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: Geometry	Grade Level: Kindergarten

K.G.B Cluster: Analyze, compare, create, and compose shapes.
(squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)

Students will understand the specific attributes that define a shape's name, and other attributes that do not define the shape's name. Using the attributes, students will identify and describe what shapes look like. Students need numerous activities to explore various forms of shapes including different types of triangles, different sizes, and different orientations.

This is a SUPPORTING cluster. *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.*

K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

K.G.6 Compose simple shapes to form larger shapes.

Aspects of Rigor for Student Learning: (Conceptual, Procedural, and/or Application)

Conceptual Understanding	*Procedural Fluency*	*Application*
Identify the attributes of two and three dimensional shapes **(K.G.4)** Compare two and three dimensional shapes based on the shapes similarities and differences **(K.G.4)** Describe a shapes attributes using informal language (eg., number of sides, number of dimensions, number of corners, length of side, color, size, etc) **(K.G.4)** Teacher Notes: Clarify the misconception that size and color are not defining attributes of shape; for example, not all circles should be red. **(K.G.4)** Clarify that all shapes must be closed		

*see example 1 below in the relevance, explanations and examples. **(K.G.4)**		
Model shapes by building and drawing using different materials **(K.G.5)**		
Combine simple shapes to create larger shapes and pictures (eg., combining two triangles to form a rectangle, or using geoblocks to create a boat) * see Example 2 in Relevance, Explanations, and Examples **(K.G.6)**		

Enacting the Mathematical Practices - Evidence of Students Engaging in the Practices

1. **Make sense of problems and persevere in solving them.**
   - The composing of larger shapes and pictures from smaller shapes
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
   - Use shapes to create a representation of real world objects
   - Use shapes to create a new shape
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
   - Use accurate vocabulary for names of shapes and attributes
   - Use position words clearly to indicate the location of shapes
7. **Look for and make use of structure.**
   - Recognize shapes with a particular set of attributes will have the same name
   - Sort a collection of shapes according to attributes
   - Perceive a variety of shapes in their environments and describe these shapes
8. **Look for and express regularity in repeated reasoning.**

Vertical and Horizontal Coherence and Learning Progressions

Previous Learning Connections	*Current Learning Connections*	*Future Learning Connections*
Early childhood learning guidelines address: Build and describe two-dimensional shapes, such as making circles and triangles with blocks and play dough Sort and match objects with the same shape and size, and lay an object of the same shape and size on top of another to show they are the same Make a picture by combining shapes Compare length and other attributes of objects, using the terms bigger, longer, and taller	Learners in kindergarten are building upon their knowledge of identifying and describing shapes **(K.G.1, 2, 3)** Students will use their knowledge of sorting by attributes to investigate measurement and data **(KMD.1,2,3)**	These understandings developed in kindergarten will support the following learning in first grade: Reason with shapes and their defining attributes Identification of additional shapes (trapezoids, half-circles, quarter-circles) Combine three-dimensional shapes to create larger shapes

Arrange objects in order according to characteristics or attributes, such as height		

Vocabulary *(Key Terms Used by Teachers and Students in this Cluster):*

- Shape
- Square
- Circle
- Triangle
- Rectangle
- Hexagon
- Cube
- Cone
- Cylinder
- Sphere
- Flat

- Solid
- Two-dimensional
- Three-dimensional
- Describe
- Compare
- Sort
- Same
- Alike
- Different
- Size

- Attributes
- Sides
- Straight
- Round
- Combine
- Build
- Add
- Different
- Larger
- Smaller

***Relevance, Explanations, and Examples:***

Example 1
Image A is classified as a shape, triangle, because it has three sides that meet forming a closed figure. Image B is not a shape because the sides do not meet and do not close the figure.

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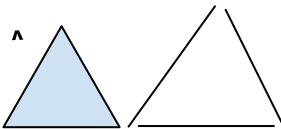
Example 2
Creating larger shapes by combining different shapes. Shapes are used in a variety of orientations, also.

Combining shapes to build pictures

a   b
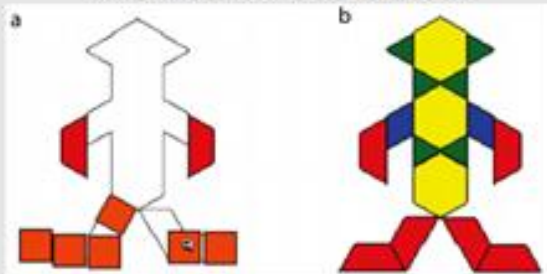
Students first use trial and error (part a) and gradually consider components (part b).