



## NCSC UNIVERSAL DESIGN FOR LEARNING MATHEMATICS UNITS: AN OVERVIEW

Produced by:  
University of Kentucky,

in partnership with the National Center State Collaborative (NCSC)

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Welcome to the Universal Design for Learning (UDL) Mathematics Units module presented by the National Center and State Collaborative (NCSC).

## MODULE ORGANIZATION

Welcome to the NCSC Universal Design for Learning Mathematics Units Overview module.

All learning modules are organized in four sections:

- Plot the Course,
- Explore the Terrain,
- Check the Map, and
- Expand Your Horizons.

Each of the icons on the left is a progress indicator which will appear in the upper right hand corner of the screen. The indicator corresponds with the section in which you are working.



Welcome to the NCSC Universal Design for Learning Mathematics Units Overview module. The NCSC professional development courses each consist of one or more modules. To help the learner navigate in the courses, the modules have a uniform design and format. All learning modules follow four themes: plot the course, explore the terrain, check the map, and expand your horizons. In plot the course learners discover what is covered in the module, including their learning objectives and other steps they will follow while viewing the module. In explore the terrain, the learner will engage with the content and learn about the topic covered in the module.


**MODULE GOALS**

Understand how to use the UDL Units.

Identify the components of a lesson.

- A table that demonstrates Alignment to the Common Core State Standards, Learning Progressions ,Core Content Connectors and your state standards
- Standard format and linkage to NCSC Instructional Resources
- Adaptations for expressive and receptive communication needs

Learn to develop your own UDL units.

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This module will help you understand how to use the Universal Design for Learning, or UDL Units and lessons. Each unit consists of multiple lessons and each lesson will have the following features:

A table that demonstrates Alignment to the Common Core State Standards (CCSS). Your state has either developed your state standards or adopted the CCSS. With either, the process used in this module is to align with grade level standards. The Table also demonstrates alignment to the Learning Progressions, and Core Content Connectors.

The lesson will also have:

A standard format and linkage to NCSC Instructional Resources

Adaptations for expressive and receptive communication needs

First you will learn about the format and components of the units. Later in this module you will review one unit and examine closely one lesson in the unit. Finally there are suggestions to help you develop your own lessons, based on grade level state standards and adapted to each student’s communication system.

## RELATED CONCEPTS



Here are some concepts that will be discussed in this module.

- CCSS – Common Core State Standards or your state standards
- UDL – Universal Design for Learning
- LPF – Learning Progressions Frameworks
- CCC – Core Content Connectors
- RTI – Response to Intervention



In this module reference is made to the following concepts:

- Grade level content standards from your state or, if adopted, from the Common Core State Standards
- Universal Design for Learning
- Learning Progressions Frameworks
- Core content Connectors

And

- Response to Intervention

## **RELATED CONCEPTS - CCSS COMMON CORE STATE STANDARDS**



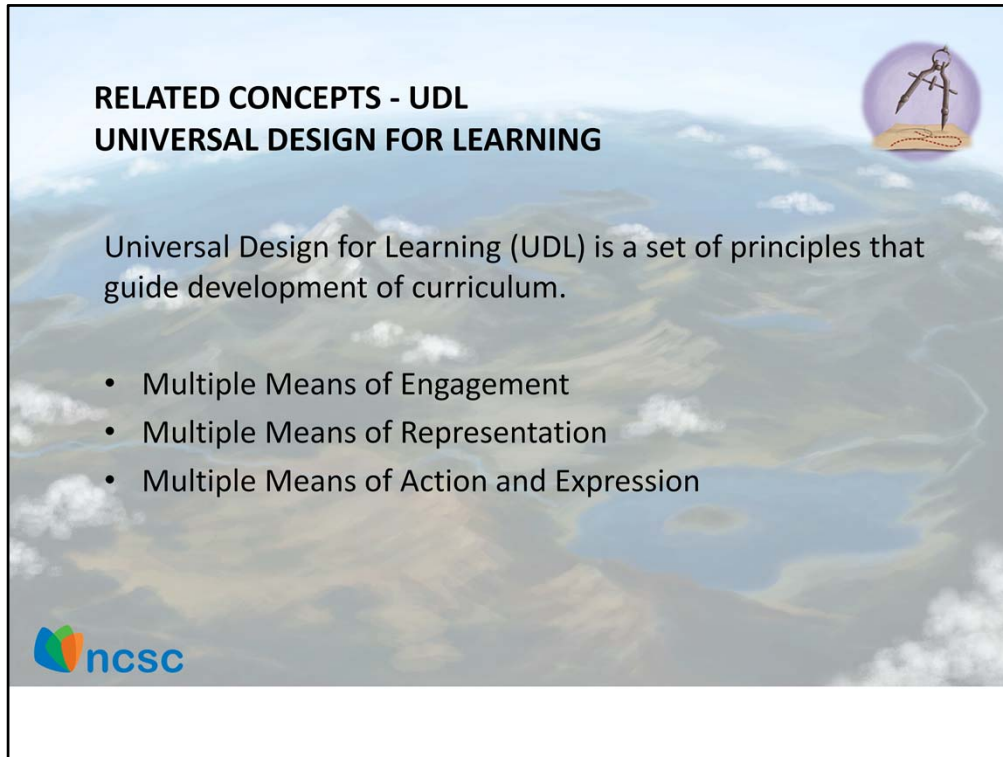
Your State has either developed their own grade level state standards or has adopted the Common Core State Standards to establish guidelines for learning in Math and English Language Arts from kindergarten through 12<sup>th</sup> grade.

Achieving the learning goals put forth in the standards will prepare students for college and career.



We based our work in the modules on the CCSS and the College and Career Readiness Standards. You can apply the same process with your state standards.


Your State has either developed their own grade level standards or has adopted the Common Core State Standards to establish guidelines for learning in Math and English Language Arts from kindergarten through 12<sup>th</sup> grade. These standards are based on the College and Career Readiness Standards.



## RELATED CONCEPTS - UDL UNIVERSAL DESIGN FOR LEARNING

Universal Design for Learning (UDL) is a set of principles that guide development of curriculum.

- Multiple Means of Engagement
- Multiple Means of Representation
- Multiple Means of Action and Expression



Universal Design for Learning (UDL) is a set of principles that guide development of curriculum. When implemented, UDL provides opportunities for learning to all individuals by utilizing:

- Multiple Means of Engagement to provide options for self-regulation, develop reflective skills and sustain interest. Promoting motivational techniques, fostering collaborative learning, providing feedback and opportunities to participate in class-wide activities, and using incentives to encourage effort are all examples of multiple means of engagement.
- Multiple Means of Representation focusing on big ideas, themes, and patterns to provide options for comprehension. Customizing the display of information, using auditory methods and other alternatives to visual presentation for conveying content, using multimedia presentations, clarifying symbols, vocabulary, and structures are all examples of multiple means of representation.
- Multiple Means of Action and Expression to provide options for demonstrating understanding and strategizing. Providing multimedia and other mediums to students for their work, providing tools and strategies for conveying learned information, scaffolding or graduated levels of support for instruction and practice, optimizing access to tools and assistive technology are all examples of multiple means of action and expression.

## RELATED CONCEPTS - LPF LEARNING PROGRESSIONS FRAMEWORKS



The Learning Progressions Frameworks:

- describe pathways for learning that focus on the big ideas of a discipline
- help educators design instruction and assessments that move students toward deeper and broader understanding of the content
- include progress indicators; descriptions of observable learning along the learning continuum in each strand



- The Learning Progressions Frameworks, or LPF, present a broad description of the essential content and general sequencing for student learning and skill development (Hess, 2010).
- The LPF is a hypothesized pathway that typical peers may take, and is meant to inform what typical peers will be working on grade by grade. In the past, we have struggled to understand how to choose content grade by grade to ensure inclusion of students with the most significant cognitive disabilities in grade AND age appropriate content, even though they may not have built all the skills in a previous grade. The pathways focus on the big ideas of a discipline.
- The LPFs give us the educational logic to help move these students along with their peers in a logical, educationally sound way.
- The LPF contain learning targets and progress indicators that are referenced in the NCSC Curriculum and Instruction materials.
  - Learning targets (general/broad performance descriptors) are defined by grade spans, K-4, 5-8 and high school.
  - The related specific skills and concepts are called the progress indicators (PIs).



**RELATED CONCEPTS - CCC  
CORE CONTENT CONNECTORS**

The Core Content Connectors (CCC's) identify the most salient grade-level, core academic content in ELA and Mathematics found in both the [Common Core State Standards](#) and the [Learning Progression Frameworks](#).



The Core Content Connectors (CCC's) identify the most salient grade-level, core academic content in ELA and Mathematics found in both the [Common Core State Standards](#) and the [Learning Progression Frameworks](#) and can be found in your state standards.

Using the LPF, NCSC identified the “big ideas” from Common Core State Standards needed to make progress through the grades.

These “big ideas” were then broken down into more frequent benchmarks called CCCs that provide a pathway to the grade level standards-not extended standards.

CCCs are the basis for the assessment, but not the starting point for instruction.



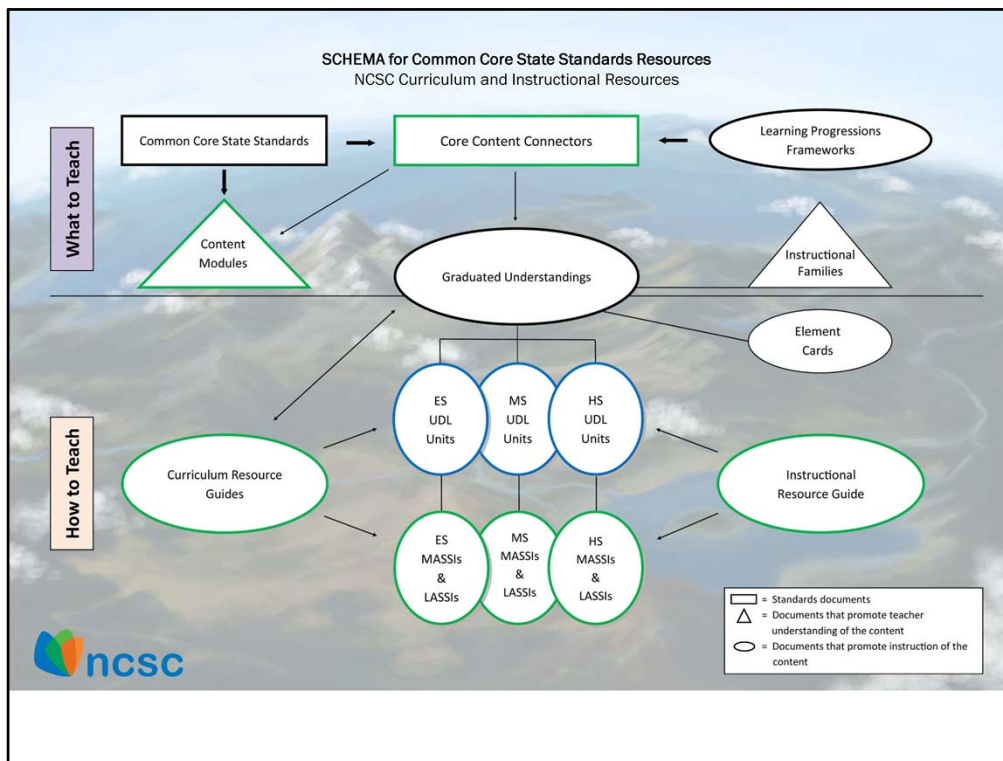
## **RELATED CONCEPTS - RESPONSE TO INTERVENTION**

- identify student needs through early and regular screening
- students in both general and special education who need support in learning and behavior
- early and regular screening
- multi-tiered instructional approach
- Interventions provided in tiers which increase in intensity and duration
- data collection evidencing student progress
- Provision of services by a variety of personnel
- integrated, effective approach to educational decision-making



Response to Intervention (RTI) is a multi-tiered instructional approach designed to identify students in both general and special education who need support in learning and behavior. Interventions are provided in tiers which increase in intensity and duration as needed, based on data collection evidencing student progress and the students' response to the interventions.

The integration of supports and services in both general and special education, and the provision of these services by a variety of personnel, lead to an integrated, effective approach to educational decision-making. An important goal of RTI is to identify student needs through early and regular screening.



- Having a copy of a UDL lesson available to refer to as we proceed will help you familiarize yourself with the unit and lesson formats.

- The Schema for Common Core State Standards Resources presents the instructional and curriculum resources in a graphic. Curriculum resources are in the “What to Teach” section and instructional resources are in the “How to Teach” section.

- The Units and Lessons provide models of universally designed instruction for an entire class of students. The Unit and Lesson examples demonstrate planning for engagement, representation, and expression. Content in the examples is aligned to the Common Core State Standards (CCSS).

- The UDL units offer a model for engaging all students in well-designed instruction of the Common Core Standards and illustrate how to target the Core Content Connectors within general education lessons. Examples are offered for meeting the unique needs of students with significant cognitive disabilities.

Description of Instructional Units:

Each of the NCSC instructional units is intended to be used to clarify *what* the academic content is, how it can be made more accessible *for all students*, and what units of study might look like when sequencing skills and concepts along a research-based learning continuum. The units take a content strand learning progression at grade level and weave within the lessons those skills or waypoints of critical understanding from the progression that a student with a significant cognitive disability may not have or may not have received in instruction.

## UDL UNIT PLANS/LESSON PLANS

UDL units:

- include sample daily lesson plans
- are developed for the entire general education class to be inclusive of ALL students
- Model how to plan for all students
- Are excellent for co-teaching and collaborative planning

UDL units promote inclusive instruction by showing how students who participate in AA-AAS can receive instruction in a general education setting

(Developed by the University of Kentucky)




•The UDL Unit Plans and Lesson plans illustrate how to target the CCCs within general education - providing models of planning universally designed instruction for an entire class of students, which will include students in the Alternate Assessment based on Alternate Achievement Standards, or AA-AAS from the onset.

The Unit Lesson Plans represent the concepts and big ideas of the grade-specific CCSS. The lessons also provide examples of additional supports that may be needed for emerging reading and emerging communication. In a Response to Intervention framework, these models provide “Tier One” plans. That is, they offer a model for how to engage all students in well-designed instruction for the Common Core State Standards. UDL units include sample daily lesson plans for all students in the general education class, and help educators plan for all students. UDL lessons are excellent for co-teaching and collaborative classrooms.

**HOW TO USE THE UNITS**

1. Review the lesson materials and vocabulary.
2. Read General Education Lesson 1.
  - Engaging in the activity:
    - Means of presenting information to your student
    - Means your student has for expressing information
    - Means your student has for engaging in the activity and materials
  - Additional Considerations for Emerging Readers and Emerging Communicators



Let's go through the steps on how to use the units.

Step 1: Review the materials and vocabulary specific for the lesson. While reviewing material, prepare supports to access the materials. Think about how you'll present each vocabulary word or concept and ensure that vocabulary is in the student's mode of communication and available in the student's communication system.

Step 2: Read General Education Lesson 1 introduction. As you read, consider the supports your student may need to actively engage in the activity.

What will be the means of presenting information to your student, means your student has for expressing information, and means your student has for engaging in the activity and materials?

If you are unsure of how to provide access, the 'Additional Considerations for Emerging Readers and Emerging Communicators' sections give suggestions for supports that correspond to each step of an activity/lesson. Some samples of supports or student work may be found at the end of the unit. Any additional materials will be labeled with the corresponding lesson number (1-5) and component name (Intro, Body, Practice, Closure).

Repeat steps 1 and 2 for the Body, Practice and Closure sections of the lesson.

## HOW TO USE THE UNITS (CONTINUED)

### 3. Consult additional resource materials.

- When you need additional information about a concept

- Content Modules
- Curriculum Resource Guides

- When you need additional ideas and strategies for supporting students

- Element Cards
- Instructional resource guides
- MASSIs

### 4. Always return to the general education lesson/unit after providing supplemental instruction and continue teaching.

### 5. Repeat these steps for the remainder of the unit.



Step 3: If you need more information to support your work with the lesson, there are additional NCSC resource materials posted in the NCSC wiki. When you need additional information about a concept refer to Content Modules and Curriculum Resource Guides. When you need additional ideas and strategies for supporting students refer to the Element Cards, Instructional resource guides and MASSIs. Not every concept will have a corresponding resource but all of the resources provide useful general examples.

Step 4: Always return to the general education lesson/unit after providing supplemental instruction. It's very important to continue teaching from the point at which you interjected with supplemental instruction. Some of the resource material targets specific skills and is not based on grade level activities and thus, may not prepare your students for the assessment.

Step 5: Repeat steps 1 through 4 for the remainder of the unit.

## MODIFYING AND ADAPTING LESSONS FOR EMERGING READERS AND EMERGING COMMUNICATORS



Emerging Readers	Emerging Communicators
<p>Students who consistently use words, pictures and or tactile representations</p>	<p>Students who inconsistently use a communication system</p>



All the lessons in the math units show adaptations for each section– introduction, body of the lesson, the practice of the skill taught, the closing activities and formative assessment. These adaptations are for emerging readers and emerging communicators.

An Emerging Reader is defined as: *A student who consistently uses words, pictures and or tactile representations*

An example of an adaptation would be: Provide picture and/or tactile representations of relevant vocabulary, paired with the written word, each time a salient concept/vocabulary word is mentioned during the presentation or discussion, as well as the meanings of each word.

An emerging communicator is *A student who inconsistently uses a communication system*

An example of an adaptation would be: Provide the student with manipulatives and or tactile representation for each key word or detail that is consistent with the student’s mode of communication

## UDL UNIT DAILY LESSON PLANS: THE PRINCIPALS OF UDL AND EXAMPLES OF MODIFIED AND ADAPTED GENERAL EDUCATION LESSONS



**Multiple Means of Representation** “present information and content in different ways”

**Multiple Means of Action and Expression** “differentiate the ways that students can express what they know”

**Multiple Means of Engagement** “Stimulate interest and motivation for learning”

Retrieved from: <http://www.cast.org/udl/>



The Unit Lesson Plans represent the concepts and big ideas of the grade-specific Common Core State Standards (CCSS) and provide models of universally designed instruction for all students. Universal Design for Learning (UDL) theory presents a great deal of research on how individuals learn. They identify barriers that exist for a variety of learners in our schools. If we consider the needs of the greatest number of learners at the onset of instruction then we can minimize the barriers that exist through the way we design our instruction. NCSC and CAST (Center for Applied Special Technology) suggest options within 3 main areas included in Universal Design for Learning: Multiple Means of Representation, Multiple Means of Action and Expression, and Multiple Means of Engagement. When included in instruction, these features will help the greatest number of learners achieve the instructional outcomes.

Multiple Means of Representation give learners various ways of acquiring information and knowledge and provide options for expressive skills and fluency. For example: Provide students with a Context Clues Place Mat graphic organizer, digital version of the text on computer, and an online dictionary.

Multiple Means of Action and Expression provide learners alternatives for demonstrating what they know and provide options for recruiting interest, sustaining effort, and self regulation. For example: Have students record information using various formats: Alpha Smart, graphic organizer (Context Clues Place Mat), etc.

Multiple Means of Engagement give learners various ways of acquiring information and knowledge and provide options for comprehension by the highlighting of critical features. For example: Have students work in small groups and use on-line versions of the text. Ensure each student is actively involved in his/her partnership.

## CONCEPT REINFORCEMENT ACTIVITIES (CRA'S) FOR MATHEMATICS



What are CRA's?

**Exploratory Activities coupled with Scripted Activities with Data Collection.**

- Supplemental instruction for key concept vocabulary
- Provided at the beginning of lesson 2 and 4 in all math units
- Provide transition activities for returning to UDL lesson
- Can be used whenever the key concept is referenced during instruction
- Does not require mastery



Concept Reinforcement Activities or CRAs provide supplemental instruction on key concept vocabulary through Exploratory Activities and Scripted Activities with Data Collection. These activities are at the beginning of lesson 2 and 4 in all math units. *If the student has not been exposed to a concept, or has limited experience with the concept, it might be helpful to provide instruction using this Concept Reinforcement Activity (CRA) before the Introduction to Lesson 2 and Lesson 4.* It is important to note that all the CRAs provide a Transition Activity to facilitate re-entry into the UDL lesson.

The CRA's are designed to provide targeted instruction on specific concepts related to the unit. Do not expect or require mastery of a CRA before the student takes part in the unit. As is the case for all students, those who are learning a concept for the first time may need to complete the activities more than once, thus CRA's may be used or repeated throughout the lesson.

The CRA is supplemental instruction and should only be provided in addition to the instruction in the unit; it does not take the place of the unit.



## UDL UNITS IN MATHEMATICS



Math UDL Units	Grades	# of lessons	Topics/Skills
Elementary: Area and Perimeter	3-4	4 lessons and a culminating activity	Standard units of measure, converting units within the same system, and area and perimeter
Middle: Surface Area and Volume	6-8	4 lessons and a culminating activity	Attributes of shapes, area of complex shapes, and surface area and volume of three-dimensional shapes
High School: Investigating Density in Real World Situations	9-10	5 lessons and a culminating activity	Area and perimeter, converting units, ratios and proportions, and unit rate (density)



This chart provides an overview of the skills taught in each unit. In the elementary unit titled Area and Perimeter, there are 4 lessons for grades 3 and 4 and a culminating activity, in the middle school unit titled Surface Area and Volume there are 4 lessons and a culminating activity, and in HS titled Investigating Density in Real World Situations there are 5 lessons and a culminating activity. Lessons target skill sets and concepts with examples of instruction and culminating activities require that students apply what they have learned throughout the unit to demonstrate their understanding of the concepts. The units are designed as examples and do not cover all math grade level content.

## EACH LESSON FOLLOWS THE SAME LESSON FORMAT:



Lesson Overview  
Objectives  
Essential questions  
Materials  
Vocabulary  
Lesson Introduction  
Activate Previous Knowledge  
Establish Goals/Objectives for the Lesson  
Lesson Body  
Direct Instruction and/or Facilitation of the Lesson Activity(ies)  
Practice  
Closure  
Revisit/Review Lesson Objectives  
Exit Assessment



All the units are aligned to the Common Core State Standards. Each unit is composed of multiple lessons. The first step in developing a UDL lesson is to examine a general education lesson and determine how it can be designed so that all students participate in and learn from the instruction.

Each lesson consists of the following components:

First, The lesson overview presents a list of materials and key vocabulary.

Next, the Lesson Introduction, which will build background knowledge and review the lesson objectives.

Next, the Body of the Lesson which will provide examples of direct instruction and guidance for the teacher.

Then, opportunities to Practice

And finally, a Closure which is a Review of Lesson Objectives and a formative Exit Assessment

## CHECK POINT




- ✓ The UDL Unit Plans and Lesson plans illustrate how to target the CCCs within general education - providing models of universally designed planning for an entire class of students.
- ✓ The lesson format uses Universal Design for Learning with adaptation for Emerging Readers and Emerging Communicators in each segment.
- ✓ Each math unit has a Concept Reinforcement Activity in lessons 2 and 4
- ✓ Each unit covers several skills in a grade span.






The High School Measurement Unit is Based on the Common Core State Standards and general education lessons.



## HIGH SCHOOL GEOMETRY UNIT

Mathematics Module Overview

Mathematics: Measurement (5 lessons)	Course/Subject: Algebra and Geometry Grade Level: 9 <sup>th</sup> and 10 <sup>th</sup>
<b>Learning Target</b> H.ME.1a - Students demonstrate an understanding of measurable attributes by... making decisions about units and scales that are appropriate for problem-solving situations involving mathematics within or across mathematics disciplines or real-world contexts.	
<b>Students will understand that...</b> Measurement process and tools help us to identify that... <ul style="list-style-type: none"> <li>• A problem/situation can require multiple measures.</li> <li>• The situation/problem dictates the type of measurement to use</li> <li>• There are different types and units of measurement</li> <li>• A problem/situation can require varying precision of measurement depending on the situation</li> </ul>	<b>Essential Questions to Guide Learning &amp; Inquiry</b> <ul style="list-style-type: none"> <li>• What are the measurable attributes in this situation/problem?</li> <li>• What types of measurement and unit(s) of measurement can be used?</li> <li>• What is the best type of measurement and most useful unit of measurement to use in this situation/problem?</li> <li>• Are there any restrictions on the types of measurements that can be used?</li> </ul>



The first page of the unit provides a summary of the content and expectations for the Unit. This includes:

- the number of lessons (the high school unit in this example has 5 lessons)
- the grade span
- the learning target from the Learning Progressions
- what the student is expected to learn
- And a list of essential questions to guide instruction.

For this lesson it's all about measurement – types of measurement and units of measurement for specific situations.

## GEOMETRY UNIT GOALS



Students will know...

- Key phrases or vocabulary.
- How to express measurement as a rate.
- How to convert between units using a table or other methods.
- When a conversion is needed to solve a problem.

The student should be able to identify, quantify and compare within real world problems, convert between units and generalize skills to varied contexts.



The lesson provides specific goals.

In this example the goals are for the student to know:

- Key phrases or vocabulary such as cover (area), capacity (volume), and wrapping (surface area).
- How to express measurement as a rate.
- How to convert between units using a table or other methods.
- And When a conversion is needed to solve a problem.

Students will be able to ...

Identify, quantify, and compare the attributes of the objects, situations, and/or events that need to be measured to solve the problem

Use appropriate units of measure to identify, quantify, and compare objects, situations, and/or events to solve a real- world problem

Convert units within a system

Generalize relationships and determine the appropriate scale to express the relationship between two quantities (areas, lengths, dimensions of figures)

## HIGH SCHOOL GEOMETRY UNIT



This unit consists of 6 lessons:

1. Review of area and perimeter; Build Background Knowledge
2. Review of ratios and proportions in the context of area and perimeter
3. Review ratios and proportions in the context of units of measure and scales
4. Use area, ratios and proportions to determine unit rate in a given situation
5. Continue to practice area, ratios, proportions and unit rate to solve authentic problems
6. Culminating Activity/Summative Assessment



In our example there are six lessons. These lessons all relate to the concepts of Geometry.

The NCSC units of study lesson plan format details how general education lessons can be broken down into steps. Within each step, specific examples of how to modify and adapt the lesson and materials are given for Emerging readers and Emerging communicators.

## HIGH SCHOOL GEOMETRY LESSON



Each Section of the lesson includes the following:

- General Instructional Activity for All Students
- Universal Design for Learning Suggestions
- Emerging Reader Accommodations
- Emerging Communication User Accommodations



Each Section of the lesson is based on a General Instructional Activity for All Students with Universal Design for Learning Suggestions, accommodations for emerging readers and emerging communicators for each segment.



## STARTING WITH THE STANDARDS



It's important to note that instructing and assessing grade level state standards have different parameters

### Instruction

- May include some prerequisite skills to build toward the final concept/skill
- Range of Depth of Knowledge (DOK)

### Assessment

- Focuses on only the final concept/skill
- Usually targets single DOK per item



Every lesson is based on grade level standards. Remember 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 within 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, and strategies taught to solve problems; you may be looking for independent responses or allowing for a system of least prompts.


You might be getting ready for a large scale assessment to show student performance of the grade specific content. At this point the student should be independently utilizing steps, strategies, and supports to evidence performance of grade specific concepts.

It is important to remember the difference between instruction and assessment when planning. As a part of this distinction, it is important to note that during instruction we expect people to hit a range of DOK or depth of knowledge levels from the lowest to the highest. However, during assessment we may target one DOK level.

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

## HIGH SCHOOL GEOMETRY UNIT

<b>Instructional Family: Problem solving using measurement process.</b>	<b>Prerequisite skills:</b> Match numbers Identify numbers Count One-to-one correspondence Parts-to-whole Addition Multiplication Area Perimeter
Core Content Connectors addressed: <ul style="list-style-type: none"> <li>• H.ME.1a1 Determine the necessary unit(s) to use to solve real world problems.</li> <li>• H.ME.1a2 Solve real world problems involving units of measurement.</li> <li>• 3. ME.1g1 Identify a figure as getting larger or smaller when the dimension is scaled.</li> </ul>	
<b>Instructional Family: Perimeter, Area, Volume</b>	
Core Content Connectors addressed: <ul style="list-style-type: none"> <li>• 8.ME.1e2 Compare area and volume of similar figures.</li> <li>• 6.ME.1a1 Identify the appropriate formula (i.e., perimeter, area, volume) to use in a real life context.</li> <li>• 4.ME.2h1 Apply the formulas for area and perimeter to solve real world problems.</li> <li>• 3.ME.2h Use addition to find the perimeter of a rectangle.</li> </ul>	
<b>Instructional Family: Scaling and Unit conversion</b>	
Core Content Connectors addressed: <ul style="list-style-type: none"> <li>• 8.ME.1e1 Describe the changes in surface area, area, and volume when the dimensions of a figure are scaled (e.g., drawings).</li> <li>• 5. ME.2a1 Solve problems involving conversions of standard measurement units when finding area, volume, time lapse, or mass.</li> <li>• 5. ME.1b2 Convert standard measurements of length.</li> </ul>	



Presented here are some of the CCCs addressed in the high school geometry unit. The skills addressed within CCCs of the first three lessons of this units indicate that students are expected to...

Match numbers

Identify numbers (used on measurement tools)

Count (number of units)

Demonstrate one-to-one correspondence

Convert parts-to-whole (inches to feet, feet to yards, centimeters to meters)

## CHECK YOUR UNDERSTANDING



Each Section of the lesson includes the following:

- A general Instructional Activity for All Students based on the common core state standards
- Universal Design for Learning Suggestions
- Emerging Reader Accommodations
- Emerging Communication User Accommodations



Remember:

Each Section of the lesson includes the following:

A general Instructional Activity for All Students based on the CCSS

Universal Design for Learning Suggestions

Emerging Reader Accommodations

Emerging Communication User Accommodations

## ENSURING ACCESS TO GENERAL EDUCATION LESSONS



This concludes the Mathematics UDL Units Module

Review the resources in the next section.

It is suggested but not required that you complete all modules in the Mathematics course.



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Review the resources in the next section.

It is suggested but not required that you complete all modules in the Mathematics course.

## NEXT STEPS

For more information and examples, review these:

Center for Applied Special Technology (2005). *UDL Guidelines*.

Retrieved from [www.cast.org](http://www.cast.org).

Denham, A. (2004). Pathways to Learning for Students with Cognitive Challenges: Reading, Writing and Presenting. Interdisciplinary Human Development Institute, University of Kentucky. [Online] Available: <http://www.hdi.uky.edu/>



These 2 resources are key to understanding how to plan access to general education lessons.

The first reference is the website for CAST (The Center for Applied Special Technology) – which includes examples and explanation concerning Universal Design for Learning. The second resource is the Pathways document developed by Anne Denham. This document has hundreds of assistive technology suggestions for presenting material and student responses.

## REFERENCES



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- Land, L., Pugalee, D., Denham, A., and Kleinert, H. (2010). Math Instruction and Assessment Linked to Grade-Level Standards. In H. Kleinert & J. Kearns, *Alternate Assessment for Students with Significant Cognitive Disabilities: An Educator's Guide*. Baltimore: Paul Brookes.



If you would like more information on the concepts we have presented today, here is a list of references.

## REFERENCES

<http://www.corestandards.org/what-parents-should-know/>

<http://www.naacpartners.org>



Visit the websites noted for more general information.