

GEOMETRIC SHAPES PRIMARY
Math and Science

Grades: K-3

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Acceleration Approach

Standard has been accelerated by moving grade level K-3 up to the standard used for grade level 5.

K	1	2	3	4	5	6	7	8	9	CIM	CRLS/ CAM yes
—————▶											

Organizing Overarching Concept (e.g. systems, patterns of change, models, scales)
Models

Organizing Higher Order Skills (e.g. Bloom’s, Paul’s Model of Reasoning)
Paul’s model of Reasoning: (Using logic and reasoning to qualitatively describe shapes and angles.)

Differentiation Features - Students:

- Used multiple higher-level skills
- Added more variables to study

COMMON CURRICULUM GOAL

Math-Geometry – Properties and Relationships

Analyze characteristics and properties of two-and three-dimensional geometric shapes and develop mathematical arguments about geometric shapes.

Science - Scientific Inquiry

Use interrelated processes to pose questions and investigate the physical and living world.

Forming the Question/Hypothesis

Formulate and express scientific questions or hypotheses to be investigated.

Designing the investigation

Design safe and ethical scientific investigations to address questions or hypotheses.

Collecting and presenting data

Conduct procedures to collect, organize, and display scientific data.

Analyzing and interpreting results

Analyze scientific information to develop and present conclusions.

CONTENT STANDARDS

Science - Scientific Inquiry

Make observations. Formulate and express scientific questions or hypotheses to be investigated based on the observations.

Design scientific investigations to address and explain questions or hypotheses.

Collect, organize and display scientific data.

Analyze scientific information to develop and present conclusions.

GEOMETRIC SHAPES PRIMARY**Math and Science****Grades: K-3****PAGE 2****Archetypal Model**

Identify, compare and contrast 2 and 3 D shapes/objects using appropriate vocabulary.

TASK DEMAND**Sample Task Activity**

- Given a set of various 3-D solid shapes, students will identify, describe, compare and classify according to type, and determine type of angle for each shape. Students will make connections with examples from the classroom environment, and create a collage to represent three different types of angles using primary colors.

Acceleration

- High-end learners will describe and classify solid geometric shapes according to the shape of faces, edges and vertices, identifying right angles, acute angles and obtuse angles in isolation and in geometric figures. They will determine if angles are \geq or \leq right angle.
- Given a set of 3D shapes from a selection of print material (i.e. picture books, photos), students will identify and classify them into acute, obtuse and right triangles.
- Student records observations on a Graphic Organizer *Geometric Shapes*.

Acceleration Approach

- Start with 2nd and 3rd grade level tasks of identifying, describing, comparing and classifying 2 and 3D objects and solid shapes, looking ahead to the CIM goal of being able to recognize and represent 3 dimensional figures and their component parts. Accelerate for high-end learners by teaching to the vocabulary and patterns representing right, acute and obtuse angles in geometric figures.

Grouping

- Cluster or Pullout of high-end learners

Questions for Planning an Investigation

How would you plan an investigation to show the use of angles in the classroom?

Students need to include the components of record keeping, a plan for collecting data, method of reporting. Sample investigations may be to answer the questions: How many angles can you find in the room, or which kind of angle do you find the most? Students may need to be guided in setting up the plan, record keeping and how to design a way to keep their records. See Graphic Organizer *Student Brainstorming Worksheet*.

GRADE LEVEL STANDARD**Math**

3rd Grade - Identify, describe, compare, and classify common three dimensional geometric objects including cubes, rectangular prisms, spheres, pyramids, cones and cylinders using appropriate vocabulary.

3rd Grade - Describe and classify solid geometric shapes (e.g., triangular prism, cube, rectangular, prism) according to the number and shape of faces, edges, and vertices.

4th Grade - Identify right, acute, and obtuse angles in isolation and in geometric figures.

5th Grade - Identify, describe, compare and classify triangles by their sides and angles, using appropriate vocabulary. (Assessed on state knowledge and skills test.)

BENCHMARKS**Science-Scientific Inquiry**

3rd Grade - Make observations. Based on these observations, ask questions or form hypotheses which can be explored through simple investigations.

3rd Grade - Plan a simple investigation.

3rd Grade - Collect data from an investigation.

3rd Grade - Use the data collected from an investigation to explain the results.

5th Grade - Design a simple scientific investigation to answer questions or test hypotheses.

5th Grade - Collect, organize, and summarize data from investigations

5th Grade - Summarize, analyze, and interpret data from investigation.

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Implementation Time

- 5 class periods

Interdisciplinary: Art and Science

Introduce *Sir Cumference at the First Round Table*.

1. What shapes are seen in the story?
2. Why are the shapes better than others for making the point of the story?
3. Which shapes found in the story do you see in this room?
4. Show video *Donald and Mathemagics Land* by Disney and discuss the “golden (mean) rectangle”

SCIENCE INQUIRY SCORING GUIDE Benchmark II Grade 5 (see Appendix Section VIII) .

Scoring Guide	6 Exemplary	5 Proficient	4 Strong	3 Developing	2 Emerging	1 Beginning
Students will be able to:						
Recognize different two and three-dimensional shapes.						
Analyze a geometric figure to see which type of angles are being used.						
Compare and classify angles according to right, obtuse, acute.						
Identify right, acute, and obtuse angles in the environment.						

Resources

- Neuschwander, Cindy. (2001). *Sir cumference at the first round table: and the great knight of angleland*. Charlesbridge Publishing, Inc.
- Serra, Michael. (2001). *Patty paper geometry*. Key Curriculum Press.

Internet

- [Geometer's Sketchpad](http://www.keypress.com/sketchpad/product_info.html), Software, Key Curriculum Press on http://www.keypress.com/sketchpad/product_info.html and
- <http://www.keypress.com/sketchpad/sketchdemo.html>

Video

- Video *Donald and Mathemagics Land* Animated/Documentary; 1959; 27 minutes; Color; Teacher's guide is at <http://www.teachwithmovies.org/guides/donald-in-mathmagic-land.html>

The editor used the internet for many resources listed in this document. The listed books and internet sites should be reviewed and evaluated by the teacher before using.

Graphic Organizer
STUDENT BRAINSTORMING WORKSHEET

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Name _____ Date _____

<p>1. Scientific Problem: What do we need to find out?</p>	<p>2. Resources: What materials do we have available?</p>
<p>3. Resources: How can we use these materials to help us find out?</p>	<p>4. Hypothesis: What do we think will happen?</p>
<p>5. Designing the Investigation: What will we need to observe or measure in order to find out the answer to our scientific question.</p>	<p>6. Conclusion: How will we explain what we learned?</p>

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Graphic Organizer

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Name _____ Date _____

Draw and label <u>acute</u> angles.	Name the picture book's title and the page you found <u>acute</u> angles.	Draw and label obtuse angles.	Name the picture book's title and the page you found <u>obtuse</u> angles.	Draw and label <u>right</u> angles.	Name the picture book's title and the page you found <u>right</u> angles.

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TAG NEEDS ADDRESSED

INTELLECTUALLY GIFTED	ACADEMICALLY TALENTED MATH	ADVANCED SCIENCE KNOWLEDGE/SKILLS	CAREER RELATED LEARNING STANDARDS FOR CAM - Certificate of Advanced Mastery	TEACHER CHECKS THE BENCHMARK LEVEL STUDENT IS PURSUING
<input checked="" type="checkbox"/> Advanced Critical Reasoning <input checked="" type="checkbox"/> Scholarly Interaction <input checked="" type="checkbox"/> Continuous Progress for Level and Rate* <input type="checkbox"/> Challenging Resources <input type="checkbox"/> Effecting Change <input type="checkbox"/> Decision Making; Ethical Use of Influence <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Regular Interaction with Intellectual Peers <input type="checkbox"/> Social-Emotional Issues; Support; Coping Strategies <input type="checkbox"/> Advanced Academic Planning <input type="checkbox"/> Opportunity for Competition/ Failures/Successes <input type="checkbox"/> Creative Problem Solving with Real Problems/Audiences <input type="checkbox"/> Pursuit of Advanced Level Research <input checked="" type="checkbox"/> Advanced Vocabulary Development	<input type="checkbox"/> Advanced Critical Thinking in Math <input checked="" type="checkbox"/> Continuous Progress/Level and Rate* in Math <input type="checkbox"/> Challenging Math Resources <input type="checkbox"/> Creative Problem Solving Strategies in Math <input checked="" type="checkbox"/> Math Advanced Vocabulary Development <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Decision Making; Ethical Use of Influence <input checked="" type="checkbox"/> Regular Interaction with Talented Math Peers <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Opportunity for Competition/Failures/Successes <input type="checkbox"/> Advanced Academic Planning in Math <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> * Rate requires monitoring to ensure that the student was allowed to move ahead upon ac- </div>	<input type="checkbox"/> Advanced Critical Thinking in Science <input checked="" type="checkbox"/> Continuous Progress/Level and Rate* in Science <input type="checkbox"/> Challenging Science Resources <input type="checkbox"/> Creative Problem Solving Strategies in Science <input type="checkbox"/> Science Advanced Vocabulary Development <input type="checkbox"/> Leadership Training/Career <input type="checkbox"/> Decision Making; Ethical Use of Influence <input type="checkbox"/> Regular Interaction with Talented Science Peer <input type="checkbox"/> Realistic Goal Setting <input type="checkbox"/> Opportunity for Competition/Failures/Successes <input type="checkbox"/> Advanced Academic Planning in Science	<input checked="" type="checkbox"/> Personal Management <input checked="" type="checkbox"/> Problem Solving <input type="checkbox"/> Communication <input type="checkbox"/> Teamwork <input type="checkbox"/> Employment Foundations <input type="checkbox"/> Career Development	<p>Math:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM <p>Social Science:</p> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> CIM <input type="checkbox"/> CAM
<p>Student _____ Grade _____</p> <p>Teacher _____ School _____</p> <p>Date Initiated _____ Date Completed _____</p> <p style="text-align: center;">Check TAG Identification category: <input type="checkbox"/> Intellectual <input type="checkbox"/> Academic Math <input type="checkbox"/> Academic LA</p>				