

## Transcript – Review for Quiz

### Video 1

As students learn, the amount and complexity of their knowledge and skill in any domain starts small and over time becomes much larger. That amount of growth varies with experiences and instruction but also seems to reflect factors associated with maturation, differences in ability, disposition, and interest. According to the National Research Council, learning progressions are descriptions of successively more sophisticated ways of thinking about an idea as a student learns. A progression happens over a broad span of time, and while there is a path typically followed, all students do not follow the same path in the same way.

### Video 2

According to the National Research Council, a learning progression has five essential elements.

1. Target learning goals ***Learning progressions require learning targets or clear end points that are defined by societal aspirations and analysis of the central concepts and themes in a discipline.***
2. Progress variables (e.g., core concepts) that are developed over time ***Learning progressions require progress variables that identify the critical dimensions of understanding and skills that are being developed over time.***
3. Intermediate levels of achievement that progress toward mastery ***Learning progressions need levels of achievement or stages of progress that define significant intermediate steps in conceptual development that most children might be expected to pass through on the path to attaining the desired proficiency. Even though it is not explicitly stated, we interpret the third element to say that it is important to be aware of students' common misconceptions and errors. We will address this more in a later lesson.***
4. Learning performances at each level that articulate students' performance capability ***Learning performances are the operational definitions of what children's understanding and skills would look like at each of these stages of progress, and provide the specifications for the development of assessments and activities which would locate where students are in their progress.***
5. Assessments that measure student development along the progression ***Assessments measure student understanding of the key concepts or practices and can track their developmental progress over time.***

### Video 3

Many may think that a learning progression is just a standard, but there is a difference between the two. The standards define the content objective but not the process by which students are

learning the content. Standards are based on analysis of the content or practice and are based on grade levels. Standards are set by the state. They describe intended learning outcomes horizontally focusing on one grade level.

A learning progression specifies the process of getting students to understanding the objective. The standards specify the knowledge that children at different grade levels should have mastered, but does not specify the inter-relationships between concepts. In contrast, learning progressions are developed based on empirical evidence of how students' understanding develops over time. Learning progressions are based on a continuum of learning over several grade levels and assess learning vertically between many grades.

#### *Video 4*

Now that you have a basic understanding of LPs and what distinguishes them from standards and a scope & sequence, how can you use the LPs to inform and improve your instruction in order to prepare your students for algebra? To implement mathematics instruction that supports students' understanding of mathematics and prepares them for algebra and beyond, teachers must not only understand the learning progressions, but also be able to use that knowledge in instruction.

A learning progression provides teachers with a pathway that communicates the connections between what comes before and after a specific learning goal, both in the short and long term. For example, when teaching students to generate multiple values from a specific set of numbers in an expression, teachers must know that students have an understanding of the order of operations and know how to evaluate an expression with a single number. They must also know that this concept is a prerequisite for learning to solve multi-step equations. In other words, learning progressions enable teachers to build explicit connections between types and levels of mathematical content. Learning progressions thread the development of increasingly complex forms of a concept or skill together.

First, learning progressions can help teachers plan the sequence of instruction with the end in mind.

Next, learning progressions help teachers make connections between the current content and previous content.

Last, learning progressions can help to correct the misconceptions and errors that arise as you are teaching.

We are going to go into detail about each one of these.

### *Video 5*

Formative assessment can take three forms, which can be thought of as a continuum. First, formative assessment can be on-the-fly, going beyond traditional classroom interactions. Teachers can ask specific questions to evaluate the level of understanding rather than simply checking to see if a student answered correctly (White and Gunstone, 1992). For example, instead of just asking students for their answers, a teacher may ask them to explain how they got to their answers.

In planned-for formative assessment, conversations during daily classroom talk allow the teacher to acquire information on an informal basis. These conversations can be planned to recognize student conceptions, address misconceptions and errors, identify strategies, and help make connections to other concepts. For example, a teacher may probe a student with questions after he works through a problem. These questions could include the following: “Why did you work the problem in this way?” “What were you thinking as you worked the problem?” “What strategy or strategies did you use to solve the problem?”

Last, there is systems-level formative assessment that occurs when specific assessments are created and used to understand students’ thinking. These assessments allow teachers to monitor students’ progress, provide students with feedback on their performance, and modify instruction based on students’ unique learning needs. They are time efficient, they are often computer based, and they provide immediate feedback for teachers. These systems are designed to influence teaching in ways that high-stakes testing do not. These include a screener, a diagnostic, and a progress monitoring tool.

### *Video 6*

The purpose of the ESTAR/MSTAR Diagnostic Assessments is to help identify why students are struggling with algebra-related content. The assessment will diagnose students’ current level of understanding and persistent misconceptions in algebra-readiness content. It is to be administered to students at risk of not being ready for algebra, in Tier II or Tier III, to help interventionists and teachers design supplemental instruction. Diagnostic items are in a multiple-choice format to allow for efficient administration and reporting.

This is a model used for RTI instruction with Tier II students. Those students who are in Tier II are provided with quality core instruction in addition to intensive intervention support and more frequent progress monitoring. The design of Tier II interventions should be based on the students’ specific strengths and areas of need using data provided by the diagnostic assessments and other instructionally relevant tools.

Using specific decision rules, the teacher and instructional team can decide if a student is making adequate progress towards the instructional goals or needs more intensive support.