

What are learning progressions?

How can they support student learning in the classroom?

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Learning progressions describe a path of increasing sophistication in student understanding in a subject matter domain. Learning progressions have been defined as the typical developmental sequence of skills and knowledge in a subject area over a span of time, based on research-conjectured hypotheses and validation studies. There are variations in the learning progressions that have been developed, however. Different types of learning progressions can be useful for different purposes.

While some types of learning progressions can inform standards and large-scale assessments, other types may be more helpful for teachers to support day-to-day student learning in the classroom (Alonzo & Steedle, 2009; Gotwals, 2012, 2017; Lehrer & Schauble, 2015). Specifically, it is important to consider the scope of the learning progression, which includes the amount of content and instructional time. In addition, the grain size of the learning progression, or the level of detail about the incremental changes in student thinking, is key to support student learning in the classroom (Alonzo, 2012; Mohan & Plummer, 2012).

Learning progressions and formative assessment

For the purposes of formative assessment, one way teachers can use learning progressions is to describe a series of incremental changes that occur in a student's thinking and skills that leads from achievement of one standard to the next in a subject matter domain. Along this pathway, there is a sequence of learning where the concepts or skills develop and deepen over time. This type of learning progression includes a series of building blocks that can be used to determine lesson-sized "chunks" of learning so that students' thinking and/or skills develop over time on the way to meeting a standard. Figure 1 shows an example of one set of building blocks for a standard for all students. Teachers may develop slightly different building blocks as needed by students at different levels of understanding.

Learning progressions include multiple building blocks

Content standards are usually substantive and too big for daily lesson planning. To plan for instruction and the formative assessment process, teachers need to describe the intermediate steps that occur in each student's thinking and ability as he or she advances in his or her learning from one standard to the next. These steps or series of changes can be thought of as "Building Blocks" (Tobiason, Chang, Heritage, & Jones, 2014). To identify a Building Block, a teacher can think about the learning steps that a student needs to take along a pathway to achieve a standard. Then, the teacher can use each Building Block to develop the related learning target(s) and success criteria. Together the Building Blocks, or learning steps, can be a form of learning progression.

How do building blocks make up a learning progression?

Building Blocks should connect to each other. They are a connected progression, not discrete or isolated instances of learning.

When teachers clarify the learning progression by outlining the Building Blocks necessary to achieve a standard, teachers are better equipped to determine the associated learning targets and success criteria for instruction. In addition, students will better understand how their learning may progress. Teachers also are better prepared to address misconceptions in student understanding— an important part of the formative assessment process.

Not all students follow the same path

Learning progressions describe "typical" learning paths. There can be outliers, and different ways in which students progress.

To learn more

- **Building Blocks, Learning Goals, and Success Criteria: Planning Instruction and Formative Assessment for K-8 Math Standards.** From the *College and Career Ready Standards to Teaching and Learning in the Classroom: A Series of Resources for Teachers. Center on Standards and Assessments Implementation.* Tobiason, G., Chang, S., Heritage, M., Jones, B., & Herman, J. (2014). <https://csaa.wested.org/resources>
- **Building Blocks, Learning Goals, and Success Criteria: Planning Instruction and Formative Assessment for K-12 English Language Arts and Literacy Standards.** From the *College and Career Ready Standards to Teaching and Learning in the Classroom: A Series of Resources for Teachers. Center on Standards and Assessments Implementation.* Lozano, M., Mancevice, N., Jones, B., Heritage, M., Chang, S., & Tobiason, G. (2013). <https://csaa.wested.org/resources>
- **Enhanced Learning Maps: Insights for Instruction.** The path to achievement is not linear. Center for Assessment and Accountability Research and Design, The University of Kansas. <https://enhancedlearningmaps.org>
- **Formative Assessment: What Do Teachers Need to Know and Do?** Margaret Heritage, Kappan, 2007, <https://bit.ly/3yvG0PJ>

There is not one path that all students will always follow in their learning. Due to differences in students' prior knowledge, experience, and skill, there will be differences as they work through these changes in understanding from the end of one standard to the next. Thus, students may follow different learning paths and take different amounts of time as they progress in their learning.

How do learning progressions support quality teaching and learning?

When the teacher thinks of learning targets for a lesson as part of a broader trajectory of learning and presents this sequence to students, it helps to communicate the purpose of learning this particular knowledge and skill, at this particular time, in this particular way. Teachers can clarify to students how this learning will build on past learning toward a broader learning goal.

Awareness of different learning paths helps the teacher to:

- understand how to connect the learning target for a given lesson to previous and future learning
- identify specific concepts and skills for student learning
- determine learning targets and success criteria
- connect instruction to learning goals
- collect relevant evidence of student understanding
- provide feedback to students about the next step in their learning
- identify and address individual student learning needs

Summary

Learning progressions are an important tool in the formative assessment process to help teachers and students connect prior knowledge to new learning as they move from less sophisticated to more sophisticated understandings.

- The teacher asks, "What steps do students need to make along the pathway of learning this standard?"
- A guiding question for the student is, "Now that I know X, what do I need to learn next to achieve the standard?"

Learning progressions can help teachers and students to make connections to the broader purpose of learning. In turn, students are able to take on greater ownership and become more active partners in their learning.

Figure 1: Example of a series of building blocks that compose a learning progression

Standard: Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 (CCSS Math Content 3. OA).

Building Blocks of a Standard	Learning Goal (Learning Target)	Success Criteria
<p>Block 1 Practice repeated addition of objects arranged in rectangular arrays with progressively more rows and columns (beyond 5 rows and 5 columns). EX $7+7+7+7$ and $2+2+2+2+2+2+2$</p>	Understand that a row in an array tells how many in the group and the column tells how many groups	Count the number in a group and the number of groups. Explain what happens when one more row and one more column are added to the array.
<p>Block 2 Move between symbolic ($2+2+2+2$) and concrete (four groups of 2 objects) representations of the same repeated addition number sentence.</p>	Understand that repeated addition can be represented with a number sentence or with a concrete representation (e.g., manipulatives arranged in an array).	Write a number sentence from a given concrete representation of repeated addition. Explain the correspondence between their number sentence and the given representation. Correctly model a given number sentence about repeated addition with a concrete representation. Explain the correspondence between their concrete representation and the given number sentence.
<p>Block 3 Describe repeated addition like $2+2+2+2$ as "the number 2, added four times," and then, "four times 2."</p>	Recognize the structure of repeated addition and understand that repeated addition can be expressed as the number of times a number repeats.	Create accurate number sentences using repeated addition, from a given set of objects. Make a pictorial representation of their number sentence. Describe the number of repeats in a concrete representation (e.g., "I have 6 repeats of this set of 3 things"). Correctly and precisely use the vocabulary "times" to express the number of repeats.

*See the cited reference for the complete list of Building Blocks for this standard.