

Unpacked South Dakota State Mathematics Standards

Purpose: *In order for students to have the best chance of success, standards, assessment, curriculum resources, and instruction must be aligned in focus, coherence, and rigor. Unpacked standards documents are intended to help align instruction to the focus, coherence, and rigor of the South Dakota State Mathematics Standards. The standards have been organized in clusters as they are not so much built from topics, but rather woven out of progressions. Not all content in a given grade is emphasized equally in the mathematics standards. Some clusters require greater emphasis than others based on the depth of the ideas, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. To say that some things have greater emphasis is not to say that anything in the standards can safely be neglected in instruction. Neglecting standards will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.*

Domain: Precalculus		Grade Level: 4th Year
HS4.PC.L.A Cluster: Define a continuous function. Students use limits to understand the concept of continuity.		
<p>This is a SUPPORTING cluster. <i>Students should spend the large majority of their time (65-85%) on the major work of the grade. Supporting work and, where appropriate, additional work should be connected to and engage students in the major work of the grade.</i></p> <p>PC.L.1 Determine if a function is continuous at a point. Find the types of discontinuities of a function and relate them to finding limits of a function. Use the concept of limits to describe discontinuity and end-behavior of the function.</p>		
Aspects of Rigor of Student Learning: (Conceptual, Procedural, and/or Application)		
<p>PC.L.1 Determine if a function is continuous at a point. Find the types of discontinuities of a function and relate them to finding limits of a function. Use the concept of limits to describe discontinuity and end-behavior of the function.</p>		
Conceptual Understanding	Procedural Fluency	Application
Students should understand that a function is continuous at a point if a limit exists at the point, the function is defined at the point, and the limit equals the function value at the point.	Students determine if a function is continuous at a point. Students determine if a function is continuous on an interval. Students identify where a function is discontinuous and the type of discontinuity.	
Enacting the Mathematical Practices - Evidence of Students Engaging in the Practices		
<ol style="list-style-type: none"> 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. <ul style="list-style-type: none"> • Students should be able to justify their continuity findings, often by detailing discontinuities and/or limits. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. <ul style="list-style-type: none"> • Students use the concept of continuity to further explore rational functions and understand the characteristics that define them. 8. Look for and express regularity in repeated reasoning. 		
Vertical and Horizontal Coherence and Learning Progressions		

<u><i>Previous Learning Connections</i></u>	<u><i>Current Learning Connections</i></u>	<u><i>Future Learning Connections</i></u>
In Algebra II students graph rational functions and encounter vertical asymptotes, horizontal asymptotes, and holes which lead to the discussion of discontinuity.	Students use limits to understand the concept of continuity.	Since many theorems in Calculus start with “If the function is continuous...”, continuity is a key concept for all Calculus classes.
<i>Vocabulary (key terms and definitions)</i>		
<ul style="list-style-type: none"> ● Continuity ● Discontinuity ● Removable discontinuity ● Non-removable discontinuity ● End behavior 		
<i>Relevance, Explanations, and Examples:</i>		