

North Dakota Mathematics Content and Achievement Standards

Standard 2

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North Dakota Department of Public Instruction

Dr. Wayne G. Sanstead, State Superintendent

600 E Boulevard Avenue, Dept. 201

Bismarck, North Dakota 58505-0440

www.dpi.state.nd.us



Standard 2: Geometry and Spatial Sense

Standard 2: Student understands and applies geometric concepts and spatial relationships to represent and solve problems in mathematical and nonmathematical situations.				
Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
Kindergarten				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
K.2.1. Identify and reproduce two-dimensional figures; i.e., circle, triangle, rectangle, and square	Students identify and reproduce two-dimensional figures with no errors.	Students identify and reproduce two-dimensional figures with no significant errors.	Students identify and reproduce two-dimensional figures with a few significant errors.	Students identify and reproduce two-dimensional figures with many significant errors.
K.2.2. Match a three-dimensional object with its stated name; i.e., cone, sphere, cube, cylinder (e.g., which of these is a cone?)	Students match a three-dimensional object with its name with no errors.	Students match a three-dimensional object with its name with no significant errors.	Students match a three-dimensional object with its name with a few significant errors.	Students match a three-dimensional object with its name with many significant errors.
COORDINATE GEOMETRY				
<i>No expectations at this level</i>				
TRANSFORMATION AND SYMMETRY				
<i>No expectations at this level</i>				
VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING				
K.2.3. Identify position and direction; i.e., inside, outside, between, above, below, behind, left, and right	Students use terms to identify position and direction with no errors.	Students use terms to identify position and direction with no significant errors.	Students use terms to identify position and direction with a few significant errors.	Students use terms to identify position and direction with many significant errors.

Standard 2: Student understands and applies geometric concepts and spatial relationships to represent and solve problems in mathematical and nonmathematical situations.

Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
Grade 1				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
1.2.1. Identify, compare, draw, and sort two-dimensional figures; i.e., circle, triangle, rectangle, square, oval, and diamond	Students identify, compare, draw, and sort two-dimensional figures with no errors.	Students identify, compare, draw, and sort two-dimensional figures with no significant errors.	Students identify, compare, draw, and sort two-dimensional figures with a few significant errors.	Students identify, compare, draw, and sort two-dimensional figures with many significant errors.
1.2.2. Identify three-dimensional objects; i.e., pyramid, cube, cone, cylinder, sphere	Students identify three-dimensional objects with no errors.	Students identify three-dimensional objects with no significant errors.	Students identify three-dimensional objects with a few significant errors.	Students identify three-dimensional objects with many significant errors.
COORDINATE GEOMETRY				
<i>No expectations at this level</i>				
TRANSFORMATION AND SYMMETRY				
1.2.3. Identify lines of symmetry in two-dimensional figures	Students identify lines of symmetry in two-dimensional figures with no errors.	Students identify lines of symmetry in two-dimensional figures with no significant errors.	Students identify lines of symmetry in two-dimensional figures with a few significant errors.	Students identify lines of symmetry in two-dimensional figures with many significant errors.
VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING				
1.2.4. Arrange and describe objects in space by proximity, position, and direction; e.g., near, far, below, above, up, down, behind, in front of, next to, left or right of	Students arrange and describe objects in space by proximity, position, and direction with no errors.	Students arrange and describe objects in space by proximity, position, and direction with no significant errors.	Students arrange and describe objects in space by proximity, position, and direction with a few significant errors.	Students arrange and describe objects in space by proximity, position, and direction with many significant errors.

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Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
Grade 2				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
2.2.1. Recognize geometric shapes and structures in their environment	Students recognize an extensive variety of geometric shapes and structures in their environment.	Students recognize a variety of geometric shapes and structures in their environment.	Students recognize some different geometric shapes and structures in their environment.	Students recognize a limited number of geometric shapes and structures in their environment.
2.2.2. Identify, describe, and sort three-dimensional objects; i.e., pyramid, cube, rectangular prism, cone, cylinder, and sphere	Students identify and sort three-dimensional objects with no errors and describe them in great detail.	Students identify and sort three-dimensional objects with no significant errors and describe them in adequate detail.	Students identify and sort three-dimensional objects with a few significant errors or describe them in some detail.	Students identify and sort three-dimensional objects with many significant errors or describe them in minimal detail.
2.2.3. Predict and demonstrate the results of putting together and taking apart shapes	Students make predictions about, and demonstrate the results of, combining and taking apart shapes with no errors.	Students make predictions about, and demonstrate the results of, combining and taking apart shapes with no significant errors.	Students make predictions about, and demonstrate the results of, combining and taking apart shapes with a few significant errors.	Students make predictions about, and demonstrate the results of, combining and taking apart shapes with many significant errors.
COORDINATE GEOMETRY				
<i>No expectations at this level</i>				
TRANSFORMATION AND SYMMETRY				
2.2.4. Identify symmetrical shapes and draw their line of symmetry	Students identify symmetrical shapes and draw their line of symmetry with no errors.	Students identify symmetrical shapes and draw their line of symmetry with no significant errors.	Students identify symmetrical shapes or draw their line of symmetry with a few significant errors.	Students identify symmetrical shapes or draw their line of symmetry with many significant errors.
2.2.5. Identify congruent figures from a selection of similar figures	Students identify congruent figures from a selection of similar figures with no errors.	Students identify congruent figures from a selection of similar figures with no significant errors.	Students identify congruent figures from a selection of similar figures with a few significant errors.	Students identify congruent figures from a selection of similar figures with many significant errors.

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	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING <i>No expectations at this level</i>				
Grade 3				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
3.2.1. Compare physical attributes of two-dimensional shapes; i.e., square, triangle, rectangle, and parallelogram	Students compare the physical attributes of two dimensional shapes with no errors.	Students compare the physical attributes of two dimensional shapes with no significant errors.	Students compare the physical attributes of two dimensional shapes with a few significant errors.	Students compare physical attributes of two dimensional shapes with many significant errors.
3.2.2. Describe the characteristics of a cylinder, pyramid, cube, sphere, and cone	Students describe in great detail the characteristics of various three-dimensional shapes.	Students describe in adequate detail the characteristics of various three-dimensional shapes.	Students describe in some detail the characteristics of various three-dimensional shapes.	Students describe in minimal detail the characteristics of various three-dimensional shapes.
3.2.3. Identify points, endpoints, lines, line segments, rays, and angles and use symbols to represent them	Students identify points, endpoints, lines, line segments, rays, angles, and right angles and use symbols to represent them with no errors.	Students identify points, endpoints, lines, line segments, rays, angles, and right angles and use symbols to represent them with no significant errors.	Students identify points, endpoints, lines, line segments, rays, angles, and right angles and use symbols to represent them with a few significant errors.	Students identify points, endpoints, lines, line segments, rays, angles, and right angles and use symbols to represent them with many significant errors.
3.2.4. Identify right angles				
COORDINATE GEOMETRY				
3.2.5. Use ordered pairs to identify the locations of points in a grid; e.g., A-10 on a map	Students use ordered pairs to identify the locations of points in a grid with no errors.	Students use ordered pairs to identify the locations of points in a grid with no significant errors.	Students use ordered pairs to identify the locations of points in a grid with some significant errors.	Students use ordered pairs to identify the locations of points in a grid with many significant errors.

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TRANSFORMATION AND SYMMETRY				
3.2.6. Identify and create shapes that have lines of symmetry	Students identify and create shapes that have lines of symmetry with no errors.	Students identify and create shapes that have lines of symmetry with no significant errors.	Students identify and create shapes that have lines of symmetry with a few significant errors.	Students identify and create shapes that have lines of symmetry with many significant errors.
3.2.7. Identify two-dimensional shapes that are congruent or similar	Students identify two-dimensional shapes that are congruent or similar with no errors.	Students identify two-dimensional shapes that are congruent or similar with no significant errors.	Students identify two-dimensional shapes that are congruent or similar with a few significant errors.	Students identify two-dimensional shapes that are congruent or similar with many significant errors.
VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING				
<i>No new expectations at this level</i>				
Grade 4				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
4.2.1. Analyze and describe the attributes of two- and three-dimensional shapes (i.e., circle, squares, trapezoid, rhombus)	Students analyze and describe in great detail the significant attributes, as well as less obvious but relevant attributes, of two- and three-dimensional shapes.	Students analyze and describe in adequate detail the significant attributes of two- and three-dimensional shapes.	Students analyze and describe in some detail the significant attributes of two- and three-dimensional shapes.	Students analyze and describe in minimal detail the significant attributes of two- and three-dimensional shapes or describe only insignificant attributes.
4.2.2. Identify, describe, and model (e.g., using straws or other materials) parallel, perpendicular, and intersecting lines and line segments	Students identify, describe, and model parallel, perpendicular, and intersecting lines and line segments with no errors.	Students identify, describe, and model parallel, perpendicular, and intersecting lines and line segments with no significant errors.	Students identify, describe, and model parallel, perpendicular, and intersecting lines and line segments with a few significant errors.	Students identify, describe, and model parallel, perpendicular, and intersecting lines and line segments with many significant errors.

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<p>COORDINATE GEOMETRY</p> <p><i>No new expectations at this level (See Grade 3)</i></p> <p>TRANSFORMATION AND SYMMETRY</p>				
<p>4.2.3. Recognize the changes in position and orientation of two-dimensional figures after transformations; i.e., flips (reflections), turns (rotations), and slides (translations)</p>	Students recognize the changes in position and orientation of two-dimensional figures after transformations with no errors.	Students recognize the changes in position and orientation of two-dimensional figures after transformations with no significant errors.	Students recognize the changes in position and orientation of two-dimensional figures after transformations with a few significant errors.	Students recognize the changes in position and orientation of two-dimensional figures after transformations with many significant errors.
<p>4.2.4. Use motion geometry to show that shapes are congruent or similar</p>	Students use motion geometry to show that shapes are congruent or similar with no errors.	Students use motion geometry to show that shapes are congruent or similar with no significant errors.	Students use motion geometry to show that shapes are congruent or similar with a few significant errors.	Students use motion geometry to show that shapes are congruent or similar with many significant errors.
<p>VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING</p> <p><i>No new expectations at this level</i></p>				
Grade 5				
<p>TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS</p>				
<p>5.2.1. Describe properties and attributes of two- and three-dimensional figures; i.e., obtuse angle, acute angle, radius, chord, diagonal, equilateral triangle, isosceles triangle, parallel lines, perpendicular lines</p>	Students describe all significant properties and attributes of two- and three-dimensional figures.	Students describe most significant properties and attributes of two- and three-dimensional figures.	Students describe some significant properties and attributes of two- and three-dimensional figures.	Students describe very few significant properties and attributes of two- and three-dimensional figures.

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5.2.2. Draw circles using a compass, and identify the components; i.e., radius, chord, diameter, center, and circumference	Students use a compass and protractor with ease to draw circles and angles.	Students use a compass and protractor with minimal difficulty to draw circles and angles.	Students use a compass and protractor with some difficulty to draw circles and angles.	Students use a compass and protractor with great difficulty to draw circles and angles.
5.2.3. Identify the attributes of an angle and draw angles using protractors	Students identify all components of a circle and attributes of an angle.	Students identify the most significant components of a circle and attributes of an angle.	Students identify some of the significant components of a circle and attributes of an angle.	Students identify very few significant components of a circle and attributes of an angle.
5.2.4. Determine the degrees of the interior angles of triangles and quadrilaterals	Students determine the degrees of the interior angles of triangles and quadrilaterals with no errors.	Students determine the degrees of the interior angles of triangles and quadrilaterals with no significant errors.	Students determine the degrees of the interior angles of triangles and quadrilaterals with a few significant errors.	Students determine the degrees of the interior angles of triangles and quadrilaterals with many significant errors.
5.2.5. Determine the characteristics of, and the relationships among, points, lines, line segments, rays, and planes	Students determine all significant characteristics of, and relationships among, points, lines, line segments, rays, and planes.	Students determine the most significant characteristics of, and relationships among, points, lines, line segments, rays, and planes.	Students determine some significant characteristics of, and relationships among, points, lines, line segments, rays, and planes.	Students determine very few significant characteristics of, and relationships among, points, lines, line segments, rays, and planes.
COORDINATE GEOMETRY				
5.2.6. Use ordered pairs in quadrant 1 of a coordinate grid	Students use ordered pairs in quadrant 1 of a coordinate grid with no errors.	Students use ordered pairs in quadrant 1 of a coordinate grid with no significant errors.	Students use ordered pairs in quadrant 1 of a coordinate grid with a few significant errors.	Students use ordered pairs in quadrant 1 of a coordinate grid with many significant errors.

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<p>TRANSFORMATION AND SYMMETRY</p> <p>5.2.7. Describe properties of congruent figures and use them to solve problems</p>	<p>Students describe in great detail properties of congruent figures and use them to solve problems with no errors.</p>	<p>Students describe in adequate detail properties of congruent figures and use them to solve problems with no significant errors.</p>	<p>Students describe in some detail properties of congruent figures and/or use them to solve problems with a few significant errors.</p>	<p>Students describe in minimal detail properties of congruent figures and/or use them to solve problems with many significant errors.</p>
<p>VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING</p> <p><i>No new expectations at this level</i></p>				
Grade 6				
<p>TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS</p> <p>6.2.1. Identify relationships between pairs of angles; i.e., adjacent, vertical, complementary, and supplementary</p>	<p>Students identify relationships between pairs of angles with no errors.</p>	<p>Students identify relationships between pairs of angles with no significant errors.</p>	<p>Students identify relationships between pairs of angles with a few significant errors.</p>	<p>Students identify relationships between pairs of angles with many significant errors.</p>
<p>6.2.2. Identify polygons; i.e., triangle, rectangle, square, rhombus, parallelogram, trapezoid, pentagon, hexagon, octagon</p>	<p>Students identify polygons with no errors.</p>	<p>Students identify polygons with no significant errors.</p>	<p>Students identify polygons with a few significant errors.</p>	<p>Students identify polygons with many significant errors.</p>
<p>6.2.3. Describe the characteristics of a right triangle</p>	<p>Students describe in great detail the characteristics of a right triangle.</p>	<p>Students describe in adequate detail the characteristics of a right triangle.</p>	<p>Students describe in some detail the characteristics of a right triangle.</p>	<p>Students describe in minimal detail the characteristics of a right triangle.</p>

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COORDINATE GEOMETRY				
6.2.4. Use ordered pairs to locate a point on a coordinate plane	Students use ordered pairs to locate points on a coordinate plane with no errors.	Students use ordered pairs to locate points on a coordinate plane with no significant errors.	Students use ordered pairs to locate points on a coordinate plane with a few significant errors.	Students use ordered pairs to locate points on a coordinate plane with many significant errors.
TRANSFORMATION AND SYMMETRY				
6.2.5. Identify, describe, and model motion geometry; i.e., rotations, reflections, and translations	Students identify and model transformations with no errors and describe transformations in great detail.	Students identify and model transformations with no significant errors and describe transformations in adequate detail.	Students identify and model transformations with a few significant errors or describe transformations in some detail.	Students identify and model transformations with many significant errors and describe transformations in minimal detail.
VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING				
6.2.6. Draw basic geometric figures using appropriate tools; i.e., circle with a compass, triangle and rectangle with a ruler or straight edge	Students select a tool and draw basic geometric figures with no errors.	Students select a tool and draw basic geometric figures with no significant errors.	Students select a tool and draw basic geometric figures with a few significant errors.	Students select a tool and draw basic geometric figures with many significant errors.
Grade 7				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
7.2.1. Make observations about relationships between two- and three-dimensional figures; e.g., a cube is made with six squares	Students make insightful observations about the relationships between two- and three-dimensional figures.	Students make relevant observations about the relationships between two- and three-dimensional figures.	Students make obvious observations about the relationships between two- and three-dimensional figures.	Students make irrelevant observations about the relationships between two- and three-dimensional figures.
7.2.2. Classify triangles based on side and angle measurements; i.e., scalene, isosceles, equilateral, acute, obtuse, and right	Students classify triangles based on side and angle measurement. with no errors.	Students classify triangles based on side and angle measurement with no significant errors.	Students classify triangles based on side and angle measurement with a few significant errors.	Students classify triangles based on side and angle measurement with many significant errors.

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COORDINATE GEOMETRY				
7.2.3. Draw and label the components of the coordinate plane; i.e., coordinates, quadrants, origin, x- and y-axes	Students draw and label the components of the coordinate plane with no errors.	Students draw and label the components of the coordinate plane with no significant errors.	Students draw and label the components of the coordinate plane with a few significant errors.	Students draw and label the components of the coordinate plane with many significant errors.
TRANSFORMATION AND SYMMETRY				
7.2.4. Identify relationships between congruent figures and similar figures	Students always identify relationships between congruent figures and similar figures.	Students consistently identify relationships between congruent figures and similar figures.	Students sometimes identify relationships between congruent figures and similar figures.	Students rarely identify relationships between congruent figures and similar figures.
7.2.5. Draw the result of a transformation in the coordinate plane; i.e., translation, reflection, and rotation	Students draw the result of a transformation in the coordinate plane with no errors.	Students draw the result of a transformation in the coordinate plane with no significant errors.	Students draw the result of a transformation in the coordinate plane with a few significant errors.	Students draw the result of a transformation in the coordinate plane with many significant errors.
VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING				
7.2.6. Build and sketch three-dimensional solids; e.g., using nets, manipulatives	Students build and sketch three-dimensional solids with no errors.	Students build and sketch three-dimensional solids with no significant errors.	Students build and sketch three-dimensional solids with a few significant errors.	Students build and sketch three-dimensional solids with many significant errors.
Grade 8				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
8.2.1. Use nets to represent the relationships between two- and three-dimensional figures	Students use nets to represent relationships between two- and three-dimensional figures with no errors.	Students use nets to represent relationships between two- and three-dimensional figures with no significant errors.	Students use nets to represent relationships between two- and three-dimensional figures with a few significant errors.	Students use nets to represent relationships between two- and three-dimensional figures with many significant errors.

Standard 2: Student understands and applies geometric concepts and spatial relationships to represent and solve problems in mathematical and nonmathematical situations.

Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
8.2.2. Classify quadrilaterals based on side lengths, angle measures, and sets of parallel sides	Students classify quadrilaterals based on side length, angle measures, and sets of parallel sides with no errors.	Students classify quadrilaterals based on side length, angle measures, and sets of parallel sides with no significant errors.	Students classify quadrilaterals based on side length, angle measures, and sets of parallel sides with a few significant errors.	Students classify quadrilaterals based on side length, angle measures, and sets of parallel sides with many significant errors.
8.2.3. Identify the angles formed and the relationships between the angles when parallel lines are intersected by a transversal	Students identify the angles formed, and the relationships between the angles, when parallel lines are intersected by a transversal with no errors.	Students identify the angles formed, and the relationships between the angles, when parallel lines are intersected by a transversal with no significant errors.	Students identify the angles formed, and the relationships between the angles, when parallel lines are intersected by a transversal with a few significant errors.	Students identify the angles formed, and the relationships between the angles, when parallel lines are intersected by a transversal with many significant errors.
8.2.4. Apply the Pythagorean Theorem to problems involving right triangles	Students apply the Pythagorean Theorem to problems involving right triangles with no errors.	Students apply the Pythagorean Theorem to problems involving right triangles with no significant errors.	Students apply the Pythagorean Theorem to problems involving right triangles with a few significant errors.	Students apply the Pythagorean Theorem to problems involving right triangles with many significant errors.
COORDINATE GEOMETRY				
8.2.5. Represent shapes using coordinate geometry	Students represent shapes using coordinate geometry with no errors.	Students represent shapes using coordinate geometry with no significant errors.	Students represent shapes using coordinate geometry with a few significant errors.	Students represent shapes using coordinate geometry with many significant errors.
TRANSFORMATION AND SYMMETRY				
8.2.6. Draw the results of a combination of transformations in the coordinate plane; i.e., reflections, rotations, and translations	Students draw the results of a combination of transformations in the coordinate plane with no errors.	Students draw the results of a combination of transformations in the coordinate plane with no significant errors.	Students draw the results of a combination of transformations in the coordinate plane with a few significant errors.	Students draw the results of a combination of transformations in the coordinate plane with many significant errors.

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<p>8.2.7. Use scale, proportion, and congruency to solve problems involving similar figures</p> <p>VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING</p>	Students use scale, proportion, and congruency to solve problems involving similar figures with no errors.	Students use scale, proportion, and congruency to solve problems involving similar figures with no significant errors.	Students use scale, proportion, and congruency to solve problems involving similar figures with a few significant errors.	Students use scale, proportion, and congruency to solve problems involving similar figures with many significant errors.
<p>8.2.8. Use two-dimensional representations of three-dimensional objects to visualize and solve problems; e.g., those involving surface area and volume</p>	Students use two-dimensional representations of three-dimensional objects to visualize and solve problems with no errors.	Students use two-dimensional representations of three-dimensional objects to visualize and solve problems with no significant errors.	Students use two-dimensional representations of three-dimensional objects to visualize and solve problems with a few significant errors.	Students use two-dimensional representations of three-dimensional objects to visualize and solve problems with many significant errors.
Grades 9-10				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
<p>9-10.2.1. Identify the properties and attributes of two- and three-dimensional objects that distinguish one from another; e.g., a cylinder has two parallel circular bases</p>	Students identify the properties and attributes of two- and three-dimensional objects that distinguish one from another with no errors.	Students identify the properties and attributes of two- and three-dimensional objects that distinguish one from another with no significant errors.	Students identify the properties and attributes of two- and three-dimensional objects that distinguish one from another with a few significant errors.	Students identify the properties and attributes of two- and three-dimensional objects that distinguish one from another with many significant errors.
<p>9-10.2.2. Determine congruence and similarity among geometric objects</p>	Students determine congruence and similarity among geometric objects with no errors.	Students determine congruence and similarity among geometric objects with no significant errors.	Students determine congruence and similarity among geometric objects with a few significant errors.	Students determine congruence and similarity among geometric objects with many significant errors.

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9-10.2.3. Use trigonometric relationships and the Pythagorean Theorem to determine side lengths and angle measures in right triangles	Students use trigonometric relationships and the Pythagorean Theorem to determine side lengths and angle measures in right triangles with no errors.	Students use trigonometric relationships and the Pythagorean Theorem to determine side lengths and angle measures in right triangles with no significant errors.	Students use trigonometric relationships and the Pythagorean Theorem to determine side lengths and angle measures in right triangles with a few significant errors.	Students use trigonometric relationships and the Pythagorean Theorem to determine side lengths and angle measures in right triangles with many significant errors.
9-10.2.4. Using given information, establish the validity of a conjecture using a two-column or paragraph proof	Students use given information in great detail and make no errors in using it to establish the validity of a conjecture.	Students use given information in adequate detail and make no significant errors in using it to establish the validity of a conjecture.	Students use given information in some detail and make a few significant errors in using it to establish the validity of a conjecture.	Students use given information in minimal detail and make many significant errors in using it to establish the validity of a conjecture.
COORDINATE GEOMETRY				
9-10.2.5. Use Cartesian coordinates to determine distance, midpoint, and slope	Students use Cartesian coordinates to determine distance, midpoint, and slope with no errors.	Students use Cartesian coordinates to determine distance, midpoint, and slope with no significant errors.	Students use Cartesian coordinates to determine distance, midpoint, and slope with a few significant errors.	Students use Cartesian coordinates to determine distance, midpoint, and slope with many significant errors.
9-10.2.6. Use distance, midpoint, and slope to determine relationships between points, lines, and plane figures in the Cartesian coordinate system; e.g., determine whether a triangle is scalene, isosceles, or equilateral given the coordinates of its vertices	Students use distance, midpoint, and slope to determine the relationships between points, lines, and plane figures in the Cartesian coordinate system with no errors.	Students use distance, midpoint, and slope to determine the relationships between points, lines, and plane figures in the Cartesian coordinate system with no significant errors.	Students use distance, midpoint, and slope to determine the relationships between points, lines, and plane figures in the Cartesian coordinate system with a few significant errors.	Students use distance, midpoint, and slope to determine the relationships between points, lines, and plane figures in the Cartesian coordinate system with many significant errors.
TRANSFORMATION AND SYMMETRY				
9-10.2.7. Identify and perform transformations of objects in the plane using sketches (translations, reflections, rotations, and dilations) and coordinates (translations, reflections, and dilations)	Students identify and perform transformations of objects in the plane with no errors.	Students identify and perform transformations of objects in the plane with no significant errors.	Students identify and perform transformations of objects in the plane with a few significant errors.	Students identify and perform transformations of objects in the plane with many significant errors.

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	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
<p>9-10.2.8. Describe the effects of combining basic transformations in a plane; e.g., two reflections over parallel lines results in a translation</p> <p>VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING</p>	Students describe, in great detail, the results of combining basic transformations in a plane.	Students describe, in adequate detail, the results of combining basic transformations in a plane.	Students describe, in some detail, the results of combining basic transformations in a plane.	Students describe, with minimal detail, the results of combining basic transformations in a plane.
<p>9-10.2.9. Construct plane figures using traditional and/or technological tools; i.e., congruent segments, congruent angles, angle and segment bisectors, perpendicular and parallel lines</p>	Students construct plane figures with no errors using traditional and/or technological tools.	Students construct plane figures with no significant errors using traditional and/or technological tools.	Students construct plane figures with a few significant errors using traditional and/or technological tools.	Students construct plane figures with many significant errors using traditional and/or technological tools.
<p>9-10.2.10. Recognize images of the same object shown from different perspectives; i.e., a two-dimensional image of a three-dimensional object</p>	Students recognize images of the same object shown from different perspectives with no errors.	Students recognize images of the same object shown from different perspectives with no significant errors.	Students recognize images of the same object shown from different perspectives with a few significant errors.	Students recognize images of the same object shown from different perspectives with many significant errors.
<p>9-10.2.11. Use geometric models to find solutions to problems in mathematics and other disciplines; e.g., art and architecture</p>	Students use geometric models to find solutions to problems in mathematics and other disciplines with no errors.	Students use geometric models to find solutions to problems in mathematics and other disciplines with no significant errors.	Students use geometric models to find solutions to problems in mathematics and other disciplines with a few significant errors.	Students use geometric models to find solutions to problems in mathematics and other disciplines with many significant errors.
Grades 11-12				
TWO- AND THREE-DIMENSIONAL SHAPES, GEOMETRIC PROPERTIES AND RELATIONSHIPS				
<p>11-12.2.1. Use trigonometric relationships to determine side lengths and angle measures in triangles; i.e., right triangle trigonometry, Law of Sines, and Law of Cosines</p>	Students use trigonometric relationships to determine side lengths and angle measures in triangles with no errors.	Students use trigonometric relationships to determine side lengths and angle measures in triangles with no significant errors.	Students use trigonometric relationships to determine side lengths and angle measures in triangles with a few significant errors.	Students use trigonometric relationships to determine side lengths and angle measures in triangles with many significant errors.

Standard 2: Student understands and applies geometric concepts and spatial relationships to represent and solve problems in mathematical and nonmathematical situations.

Benchmark Expectations	PROFICIENCY DESCRIPTOR			
	ADVANCED PROFICIENT	PROFICIENT	PARTIALLY PROFICIENT	NOVICE
<p>COORDINATE GEOMETRY</p> <p><i>No further expectations</i></p>				
<p>TRANSFORMATION AND SYMMETRY</p> <p><i>No further expectations</i></p>				
<p>VISUALIZATION, SPATIAL REASONING, AND GEOMETRIC MODELING</p> <p><i>No further expectations</i></p>				