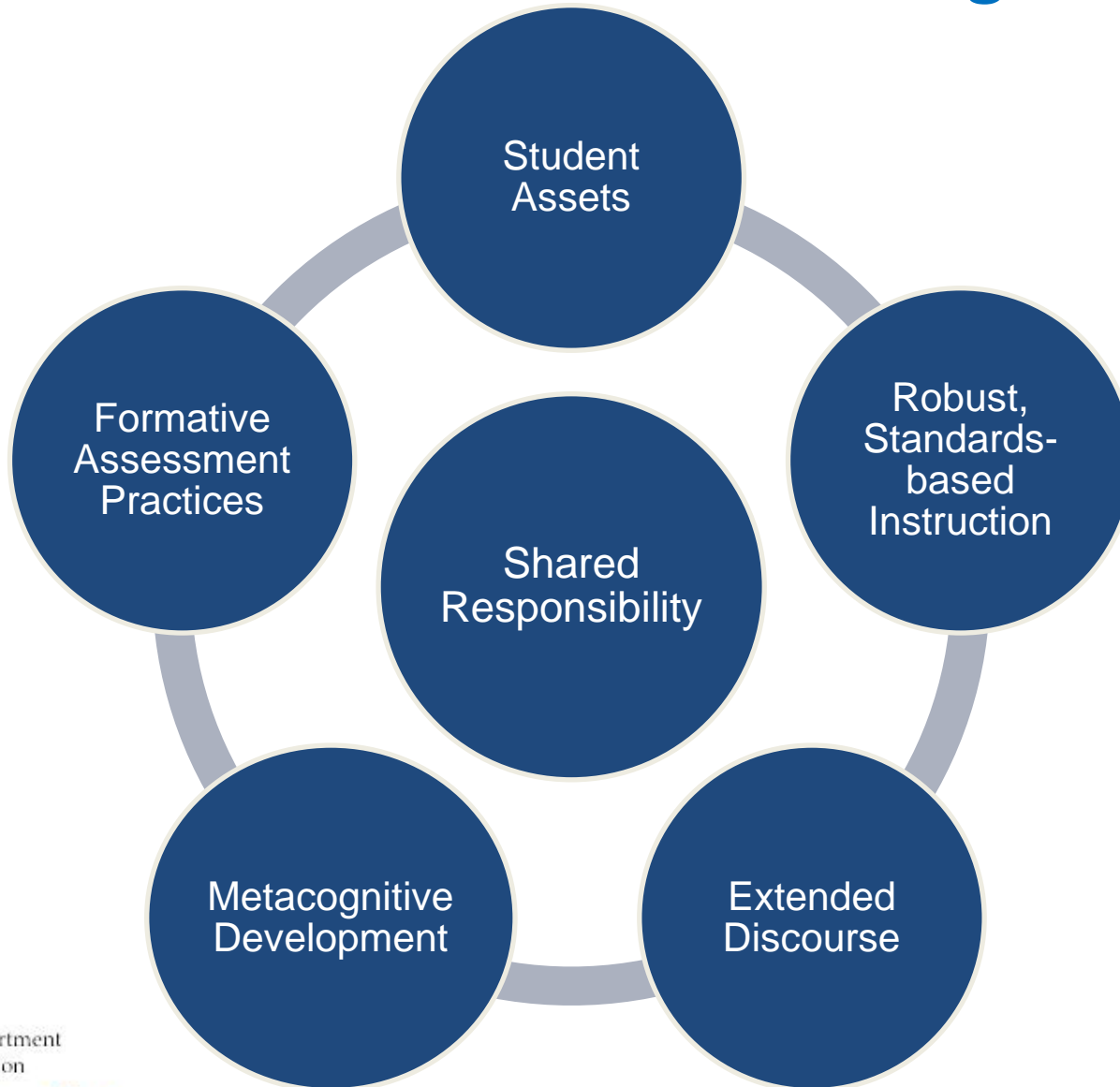
Poll: What's Your Role?

- Classroom teacher
- Instructional coach
- English Learner specialist/Teacher of Special Assignment
- School district office staff
- Regional professional development program staff
- NDE staff
- Other (specify in the chat)

Agenda for Today

- Aligning to the ELD Guiding Principles
- Quality Learning of Mathematics
- Example lesson
- Applying the ELD Standards Framework for Elementary Mathematics
- Questions and Answers

ELD Standards Framework Guiding Principles



ELD Standards Framework Guiding Principles (1)

Guiding Principle 1: Teachers recognize and **value English Learners' assets:** home language(s), cultural assets, existing knowledge, prior schooling experiences, and English language and translinguaging abilities; teachers **leverage these assets to accelerate** English language development and content proficiency.

Guiding Principle 2: Teachers provide **robust, grade-level, and content standards-based** instruction to EL students with **intentional scaffolding** designed to support their content understandings, language development, and analytical thinking.

Guiding Principle 3: Teachers provide frequent opportunities for EL students to engage in **extended discourse through multiple modalities**, including oral, written, visual, and kinesthetic modes of communication focused on developing students' content understandings, language, and analytical thinking.

ELD Standards Framework Guiding Principles (2)

Guiding Principle 4: Teachers provide opportunities for EL students **to develop metacognitive, metalinguistic, and metacultural awareness** and to use this knowledge to develop autonomy and monitor their progress in content, language, and socio-emotional learning.

Guiding Principle 5: Teachers align assessment practices with content and language learning goals; teachers use **formative assessment practices** during instruction to support EL students' content and language learning.

Quality Learning of Mathematics

Dimension	Characteristics
Conceptual Focus	<ul style="list-style-type: none">• Develops deep, conceptual understanding• Engages student in mathematical practices
Participation by Design	<ul style="list-style-type: none">• Engages students in sustained talk and reciprocal interactions about math.• Offers students opportunities to grow into new roles over time
Purposeful Focus on Language	<ul style="list-style-type: none">• Develops students' understanding of how language works in doing mathematics• Supports students in uses of language that grow more monologic, authoritative, and technical.

Process Outline for Lesson Planning

- Read and analyze the key mathematical concepts and necessary mathematical practices required for the lesson.
- Identify key ideas and relevant prior knowledge.
- Create extension activities that will enable students to apply their understanding.

Scaffolding Throughout the Lesson

- Read and analyze the key mathematical concepts and necessary mathematical practices required for the lesson
- Identify key ideas and relevant prior knowledge.
- Create extension activities that will enable students to apply their understanding.
- Offer designed-in scaffolding:
 - Structures for participation and interaction
 - Choices of language to focus on ideas and practices

Starting with the Task (1)

If there are 9 people in a room and every person shakes hand exactly once with each of the other people, How many handshakes will there be?



ORIGINAL SOURCE: Illustrative Mathematics

Connecting to Prior Knowledge

For English Learners, what prior knowledge or lived experiences may they bring?

Please respond in the chat!



Lesson Sequence

Activating Prior Knowledge (1)

Think-Pair-Share

- THINK about the prompt and write an individual response
- PAIR with a partner and exchange ideas
- SHARE with the whole class what **your partner** shared

Activating Prior Knowledge (2)

Here are four pieces of fruit. You can choose 2. Which 2 do you choose and why?



Math Language Routines

- Support Sense Making
- Optimize Output
- Cultivate Conversation
- Maximize Meta-Awareness

Reading and Understanding the Problem Mathematics Protocol (1)

Step 1. Read the problem out loud to a peer.

Try to answer this question. What's the problem about?

Step 2. Read the problem again.

Talk to your partner about these questions:
What is the question in the problem?

Also known as The Three Reads Protocol

Reading and Understanding the Problem Mathematics Protocol (2)

Step 3. Read the problem a third time.

Talk to your partner about these questions.

- a) What information do you need to solve the problem? (What do you want to know?)
- b) What information do you have? (What do you know?)
- c) What information are you missing? (What don't you know?)

Reading and Understanding the Problem Mathematics Protocol (3)

Step 3A. Talk to your partner about these questions.

- a) What tools could you use to solve this problem?
- b) What tools are you going to use first to solve the problem?

Reading and Understanding the Problem Mathematics Protocol (4)

Step 4. Draw a diagram, act the problem out, use tools to represent the problem situation.

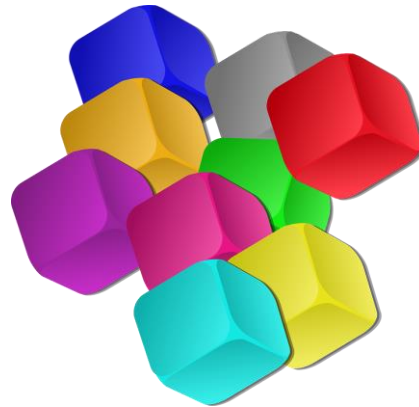
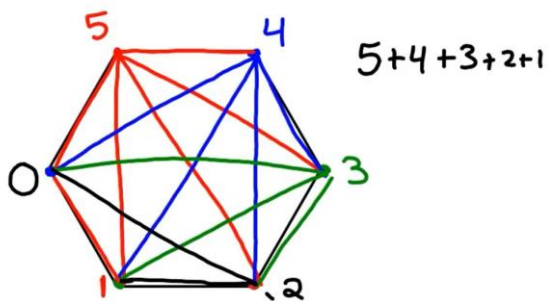
Think-Pair-Share Squared



Minilecture - Combinations

Systematic Lists, Draw Picture, Use manipulatives

How did you solve the problem?



$\{1,2,3,4,5,6\}$ 3 2 1
 $\{1,2\}$ (2,3) (3,4) (4,5) (5,6)
 $\{1,3\}$ (2,4) (3,5) (4,6)
 (1,4) (2,5) (3,6)
 (1,5) (2,6) 2
 (1,6) 4

The Handshake Problem

	A	B	C	D	E	F	G	H	I
A	0								
B	1	0							
C	1	1	0						
D	1	1	1	0					
E	1	1	1	1	0				
F	1	1	1	1	1	0			
G	1	1	1	1	1	1	0		
H	1	1	1	1	1	1	1	0	
I	1	1	1	1	1	1	1	1	0
	8	7	6	5	4	3	2	1	0
									36

Extension

What if people were greeting each other in groups of 3?

How would you solve the problem?
Did your strategy change? How?



Looking Back

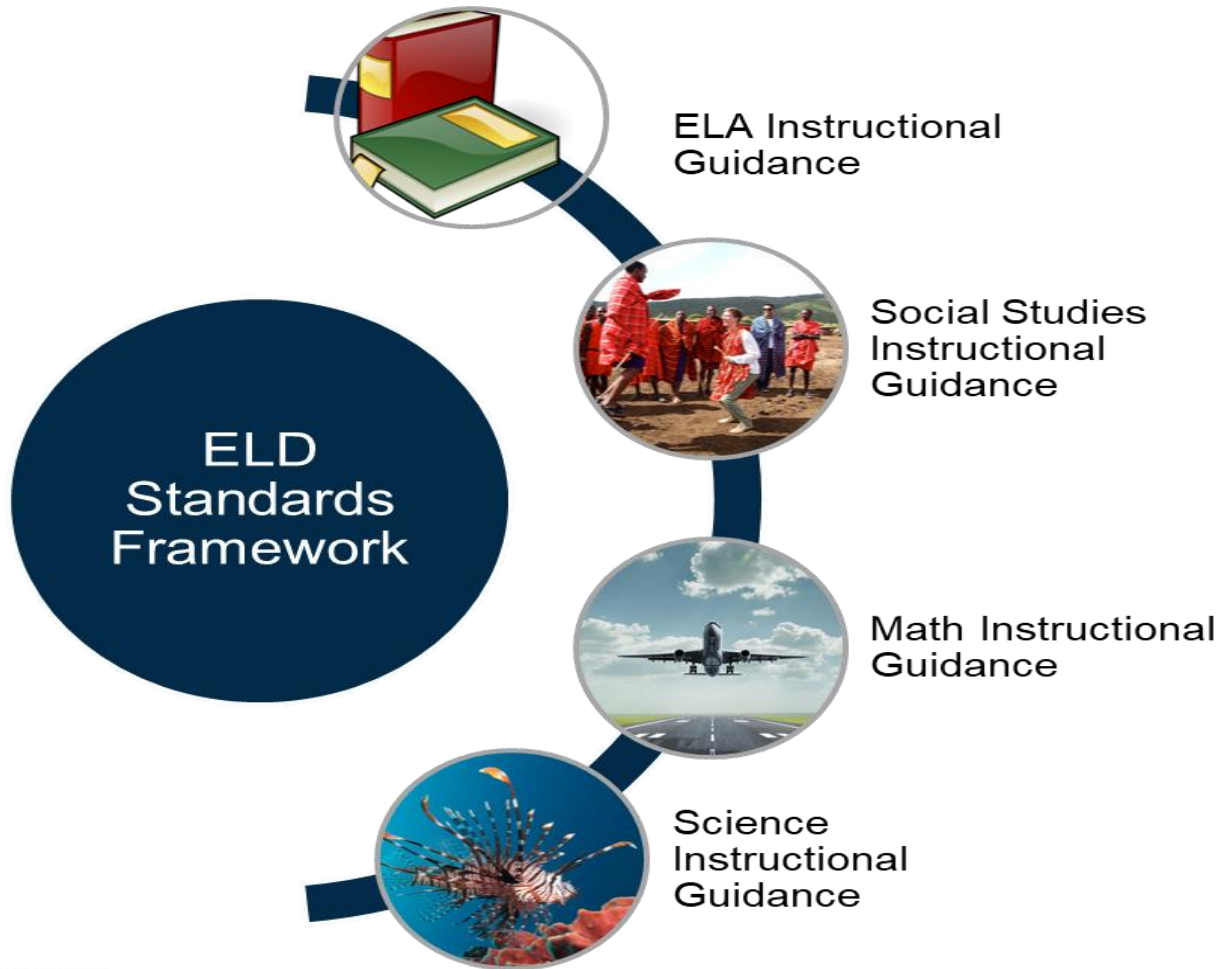
Activity	Purpose
Think-Pair-Share	Brings out background knowledge of mathematical tools
Reading & Understanding the Problem	Determining what the problem is asking and how to solve it Support sense making
Think-Pair-Share Squared	Exposure to multiple tools and ways to solve the problem
Mini-lecture	Provides the language for the three strategies for solving the problem

How do these activities support meaningful discourse?

- Look back at the activities.
- Select **one activity** and connect it to -
 - *Guiding Principle 3: Teachers provide frequent opportunities for EL students to engage in **extended discourse through multiple modalities**, including oral, written, visual, and kinesthetic modes of communication focused on developing students' content understandings, language, and analytical thinking.*
- Please share your thoughts on the community wall linked in the chat.



Nevada ELD Standards Framework



A Focus On Elementary Mathematics



ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF MATH GRADES 4-5

The Structure of the Framework

ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF MATH GRADES 4-5

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ELD Standards Framework for Developing the Language of Math Grades 4-5

2A: Student Moves: Language Use Expectations

2B: Teacher Moves: Supports for Processing and Producing Language

2C: Teacher Moves: Supports for Collaborating in the Academic Language

2A: Student Moves for Receptive Listening and Reading

Section 2A: Student Moves: Language Use Expectations

TASK SAMPLES from the *WIDA Can Do Descriptors, Key Uses Edition* show us that toward the end of a given level of English language proficiency, and with instructional support, English learners can process or produce...

Language Domains	Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Receptive Listening & Reading	<p>With appropriate visual, graphic or interactive support students can...</p> <ul style="list-style-type: none"> • Recognize the meaning of some words learned through conversation and show increasing awareness of differences between informal and language appropriate to the classroom. • Determine the meaning of some general academic and content-specific words and phrases. • Label key vocabulary or steps within a math operation. • Mark position/location of numbers or illustrated objects from oral commands. • Identify comparative quantities of numbers or illustrated objects from oral commands or questions. • Identify large whole numbers from pictures or models and phrases or short sentences. • Match words or phrases related to estimation to estimate word banks of varying quantities. 	<p>With appropriate visual, graphic or interactive support, as necessary, student can...</p> <ul style="list-style-type: none"> • Determine the meaning of general academic and content-specific words and phrases. • Match general and some specific technical language of associated content to oral examples. • Discriminate between different meanings of language general and specific technical language associated with content in oral discourse. • Sort examples of large whole numbers from pictures or models and text (e.g., those more than or less than one thousand). 	<p>Determine the meaning of general academic and content-specific words and phrases.</p> <ul style="list-style-type: none"> • Distinguish between language of estimation sentences (e.g., "I have almost one dollar.") and language of precision ("I have one dollar.") in illustrated sentences. • Apply technical language related to content grade-level oral scenarios (e.g., concepts of volume and related volume to multiplication and to addition).

2A: Student Moves for Productive Speaking & Writing

Section 2A: Student Moves: Language Use Expectations (continued)

TASK SAMPLES from the *WIDA Can Do Descriptors, Key Uses Edition* show us that toward the end of a given level of English language proficiency, and with instructional support, English learners can process or produce...

Language Domains	Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
Productive Speaking & Writing	<p>With appropriate visual, graphic or interactive support students can...</p> <ul style="list-style-type: none"> • State words in figures or formulas from illustrated examples. • Use general vocabulary in math sentences from illustrated examples. • Participate in short written exchanges. • Listen actively to others and respond to simple questions and some wh-questions. • Construct a simple claim and provide a reason to support the claim in solving a problem. • Reproduce names of three-dimensional shapes from labeled models. • Make lists of real-world examples of three-dimensional shapes from labeled models. 	<p>With visual, graphic or interactive support, as necessary, student can...</p> <ul style="list-style-type: none"> • Use transitional words and phrases to connect ideas. • Describe how reasons support the specific approach or strategy in a math scenario. • Participate in written exchanges and respond to others' comments. • Ask and answer relevant questions and add relevant information with reasoning. • Construct a claim and provide a few reasons to support the claim in solving a problem. • Relate multiple uses of specific vocabulary in illustrated math sentences. • Paraphrase illustrated math sentences using specific or technical vocabulary. • Compare/contrast attributes of three-dimensional shapes from labeled models or charts (e.g., "A__ is like a__ because __.>"). 	<ul style="list-style-type: none"> • Use a variety of lining words and phrases to connect ideas and reasoning. • Use a wide variety of general academic and content-specific words and phrases. • Explain different ways of problem-solving grade-level examples using specific or technical vocabulary. • Participate in extended conversations and discussions and build on the ideas of others. • Pose and respond to relevant questions and add relevant comments with reasoning. • Construct a claim and provide logically ordered reasons to support the claim in solving a problem. • Write algebraic expressions and use academic language related to content grade-level (e.g. interpret numerical expressions). • Incorporate descriptions of three-dimensional shapes into real-world situations.

2B: Teacher Moves: Supports for Processing and Producing Language

Section 2B: Teacher Moves: Supports for Processing and Producing Language

What general supports can teachers provide to students at different language proficiency levels to process or produce academic language in all language domains? (See the [Go to Strategies Matrix](#), page 19.)

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
<ul style="list-style-type: none"> • Build background in key language and concepts. • Provide explicit instruction and practice in key social and instructional vocabulary. • Model orally the academic language and specific vocabulary. • Provide explicit instruction and practice for students to construct the language using sentence and discourse starters and visual aids from the text. • Use physical gestures to accompany oral directives. • Label visuals and objects with target vocabulary. • Introduce cognates to aid comprehension. • Give two step contextualized directions. • Restate/rephrase and use Patterned Oral Language routines. • Provide a list of important concepts on a graphic organizer. • Provide a content vocabulary Word Bank with non-linguistic representations. 	<ul style="list-style-type: none"> • Build background in key language and concepts. • Model orally the academic language and specific vocabulary. • Provide explicit instruction and practice for students to construct the language using sentence and discourse starters and visual aids from the text. • Provide a system for students to record and process key academic and content-specific vocabulary. • Check comprehension of all students frequently. Use wait time. • Require full sentence responses by asking open ended questions. • Require the use of academic language. • Provide a list of important concepts on a graphic organizer. • Provide a content vocabulary Word Bank with non-linguistic representations. 	<ul style="list-style-type: none"> • Build background in key language and concepts. • Use complex sentence and discourse starters. • Model orally the academic language and specific vocabulary. • Confirm students' prior knowledge of content topics. • Extend content vocabulary with multiple examples and non-examples.

2C: Teacher Moves: Supports for Collaborating in the Academic Language

Section 2C: Teacher Moves: Supports for Collaborating in the Academic Language

How can teachers provide ongoing opportunities for students to collaborate using academic language?

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
<p>Prior to reading, writing, and discussion, Teacher prepares collaborative discourse structures for students to...</p> <ul style="list-style-type: none"> • Engage in pair work (in L1 if possible) to prepare questions for discussion using graphic, interactive, and/or language supports. • Participate in pair/triad/small group discussions using graphic, interactive, and/or language supports (including L1 as appropriate). • Use Clock Buddies. • Use Numbered Heads Together. • Use Think-Pair-Share Squared. • Use key sentence frames for pair interactions. • Participate with Strategic Partners at a higher English proficiency level and/or with same primary language peer(s). • Use Cloze sentences with a Word Bank. • Use dialogue structures (e.g.): My turn/ your turn; Partner A/Partner B; Collaborative groups. 	<p>Prior to reading, writing, and discussion, Teacher prepares collaborative discourse structures for students to...</p> <ul style="list-style-type: none"> • Engage pair work to prepare questions for discussion using graphic, interactive, and/or language supports as needed. • Contribute to pair/triad/small group discussions by supporting with examples, asking clarifying questions, and using graphic, interactive, and/or language supports as needed. • Engage with whole/large group discussions by connecting ideas with supporting details, generating original questions, and using graphic, interactive, and/or language supports as needed. • Use Think-Pair-Share. • Repeat and expand their responses and other students' responses in a Collaborative Dialogue. • Use dialogue structures (e.g.): My turn/ your turn; Partner A/Partner B; Collaborative groups. 	<p>Prior to reading, writing, and discussion, Teacher prepares collaborative discourse structures for students to...</p> <ul style="list-style-type: none"> • Engage in structured pair work to process. • Inform and formulate thinking, then prepare questions for discussion. • Contribute to pair/triad/small group discussions to share individual ideas and compare with other ideas in the group, using graphic, interactive, and/or language supports as needed. • Engage with whole/large group discussions by generating original questions and/or building on the ideas of others using graphic, interactive, and/or language supports as needed. • Use dialogue structures (e.g.): My turn/ your turn; Partner A/Partner B; Collaborative groups.

Looking Back for Moves

Activity	Teacher Moves	Student Moves
Think-Pair-Share	Structured pair work to share experience	Listen, speak, and report partner's ideas
Reading & Understanding the Problem	Structured small group work Chunking parts of the process	Identify what the problem is asking, tools needed to solve it, and one way to solve the problem
Think-Pair-Share Squared	Structured small group work	Offer ideas, compare tool use and solutions with others
The Math Conversation Protocol	Structured pair work to solve combinations problems	Solve more complex combinations problems and create new problems

Activating Prior Knowledge

Here are four pieces of fruit. You can choose 2. Which 2 do you choose and why?



Starting with the Task (2)

If there are 9 people in a room and every person shakes hand exactly once with each of the other people, How many handshakes will there be?

There are 9 people in a room.

They greet each other.

How many greetings are made?

Focus on Math Practice 5

Please Respond in the Chat



- How does the sequence of activities above provide English Learners with opportunities to engage in using appropriate tools strategically?
- What additional supports might they need?

3B: Teacher Moves for “...disciplinary practice?”

Practice 5a: Use Appropriate Tools Strategically – Teacher Moves

Teacher Moves: What supports can teachers provide students at different proficiency levels to use language to interpret or make meaning of the content? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
<ul style="list-style-type: none"> • Provide scaffolded tasks for students to draw a picture of their solution and to label it. • Model the language of mathematical expression examples, and then provide the task for students to label the mathematical expressions; have students state the academic vocabulary associated with the number or illustrated expression with a predetermined learning partner. • Provide simple sentence frames for students to emulate/copy basic content provided with a predetermined learning partner. Example: The best tool to use is _____. The tool that I drew was _____. The best tool is _____ because _____. Can you please repeat that? • Students record academic vocabulary on the Mathematically Speaking Task Template with L1 (primary language) translation or non-linguistic representation. (NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3) 	<ul style="list-style-type: none"> • Provide learning tasks in which students can use illustrations or numbers to explain their understandings. • Model consistently a predetermined dialogue structures for students to state and clarify their reasoning to a partner or small group and listen to the ideas of others to agree or disagree with reasons to ensure the participation of all students. • Provide students with sentence starters from a leveled list of scaffolding statements. Example: I’m using a tool different than you because _____. I used _____ tool to solve the problem by _____. I used the same/different tool as you. My reason is _____. Can you tell me more about _____? Using a _____ shows us _____. Using a _____ can’t show us _____. (NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3) 	<ul style="list-style-type: none"> • Provide learning tasks in which students can use illustrations or numbers to explain their understandings. • Model consistently predetermined dialogue structures for students to state and clarifies their reasoning to a partner or small group and listens to the ideas of others to agree or disagree with reasons to ensure the participation of all students. • Provide students with sentence starters from a leveled list of scaffolding statements. Example: I was thinking about what _____ said, and I was wondering if _____ would be a better tool for this problem/process. I’m not sure I understood why/how you used _____ tool. Could you say more about that? I agree / disagree with _____’s choice of _____ tool, but I chose _____ also/instead because of _____. I could have used _____ (tool) because _____. (NEPF – IP.1.2; 2.1; 2.2; 3.1; 3.2; 5.3)

3B: Success Criteria for “..disciplinary practice?”

Practice 5b: Use Appropriate Tools Strategically – Success Criteria

Success Criteria: How will students be able to **communicate** or **demonstrate** their learning of language and content in at **different language proficiency levels**? Examples:

Entering/Emerging (Levels 1-2)	Developing/Expanding (Levels 3-4)	Bridging/Reaching (Levels 5-6)
<p style="text-align: center;">Success Criteria</p> <p>Students will...</p> <ul style="list-style-type: none"> • Solve problems and identify the associated academic vocabulary on Exit Slips and other formal or informal assessments. • Describe steps to solve problems using pictures, symbols, or artifacts. <p>(NEPF – IP.1.3; 2.2; 3.4; 5.3)</p>	<p style="text-align: center;">Success Criteria</p> <p>Students will...</p> <ul style="list-style-type: none"> • Orally explain and produce a graphic representation (illustration or numbers) of their strategy for solving problems. • State some specific and technical academic vocabulary in their explanation and justification of one of the preferred student strategies. <p>(NEPF – IP.1.3; 2.2; 3.4; 5.3)</p>	<p style="text-align: center;">Success Criteria</p> <p>Students will...</p> <ul style="list-style-type: none"> • Orally explain, justify, and defend their problem solving strategies. • Use specific and technical academic vocabulary in their explanation, justification, and defense of one of the preferred student strategies. <p>Assessment Tool Assessing the 8 Mathematical Practices Rubric (NEPF – IP.1.3; 2.2; 3.4; 5.3)</p>

Dialogue Guide: Use Appropriate Tools Strategically

What you can do	What you can say
Select a tool	<ul style="list-style-type: none">• Because I see ..., I am going to try...• If we use, we will be able to...• The ... tool will help me make...
Check results	<ul style="list-style-type: none">• I can estimate the answer to be...• Reasonable answers would be ...• The answer should be closer to... because..
Identify how tools are strong or weak	<ul style="list-style-type: none">• The tool will help us to see....• I am not sure if ... will help us to...• Another place I can use this tool is....



Questions and Wrap- up



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