

Guidelines for Developing Range Performance Level Descriptors

Christina Schneider
The National Center for the Improvement of
Educational Assessment
cschneider@nceia.org

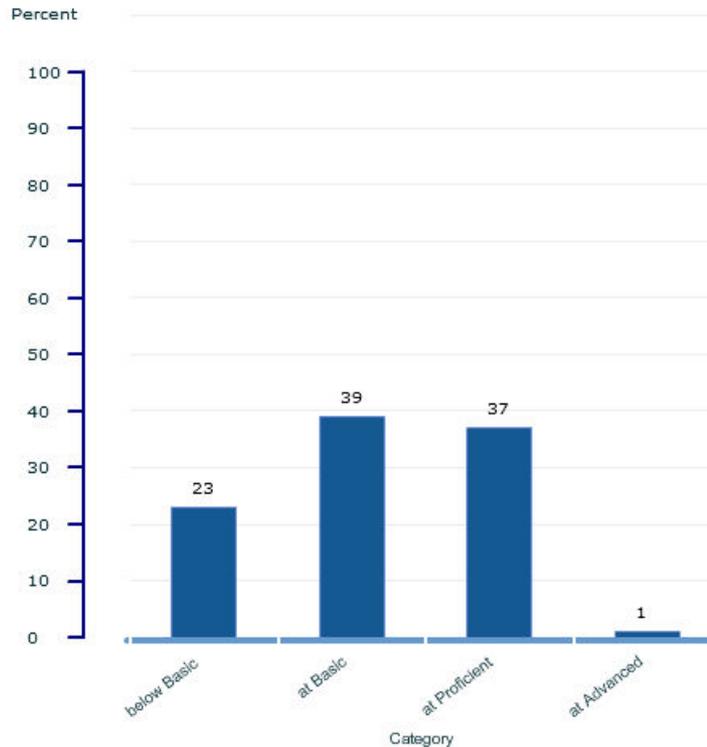
This work is licensed for your use under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Assessments

- measure what students know and can do in relation to the state standards.
- Test results will include
 - Scale scores
 - Performance levels

Performance Levels

- Group students based on test performance
- For example, Grade 4 Utah students on NAEP Science, 2009



NOTE: Detail may not sum to totals because of rounding. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2009 Science Assessment.

Performance Level Labels

- describe the student's level of achievement on a large scale assessment (e.g., Basic, Proficient, Advanced).

Performance Level

- articulate what a student **should** know and be able to do to be in a particular performance level

Retrieved from <http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/11/Smarter-Balanced-Math-ALDs.pdf>

<i>CLAIM 1: Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.</i>	<i>CONTENT ALD: The Level 1 student can minimally explain and in a minimal way apply mathematical concepts. The Level 1 student interprets and carries out mathematical procedures with minimal precision and fluency.</i>	<i>CONTENT ALD: The Level 2 student can partially explain and partially apply mathematical concepts. The Level 2 student interprets and carries out mathematical procedures with partial precision and fluency.</i>	<i>CONTENT ALD: The Level 3 student can adequately explain and adequately apply mathematical concepts. The Level 3 student interprets and carries out mathematical procedures with adequate precision and fluency.</i>	<i>CONTENT ALD: The Level 4 student can thoroughly explain and accurately apply mathematical concepts. The Level 4 student interprets and carries out mathematical procedures with high precision and fluency.</i>
Concepts and Procedures: Domain #1				
Operations and Algebraic Thinking				
RANGE ALD Target A: Represent and solve problems involving multiplication and division.	Level 1 students should be able to represent multiplication and division problems within 100 involving equal groups of objects.	Level 2 students should be able to use multiplication and division within 100 to solve one-step problems using arrays, to interpret the meaning of multiplication of two whole numbers, and to determine the unknown number in a multiplication equation relating three whole numbers.	Level 3 students should be able to select the appropriate operation (multiplication or division) within 100 to solve one-step problems involving measurement quantities of single-digit whole numbers and determine the unknown number in a division equation relating three whole numbers. They should be able to interpret the meaning of whole number quotients of whole numbers.	Level 4 students should be able to use multiplication and division within 100 to solve one-step problems involving measurement quantities.
RANGE ALD Target B: Understand properties of multiplication and the relationship between multiplication and division.		Level 2 students should be able to apply the commutative property of multiplication to mathematical problems with one-digit factors.	Level 3 students should be able to apply the commutative and associative properties of multiplication and the distributive property within 100. They should be able to understand the relationship between multiplication and division when solving an unknown factor problem.	Level 4 students should be able to communicate a deep understanding of the commutative and associative properties of multiplication and the relationship between multiplication and division.
RANGE ALD Target C: Multiply and divide within 100.	Level 1 students should be able to multiply a one-digit number by 1, 2, and 5.	Level 2 students should be able to recall from memory all products of two one-digit numbers.	Level 3 students should be able to apply relevant strategies to fluently multiply and divide within 100 and recognize division as an unknown factor problem.	Level 4 students should be able to use relevant procedures to multiply or divide in a wide range of contexts.
RANGE ALD Target D: Solve problems involving the four operations and identify and explain patterns in arithmetic.	Level 1 students should be able to represent and solve one-step problems using addition and subtraction within 100 and multiplication and division within the 10 by 10 multiplication table.	Level 2 students should be able to solve two-step problems using addition and subtraction with numbers larger than 100 and solutions within 1,000; assess the reasonableness of an answer; and identify patterns in the addition table.	Level 3 students should be able to solve two-step problems using multiplication and division within the 10 by 10 multiplication table. They should be able to represent the problem using equations with a letter or symbol to represent an unknown quantity. They should also be able to explain patterns in the multiplication table.	Level 4 students should be able to use the properties of operations to explain arithmetic patterns (including patterns in the addition and multiplication tables).

Different Types of PLDS

- Policy
 - Range
 - Target
 - Reporting
-
- The purpose of this workshop is to create the Range PLDs.



Policy PLDs

- Describe the vision of what it means, for example, to be Proficient.

Proficient

The Level 3 student is proficient in applying the science knowledge/skills as specified in the Utah Core State Standards. The student generally performs at the standard for their grade level, is able to access grade level content, and engage in higher order thinking skills with some independence and minimal support.



Range PLDs

- demonstrate how the skill described in a standard changes and becomes more sophisticated across performance levels
- Define the increasing content, cognitive level reasoning, and contextual evidence needed to categorize students into a particular performance level

Level 1	Level 2	Level 3	Level 4
Asks and answers explicit questions to demonstrate understanding of a text.	Asks and answers explicit questions to demonstrate understanding text, referring to the text as the basis for answers.	Asks and answers questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.	Asks and answers complex questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.

Retrieved from Utah Department of Education: [http://www.schools.utah.gov/assessment/Adaptive-Assessment-System/English-Language Arts/DRAFTELAandLiteracyGrade3PLDs.aspx](http://www.schools.utah.gov/assessment/Adaptive-Assessment-System/English-Language%20Arts/DRAFTELAandLiteracyGrade3PLDs.aspx)



Target PLDs

- Specify a state's expectations for students at the **threshold** of the performance level
- Define the **state's policy** and content-based expectations
- Guide the cut score recommendation workshop by describing the transition point skills that move a student *just* into the Proficient level.

Proficient

Proficient students located at the cut score are able to read, analyze, and make connections to texts of different genres. These students are able to cite specific pieces of evidence to support their conclusions and the main of idea of texts in a cogent manner. When reading unfamiliar texts, Proficient students located at the cut score are able to use multiple strategies to determine the meaning of unfamiliar words such as using root words, affixes, prefixes, and context clues. **Students at the threshold of this category are ready to be successful in the next grade.**



Reporting PLDs

- Reconcile the Target PLDs with the final cut scores that are the outcome of the standard setting process
- Link the PLDs to the actual test scale
- Beyond the scope of this workshop

Assumptions

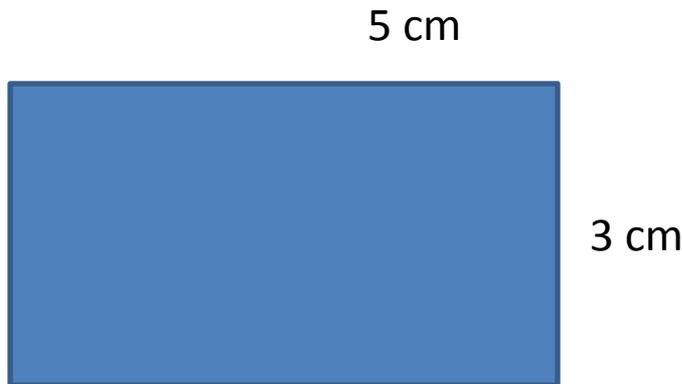
- items measuring skills across performance levels should increase in difficulty. The easiest items should be represented in the skills in *Below Basic* and the most difficult should represent skills found in *Advanced*
- descriptions about what students *should* be able to do within a performance level should be reflective of the Policy PLDs and tasks students are asked to perform on the assessment and in the classroom in terms of
 - Content
 - Cognitive complexity reasoning
 - Context
- PLDs depict the evidence students need to show in order for stakeholders to conclude they are engaging in more complex knowledge, skills, and reasoning as the scale increases (e.g., the evidence for *Advanced* is more difficult than in *Basic*)

Range PLDs should define how the **content** increases in difficulty as performance levels increase.

Level 1	Level 2	Level 3	Level 4
<p>Apply perimeter formula to a rectangle in a mathematical problem when 1 digit whole numbers are used</p>	<p>Solve for an unknown side length of a rectangle when given the perimeter in a mathematical problem</p>	<p>Apply perimeter formula to a rectangle in a multistep real world problem</p>	<p>Apply perimeter formula to polygons and solve for an unknown side length in a real world problem when whole numbers and fractions are used</p>

Range PLDs describe content that grows in sophistication.

Find the perimeter.



Apply perimeter formula to a rectangle in a mathematical problem when 1 digit whole numbers are used

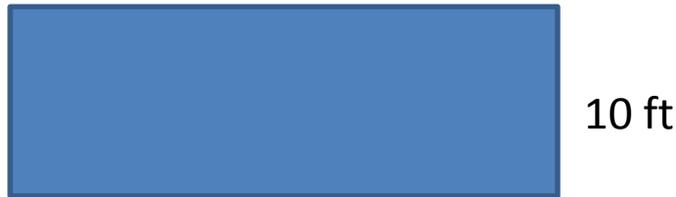
If the perimeter=98 ft, how long is the value L?



Solve for an unknown side length of a rectangle when given the perimeter in a mathematical problem

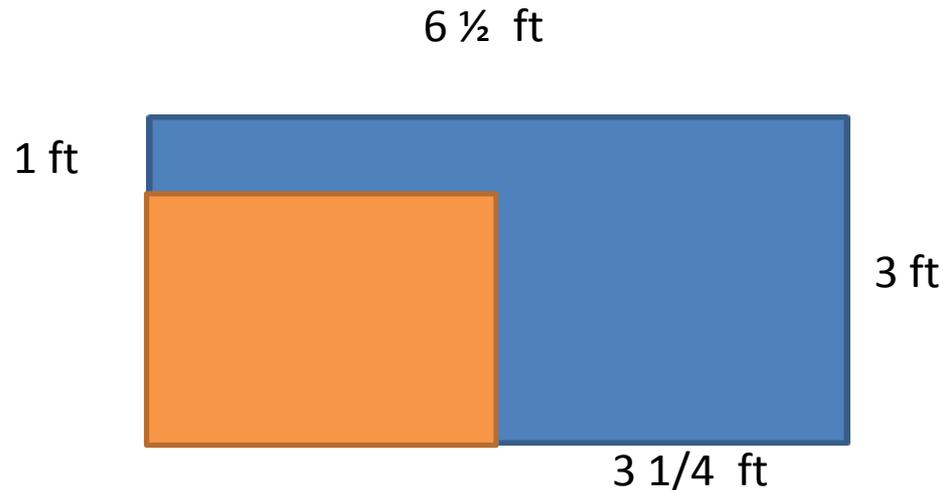
Range PLDs describe content that grows in sophistication.

A rectangular driveway has a width of 10 feet. The length is five times the width. What is the perimeter?



Apply perimeter formula to a rectangle in a multistep real world problem

A porch has a length of $6\frac{1}{2}$ ft and a width of 3 feet. What is the perimeter of the box sitting on the porch?



Apply perimeter formula to polygons and solve for an unknown side length in a real world problem when whole numbers and fractions are used

Range PLDs describe content that grows in sophistication.

- What water cycle concepts are easy (concrete)?
- What water cycle concepts are hard (abstract)?
- Range PLDs describe what students *should* be able to do given good instruction and the policy vision.

Level 1	Level 2	Level 3	Level 4
<p>Identifies evaporation and precipitation in the water cycle and identifies bodies of water as water holding location. Identifies liquid and solid as a state and reports observations of simple patterns</p>	<p>Identifies condensation, explains the difference between evaporation and condensation in the water cycle, identifies atmosphere as water holding location, and identifies gas as a state, makes simple predictions and inferences based on observations, constructs simple diagrams of the water cycle</p>	<p>Identifies evaporation as occurring from people, plants, ice and ground water as well as identifies them as a water holding location, supports predictions and inferences with data and evidence, and constructs sophisticated diagrams of the water cycle</p>	<p>Understands water supply is constant, relates water cycle principles to the water supply in his/her community, and relates evaporation and condensation to fluctuations in temperature</p>



Range PLDs describe content that grows in sophistication.

- Describe content not the frequency with which students respond to content
- Avoid phrases such as partially demonstrates, adequately demonstrates, and consistently demonstrates
- Describe *when* student can demonstrate the skill

Level 1	Level 2	Level 3	Level 4
uses specific aspects of a text's simple illustrations to understand the text and identifies explicit details about how the illustrations reflect characters, setting or mood	uses specific aspects of a text's simple illustrations to understand the text and make lower-level inferences about how the illustrations reflect characters, setting, or mood	explains how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting)	explains how specific aspects of a text's complex illustrations contribute to an understanding of the text; makes higher-level inferences about how the illustrations reflect mood, characters, and setting

Retrieved from Utah Department of Education: <http://www.schools.utah.gov/assessment/Adaptive-Assessment-System/English-Language-Arts/DRAFTELAandLiteracyGrade3PLDs.aspx>



Cognitive complexity (e.g., DOK) is embedded into the skill trajectory and not wed to a particular performance level

Level 1	Level 2	Level 3	Level 4
identify data point in a simple graph	use data points in a line graph with 1 point increments to solve one-step problem	use data points in a line graph with more than 1 point increments to solve a one-step real world problem	use data points in a double line graph with more than 1 point increments to solve a multi-step real world problem

Complexity is embedded into the skill trajectory and not wed to a particular performance level

Level 1	Level 2	Level 3	Level 4
<p>Observe and record effects of air temperature on precipitation when measurements are provided</p>	<p>Observe, measure, and record effects of air temperature on precipitation. Graph data when scaffolding is provided.</p>	<p>Independently graph recorded data to show daily and seasonal patterns in weather, explains relationships between wind and weather change</p>	<p>Infer relationships between wind and weather change and make predications</p>

Complexity is embedded into the skill trajectory and not wed to a particular performance level

- **RL.3.4. Determine the meaning of words and phrases as they are used in a text, distinguishing literal from nonliteral language.**

Level 1	Level 2	Level 3	Level 4
Identify the meaning of common multiple meaning words when support is explicit in the text	Identify the meaning of unfamiliar words in context when support is implicit in the text	Interpret meaning of figurative language in text, distinguishing literal from nonliteral language	Interpret multiple layered meanings of figurative language in text, distinguishing literal from nonliteral language

Complexity is embedded into the skill trajectory and not wed to a particular performance level

- Cognitive complexity transition points should vary based upon the skill.

Level 1	Level 2	Level 3	Level 4
identify data point in a simple graph	use data points in a line graph with 1 point increments to solve one-step problem	use data points in a line graph with more than 1 point increments to solve a one-step real world problem	use data points in a double line graph with more than 1 point increments to solve a multi-step real world problem



Contextual characteristics describe the conditions under which a student can demonstrate their knowledge and skills

Level 1	Level 2	Level 3	Level 4
uses specific aspects of a text's simple illustrations to understand the text and identifies explicit details about how the illustrations reflect characters, setting or mood	uses specific aspects of a text's simple illustrations to understand the text and make lower-level inferences about how the illustrations reflect characters, setting, or mood	explains how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting)	explains how specific aspects of a text's complex illustrations contribute to an understanding of the text; makes higher-level inferences about how the illustrations reflect mood, characters, and setting

Retrieved from Utah Department of Education: <http://www.schools.utah.gov/assessment/Adaptive-Assessment-System/English-Language-Arts/DRAFTELAandLiteracyGrade3PLDs.aspx>



Contextual characteristics describe the conditions under which a student can demonstrate their knowledge and skills

Level 1	Level 2	Level 3	Level 4
identify data point in a single bar graph or circle graph	use data points in a line graph with 1 point increments to solve one-step problem	use data points in a line graph with more than 1 point increments to solve a one-step real world problem	use data points in a double line graph with more than 1 point increments to solve a multi-step real world problem



Contextual characteristics describe the conditions under which a student can demonstrate their knowledge and skills

Level 1	Level 2	Level 3	Level 4
<p>Identifies evaporation and precipitation in the water cycle and identifies bodies of water as water holding location. Identifies liquid and solid as a state and reports observations of simple patterns</p>	<p>Identifies condensation using, explains the difference between evaporation and condensation in the water cycle, identifies atmosphere as water holding location, and identifies gas as a state and makes simple predictions and inferences based on observations, constructs simple diagrams of the water cycle</p>	<p>Identifies evaporation as occurring from people, plants, ice and ground water as well as identifies them as a water holding location, supports predictions and inferences with data and evidence; and constructs sophisticated diagrams of the water cycle</p>	<p>Understands water supply is constant, relates water cycle principles to the water supply in his/her community, and relates evaporation and condensation to fluctuations in temperature</p>

Review

- Content becomes more rigorous across performance levels. Describe the content rather than the frequency of it.
- Related skills within a grade should grow similarly across standards/objectives.
- Cognitive complexity follows the skill trajectory and varies in how it changes depending upon the skill being measured rather than the performance level.
- Context describes when students can demonstrate the skill. It is a mix of content and degree of scaffolding found in tasks students are asked to do. For example, are students solving problems with benchmark fractions (e.g., $\frac{1}{2}$, $\frac{1}{4}$) or more sophisticated fractions?

Links if Needed

Smarter Balanced Assessment Consortium Range Achievement Level Descriptors

English Language Arts/literacy

<http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/11/Smarter-Balanced-ELA-Literacy-ALDs.pdf>

Mathematics

<http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/11/Smarter-Balanced-Math-ALDs.pdf>

Partnership for Assessment of Readiness for College and Careers

English Language Arts/literacy

<http://www.parcconline.org/ela-plds>

Mathematics

<http://www.parcconline.org/math-plds>