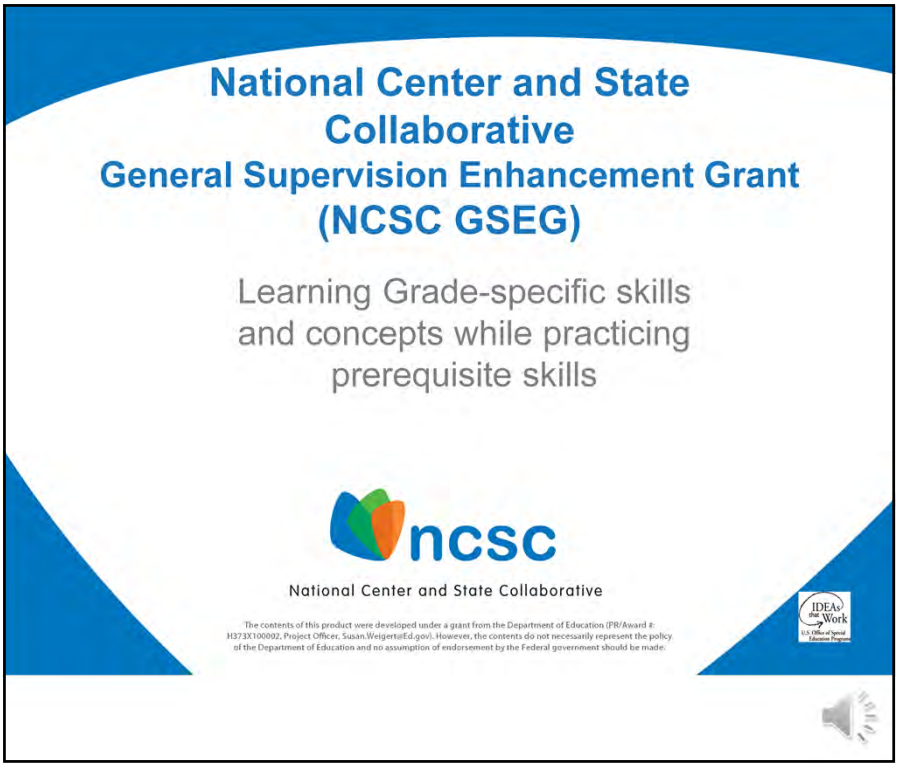
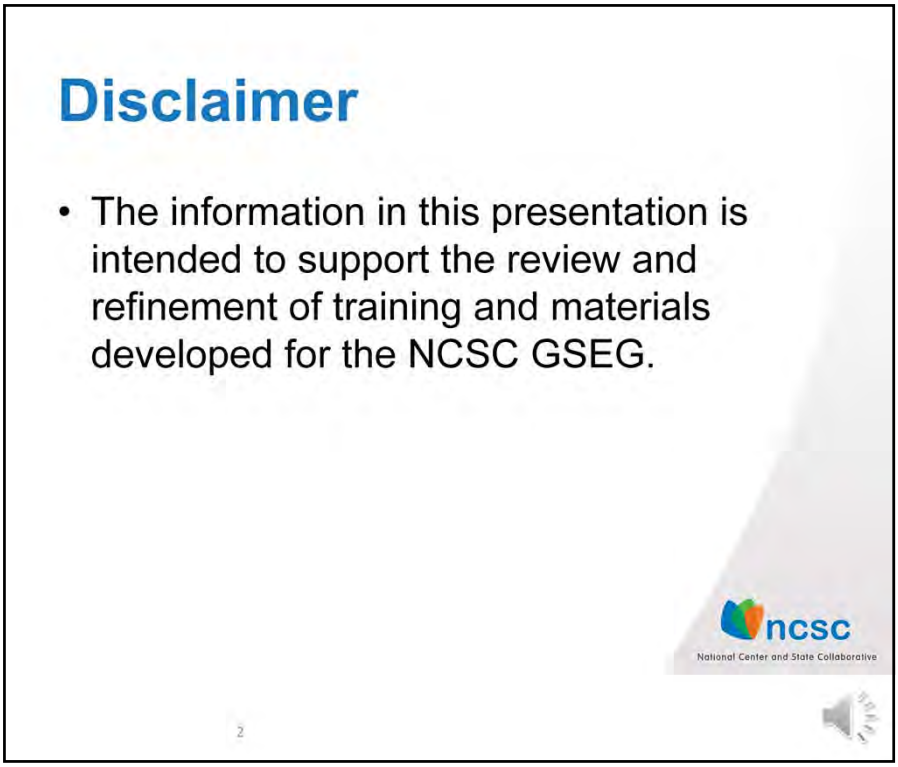
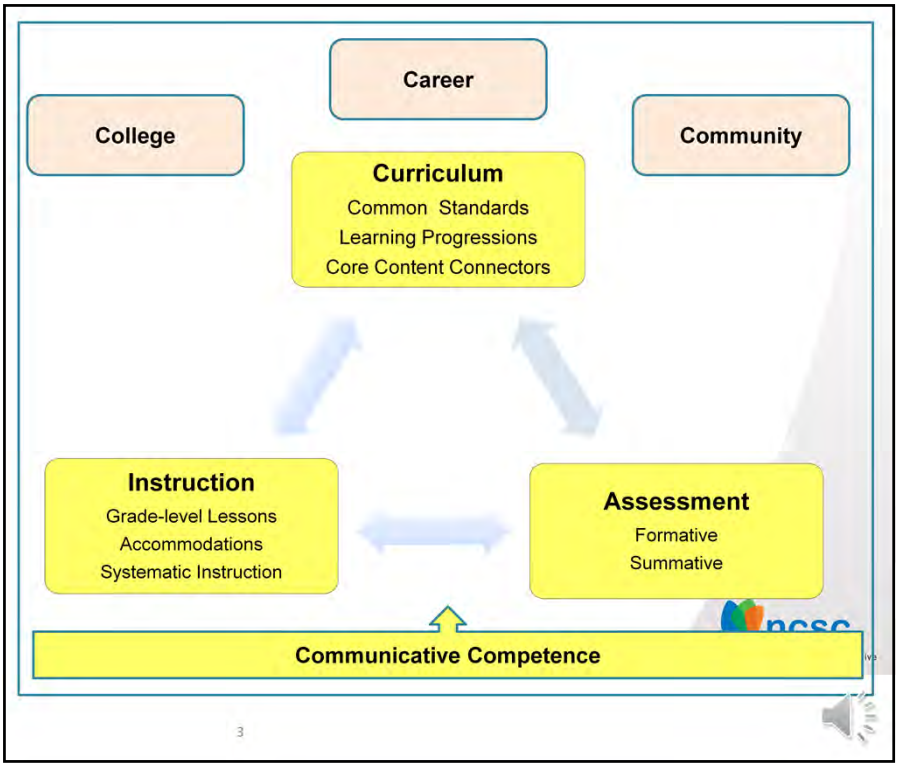


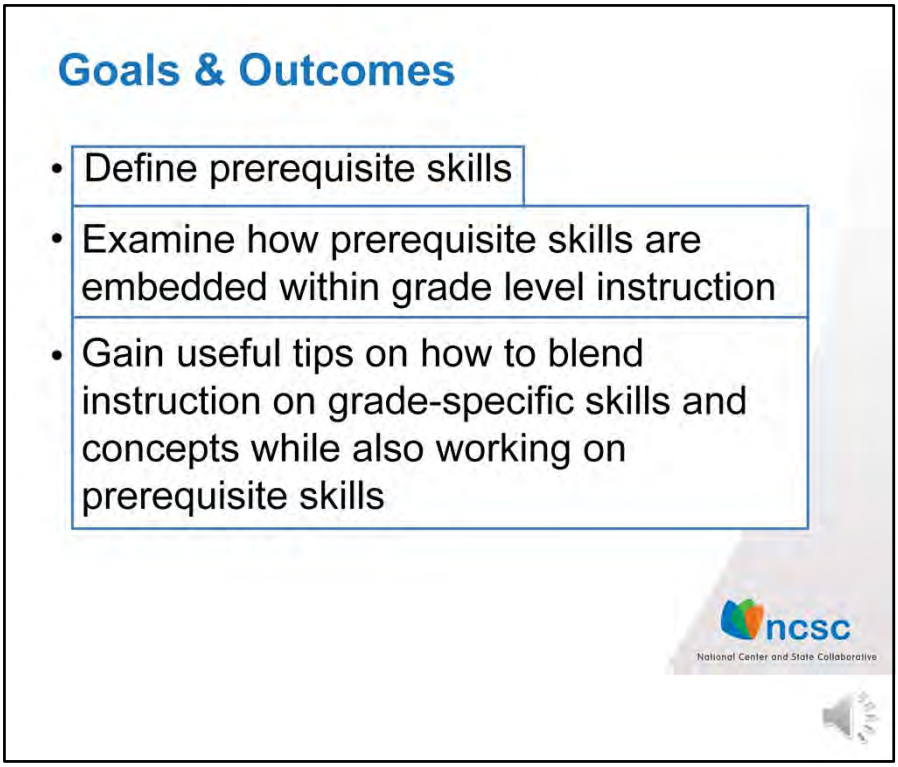
Welcome back to the National Center and State Collaborative's Community of Practice Webinars. In this webinar, we will discuss how to teach grade specific skills and concepts when a student is not yet demonstrating prerequisite skills.



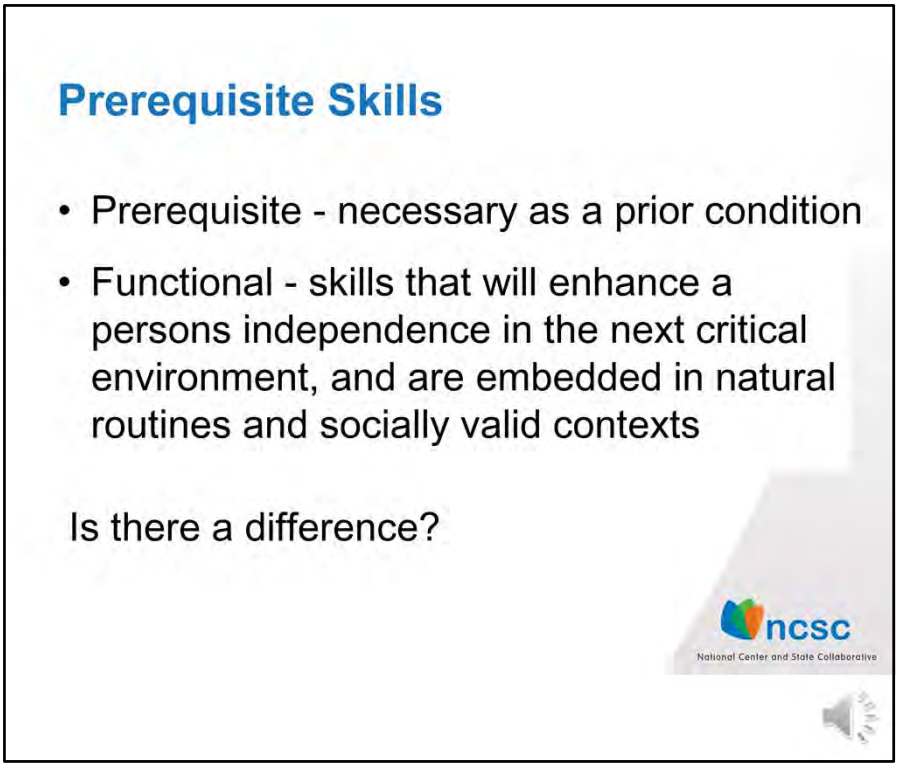
This presentation is considered a draft. In keeping with the project's goal to provide quality instructional resources, feedback on the presentation and materials is welcomed and valued. Any feedback will be used to make improvements to these resources.



As you know, this instructional triangle is used as the framework for all webinars. Each component of the triangle (curriculum, instruction and assessment) informs each of the other components, which are all directed toward the goal of College, Career and Community readiness. In order for any student to benefit from challenging curriculum and high quality instruction, he or she has to be able to communicate what he or she knows and can do. Therefore, Communicative Competence is the base.
This webinar will focus on the instructional component of the triangle.



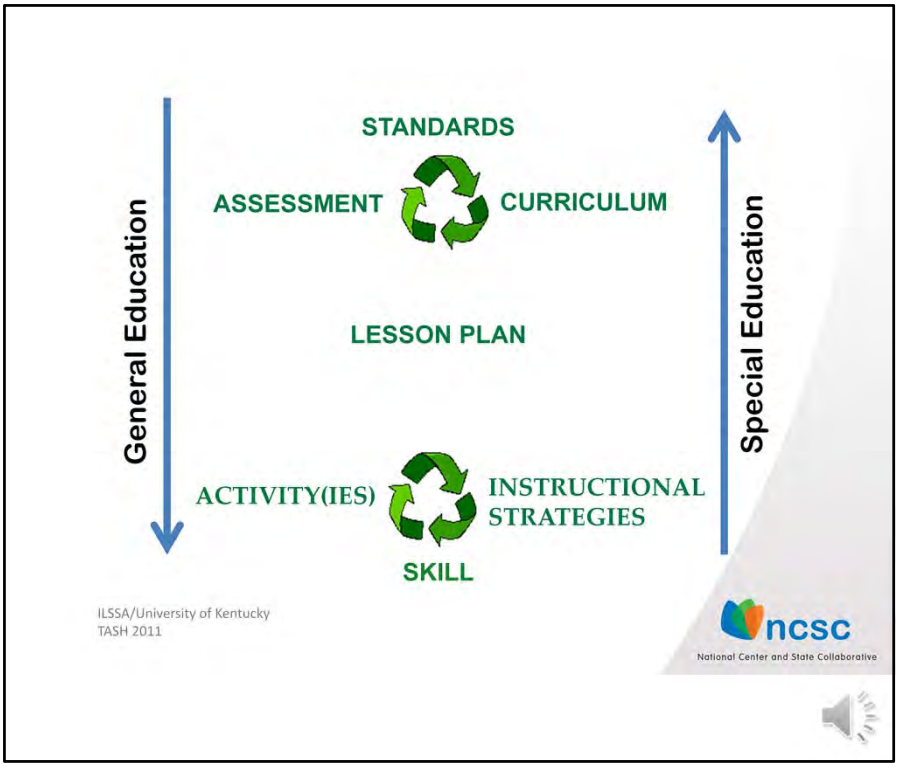
Many teachers ask how can students be taught grade-specific skills and concepts when they don't yet have the prerequisite skills.
The goals of this webinar will examine that dilemma, by
Defining prerequisite skills, so that we are all on the same page when we use that term
Examine how prerequisite skills are embedded within instruction on grade-specific skills and concepts
And gain useful tips on how to teach grade-specific skills and concepts while also working on prerequisite skills



Let's begin by defining what we mean by prerequisite skills and, while we are at it, let's define functional skills.
Prerequisite skills are defined as skills that are necessary as a prior condition for something else to happen or exist. Therefore prerequisite skills describe the skills or background knowledge a student needs (prior condition) before working on a specified concept.
Maryland School performance website
http://mdk12.org/instruction/prereqs/mathematics/grade6/3C1b.html

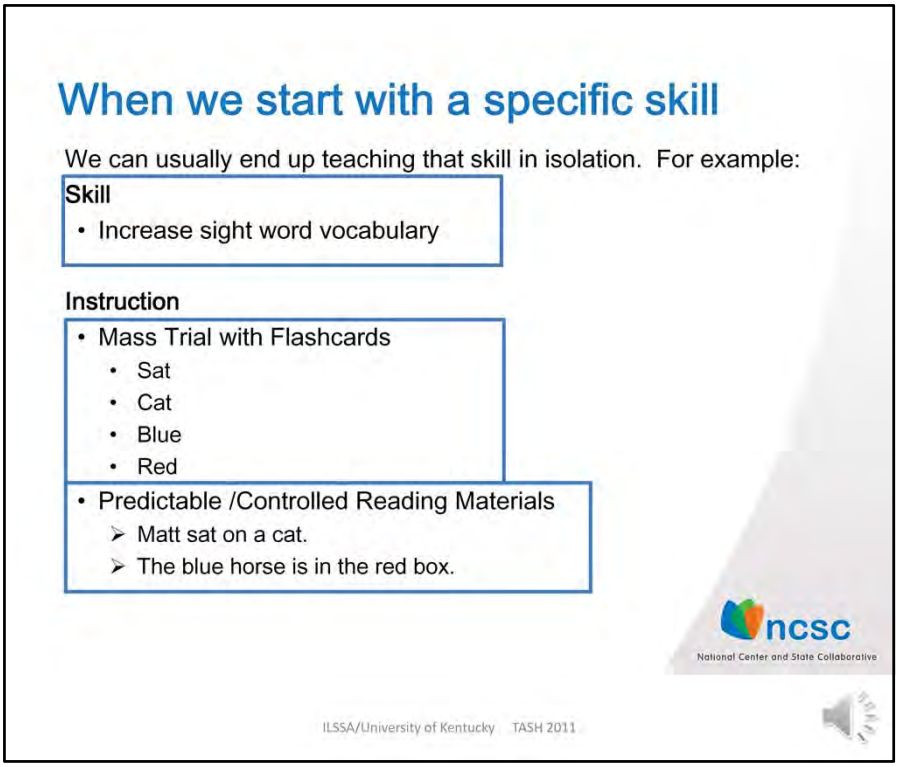
Teachers also ask where "functional skills" fit in standards-based instruction, so let's look at the definition of functional.
Functional skills are those skills that enhance a persons independence in the next critical environment, and are embedded in natural routines and socially valid contexts.
Let's think about what that means for school aged children. What are the next critical environments for a student? If a student is in the first grade, the next critical environment is the 2nd grade, if a student is in 8th grade, the next critical environment is 9th grade, and if a student is in the 12th grade, the next critical environment is college, career and community.
So what are the skills students need in their next critical environments to be as independent and successful as possible?

Is there a difference between prerequisite skills related to the grade level standards-based instruction and functional skills? Think about this as we go through this webinar.



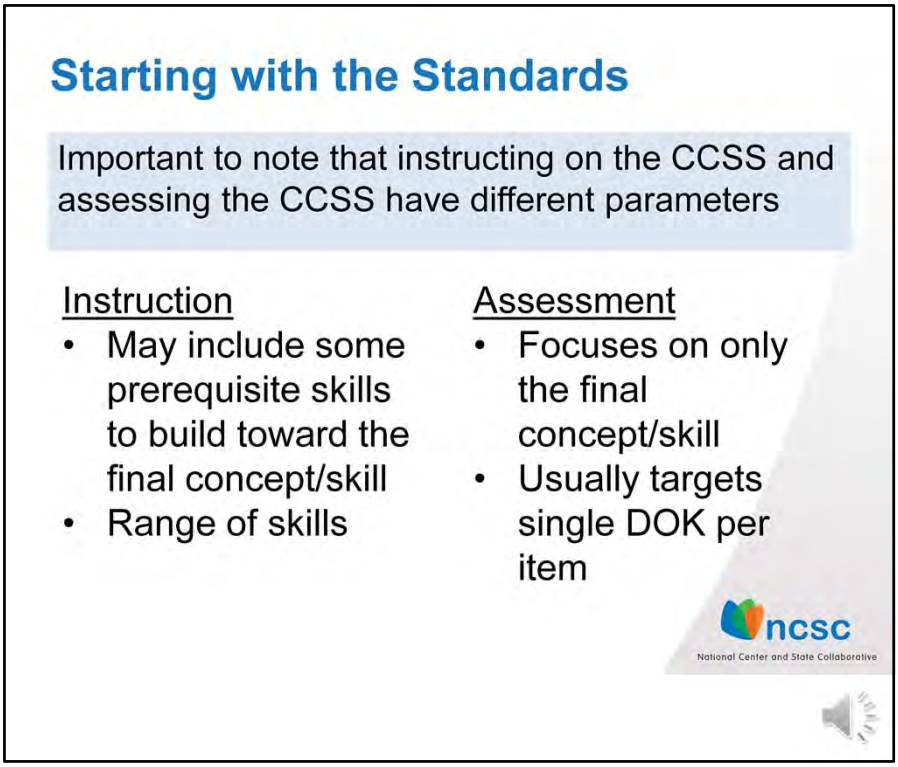
Planning standards based instruction on the CCSS, is most successful when designed in a top down or backwards manner. According to Wiggins and McTighe, "Effective curriculum is planned backward from long-term, desired results through a three-stage design process (Desired Results, Evidence, and Learning Plan)" starting with the standard, determine what the outcomes of instruction should be and how the student will demonstrate those outcomes, then plan the lessons, activities, and so that students obtain the specific skills, concepts and strategies needed to demonstrate those outcomes. "This process helps avoid the common problems of treating the textbook as the curriculum rather than a resource, and to avoid activity-oriented teaching in which no clear priorities and purposes are apparent."

Historically, special education has planned and instructed from the bottom up, starting with specific, discrete skills or activities and then trying to determine where they "fit" within the standards and outcomes.



Let's take a look at instruction that begins with a specific skill. In this example, instruction begins with the skill of "increase sight word vocabulary" and includes two activities, mass trial practice of words in isolation, and then practice reading within a controlled reading text.

Although students will acquire sight word reading skills in this scenario, it is done in isolation, removed from standards-based instruction and removed from the context of what peers are reading and talking about. It is missing the purpose for why we learn and use these words.



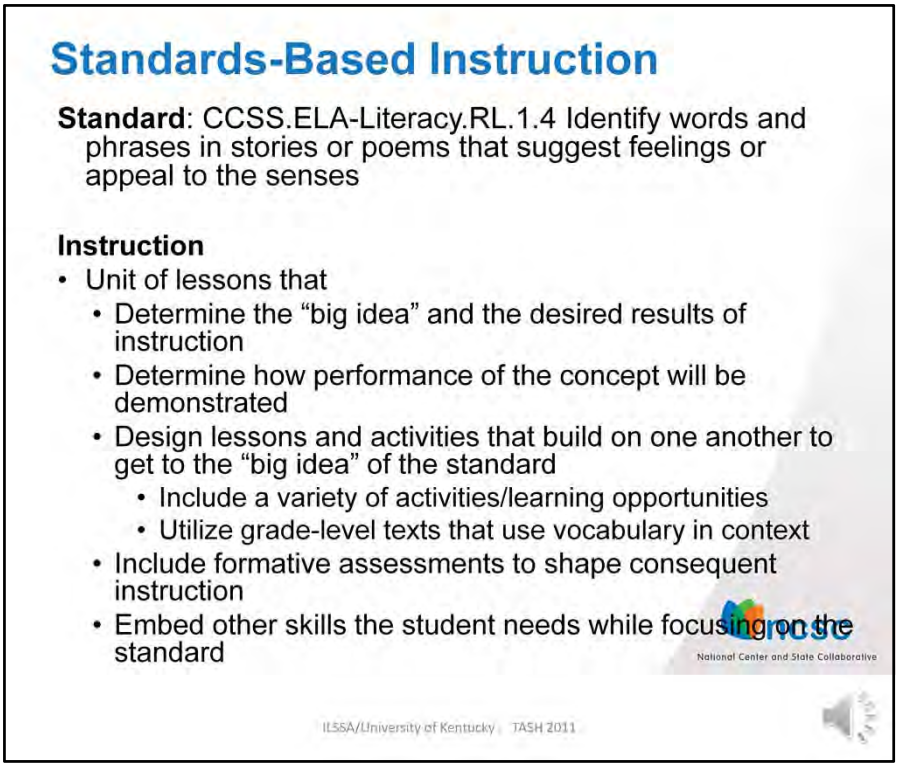
It is important to remember the difference between instruction and assessment when planning. During instruction students use, and therefore we teach, a variety of skills and strategies that build to the grade-specific concept. However, during assessment we typically target a specific skill or concept.

It is important to understand the difference between instruction and assessment on grade specific concepts that embed the use of prerequisite skills in the problem solving process:
During instruction you can teach students to identify numbers, count, or use one-to-one correspondence within the concept of solving for area and perimeter. You can provide direct instruction on the prerequisite skills within the process of solving for the area and perimeter. Because the prerequisites are used over and over within the concept, the student can receive lots of functional practice on using the skills in context, not in isolation
During Assessment, you are looking for performance of specific skills:
You might be doing progress monitoring on whether the student is learning/using the prerequisite skills, a system of least prompts or time delay strategy might be used and data recorded to keep track. Or you might use observational data during the activities within the lesson to see how the student is performing
You might be doing formative assessment to see which steps with in the concept the student is learning, and which steps still need continued instruction. You may be checking on whether the student is using the processes, steps, strategies taught to solve problems; you may be looking for independent responses or allowing for a system of least prompts
You might be large scale assessment to show student performance of the grade specific concept. At this point the student should be independently utilizing steps strategies supports to evidence performance of grade specific concepts.

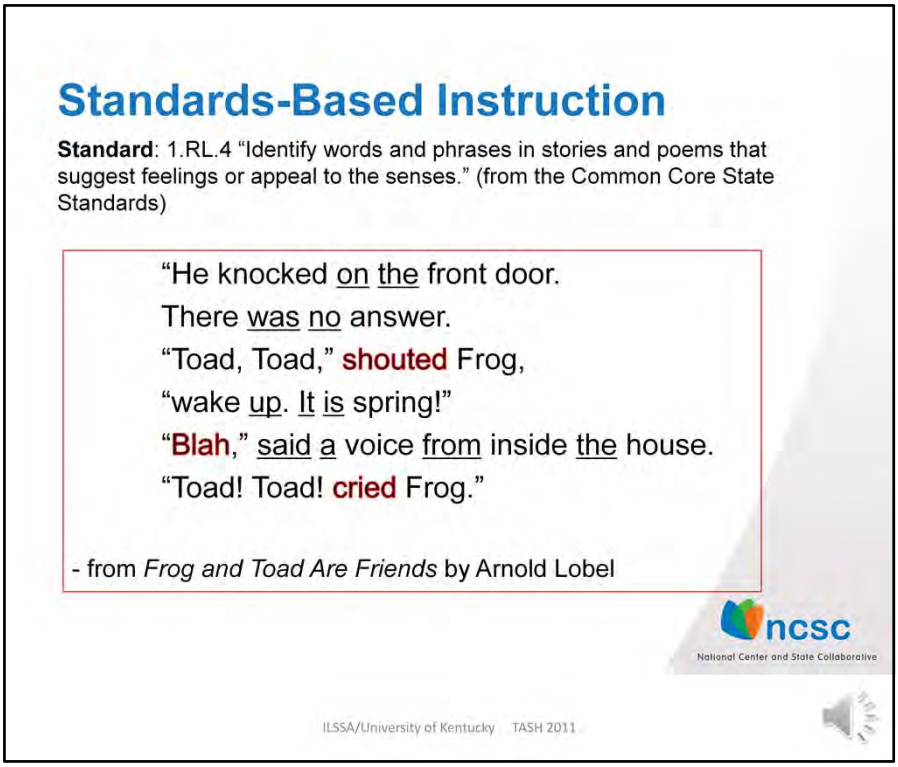
Assessment may focus on one or even two concepts or skills while instruction should scaffold from old skills while building new ones

As a part of this distinction, it is important to note that during instruction we expect people to hit a range of DOK levels from the lowest to the highest. However, during assessment we may target one DOK level and it may not be the highest one.

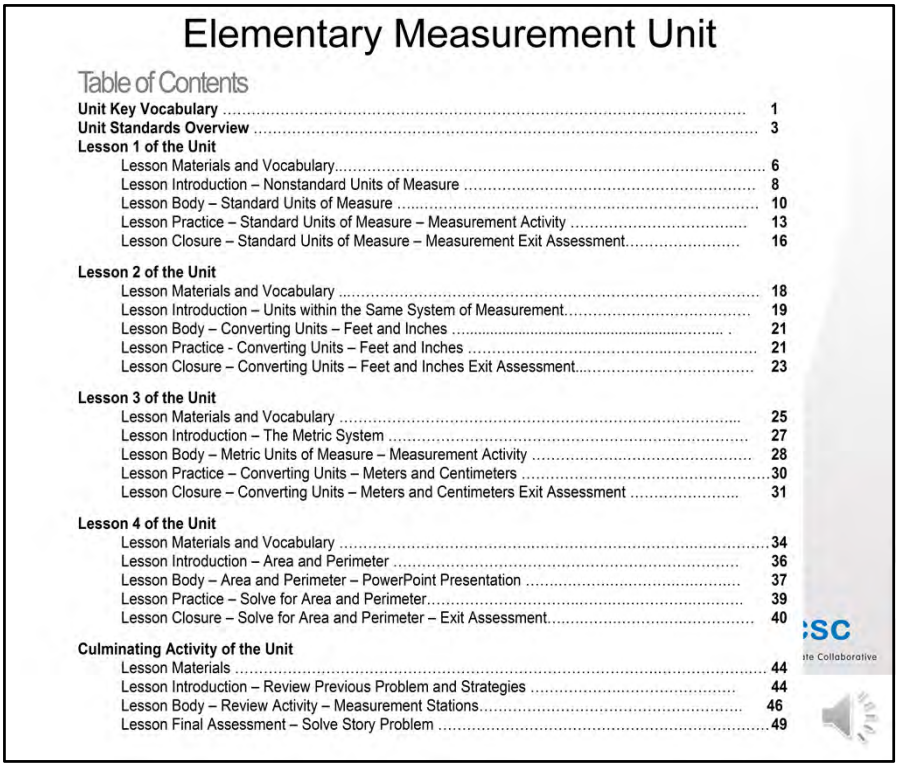
Assessment may focus on one or even two concepts or skills while instruction should scaffold from old skills while building new ones



Now let's see how instruction looks when we start with the standards. Using the first grade common core state standard of "Identify words and phrases in stories and poems that suggest feelings or appeal to the senses"…
Begin with the big idea – reading words/phrases in context, read words/phrases that appeal to feelings or the senses. Then it is important to determine how students will demonstrate achievement of that standard. (Students will identify words that suggest feelings/sense and match to the feeling or sense it suggests)
Once the outcome has been determined, a variety of activities that lead the student toward acquisition of the skills necessary to demonstrate the outcome can be designed. Specific strategies and supports should also be designed and implemented. Formative assessments and/or progress monitoring should be utilized to shape instruction and help determine if intervention strategies or prerequisite skills are needed.

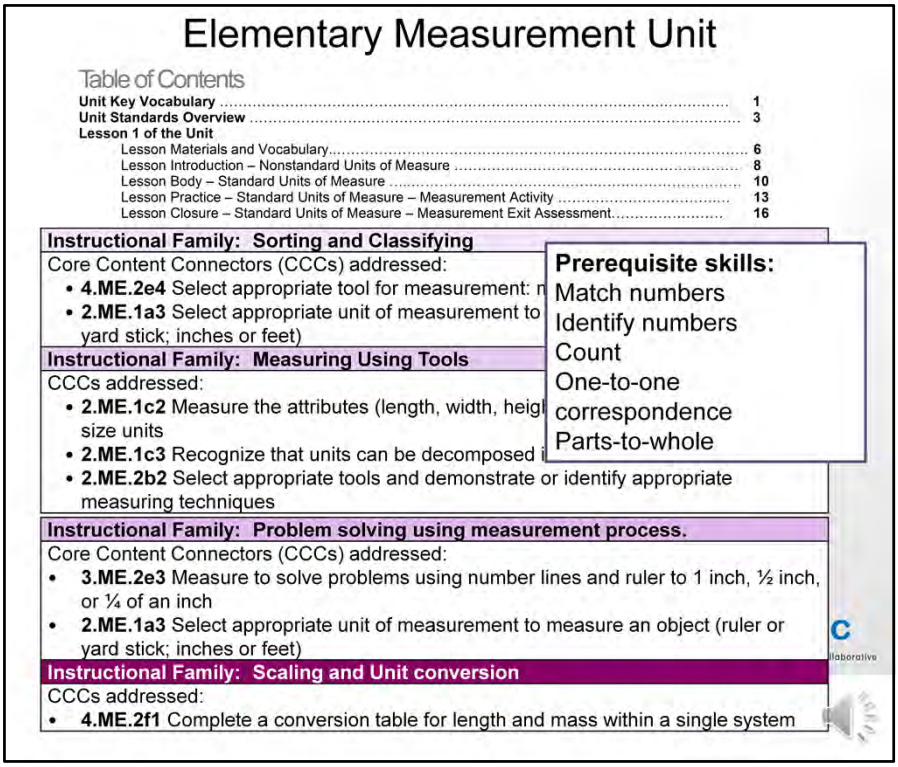


Here is an example of one activity designed with the end in mind. The example allows for instruction on the standards using grade level text. The targeted words that "suggest feelings," are highlighted in red. The specific skill of reading sight words is embedded within the instruction and the words are underlined.
So you can see, the skill of increasing sight word vocabulary can still be achieved while addressing the standard and allowing the student to work with the same materials as peers. This also naturally provides opportunities for communicating with peers on a shared topic.
.
Tiered intervention Strategies can be designed based on formative assessment data, and might include mass trial practice of the target words prior to instruction to help build background knowledge or prepare the student for instruction; and the use of controlled reading materials. And of course all materials should be presented using the student's mode of communication.



Using the NCSC sample UDL Units on Measurement and Geometry, we will look at the grade-specific skills and concepts addressed within each lesson and activity, and then determine the prerequisite skills embedded within the instruction.

Using the table of contents from the Elementary Measurement Unit, **click**

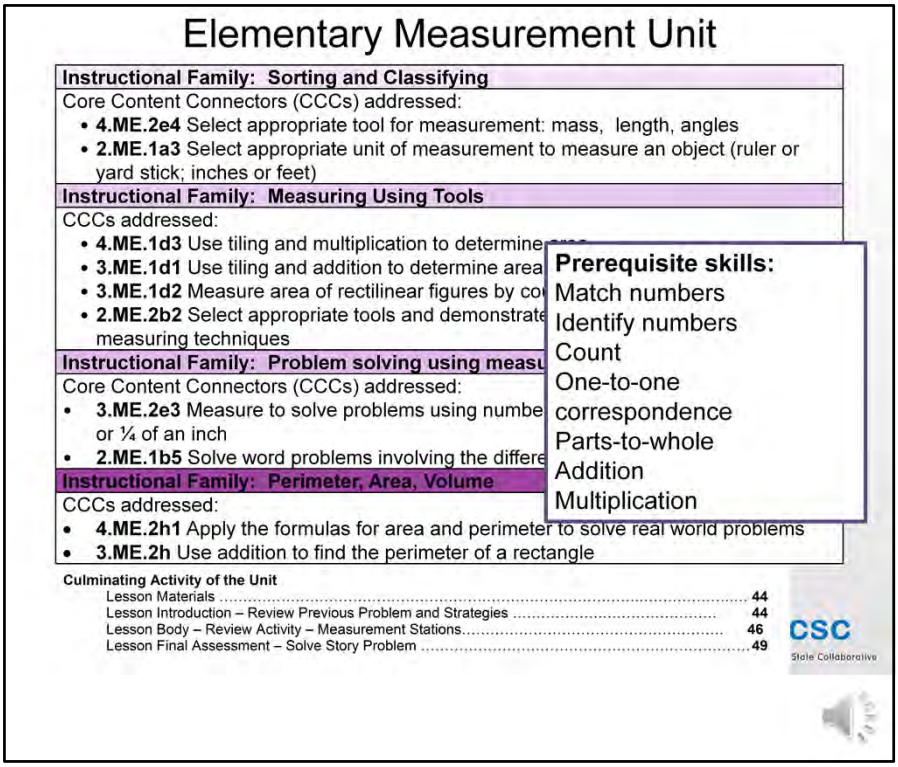


we see that the skills addressed within the first three lessons include measurement using non-standard and standard units, and converting units .

Here is the list of the Core Content Connectors addressed within these first 3 lessons.

Using the CCCs, analyze the concepts to consider the prerequisite skills embedded within these concepts:

Prerequisite skills used by students to demonstrate the concepts might include:
Match numbers (numbers from a ruler to the correct answer when measuring)
Identify numbers (on rulers, in multiple choice answers, last number counted)
Count (number of units, number of manipulatives used to …
One-to-one correspondence (one unit to one corresponding …
Parts-to-whole (inches to feet, feet to yards, centimeters to meters)

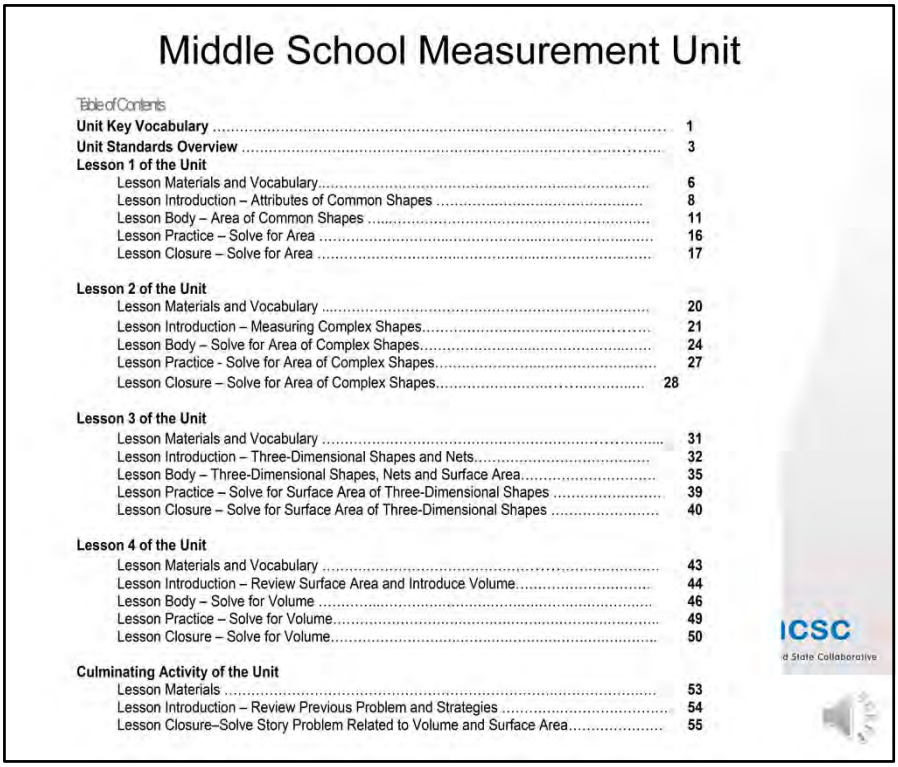


In the last two lessons of this units include the concepts of area and perimeter and the skill of determining the area and perimeter of various two dimensional shapes.

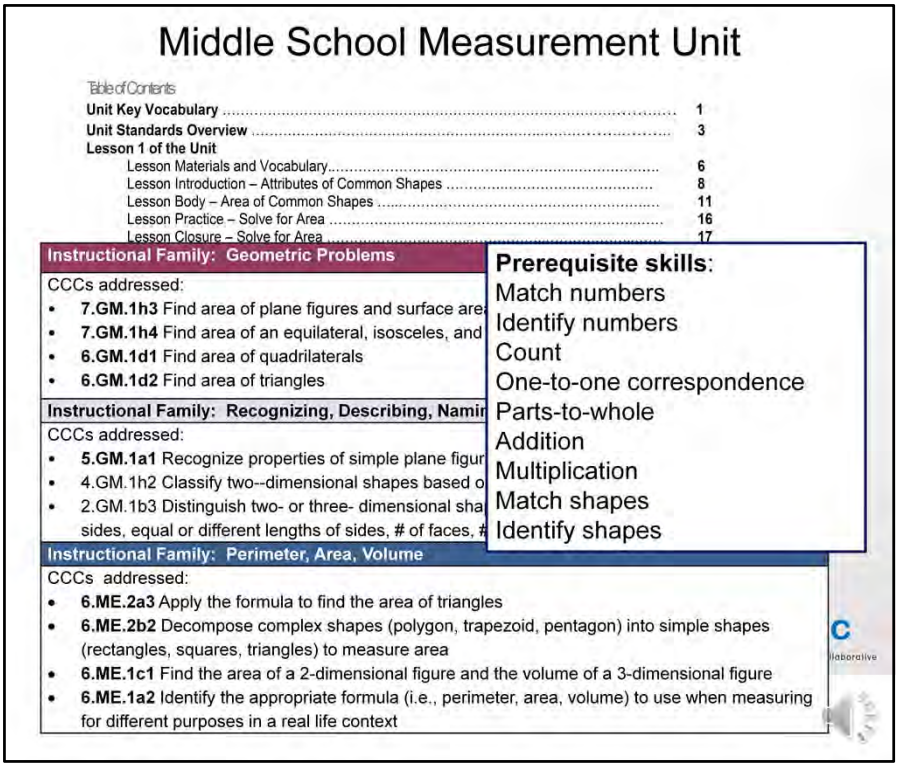
Here is the list of the Core Content Connectors addressed within these 2 lessons.

You'll notice that the same prerequisite skills embedded within the first three lessons are also embedded and used to demonstrate the skills in the last two lessons, with the inclusion of
Addition
Multiplication

Each lesson ends with a formative assessment piece, that allows for collection of observational data or progress monitoring on how the student is performing the skill and using the strategies, processes, and supports included.



Now let's review the skills and concepts addressed in the Middle School unit. Notice how the concept has progressed from the elementary unit on measurement of basic two dimensional shapes, perimeter and area to measurement of complex and three dimensional shapes, surface area and volume.

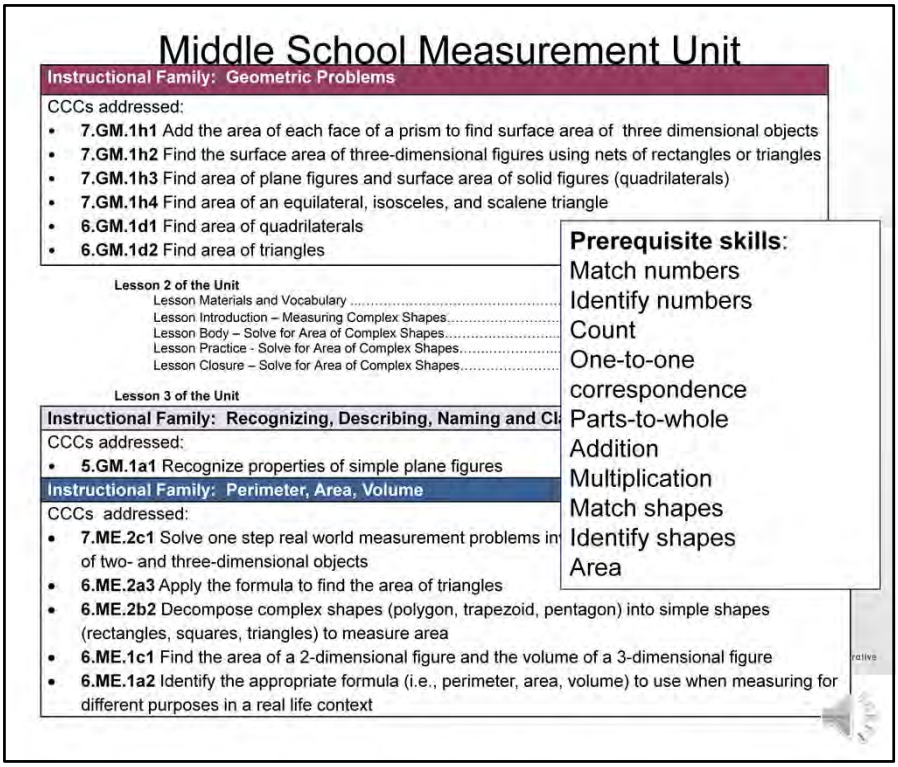


As you look at the skills addressed within the first lesson of this unit, you see instruction focuses on attributes of common shapes and area and perimeter of those shapes.

Here is the list of the Core Content Connectors addressed within this lesson.

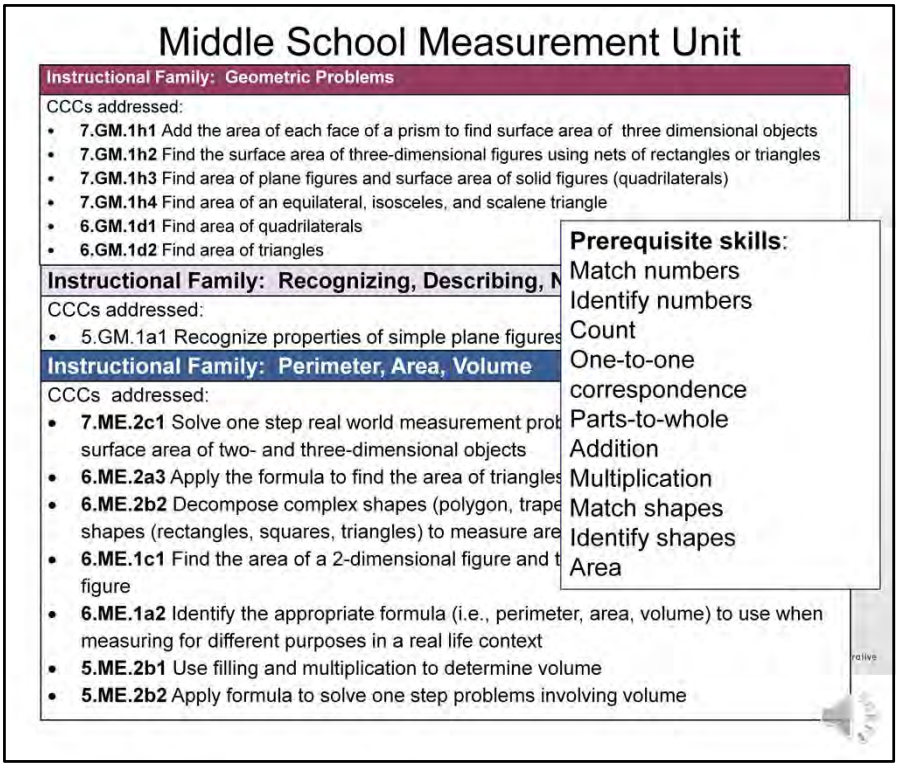
Using the CCCs, analyze the concepts to consider the prerequisite skills embedded within these concepts:

Prerequisite skills embedded within/used to demonstrate the skills and concepts include
Match numbers (which might be used when…
Identify numbers (on rulers, …
Count (number of units…
One-to-one correspondence (one unit to one corresponding …
Parts-to-whole (inches to feet, feet to yards, centimeters to meters)
Addition and multiplications.
These are all the same prerequisite skills taught and used within the elementary unit. The student will continue to use those skills embedded throughout the middle school unit.
In addition, the middle school unit includes the prerequisite skills of identifying and matching shapes.



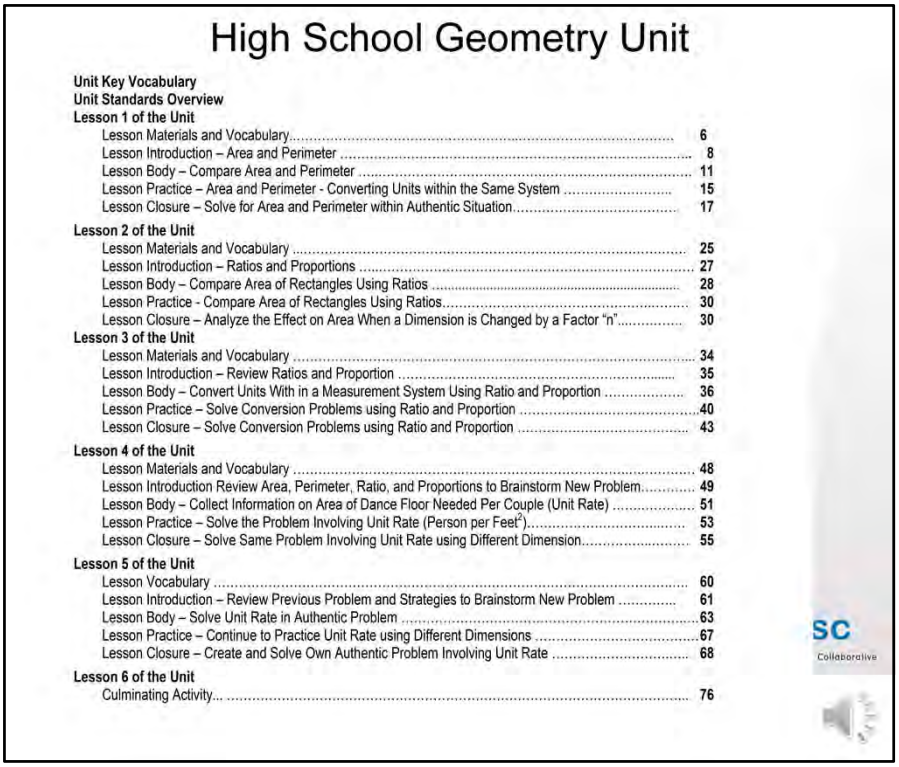
The second and third lessons of this units include the concepts of area of complex shapes and surface area of three dimensional shapes based on the shape's net.

You'll notice that the same prerequisite skills embedded within the first lesson are also embedded and used to demonstrate the skills in these two lessons, with the inclusion of area. The understanding and use of area has now become a prerequisite skill used within the concept of surface area.

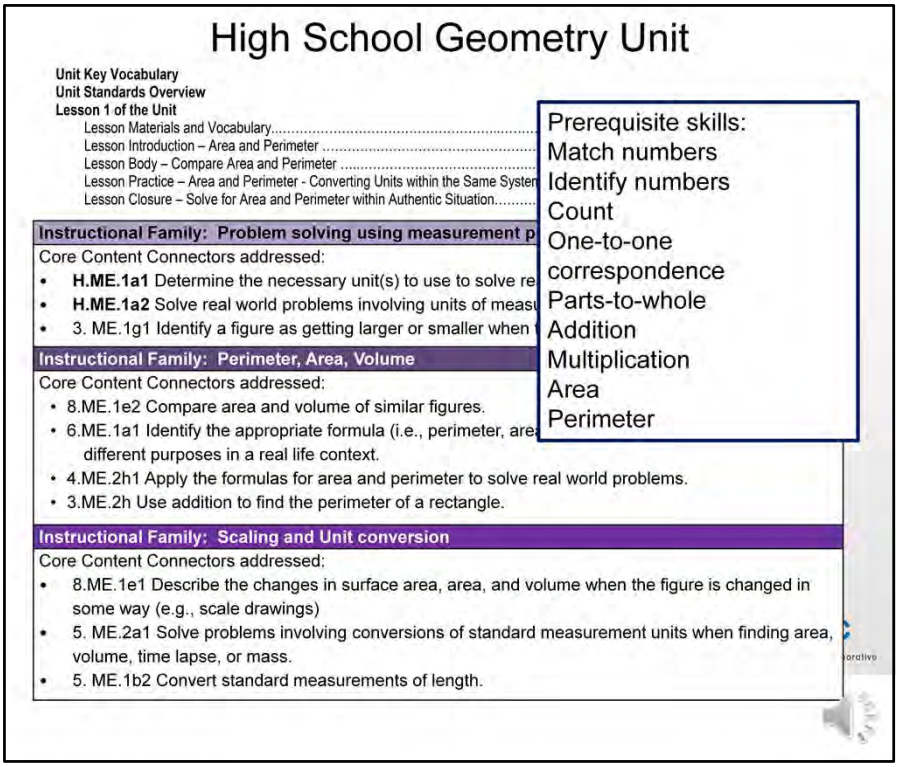


The last two lessons continue instruction on surface area and add in the concept of volume

Notice how the same prerequisite skills embedded and used in the Elementary lessons continue to be used to demonstrate the grade level concepts in the middle school unit. You will also notice that the **learning has progressed** so that the student is using the same prerequisite skills, but the processes, strategies and concepts are more sophisticated.



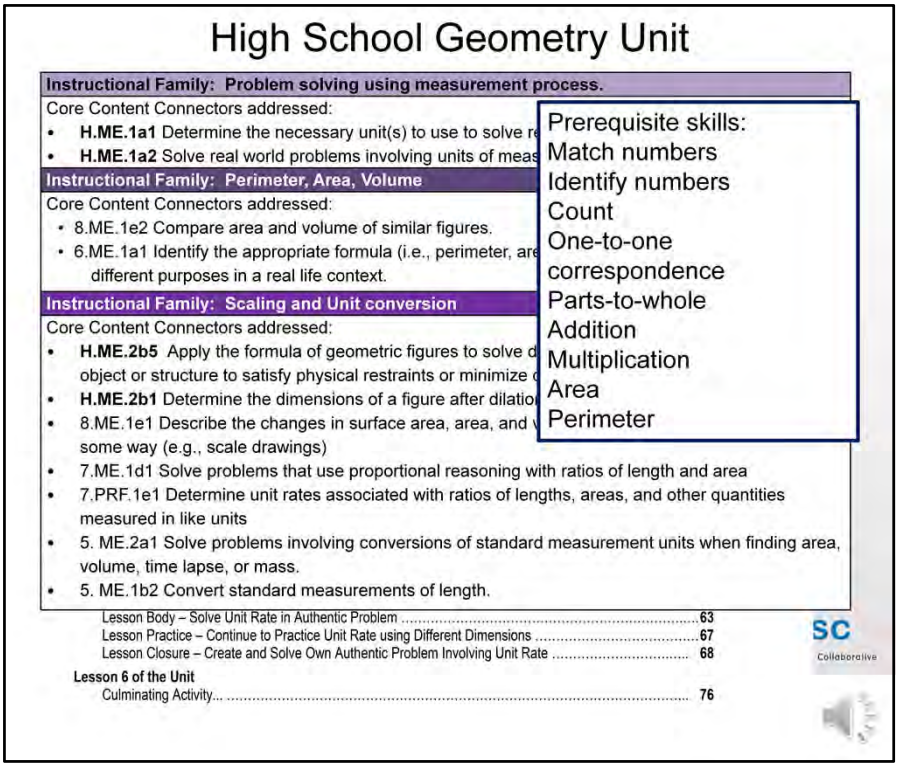
In the High School unit, we see the concepts of ratio and proportion throughout and the skills of determining unit rate and converting units of measure to determine equivalent ratios.



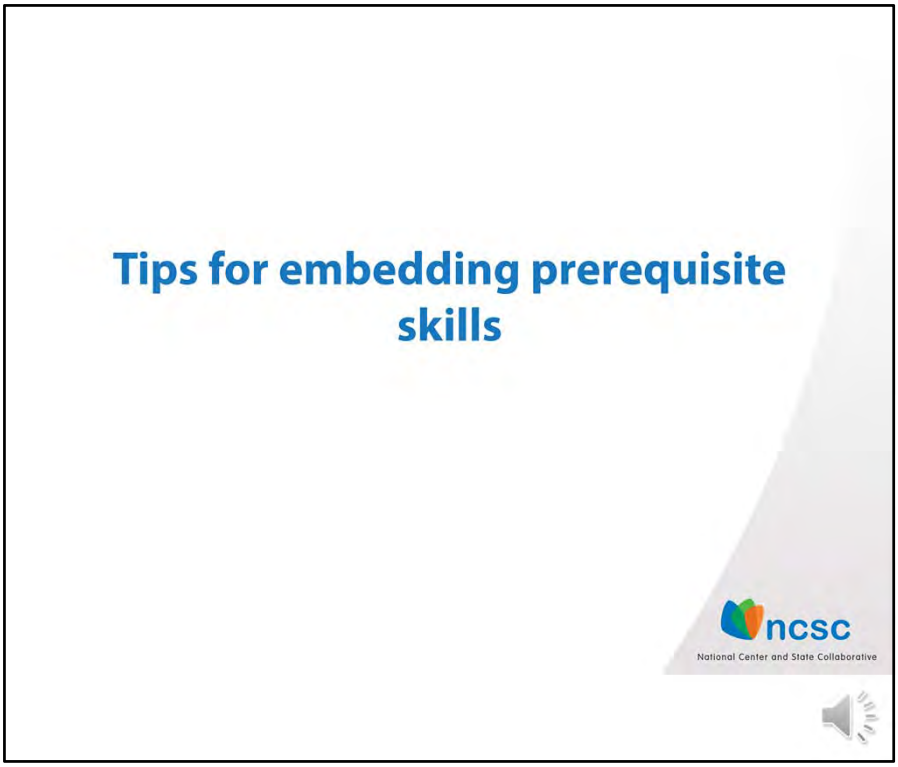
As you look at the skills addressed within the first lesson of this unit, you see students are expected to demonstrate area and perimeter of similar figures.

Here is the list of CCCs addressed

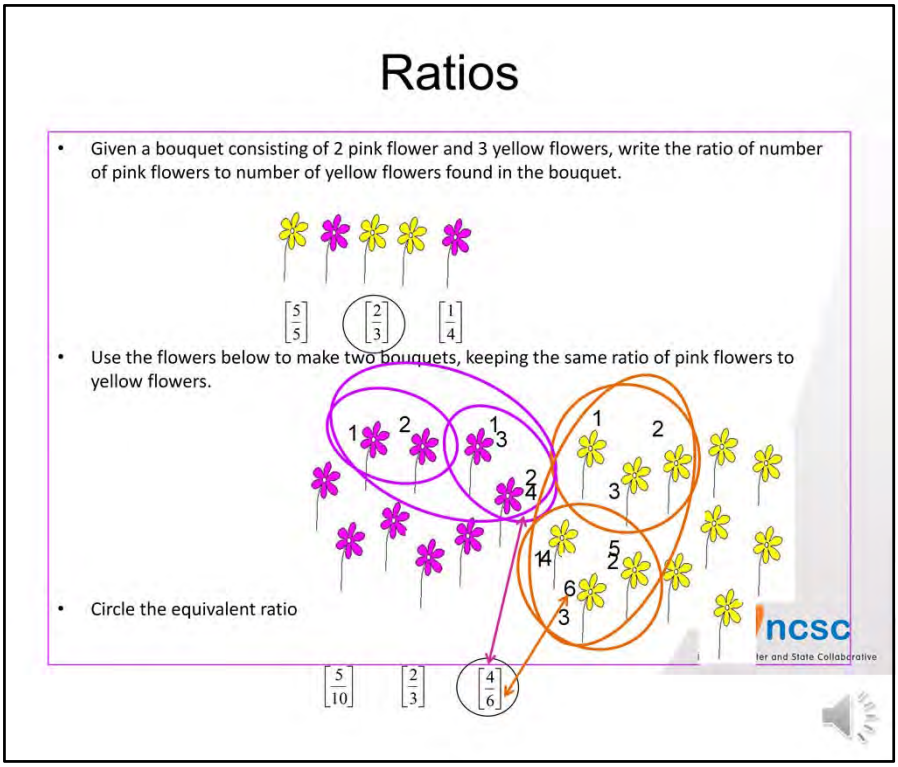
As you think about the Prerequisite skills embedded, you will notice that they are the same as those addressed in the elementary and middle school units.



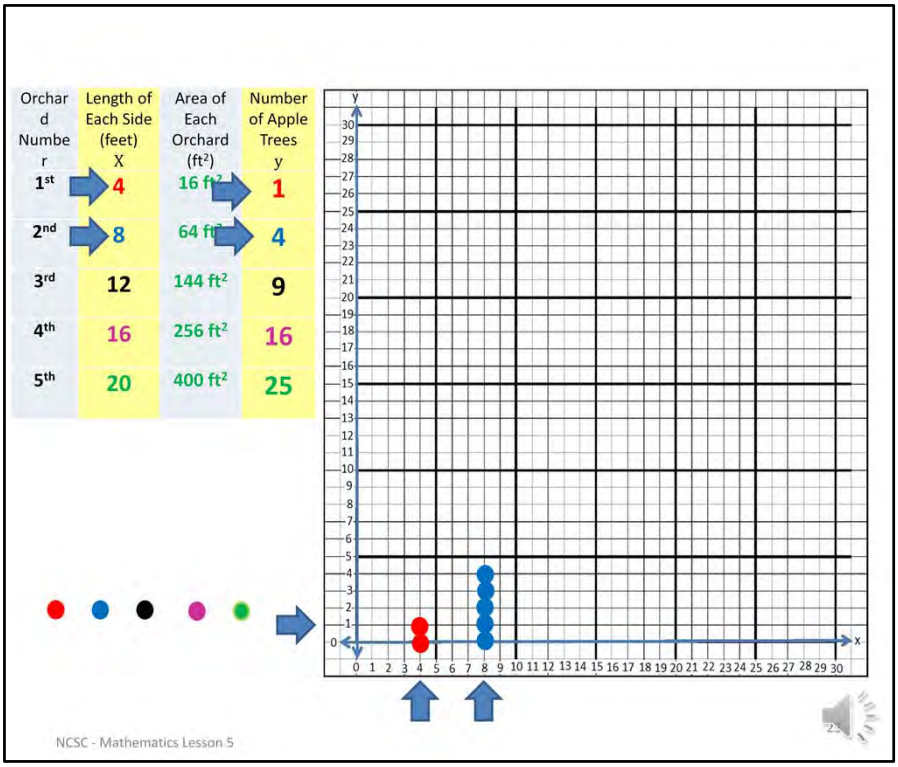
The remaining lessons of this unit include the concepts of ratios and unit rate within the context of area.
Prerequisite skills embedded within and used to demonstrate the skills and concepts are the same as all previous lessons and grades.



So let's look at how we can use and teach prerequisite skills while demonstrating the grade-specific skills and concepts.

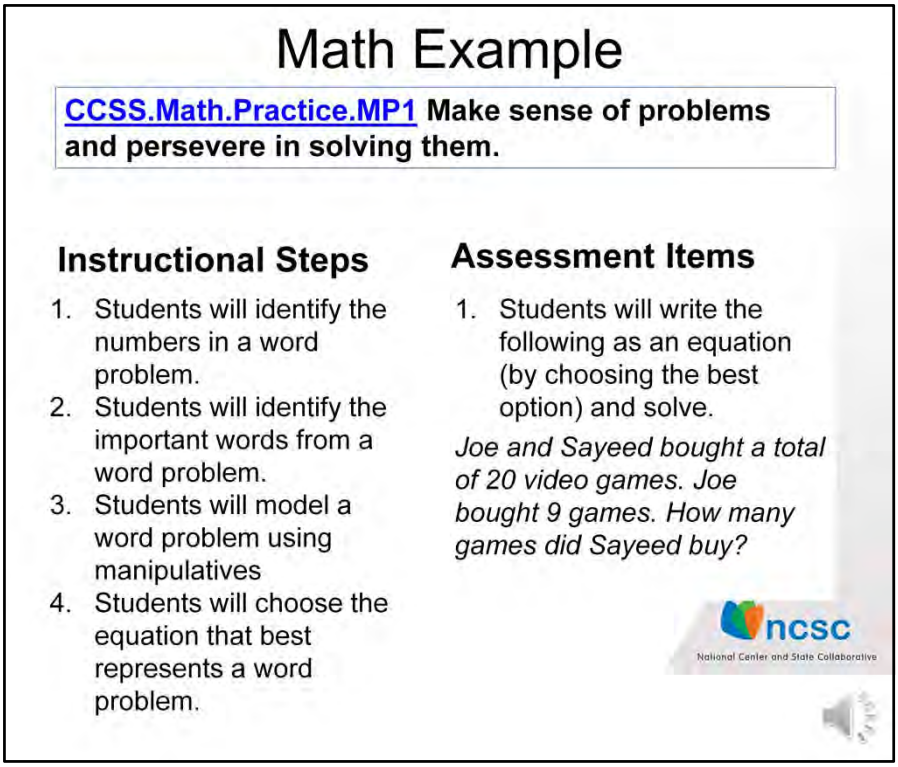


When working on ratios and equivalent ratios, students begin by determining unit rate. Students can create models of the unit rate by counting the correct number of corresponding colors and circling to create two new bouquets. **Click.**
During instruction, a teacher can model the process and reinforce prerequisite skills by writing the numbers 1, 2 and 1, 2, 3 by each grouping. Student can repeat that step to create several models of the ratio 2:3. Next model for the students how to group all the pink groups together and all the yellow groups together. **Click**
Have student count the total and match the total number of each to the numerical representation of the ration. **Click**



This is one example of embedding prerequisite skills in the concept of graphing coordinate pairs

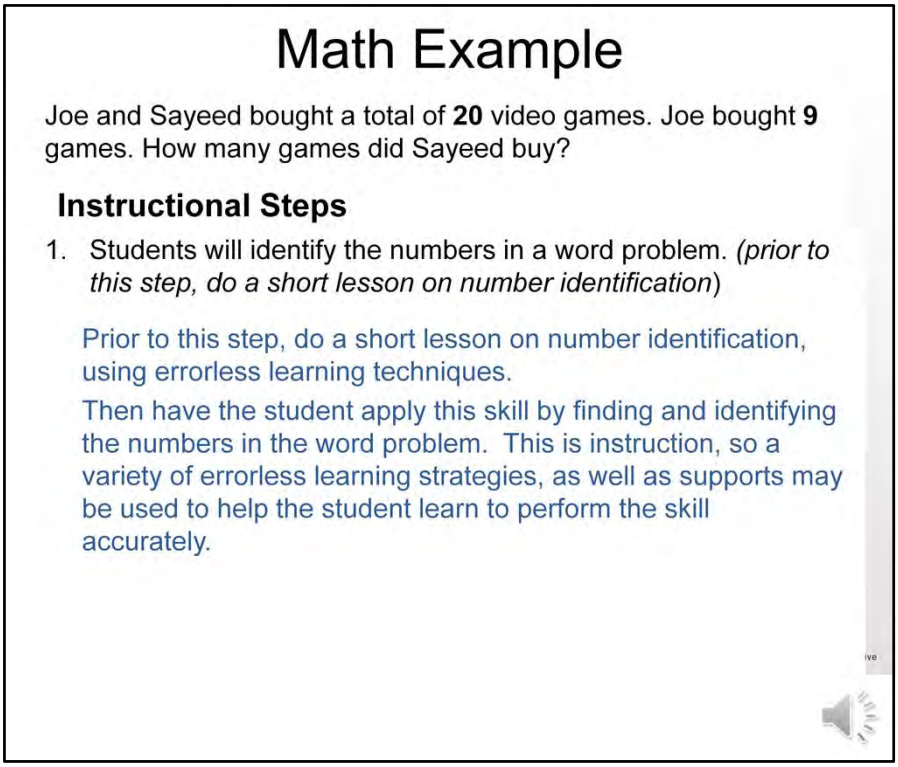
A student can learn to plot points of a coordinate grid by learning the concept of run and rise, coordinate pairs, (x,y) coordinates, by matching the numbers to determine where the point will go and naming the numbers **Click**, or counting run and rise to plot points **Click**. In doing so, the student is working learning the concept of graphing and practicing the skills of identifying numbers and counting.



Let's look at how to incorporate the first of the standards for mathematical practice: Make sense of problems and persevere in solving them.
Word problems are used as a context for demonstrating understanding of a variety of math concepts across the grade bands from K-12. As students move from one grade to the next, they continue to solve word problems, the difference found from one grade to the next is the complexity of the word problem and the complexity of the number systems used.

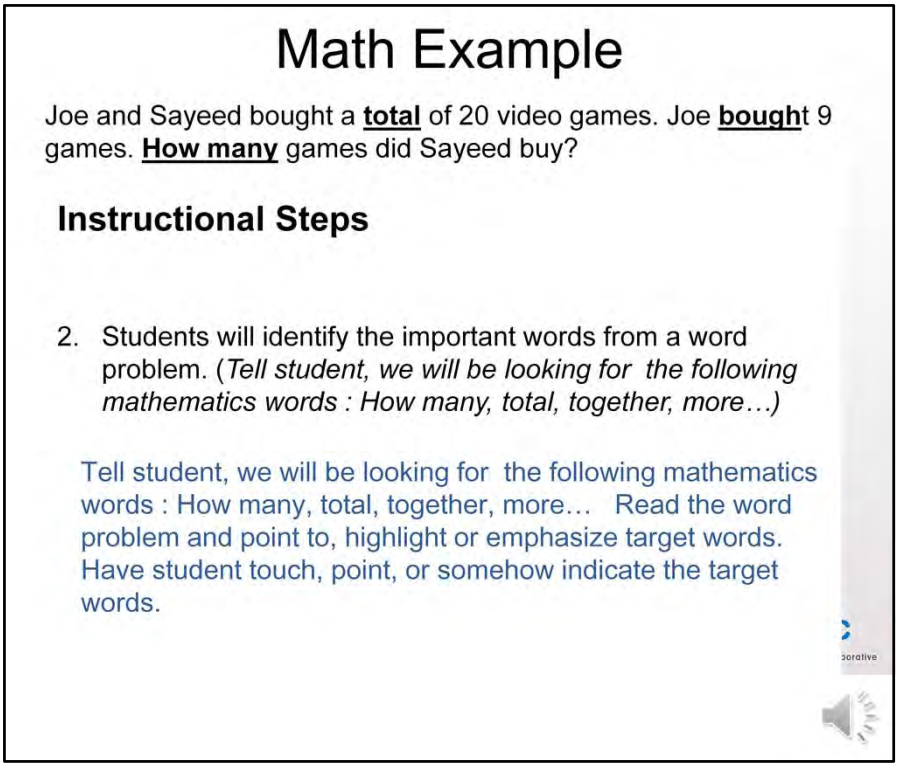
During instruction, the student is taught how to work through all the steps of a process for solving problems and may include emphasis on practicing/learning prerequisite skills at the same time. Whereas assessment is looking for the end result related to the standard only. The grade-specific concepts and activities give purpose for using those prerequisite skills. We need to recognize numbers when solving problems, we need to use one to one correspondence when solving problems, we need to add/subtract/multiply/divide when solving problems, whether those problems are related to patterns and algebra, geometry and measurement, data analysis.

We will go through each step of this ***activity and think about strategies to use to not only teach the grade level concept, but to practice the prerequisite skills as needed.***

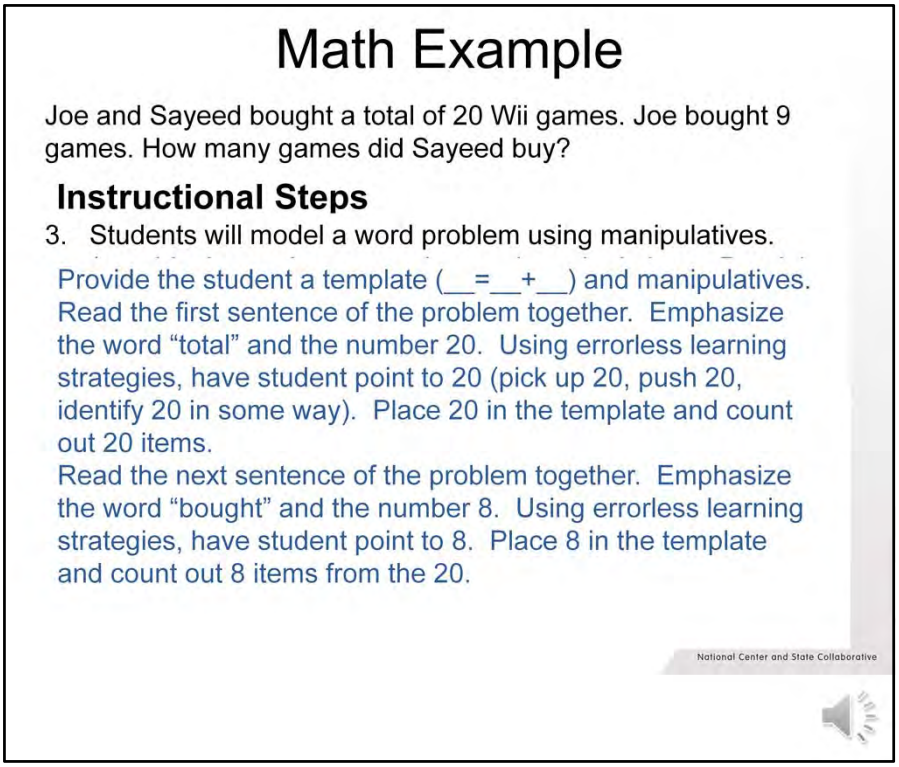


In step one of this process for solving problems, students will identify the numbers in a word problem.

In order to make sense of a problem, a student must be able to identify the important numbers of the problem. Identifying or naming numbers is a prerequisite skill, and can be practices prior to the lesson using a variety of errorless learning techniques.
The student can then apply the skill of identifying numbers, by finding the numbers in the word problem.

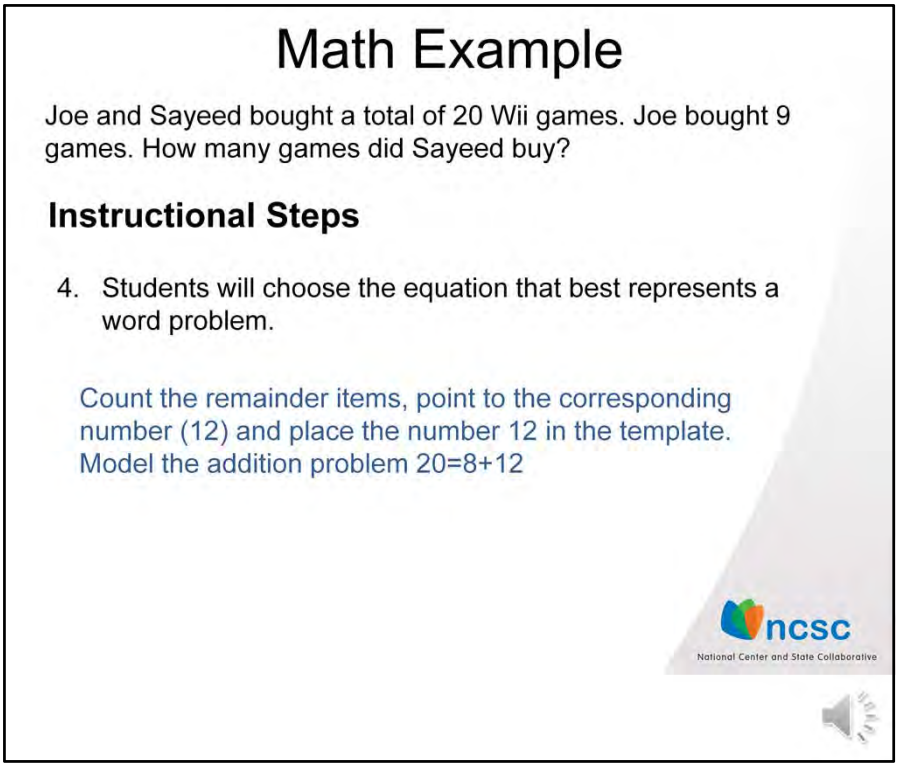


In order to make sense of a problem, a student must be able to identify the relevant words of the problem. During instruction, the teacher can point out the relevant mathematics words needed to determine the correct operation to use to solve a problem, and the student can match a word card to the relevant words in the problem as it is read.



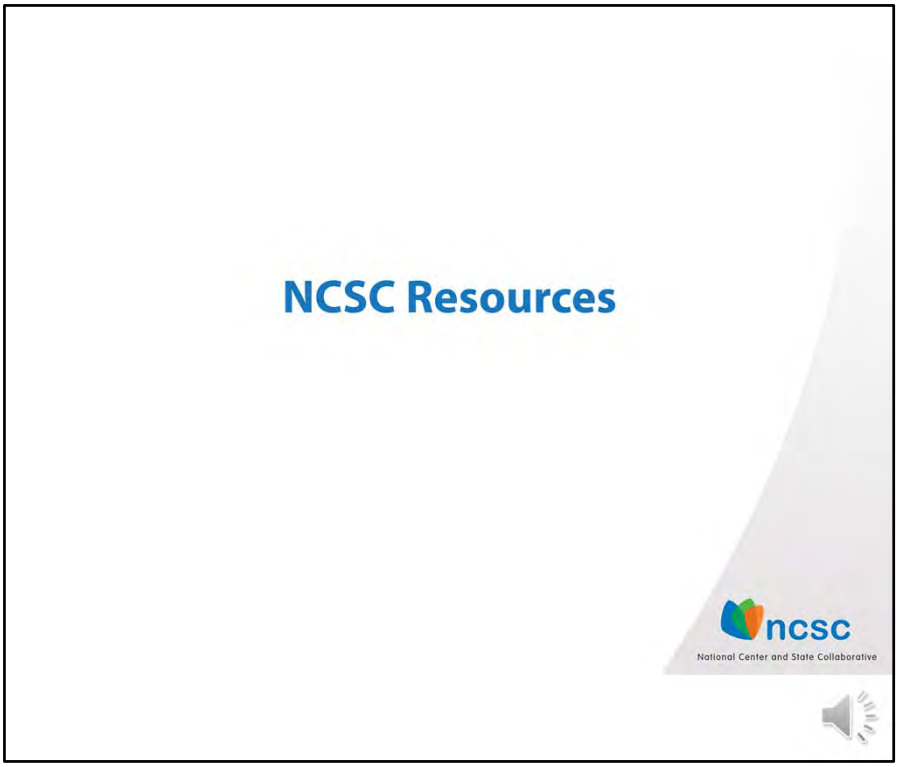
In step three of this process for solving problems, students will model the word problem using manipulatives.

In order to make sense of a problem, provide the student with an equation template and manipulatives. After the first sentence of the problem has been read, and the student has identified the number in the sentence, have the student count out the total number of items and find the corresponding numeral. Place the numeral in the template. Repeat with the second sentence. The manipulatives can be used to help solve the problem, by creating matching pairs of items the first and second set of manipulatives using one to one correspondence. Count the items left without a pair, and record as the answer.

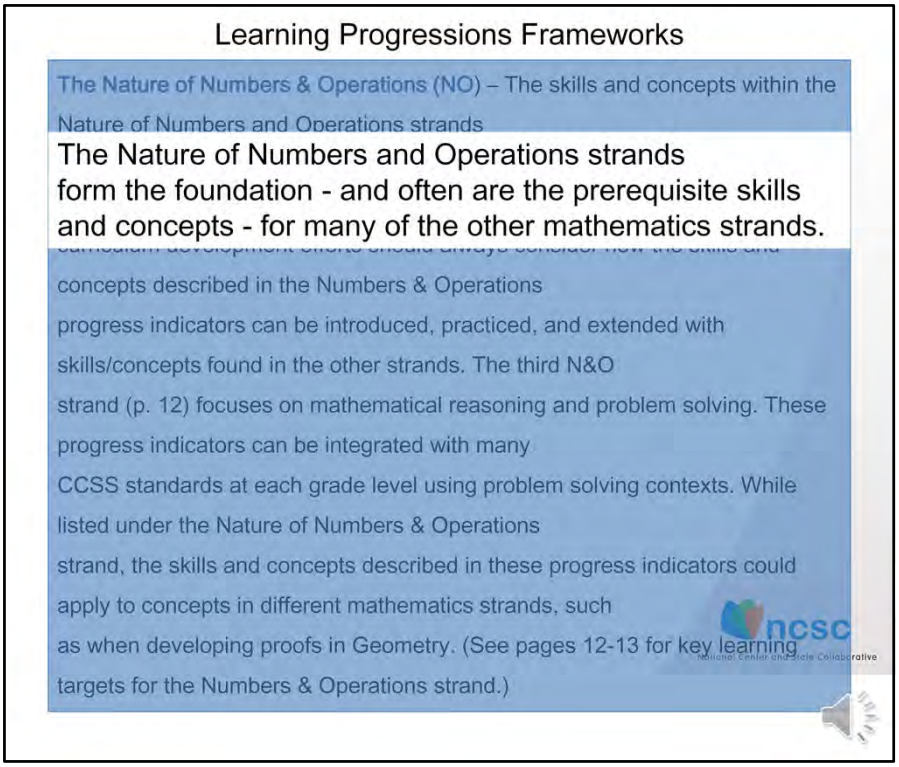


In the last step of this process for solving problems, students will identify or write the equation that represents the word problem.

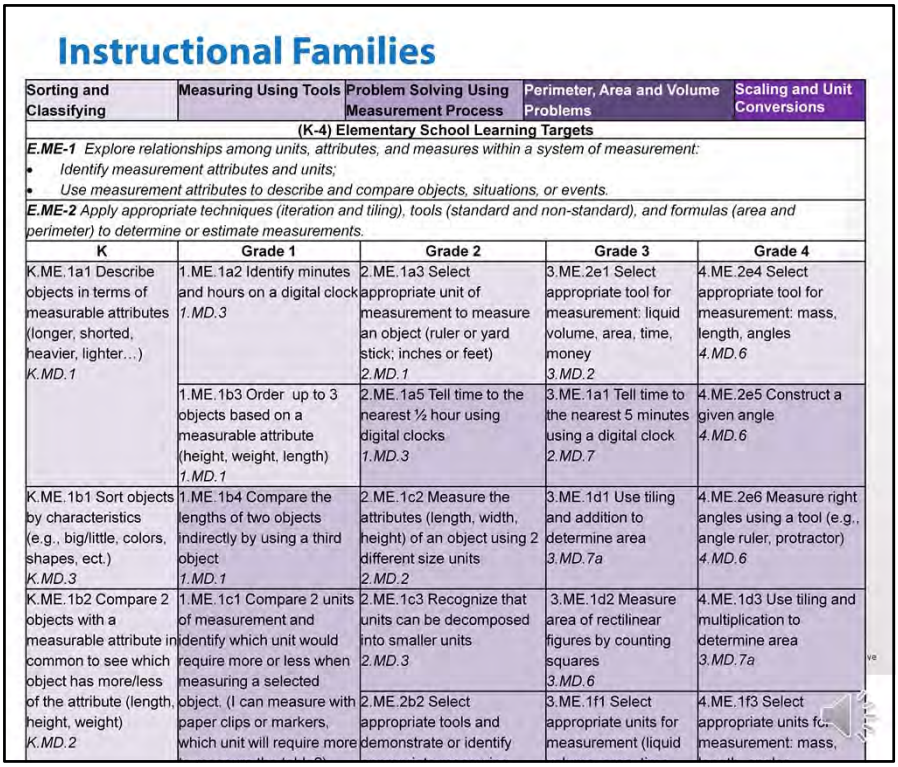
The student should record the correct number in the equation template, the correct operation, and the answer, based on all the previous steps.



Let’s look at some NCSC resources that might help you think about prerequisite skills that are embedded in grade specific concepts.



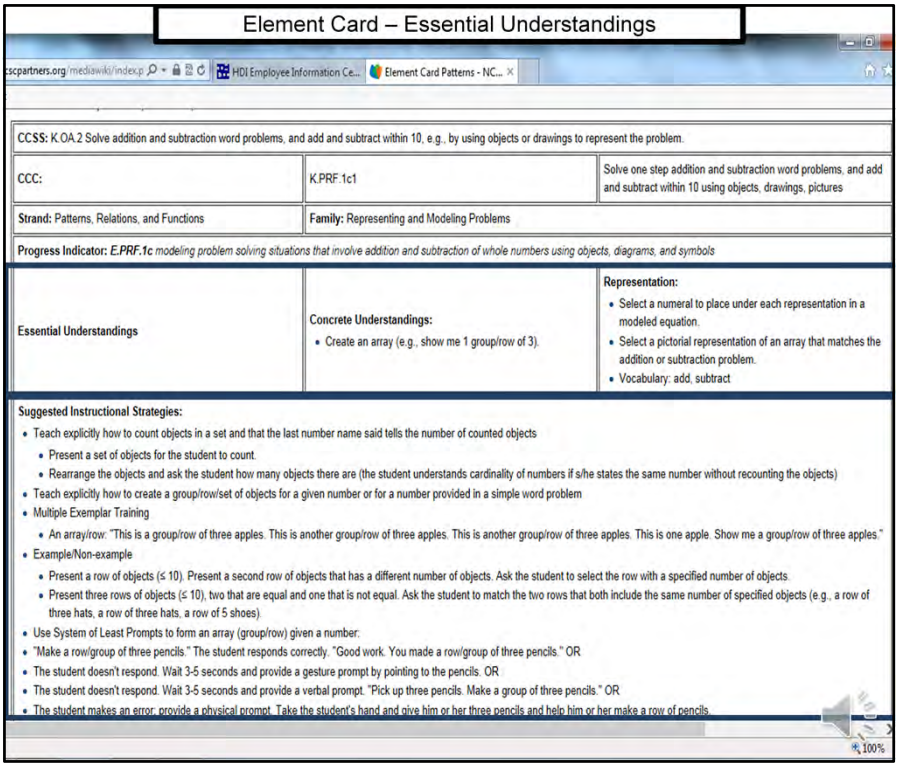
Learning Progression Frameworks build on skills and concepts to build more sophisticated understandings, beginning with prerequisite skills.



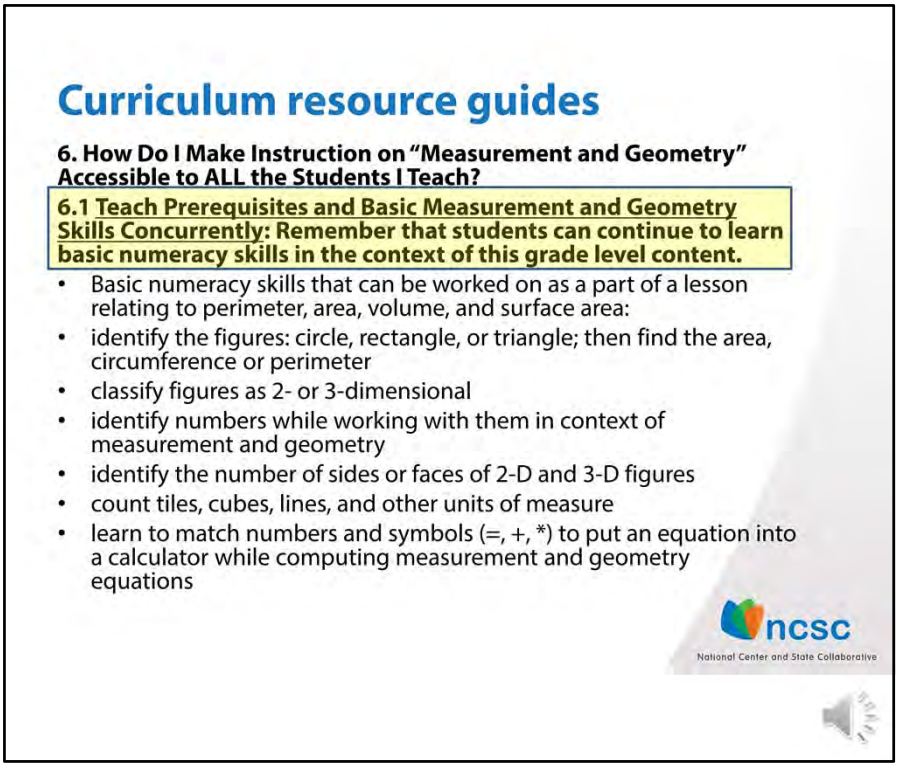
Instructional Families

Sorting and Classifying	Measuring Using Tools	Problem Solving Using Measurement Process	Perimeter, Area and Volume Problems	Scaling and Unit Conversions
(K-4) Elementary School Learning Targets				
E.ME-1 *Explore relationships among units, attributes, and measures within a system of measurement:* • *Identify measurement attributes and units;* • *Use measurement attributes to describe and compare objects, situations, or events.*				
E.ME-2 *Apply appropriate techniques (iteration and tiling), tools (standard and non-standard), and formulas (area and perimeter) to determine or estimate measurements.*				
K	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**
K.ME.1a1 Describe objects in terms of measurable attributes (longer, shorted, heavier, lighter…) *K.MD.1*	1.ME.1a2 Identify minutes and hours on a digital clock *1.MD.3*	2.ME.1a3 Select appropriate unit of measurement to measure an object (ruler or yard stick; inches or feet) *2.MD.1*	3.ME.2e1 Select appropriate tool for measurement: liquid volume, area, time, money *3.MD.2*	4.ME.2e4 Select appropriate tool for measurement: mass, length, angles *4.MD.6*
	1.ME.1b3 Order up to 3 objects based on a measurable attribute (height, weight, length) *1.MD.1*	2.ME.1a5 Tell time to the nearest ½ hour using digital clocks *1.MD.3*	3.ME.1a1 Tell time to the nearest 5 minutes using a digital clock *2.MD.7*	4.ME.2e5 Construct a given angle *4.MD.6*
K.ME.1b1 Sort objects by characteristics (e.g., big/little, colors, shapes, ect.) *K.MD.3*	1.ME.1b4 Compare the lengths of two objects indirectly by using a third object *1.MD.1*	2.ME.1c2 Measure the attributes (length, width, height) of an object using 2 different size units *2.MD.2*	3.ME.1d1 Use tiling and addition to determine area *3.MD.7a*	4.ME.2e6 Measure right angles using a tool (e.g., angle ruler, protractor) *4.MD.6*
K.ME.1b2 Compare 2 objects with a measurable attribute in common to see which object has more/less of the attribute (length, height, weight) *K.MD.2*	1.ME.1c1 Compare 2 units of measurement and identify which unit would require more or less when measuring a selected object. (I can measure with paper clips or markers, which unit will require more	2.ME.1c3 Recognize that units can be decomposed into smaller units *2.MD.3*	3.ME.1d2 Measure area of rectilinear figures by counting squares *3.MD.6*	4.ME.1d3 Use tiling and multiplication to determine area *3.MD.7a*
		2.ME.2b2 Select appropriate tools and demonstrate or identify	3.ME.1f1 Select appropriate units for measurement (liquid	4.ME.1f3 Select appropriate units fo… measurement: mass,

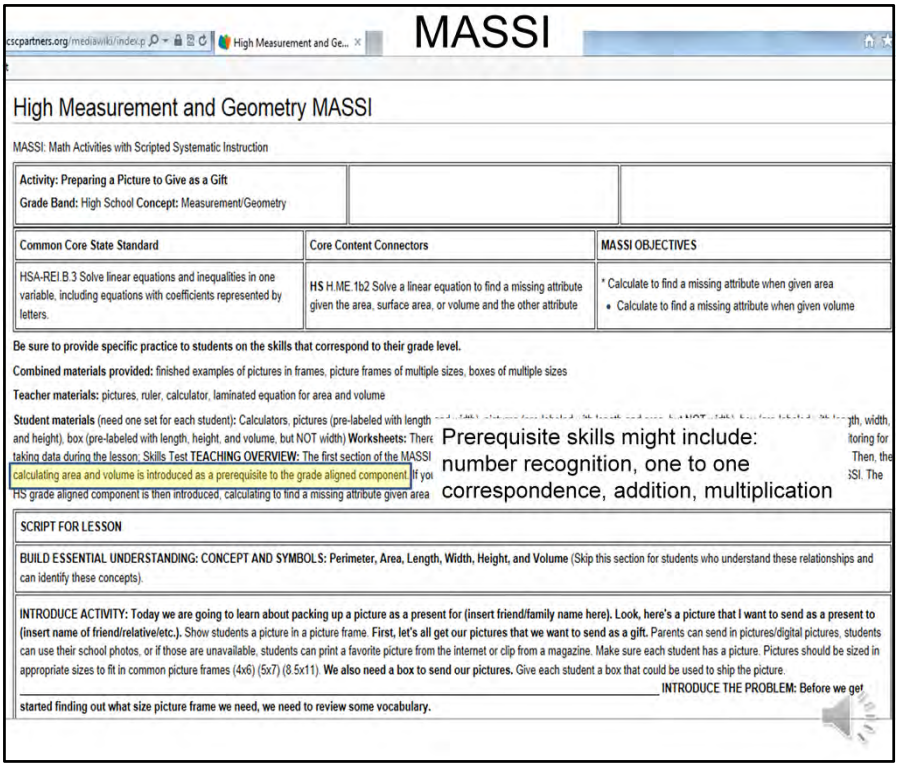
The Instructional Families took the concept of the learning progressions and organized the CCCs to help visualize that progression of skills from simpler to more sophisticated. Some earlier skills end up being prerequisites of a sort for later skills. So we can use the instructional families to help determine those prerequisite skills that are used demonstrating performance of the grade level concepts.



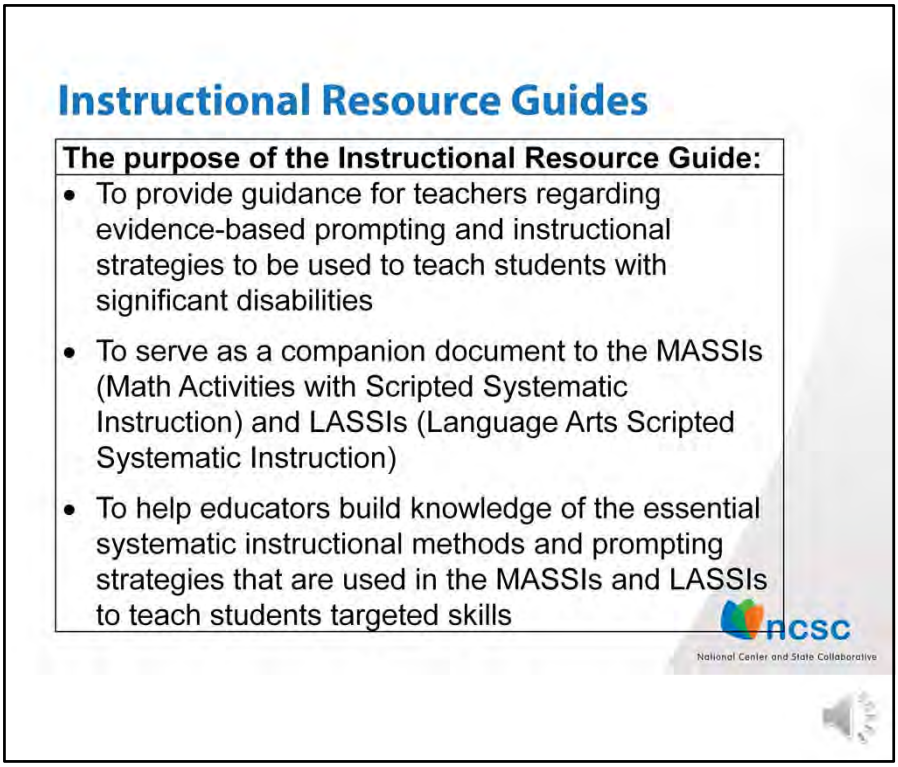
Element cards can help us think about the embedded prerequisite skills and how to use those skills to help learn and demonstrate grade-specific concepts through the essential understanding and suggested instructional strategies. These pieces help us identify the prerequisites and give us some strategies on how to embed instruction within student learning.



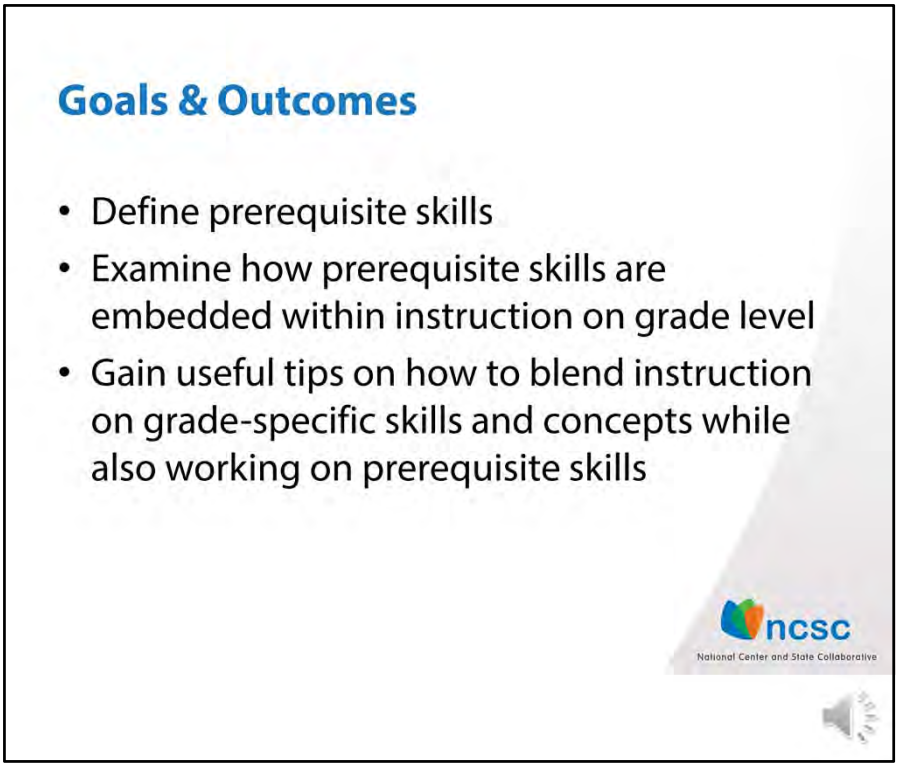
Curriculum resource guides also provide some ideas on how to use prerequisite skills in a systematic process to demonstrate more sophisticated math concepts. Or where prerequisite skills can be taught and practices within instruction on more sophisticated concepts.



MASSIs can be used to build background knowledge and practice prerequisite skills as a tiered intervention.



The Instructional resource guides provides ideas on systematic instructional strategies that can be used incorporate errorless learning techniques when teaching, not only the grade specific concepts, but also to reinforce prerequisite skills.



In this webinar, did we
Define foundational skills, so that we are all on the same page when we use that term
Examine how foundational skills are embedded within instruction on grade-specific skills and concepts
And provide tips and resources on how to teach grade-specific skills and concepts while also working on foundational skills

Think about something from this webinar you can immediately try when planning instruction in your classroom or to support teachers in designing instruction.

Thank You.