

# The ELD Standards Framework: Secondary Mathematics

February 23, 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  
**CCNETWORK**  
Comprehensive Center Network



REGION 15  
Arizona | Nevada  
California | Utah



# 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.

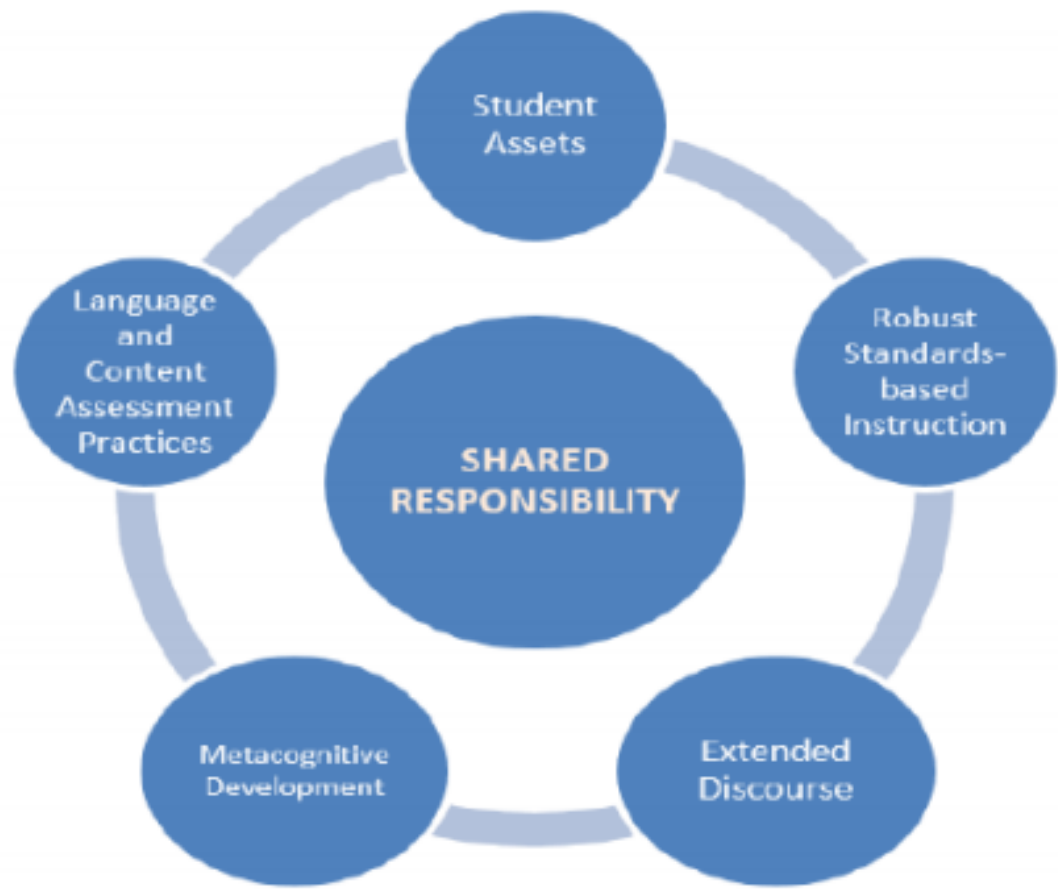
# Poll: What's Your Role?

- Classroom math 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 sequence: Proportional reasoning
- Applying ELD Standards Framework for Secondary Mathematics
- Questions and Answers

# ELD Standards Framework Guiding Principles





# ELD Standards Framework Guiding Principles

**Guiding Principle 1:** Teachers recognize and **value English Learners' assets:** home language(s), cultural assets, existing knowledge, prior schooling experiences, and English language and translanguaging 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

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

# Process Outline for Lesson Planning

- Read and analyze the central problem, text, or concept.
- 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 central problem, text, or concept.
- 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 Problem of “Sale!”

Four different stores are having a sale. The signs below show the discounts available at each of the four stores.

Two for the price of one	Buy one and get 25% off the second
Buy two and get 50% off the second one	Three for the price of two

- Which of these four different offers gives the biggest price reduction? Explain your reasoning clearly.
- Which of these four different offers gives the smallest price reduction? Explain your reasoning clearly.

# Connecting to Prior Knowledge

Four different stores are having a sale. The signs below show the discounts available at each of the four stores.

Two for the price of one	Buy one and get 25% off the second
Buy two and get 50% off the second one	Three for the price of two

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

**Please respond in the chat!**



# Activating Prior Knowledge

## 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



# 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

*Tell me about a time you or your family bought something on sale. What did you buy, and how much did you save?*

# Sort and Order

- Work in a small group of no more than four.
- Take turns, reading the cards one by one and then sorting them in order.

50% off of \$40

50% off of \$50

25% off of \$50

10% off of \$200

25% off of \$100

\$10 off of \$40

\$25 off of \$50

\$15 off of \$50

# Interacting with the Case and Peers

## Creating a Collaborative Table

- Organize students in groups of four.
- Prepare cards with each of the discounts in the problem.
- Distribute the cards to students and tell them only they can write down information about their cards.
- Have groups try different scenarios using prices

# Extending to Other Discounts

## Creating New Discounts

- Work in pairs.
- Create a new discount that is different from the others.
- Give a few amounts for individual items and calculate the discounts.
- Place the discount within the range defined.
- Exchange discounts and try each others' out

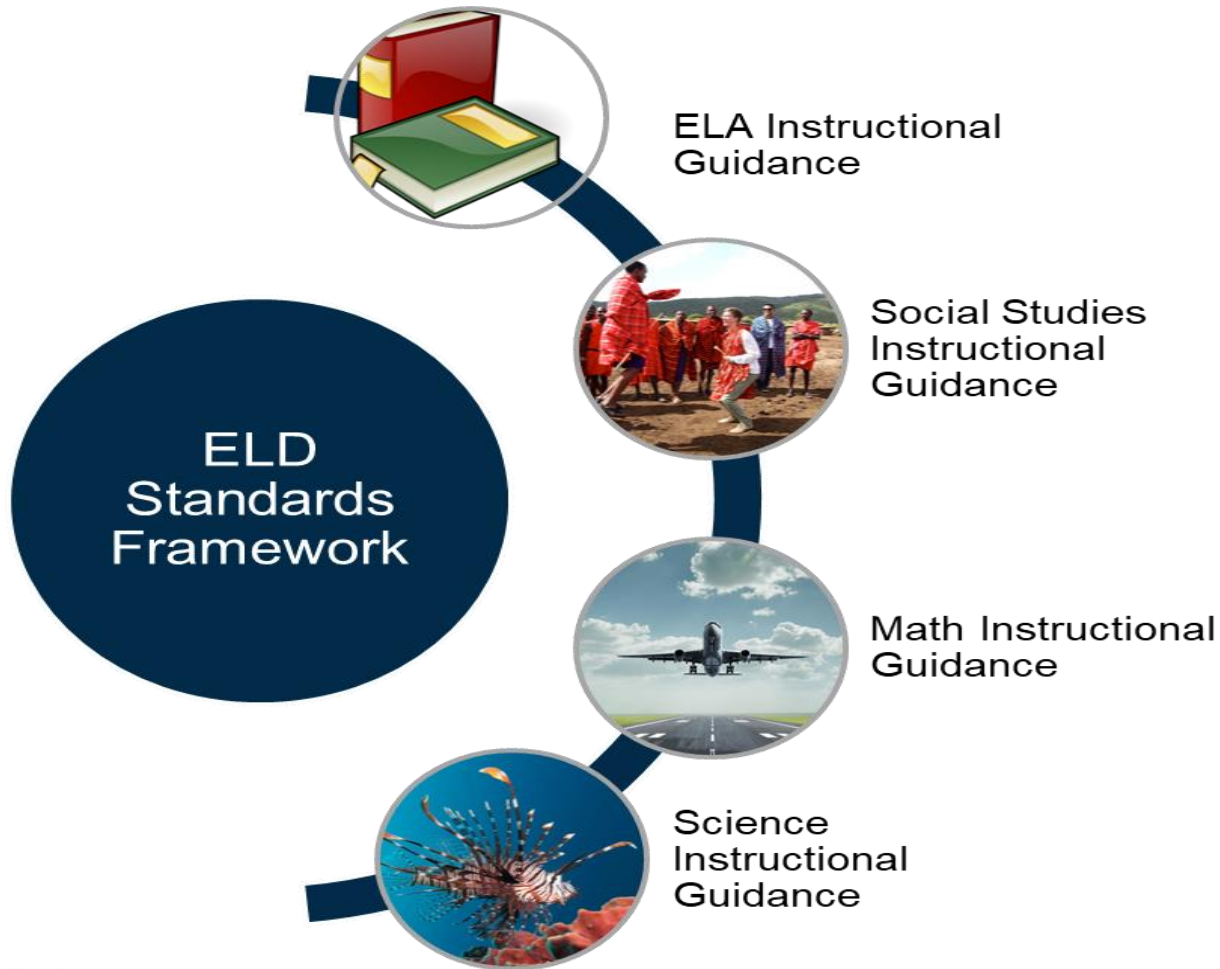
# Looking Back: Sale!

Activity	Purpose
Think-Pair-Share	Surface past experience with sales
Sort and Order	Sort different discounts with different prices
Collaborative Table	Compare and order multiple discounts or prices
Create New Discounts	Compute and compare new discounts to the existing range

# Reflection

- Look back at the activities.
- Select **one activity** and connect it to one of the ELD Guiding Principles.
- Please share your thoughts on the community wall linked in the chat.

# Nevada ELD Standards Framework



# A Focus On Secondary Mathematics



## ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF MATH GRADES 6-8



# The Structure of the Framework

## ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF MATH GRADES 6-8

### Table of Contents

<b>SECTION 1: ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF MATH GRADES 6-8 - OVERVIEW</b> .....	
Section 1: Purpose .....	
Section 1: Key Uses of Academic Language .....	
<b>SECTION 2: ELD STANDARDS FRAMEWORK FOR DEVELOPING THE LANGUAGE OF MATH GRADES 6-8</b> .....	
Section 2A: Student Moves: Language Use Expectations.....	
Section 2B: Teacher Moves: Supports for Processing and Producing Language.....	
Section 2C: Teacher Moves: Supports for Collaborating in the Academic Language.....	
<b>SECTION 3: INSTRUCTIONAL GUIDANCE</b> .....	
<b>SECTION 3: INSTRUCTIONAL GUIDANCE: MATH PRACTICES GRADES 6-8</b> .....	

# ELD Standards Framework for Developing the Language of Math Grades 6-8

**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 Writing

## 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"> <li>• <b>Identify</b> language of basic components of coordinate planes, graphs or equations from figures and oral statements.</li> <li>• <b>Compare</b> angles from figures and oral commands.</li> <li>• <b>Identify</b> basic components of multi-dimensional shapes from visually supported words or phrases.</li> <li>• <b>Pair</b> descriptions of multi-dimensional shapes or their components with visually supported sentences.</li> </ul>	<p>With appropriate visual, graphic or interactive support, as necessary, student can...</p> <ul style="list-style-type: none"> <li>• <b>Match</b> specific language of complex graphs, equations or coordinate planes with figures and detailed oral descriptions.</li> <li>• <b>Compare/contrast</b> graphs, equations or coordinate planes from figures and oral scenarios using some technical language.</li> <li>• <b>Compare/contrast</b> multi-dimensional shapes or arguments within visually supported text.</li> <li>• <b>Match</b> specific and some technical language associated with components of geometric arguments, constructions or shapes to visually supported text.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Analyze</b> graphing techniques, graphical models or equations from oral reading of grade-level material (e.g., best fit lines, connections between multiple representations).</li> <li>• <b>Analyze and defend</b> geometric arguments, theorems or shapes (e.g., examples v. proofs).</li> </ul>

# 2A: Student Moves for Productive Speaking and Listening

## 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"> <li>• <b>Name</b> variables from illustrations and notation.</li> <li>• <b>Relate</b> functions of two variables from illustrations and notation.</li> <li>• <b>Produce</b> elements of equations or formulas from word/phrase banks and models (e.g., labeling diagrams).</li> <li>• <b>Describe</b> equations or formulas using figures and notation from word/phrase banks and models.</li> </ul>	<p>With visual, graphic or interactive support, as necessary, student can...</p> <ul style="list-style-type: none"> <li>• <b>State</b> examples of representations of functions of two variables from illustrations and notation.</li> <li>• <b>Interpret</b> representations of functions of two variables with or without visual support.</li> <li>• <b>Sequence</b> steps from solving problems involving equations or formulas using figures, notation, and sequential language.</li> <li>• <b>Explain</b> uses of equations or formulas using figures, notation, and complex sentences.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Analyze</b> functions of one variable in relation to another (e.g., rates of change, intercepts, zeros, asymptotes).</li> <li>• <b>Summarize</b> procedures for solving problems involving formulas and equations (e.g., geometry problems involving algebra).</li> </ul>

# 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"> <li>• <b>Build</b> background in key language and concepts.</li> <li>• <b>Provide</b> explicit instruction and practice in key social and instructional vocabulary.</li> <li>• <b>Model</b> orally the academic language and specific vocabulary.</li> <li>• <b>Provide</b> explicit instruction and practice for students to construct the language using sentence and discourse starters and visual aids from the text.</li> <li>• <b>Use</b> physical gestures to accompany oral directives.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Build</b> background in key language and concepts.</li> <li>• <b>Model</b> orally the academic language and specific vocabulary.</li> <li>• <b>Provide</b> explicit instruction and practice for students to construct the language using sentence and discourse starters and visual aids from the text.</li> <li>• <b>Provide</b> a system for students to record and process key academic and content-specific vocabulary.</li> <li>• <b>Check</b> Comprehension of all students frequently. <b>Use</b> Wait Time.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Build</b> background in key language and concepts.</li> <li>• <b>Use</b> complex sentence and discourse starters.</li> <li>• <b>Model</b> orally the academic language and specific vocabulary.</li> <li>• <b>Use</b> Video Observation Guides.</li> <li>• <b>Confirm</b> students' prior knowledge of content topics.</li> <li>• <b>Ask</b> students to analyze text structure and select an appropriate Graphic Organizer for summarizing.</li> </ul>

# 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"> <li>• <b>Engage in pair work (in L1 if possible)</b> to prepare questions for discussion using graphic, interactive, and/or language supports.</li> <li>• <b>Participate in pair/triad/small group</b> discussions using graphic, interactive, and/or language supports (including L1 as appropriate).</li> </ul>	<p>Prior to reading, writing, and discussion, Teacher prepares collaborative discourse structures for students to...</p> <ul style="list-style-type: none"> <li>• <b>Engage pair work</b> to prepare questions for discussion using graphic, interactive, and/or language supports as needed.</li> <li>• <b>Contribute to pair/triad/small group discussions</b> by supporting with examples, asking clarifying questions, and using graphic, interactive, and/or language supports as needed.</li> </ul>	<p>Prior to reading, writing, and discussion, Teacher prepares collaborative discourse structures for students to...</p> <ul style="list-style-type: none"> <li>• <b>Engage in structured pair work</b> to process information and formulate thinking, then prepare questions for discussion</li> <li>• <b>Contribute to pair/triad/small group discussions</b> to share individual ideas and compare with other ideas in the group, using graphic, interactive, and/or</li> </ul>



# Looking Back: Sale!

Activity	Teacher Moves	Student Moves
Think-Pair-Share	Structure pair work to share experience	Listen, speak, and report partner's ideas
Sort and Order	Structure small group work in fours	Identify groups and compare quantities.
Collaborative Table	Offer organizer for recording work.	Offer ideas, try others, and sort discounts
Create New Discounts	Group students to apply knowledge.	Create new discounts, calculations, and sort.

# Focus on Mathematical Practices

Please Respond in the Chat



- How does the sequence of activities above provide English Learners with opportunities to engage in the practice “Reason Abstractly and Quantitatively”?
- What additional supports might they need?



# Connecting Math Practices to Key Uses of Language

## Section 3A: Summary: Content Disciplinary Practices and Example Tasks

Table of example tasks for each practice, with sample proficiency descriptors for each [Key Use of Academic Language](#):

Math Practices	Example Tasks	Recount	Explain	Argue	Discuss
1. <b>Make</b> sense of problems and persevere in solving them.	<a href="#">Ratios</a>	Proficient math students <b>make sense</b> of problems by <b>describing</b> and <b>summarizing</b> their strategies.	Proficient math students <b>explain</b> their strategy to solve a mathematical task.	See Math Practices 3.	Proficient math students <b>recount</b> , <b>elaborate</b> , and <b>extend</b> the mathematical reasoning of others.
2. <b>Reason</b> abstractly and quantitatively.	<a href="#">Properties of Real Numbers/Solve Linear Equations</a>	Proficient math students <b>can reason</b> abstractly and quantitatively by <b>describing</b> and <b>summarizing</b> their strategy used in a mathematical task.	Proficient math students <b>explain</b> their strategy to solve a mathematical task.	See Math Practices 3.	Proficient math students <b>elaborate</b> , and <b>extend</b> the mathematical reasoning of others.
3. <b>Construct</b> viable arguments and critique the reasoning of others.	<a href="#">Dan's Division Strategy</a>	Proficient math students <b>convey</b> clear and precise arguments.	Proficient math students <b>explain</b> their strategy to solve a mathematical task.	Proficient math students <b>justify</b> , <b>persuade</b> , and <b>rationalize</b> their use of strategies and communicate them to others using evidence. They also <b>respond</b> and <b>evaluate</b> the mathematical reasoning of others using evidence.	Proficient math students <b>recount</b> , <b>elaborate</b> , and <b>extend</b> the mathematical reasoning of others.

# 3B: Teacher Moves for “Reason Abstractly and Quantitatively”

## Practice 2a: Reason Abstractly and Quantitatively – 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"> <li>• <b>Provide</b> scaffolded tasks for students to draw a picture of their solution and to label it.</li> <li>• <b>Provide</b> simple patterned oral and written sentence frames for students to <b>emulate/copy</b> basic content provided with a predetermined learning partner.</li> <li>• <b>Model</b> the language of mathematical expressions for students to <b>label</b> the mathematical expressions with a predetermined learning partner; have students <b>state</b> the academic vocabulary associated with the number or illustrated expression.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Provide</b> learning tasks in which students can use <b>illustrations or numbers</b> to <b>explain</b> their understandings.</li> <li>• <b>Model</b> a predetermine dialogue structure for students to <b>state</b> and <b>clarify</b> their reasoning to a partner or small group and <b>listen</b> to the ideas of others to <b>agree</b> or <b>disagree</b> with reasons to ensure the participation of all students.</li> <li>• <b>Provide</b> students with <b>sentence starters</b> from a leveled list of scaffolding statements. <b>For example:</b> I know _____ because _____. I learned _____.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Provide</b> learning tasks in which students can use <b>illustrations or numbers</b> to <b>explain</b> their understandings.</li> <li>• <b>Model</b> consistently predetermine dialogue structures for students to <b>state</b> and <b>clarify</b> their reasoning to a partner or small group and <b>listen</b> to the ideas of others to <b>agree</b> or <b>disagree</b> with reasons to ensure the participation of all students.</li> <li>• <b>Provide</b> students with <b>sentence starters</b> from a leveled list of scaffolding statements. <b>For example:</b> A different way to find the answer is _____. I noticed that _____.</li> </ul>

# 3B: Success Criteria for “Reason Abstractly and Quantitatively”

## Section 3B: Math Disciplinary Practices (continued)

### Practice 2b: Reason Abstractly and Quantitatively – 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;"><b>Success Criteria</b></p> <p>Student will ...</p> <ul style="list-style-type: none"> <li>• Solve problems and identify the associated <b>academic vocabulary</b> on Exit Slips and other formal or informal assessments.</li> <li>• Describe steps to solve problems using pictures, symbols, or artifacts.</li> </ul> <p>(NEPF – IP.1.3; 2.2; 3.4; 5.3)</p>	<p style="text-align: center;"><b>Success Criteria</b></p> <p>Students will...</p> <ul style="list-style-type: none"> <li>• Solve problems and identify the associated <b>academic vocabulary</b> on Exit Slips and other formal or informal assessments.</li> <li>• Describe steps to solve problems using pictures, symbols, or artifacts.</li> </ul> <p>(NEPF – IP.1.3; 2.2; 3.4; 5.3)</p>	<p style="text-align: center;"><b>Success Criteria</b></p> <p>Students will...</p> <ul style="list-style-type: none"> <li>• Orally explain, justify, and defend their problem solving strategies.</li> <li>• Use specific and technical <b>academic vocabulary</b> in their explanation, justification, and defense of one of the preferred student strategies.</li> </ul> <p><b>Assessment Tool</b>  <a href="#">Assessing the 8 Mathematical Practices Rubric</a>            (NEPF – IP.1.3; 2.2; 3.4; 5.3)</p>

# Dialogue Card: Reason Abstractly and Quantitatively

What you can do	What you can say
Change the value of quantities	<ul style="list-style-type: none"><li>• If I double ..., then....</li><li>• If I change the quantity from... to ..., then...</li><li>• A convenient value to use for ... is...</li></ul>
Use pictures or symbols.	<ul style="list-style-type: none"><li>• I can represent ... with ...</li><li>• This part shows....</li><li>• When I compare these two...., I can see...</li></ul>
Work forwards and backwards	<ul style="list-style-type: none"><li>• If we make the quantity..., then...</li><li>• If the result was..., the quantity was...</li><li>• I can check this calculation by....</li></ul>



# Questions and Wrap-up



## Contact Information

Sophia Masewicz

Email: [smasewicz@doe.nv.gov](mailto:smasewicz@doe.nv.gov)

Phone: 702.668.4347

Kulwadee (Kul) Axtell

Email: [kaxtell@doe.nv.gov](mailto:kaxtell@doe.nv.gov)

Phone: 775.687.9256



# Disclaimer

The content of this PowerPoint was developed under a grant from the Department of Education through the Office of Program and Grantee Support Services (PGSS) within the Office of Elementary and Secondary Education (OESE), by the Region 15 Comprehensive Center at WestEd under Award #S283B190053. This contains resources that are provided for the reader's convenience. These materials may contain the views and recommendations of various subject matter experts as well as hypertext links, contact addresses, and websites to information created and maintained by other public and private organizations. The U.S. Department of Education does not control or guarantee the accuracy, relevance, timeliness, or completeness of any outside information included in these materials. The views expressed herein do not necessarily represent the positions or policies of the U.S. Department of Education. No official endorsement by the U.S. Department of Education of any product, commodity, service, enterprise, curriculum, or program of instruction mentioned in this document is intended or should be inferred.