National Center and State Collaborative approach to Content for Students with Significant Disabilities

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Theory of Action

Long-term goal:

To ensure that students with significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school ready for post-secondary options.

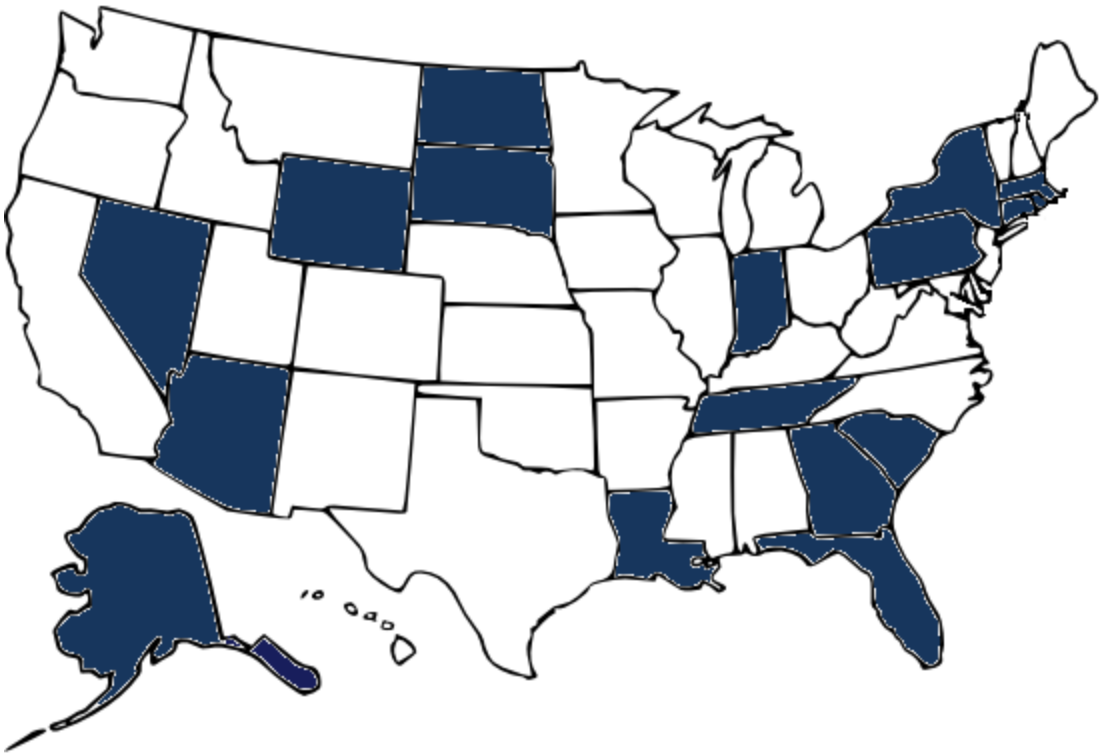
A well-designed summative assessment alone is insufficient.

To achieve this goal, an AA-AAS system also requires:

- Curricular & instructional frameworks
- Teacher resources and professional development

NCSC *States*

Alaska Arizona Connecticut District of Columbia Florida Georgia Indiana Louisiana Massachusetts Nevada New York North Dakota Pacific Assessment Consortium (PAC-6) Pennsylvania Rhode Island South Carolina South Dakota Tennessee Wyoming



Organizations

- National Center on Educational Outcomes
- National Center for the Improvement of Educational Assessment
- University of Kentucky
- University of North Carolina-Charlotte
- edCount, LLC

Building an assessment system based on research-based understanding of:

- technical quality of AA-AAS design
- formative, interim, and summative uses of assessment data (how to measure student progress)
- academic curriculum and instruction for students with significant cognitive disabilities
- student learning characteristics and communication
- professional development

Alternate assessments to PARCC and SBAC, general education assessment consortiums

Dynamic Learning Maps (DLM) is a partner AA-AAS project

Common Core State Standards

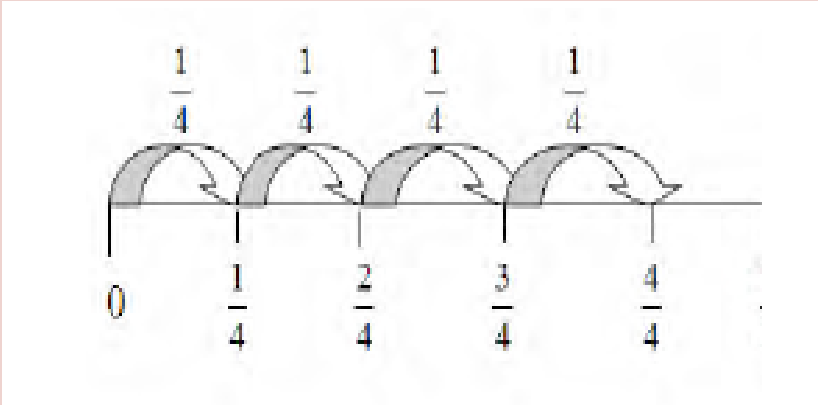
- *"Common Core Standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school able to succeed in entry-level, credit-bearing academic college courses and in workforce training programs."*
  - (NGA & CCSSO, 2010)

- http://www.corestandards.org

Resources- ELA CCSS Unpacking documents

CCSS Anchor Standard	CCSS Standard	Unpacking
College and Career Readiness Anchor Standards for Reading	Reading Literature	First grade students continue to build on the skill of asking and answering questions about key details in a text. At this level, students use key details to retell stories in their own words, reveal an understanding about the central message of the text, and tell about the story elements. Use questions and prompts such as: Can you tell me what happened in the story at the beginning? What happened after that? What happened at the end of the story? Can you tell me where the story took place? Can you tell me the important things that happened in the story? Who are the characters in the
1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.	1. Ask and answer questions about key details in a text	
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.	2. Retell stories, including key details, and demonstrate understanding of their central message or lesson.	
3. Analyze how and why individuals, events, and ideas develop and interact over the	3. Describe characters, settings, and major events in a story, using key details.	

Resources-Math CCSS Unpacking documents

3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b on a* number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b equal* parts. Recognize that each part has size 1/*b and that the endpoint of the* part based at 0 locates the number 1/*b on the number line.* b. Represent a fraction *a/b on a* number line diagram by marking off a lengths 1/*b from 0. Recognize* that the resulting interval has size *a/b and that its endpoint locates the* number *a/b on the number line.*	The number line diagram is the first time students work with a number line for numbers that are between whole numbers (e.g., that . is between 0 and 1). In the number line diagram below, the space between 0 and 1 is divided (partitioned) into 4 equal regions. The distance from 0 to the first segment is 1 of the 4 segments from 0 to 1 or . (**3.NF.2a). Similarly, the distance** from 0 to the third segment is 3 segments that are each one-fourth long. Therefore, the distance of 3 segments from 0 is the fraction . (**3.NF.2b).** 

Making Standards Accessible

- Option One: Work directly from the Common Core State Standards (CCSS) without translation
- Option Two: Write extensions; one extension for each CCSS
- Option Three (New Idea!): Identify the core content using learning progressions as an organizational framework that is aligned with the CCSS
  - Option 3 is the NCSC approach

Foundation for the Content

- Learning progressions
  - Hypothesized sequence about how students learn concepts and big ideas
  - Tested with typically developing children
- This project uses a developed learning progression framework (Hess et al., 2010) in ELA and math to inform what content is taught as well as the stream of content that helps students reach the concept/big idea
- Each step in Hess's learning progression is called a progress indicator (PI)
- http://www.nciea.org/publications/Math_LPF_KH11.pdf
- http://mast.ecu.edu/modules/lpssd/background/

DPS: Questions are posed and investigated by collecting data or retrieving existing data, and representing, analyzing, and interpreting data. Investigations, inferences, and predictions are used to make critical and informed decisions.

Elementary School Learning Targets		Middle School Learning Targets		High School Learning Targets
DPS-1 Gather and interpret data to answer questions related to a particular/single context. • *Formulate questions, gather data, and build representations;* • *Identify and describe variation in data, and describe and compare shapes of distributions and measures of central tendency.*		*DPS-1 Design investigations and gather data to answer questions about multiple populations.* • *Formulate questions, gather data, and build representations;* • *Compare populations by analyzing distributions in terms of variability and measures of central tendency.*		*DPS-1 Design and conduct statistical studies:* • *Use appropriate statistical measures for analysis;* • *Develop the concepts of statistical inference and statistical significance, especially in relation to probability principles and sampling distributions.*
Grades K-2	**Grades 3-4**	**Grades 5-6**	**Grades 7-8**	**Grades 9-12**
Students gather, organize, and interpret data by… **E.DPS.1a** posing questions of interest that can be answered by counting/collecting data (e.g., concrete comparisons about students, classroom materials, science topics) with teacher guidance K.CC-5, 6 1-MD-1 2.MD-2, 5, 9 **E.DPS.1b** identifying and sorting data/attributes; identifying rules for classifying data/attributes K.MD-1, 2, 3; K.G-2, 4 1.MD-1, 4; 1.G-1 2.G-1 **E.DPS.1c** collecting and organizing/ representing data (e.g., picture graphs, tally charts, bar graphs) K.CC-5, 6; K.MD-1, 2, 3 1-MD-1, 4 2.MD-1, 2, 4, 5, 6, 9, 10 **E.DPS.1d** recognizing that data can take on different values 1.MD-4 2.MD- 9, 10 **E.DPS.1e** describing and comparing data and beginning to identify what the data do or do not show (e.g., bar graphs, line plots, picture graphs)	**Students gather, organize, and interpret data by…** **E.DPS.1f** formulating questions and designing investigations (defining measures and variables) 3.OA-8; 4.OA-3; 4.MD-2 **E.DPS.1g** collecting data and representing data (e.g., bar graphs, frequency tables, line plots) 3. MD-3, 4; 4.MD-4 **E.DPS.1h** recognizing and identifying sources of variability in the data (measurement variabiity and natural variability) 3. MD-3, 4; 4.MD-4 **E.DPS.1i** describing data shapes and what the data representations do and do not show (bar graphs, picture graphs, frequency tables, line plots, circle graphs) including the attirbutes used **E.DPS.1j** identifying clumps, gaps, trends, or central tendency (mode, median) in the data 4.MD-4 **E.DPS.1k** using data to make and support claims and interpretations (e.g., making comparisons among individuals, between individuals and the group, and among groups) 3. MD-3, 4; 4.MD-4	**Students gather, organize, and interpret data by…** **M.DPS.1a** formulating questions about groups larger than classroom groups and comparing different populations or samples 6.SP-1,2, 5 **M.DPS.1b** distinguishing among populations, censuses, and sampling 6.SP-1,2 **M.DPS.1c** using representations (e.g., dot plots, scatter plots, line plots) to display data from investigations to describe the shapes of the data 5.MD-2; 5.G-2 6.SP-2, 4, 5 **M.DPS.1d** identifying the three common measures of central tendency (mean, median, and mode) and interpreting the mean as a fair share and a center of balance 5.NBT-6; 5.MD-2 6.SP-2, 3, 5 **M.DPS.1e** making claims about populations from data distributions, supporting interpretations on the basis of mean, median, or mode, and the shape of the distribution	**Students gather, organize, and interpret data by…** **M.DPS.1f** formulating questions about groups larger than classroom groups, comparing different populations or samples, and involving two variables 7.SP-1 **M.DPS.1g** displaying univariate data using dot plots, histograms, and circle graphs 7.SP-2, 4 **M.DPS.1fh** displaying data in scatter plots and investigating the association between the variables 7.SP-2, 3, 4; 8.SP-1, 2 **M.DPS.1i** using box plots, interquartile range, mean absolute deviation, range, and the concept of outliers to characterize the distribution (variability) of univariate data 7.SP-2, 3, 4 **M.DPS.1j** comparing two unequal distributions of data using number of data points, measures of central tendencey, shape, and variability (numerical data), and two-way tables (categorical variables) 7.SP- 3, 4; 8.SP-1, 2, 3, 4 **M.DPS.1k** supporting claims about the results of investigations, coordinating among the measures of central	**Students gather, organize, and interpret data by…** **H.DPS.1a** designing and conducting different kinds of studies using categorical and numerical data, explain results, and use data to estimate a population mean or proportion: • observational studies (e.g., traffic patterns at an intersection near the school); • sample surveys (a survey of student nutritional habits); • simple comparative experiments (e.g., comparisons of water and fertilizer treatments in a plant growth experiment) S.CP-3, 4 **H.DPS.1b** representing data with plots on the real number line (dot plots, histograms, box plots) S.ID-1 **H.DPS.1c** analyzing and summarizing the data resulting from studies using statistical measures appropriate to shape of the data (median, mean) and spread (interquartile range, standard deviation), and using data to support inferences (population parameters, sample size) or explain possible outliers S.ID-2, 3, 4, 5 S.IC-1 **H.DPS.1d** representing and interpreting data (graphs, scatter plots) to explain how variables are related, or to fit a function to the data S.ID-6

Advantage of Dual Alignment

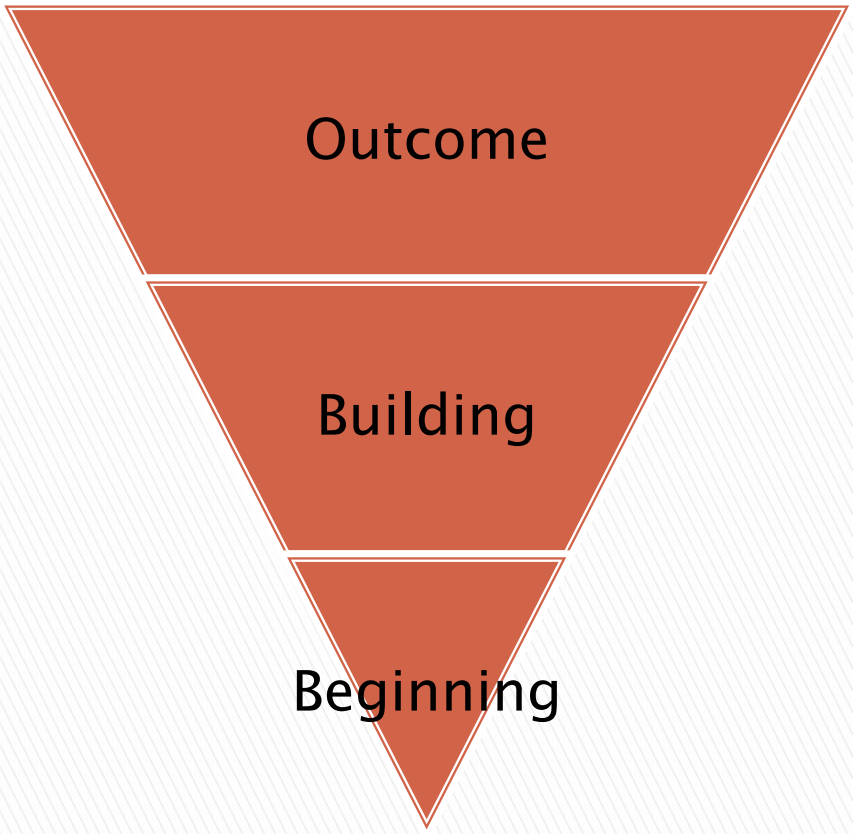
- Promotes access to grade level content standards
- Foster instruction of common core standards for students with SCD

- Promotes teaching towards defined learning outcomes
- Promotes sequential instruction across grades and grade bands within big ideas or concepts (i.e., first teach this, and then this, and then this to develop mastery of big idea)

Aligning with Common Core

Aligning with Learning Progressions

Key Points to Remember about Common Core Connectors



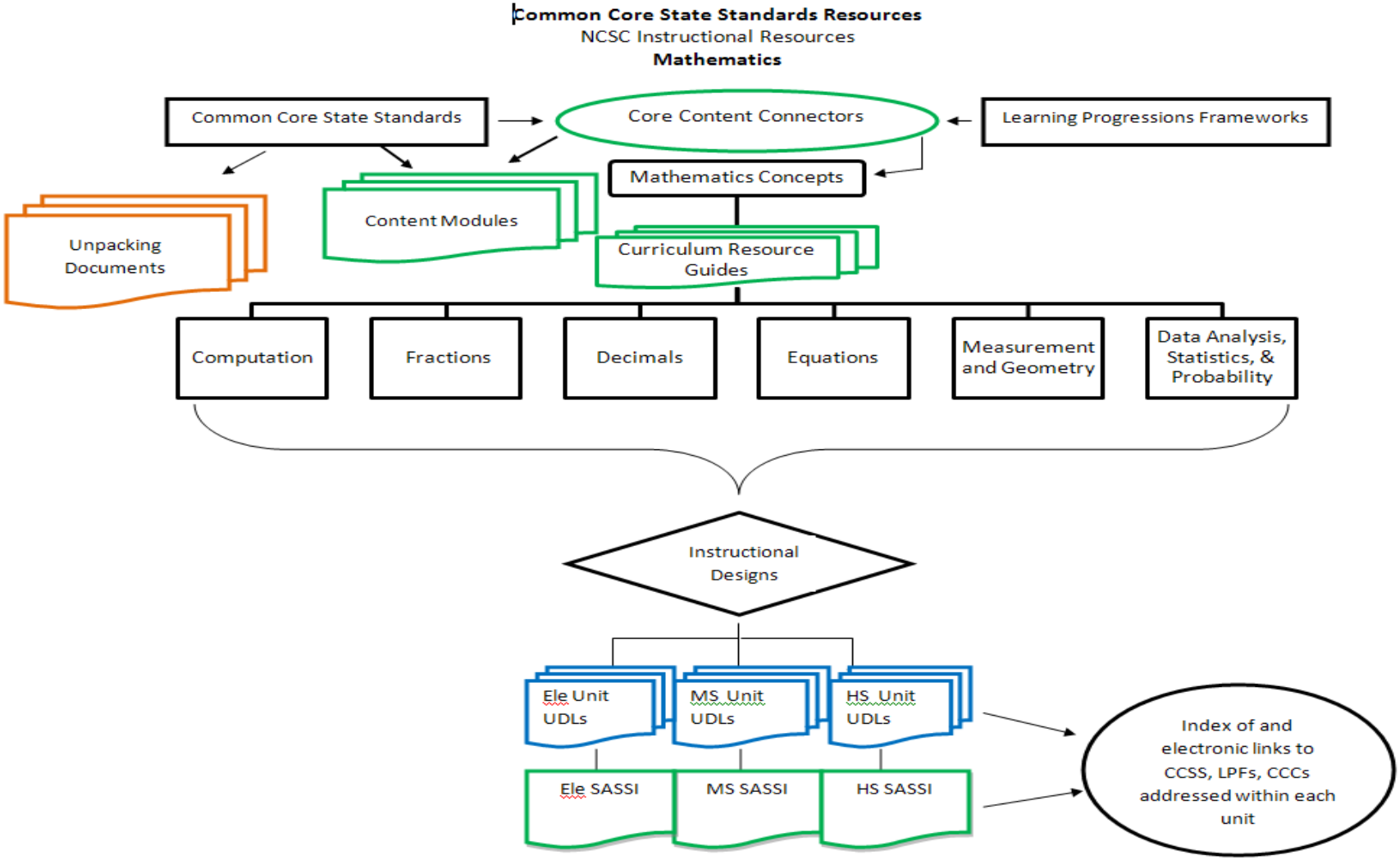
Identify the Core Content of the Common Core State Standards

Identify How to Build Learning Across Grades (from Learning Progressions)

What Teachers Need to Know

- How to read the CCC to plan instruction that links to the Common Core and builds across grades
  - Teachers will *not* need to create their own CCCs or other extensions of the Common Core Standards
- How to use the Curriculum Resource Guide and accompanying materials to plan lesson plans that are individualized for students with SCD

C & I Schema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Index of and electronic links to CCSS, LPFs, CCCs addressed within each unit

Example of the CCC– Big Idea– Geometry

	Grades K-2	Grades 3-4	Grades 5-6	Grades 7-8	HS
Properties and attributes of shapes and figures and their corresponding parts	K-1a1 Recognize two-dimensional shapes (e.g., circle, square, triangle, rectangle)regardless of orientation of size	3-1h1 Recognize two-dimensional shapes (e.g., rhombus, pentagons, hexagons, octagon, ovals, equilateral, isosceles, and scalene triangles)	5-1a Recognize properties of simple plane figures	7-1e Construct or draw plane figures using properties.	
	K-1a2 Recognize shapes in environment	3-1h2 Compare shapes based upon their attributes	5-1b Distinguish plane figures by their properties	8-1g Recognize congruent and similar figures	HS-1b Use definitions to determine congruency and similarity of figures
	1.1b1 Distinguish two-dimensional shapes based upon their attributes (i.e., size, corners, and points)	4-1j1 Recognize a point, line, line segment, rays			

Example continued

Progress Indicators	Grade 5	Closest Match Common Core Standard
E.GM.1j recognizing and drawing points, lines, line segments, rays, angles, and perpendicular and parallel lines and identifying these in plane figures	**5-1j6** **Recognize parallel and perpendicular lines within the context of figures**	4.G.1 Draw points, lines, line segments, rays, angels, perpendicular, and parallel lines. Identify these in two-dimensional figures
M.GM.1a describing and classifying plane figures based on their properties	**5-1a** **Recognize properties of simple plane figures**	5.G.3 Understand that attributes belonging to a category of two dimensional figures also belong to all subcategories of that category
M.GM.1b recognizing and using properties belonging to categories and subcategories of plane figures (e.g., all rectangles have four right angles, so all squares are rectangles and have four right angles)	**5-1b** **Distinguish plane figures by their properties**	5.G.4 Classify two dimensional figures in a hierarchy based on properties

Grade band view

Progress Indicator: E.RL.d identifying main characters, key events, a problem, or solution when prompted K.RL-1, 2, 3		
K	1	2
K.RL.d1 With prompting and support answer questions about key details in a story. K.RL.1	1.RL.d1 Answer questions about key details in a story. 1.RL.1	2.RL.d1 Answer “who”, “what” and “where” questions from stories. 2.RL.1
K.RL.d2 With prompting and support identify a main character in a story. K.RL.3	1.RL.d2 Ask questions about key details in a familiar story. 1.RL.1	2.RL.d2 Answer “how” and “when” and “why” questions from stories. 2.RL.1
K.RL.d3 With prompting and support identify a setting in a story. K.RL.3	1.RL.d3 Identify the main character from a story. K.RL.3	2.RL.d3 Describe or select a description of a major event or challenge in a story. 2.RL.3
K.RL.d4 With prompting and support identify major events in a story. K.RL.3	1.RL.d4 Describe a main character from a story. 1.RL.3	2.RL.d4 Describe or select a description of how characters respond to major events or challenges in a story. 2.RL.3

Learning Progression Framework
Lesson 5

Graphing
- ✓ Locate the x and y axis on a graph
- ✓ Locate points on a graph
- ✓ Use order pairs to graph given points

Area
- ✓ Find area of quadrilaterals
- ✓ Find area of plane figures and surface area of solid figures (quadrilaterals)
- ✓ Describe the changes in surface area, area, and volume when the figure is changed in some way (e.g., scale drawings)

Solve Linear Equations
- ✓ Solve a linear equation to find a missing attribute given the area, surface area, or volume and the other attribute

Ratio & Proportion
- ✓ Solve problems that use proportional reasoning with ratios of length and area
- ✓ Describe the changes in surface area, area, and volume when the figure is changed in some way (e.g., scale drawings)

Fractions
- ✓ Partition circles and rectangles into two and four equal parts
- ✓ Partition shapes into equal parts with equal area

Apply formulas
- ✓ Solve word problems using perimeter and area where changes occur to the deminsions of a figure

Area
- ✓ Use addition to find the perimeter of a rectangle
- ✓ Use tiling and multiplication to determine area

Basic operations
- ✓ Addition
- ✓ Subtraction,
- ✓ Multiplication
- ✓ Division

Part to Whole
- ✓ Partition circles and rectangles into two equal parts

Create schemas; deepen & broaden conceptual understanding
CCCs = that connect skills

CCCs=Sub-skills that develop conceptual understanding

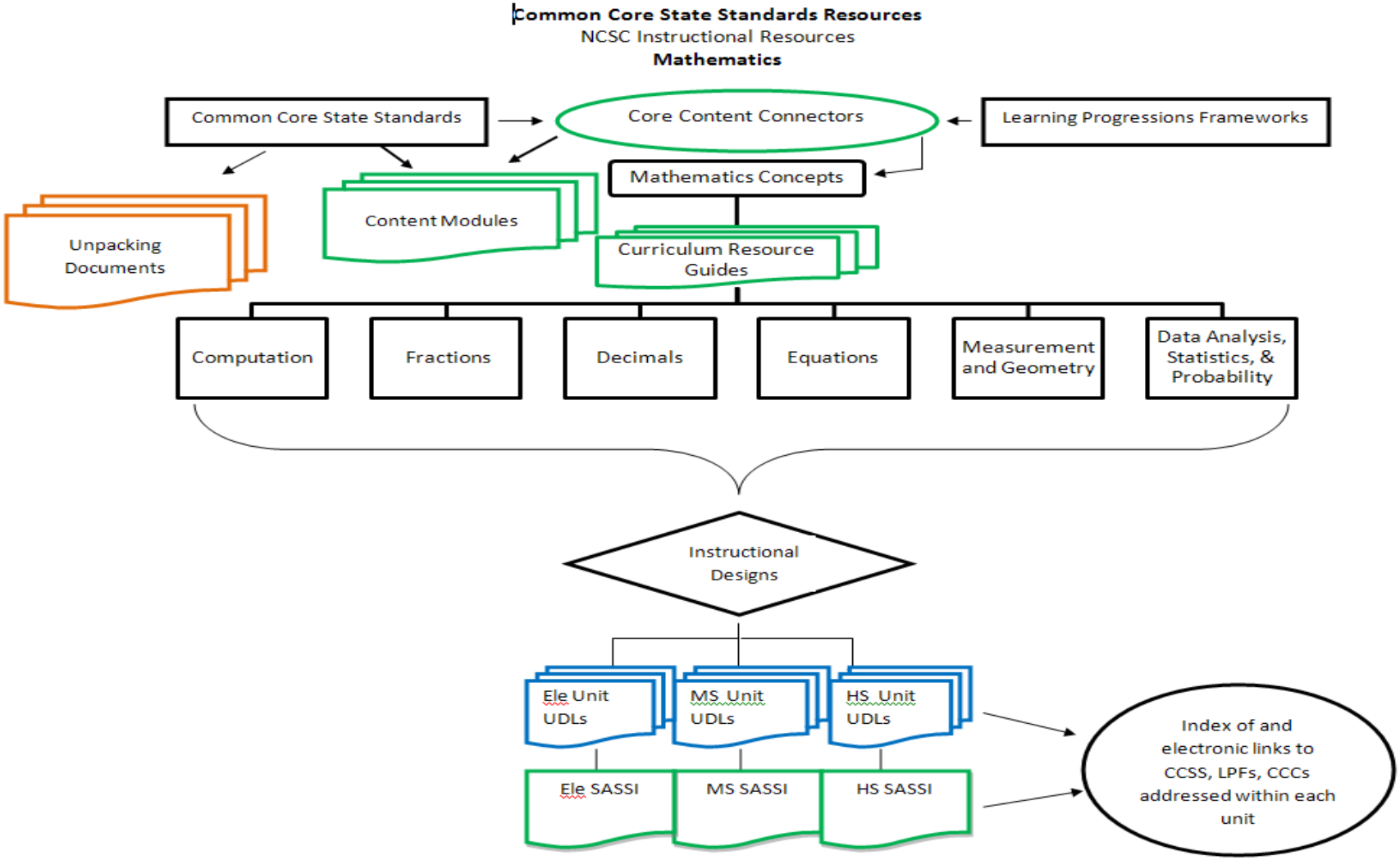
CCCs =Prerequisite knowledge or emergent skills

Validation from Special Educators

- Surveys
  - Instructional package
  - CCCs
  - Content Modules
- Case Studies
  - Instructional package

Creating Teacher Supports

C & I Schema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Guiding Principles for Curricular Resources

- Promote Common Core State Standards
  - By using the Core Content Connectors
    - Dually aligned with learning progressions and CCSS
- Set high expectations for all students
- Apply principles of universal design for learning
- Apply evidence-based teaching practices for students with SCD
- Use general curriculum resources and general education content experts' review
- Offer options for ALL students in the 1%
- Reflect same emphasis/ priorities being used for assessment in WG1

Curriculum Resource Guide

- Umbrella resource for all the other resources
- Purpose: to provide background information on key concepts for teachers who do not have the content background
- Synthesizes general education curricular resources
- There will be one resource guide for each topic
- All other resources relate to the resource guide

Curriculum Resource- Purpose

- To provide guidance for teaching the CCSS to students with Significant Cognitive Disabilities
- To serve as a companion document to the CCC
- To help educators build knowledge of the essential content
- To delineate the necessary skills and knowledge students need to acquire to master these indicators
- To provide examples for differentiating instruction for a wide range of SWSCD

Example- Curriculum Resource Guide

- 1.What are “fractions” and how are they taught in general education settings?
  - 1.1 The essential knowledge in this content area
  - 1.2 Common misunderstandings in this content area
  - 1.3 Prior Knowledge/skills needed (can be taught concurrently)
    - Number sense with whole numbers
    - Addition, subtraction, multiplication and division.
    - Understanding greater than less than.
    - Sequencing numbers

- **2. What Connectors to the Common Core Standards Are Addressed in Teaching "Fractions"?**
  - Also provides the CCSS being addressed

Provides a performance example of priority CCCs

Student selects correct symbol to compare two fractions.

You are going to compare fractions using these symbols. This is equal to (point to =). This is less than (point to <). This is greater than (point to >). This fraction is 2/5. This fraction is 4/5. Choose the symbol that shows your answer. Is 2/5 greater than, less than, or equal to 4/5.

2/5 4/5

- **3. What are some of the types of activities general educators will use to teach this skill?**
  - **3.1 Activities from General Education Resources Fractions**
    - Have students make a quilt by gluing 16 precut squares of three different colors onto their paper. Now have them describe the number of colors used in fractions. (i.e. “Using a fraction tell me how much of the quilt is purple.”)[8]
  - **3.2Links Across Content Areas**

- **4. What are Some Additional Activities That Can Promote Use of this Academic Concept in Real World Contexts?**
  - Measuring out fractions of ingredients for cooking.
  - Using a ruler to measure out fractions of a foot and inch to cut wood to make a birdhouse.

- **5. How Can I Further Promote College and Career Readiness when Teaching "Fractions"?**
  - Communicative competence
  - Fluency in reading, writing, and math
  - Age appropriate social skills
  - Independent work behaviors
  - Skills in accessing support systems

- **6. How Do I Make Instruction on "Fractions" Accessible to ALL the Students I Teach?**
  - **6.1 <u>Teach Prerequisites and Basic Numeracy Skills Concurrently</u>**
    - Identify numbers
    - Identify and use symbols <, >, and = to compare numbers
    - Demonstrate concept of "more", "less", "bigger", "smaller" when comparing visual representations of fractions
  - **6.2 Incorporate UDL: Universal Design of Learning When Teaching Fractions and Decimals**

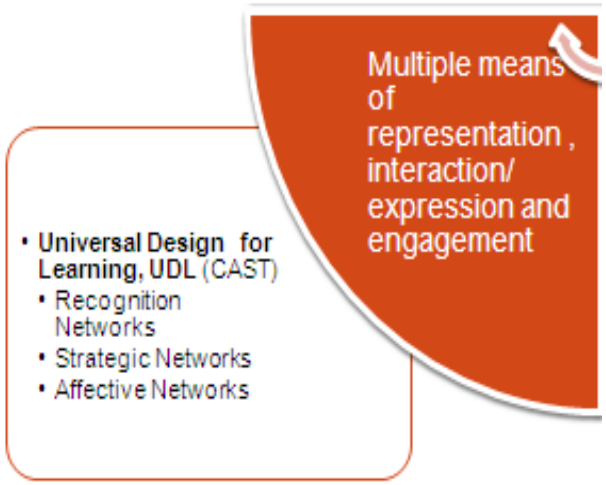
- 7. Where Can I Get More Information on the Curricular Resource Guides?

UDL Unit Plans/ Lesson Plans

- For each topic there will be a UDL unit plan and sample daily lesson plans
  - These are developed for the entire general education class to be inclusive of ALL students
    - Purpose: to model how to plan for all students from the onset of instructional planning (universally designed learning) including students in AA-AAS
    - Excellent for co-teaching and collaborative planning
    - Promote inclusive instruction; show how students who participate in AA-AAS can be in general education
    - Developed by University of Kentucky

Units and Lessons based on Universal Design for Learning (UDL)

- **Provide multiple means of representation**
- **Provide multiple means of expression**
- **Provide multiple means of engagement**



http://bookbuilder.cast.org/

- Can the student *access* instruction? Is targeted information provided in student's mode of communication?
- Can the student *interact* with instruction and materials? Does the student have the means to *demonstrate* knowledge, skills, and concepts acquired?
- What will *engage* the student in the activity? How will the student remain motivated long enough to learn?

Unit Plans

Lessons are taken from the general education curriculum; principles of UDL are applied

For example, a lesson on area might provide:

Multiple means of representation – Provide students with a copy of the word problems and the table. Have drawings and 2 and 3 dimensional manipulatives available for students to use.

Multiple means of expressions – Allow students to solve the problem using formulas and/ or models and record information into tables using various formats: computer, graphic organizer (premade or original), etc. Allow students to use a reference of formulas: print, pictorial or tactile.

Multiple means of engagement – Ensure each student is actively involved in his/her partnership. Use scenarios (unit rates) related to student interests. For example, if a student is interested in animals instead of orchard trees, the scenario could involve a rate of grazing area per horse. As you observe pairs working, use questioning to get students to explain their strategies.

Unit Plan cont.

then modified and or adapted for Emerging Readers and Emerging Communicators

- ***Multiple means of Engagement***..... Showing the end first – present the concrete example of the graph with the trees.... Then with the end in mind... students at multiple levels can solve in multiple ways... either count or solve using a calculator, graph paper, 2 and 3 dimensional manipulative materials

- ***Multiple Representation***.... 2 dimensional paper with trees, 3 dimensional objects on green construction paper or cardboard squares.

- ***Multiple means of Expression*** – Picture problem choices: present 2 choices of possible correct responses... including words or pictures, tactile representations ...

SASSI and Progress Monitoring
Diane Browder

Use An Activity for Meaning

SASSI: ***Simple Activities with Scripted Systematic Instruction***

Activity: Preparing Bread for Sub Sandwiches

Grade Band: Grades 6-8 **Concept:** Fractions **Script Level:** Combined

Core Content Connectors	Common Core State Standard	SASSI OBJECTIVES
6th 6.NO.2c3 Solve one-step addition, subtraction, multiplication, or division problems with fractions or decimals.	6.NS.1	CONCEPT/SYMBOL -Identify part/whole -Use fraction symbols COMPONENT OF GRADE -Add simple fractions (1/2, 1/3, ¼) with same denominator
8th 8.NO.2i4 Solve two-step addition, subtraction, multiplication, and division problems with fractions, decimals, or positive/negative numbers.	7.NS.1d	-Perform second step to determine how many wholes needed for parts used FULL GRADE -Extend to -, /, x

Be sure to provide specific practice to students on the skills that correspond to their grade level.

Combined materials provided:

Teacher materials: Picture of people making sandwiches in sub shop; whole and fraction cards: 1, ½, 1/3, ¼; write-on fraction cards /3, /2, /4; fraction models; zero to three number line; three small loaves (pictures or actual sub rolls: some are cut into halves and fourths; some are whole); for generalization: pictures of pizzas cut into 1, ½, 1/3, ¼; number line divided into halves; number line divided into fourths; sub chart; worksheets.

Student materials (need one set for each student): number line 1-10 for student to indicate answer if nonverbal; zero to two number line; number line divided into halves; number line divided into fourths; sub chart; worksheet.

Teach Underlying Concept

INTRODUCE ACTIVITY: Present picture of people making sandwiches in sub shop. **Some people work in sub sandwich shops. One job in a sub sandwich shop might be to prepare the bread for the sandwiches. In most sandwich shops, the bread is baked fresh in the store in whole loaves. But most people do not order whole loaves. They order parts of a loaf. We communicate about parts using fractions that look like these** (show fraction cards). **To keep track of sandwiches, we have to add the parts of bread we need to know how many whole loaves to bake in our sub shop.**

BUILD THE FOUNDATIONAL CONCEPT AND SYMBOLS: Part/ Whole and Fractions *(Skip this section for students who understand part-whole relationships and can identify fractions).*

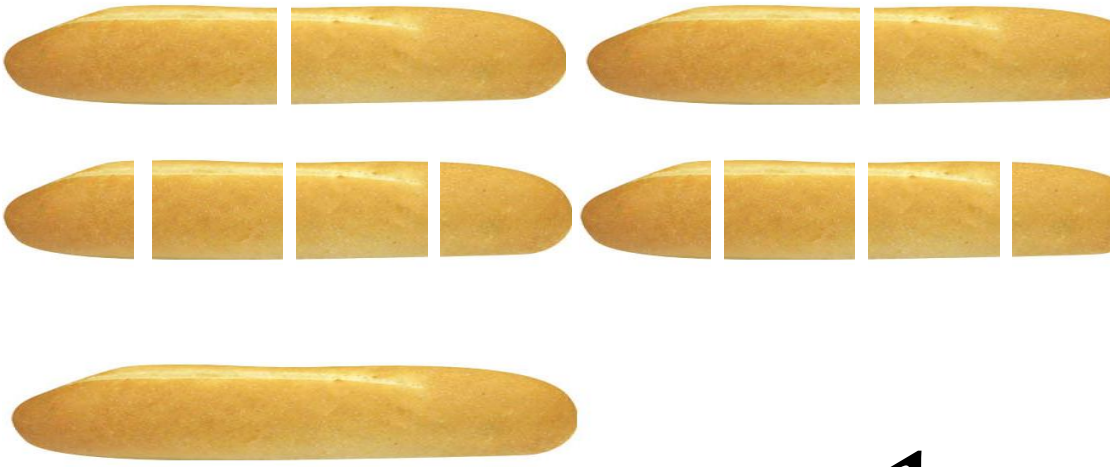
DEMONSTRATION: Present whole loaf and no distracters. **This is a whole loaf. Show me the whole loaf.** Wait for students to point or eye gaze towards whole loaf. Correct? Praise: **Good.** No response? Guide student to make the response.

CONCEPT: whole	**Teacher Says/Does**	**Student Response**	**Error Correction**
1.	Show the whole loaf with two distracters: a half loaf and an unrelated object (e.g., stapler). **Show me a whole loaf.** Wait for students to point or eye gaze towards the whole loaf. Point to the whole.	**Indicates whole loaf** PRAISE: Point to the whole. **"Yes, this is the whole loaf."**	Incorrect or no response? Guide to select correct answer and say, "**This is the whole loaf".**

DEMONSTRATION: **Now let's review a part.** Show the part of the loaf with no distracters. **This is part of a loaf. Show me part of the loaf.** Wait for students to point or eye gaze towards whole loaf. Correct? Praise: **Good.** No response? Guide student to make the response.

CONCEPT: part/whole			
2.	Show the part loaf with two distracters: a whole and an unrelated object (e.g., pencil). **Show me the part of a loaf.** Wait for students to point or eye gaze towards the part.	**Indicates part of loaf** PRAISE: Point to the part. **"Yes, this is part of the loaf."**	Incorrect or no response? Guide to select correct answer and say, **"This is part of the loaf."**

Teach Related Numeracy



1 $\frac{1}{2}$ $\frac{1}{4}$

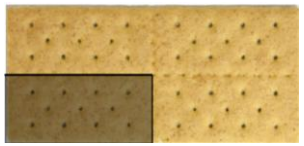
Teach Component of the Grade Level Standard

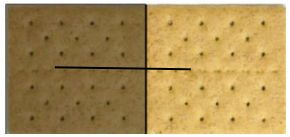
DEMONSTRATION: **Sometimes in our sub shop, we start out with a certain number of parts of our bread, but then we need more. Maybe a customer says** (imitate a customer's voice to add humor)**, "I want three minis…oh, and two more minis." Remember our minis are cut in fourths. So when the customer said three minis I know he wants 3/4.** Show loaf divided into fourths, and push 3 of the mini loaves forwards towards student. Write ¾ on board or paper. **But then he said he wanted two more minis. More minis? That's a plus + to add more minis to his order.** Write +. **How many more? Two more minis or 2/4.** Write 2/4. Get out another loaf divided into fourths. Push remaining 1 from initial loaf and one more from new loaf to demonstrate adding 2 more. **So now how many altogether? Let's count.** Count the minis with the student. **Before we forget, let's write down that order 5/4.** Finish the equation 3/4 + 2/4 = 5/4. **Wow! 5 minis or five-fourths! You added fractions together!**

One rule we have to remember when adding fractions together is that we can only add fractions when the whole has the same number of parts. Remember, the denominator tells us the number of parts in the fraction, so if the denominators are the same, then we can add the top numbers together. We can add minis together because the wholes are divided into fourths. (Point to both denominators in previous examples).

ALIGNING TO GRADE LEVEL COMPONENT: Adding Fractions with Like Denominators			
1.	**Now you try to add an order. What if a customer wants one regular? Remember, a regular is 1/2.** Have student slide out one half. You write ½ on board/paper. **Then, the customer asks for two more halves.** Have student slide out two more halves. You write 2/2 on the equation (1/2+2/2=). **How many halves altogether?**	**Student writes or indicates 3/2.** PRAISE: **You did it! One half plus two halves equals three halves!**	Incorrect or no response? Count the halves together and then select the three. Have student repeat it.

Practice Test





Sara ate $\frac{1}{4}$ of the graham cracker. Ian ate $\frac{2}{4}$ of the graham cracker. How much of the graham cracker did they eat altogether?

$\frac{3}{4}$ $\frac{1}{4}$ $\frac{4}{2}$

Formative Assessment

COMPONENT OF GRADE ALIGNED CCC: Addition of fractions with same denominator									
1. Display three fraction cards: ½, 1/3, ¼.	**"Find ½."** (repeat for 1/3, ¼; vary order daily and score the first response only)	Says/indicates fraction							
2. Display one fraction card and several pictures of parts.	**"Find the picture for this fraction."** (repeat for each fraction; score first response only)	Finds correct picture.							
3. Display one picture and the three fraction cards: ½, 1/3, ¼.	**"Find the fraction for the picture."**	Finds the fraction.							
4. Display write-on fraction cards (e.g., /3) and object divided into thirds. Move two parts to the side and ask question. Note: Vary denominator and numerator selected daily.	**" If I use two parts, what number goes in my numerator?"**	Says/indicates numerator.							
5. Student selects objects divided into halves, thirds, or fourths and corresponding fraction card. Student, or teacher, moves parts to the side to indicate number of parts used (i.e., numerator). *Note: Student must get both steps correct to get problem correct (e.g., selects denominator and writes/indicates numerator).*	**"Write the fraction."**	Student selects fraction card with correct denominator and writes/selects the numerator in the fraction (e.g., 3/4).							
6. Display at least two whole objects divided into thirds, fourths, or fifths. Have student select corresponding write-on fraction card. Move multiple parts to the side to show they are used, so the numerator is greater than the denominator. For example, display two subs divided into thirds. Move five parts to the side. Student should write "5/3".	**"Write it as a fraction."**	Student writes or selects 5 to fill in 5/3.							
7. Repeat step 14, but target a different denominator and numerator (e.g., 5/4; 3/2; 6/4; 4/3, etc.). Score first example.	**"Write the fraction."**	Student writes or selects the numerator in the fraction (e.g., 5/4).							
8. Present 2 sets of an object divided into halves (e.g., 2 subs divided into halves). Slide out one part from first object and two parts from second object. Write equation for student and have student add fractions ½+2/2.	**"How many halves altogether?"**	Writes/indicates 3/2.							
9. Generalization of step #16. Use fraction models and write equation for student (e.g., "¼ + ¾" or "1/3 + 1/3"). Score first example.	**"Add the fractions together."**	Student counts shaded area(s) and writes/indicates fraction.							
10. Repeat step #17 but with different models and equations (i.e., use different denominator than used in step 17).	**"Add the fractions."**	Student counts shaded area(s) and writes/indicates fraction.							
		NUMBER CORRECT:							

Content Module

- Purpose: To provide additional information on the most complex concepts in a multimedia format for teachers who do not have the content background
- These are based upon mathematic concepts that may be difficult to teach or unfamiliar to special education teachers
- Format is anticipated similar to the IRIS or MAST modules to serve as an on-line teacher resource for each content topic

Sample from Module

- **Module Objectives**
- After viewing the content module, teachers should be able to:
- Apply various strategies to determine perimeter, area, surface area, and volume of two and three dimensional shapes
- Apply formulas to determine perimeter, area, surface area, and volume of various polygons and shapes
- Solve word problems pertaining to area, surface area, and volume of various two and three dimensional shapes

What comes next?

- Once the CCC are finalized:
  - Curriculum packages within prioritized big ideas or concepts will be developed in ELA and math
  - These packages will be piloted in several states with teachers to determine use and degree to which students learn content via the instruction using the plans
  - Once finalized (after pilot work), lesson plans will be disseminated to all NCSC states for teacher use

Questions and follow up

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