

Strategies Used: Motivation, explanation, hypothesize, compare, modeling, shaping

**Student Teacher Candidate:** Courtney Harriman

**Lesson Subject(s)/Title:** 9.6 Geometric Probability

**Lesson Date(s):** Days 8 and 9

**Course & Grade(s):** 8-11

**INSTRUCTIONAL MATERIALS:**

Compass, protractor, ruler, scissors, paper, colored pencils, paper clips

**ESSENTIAL QUESTIONS/ SUBSIDIARY QUESTIONS:**

1. How can geometric probability be used to predict real results in real-world situations?
  - What is an event?
  - What is a sample space?
  - What is theoretical probability?
  - What is the difference between theoretical probability and geometric probability?

**PURPOSE:** Students will calculate geometric probabilities and use geometric probability to predict results in real-world situations.

**SPECIFIC LEARNING OBJECTIVES: (clear, observable)**

1. Before the lesson, students will draw shapes and construct hypotheses about how they would calculate the geometric mean.
2. During the lesson, students will take notes on examples using geometric mean during modeling to help them reach an understanding.
3. After the lesson, students will correctly calculate geometric mean.
4. After the lesson, students will compare theoretical probability to geometric probability through a written response.

**STANDARDS:**

**CC.2.3.HS.A.3** Verify and apply geometric theorems as they relate to geometric figures.

**CC.2.3.HS.A.9** Extend the concept of similarity to determine arc lengths and areas of sectors of circles.

Sensory Register	STM	LTM
Attention Recognition Perception	Focus Organization Rehearsal Visualization	Connections Elaborations Meaning

Facets of Understanding

1. Explanation
2. Interpretation
3. Application
4. Perspective
5. Empathy
6. Self-Knowledge

Multiple Intelligences

1. Linguistic [words]
2. Visual [pictures]
3. Mathematical [numbers & reasoning]
4. Kinesthetic [hands-on]
5. Musical [music]
6. Interpersonal [social]
7. Intrapersonal [self]
8. Naturalist [nature]

Multiple Exposures [4 x 2]

1. Dramatization
2. Visualization
3. Verbal

Complex Interactions

1. Discussion
2. Argumentation

Bloom's Taxonomy

1. Knowledge [Verbatim]
2. Comprehension [Own Words]
3. Application [Problem-Solving]
4. Analysis [Identify components]
5. Synthesis [Combine information]
6. Evaluation [Decisions]

Aspects of the Topic

1. Facts
2. Compare
3. Cause/Effect
4. Characteristics
5. Examples
6. Relationships

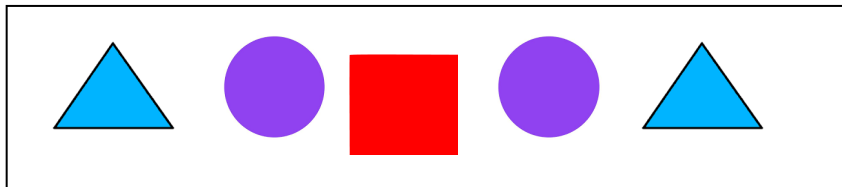
9 Effective Strategies

1. Similarities and Differences
2. Summarization and Note Taking
3. Reinforcing Effort and Providing Recognition
4. Homework and Practice
5. Nonlinguistic Representations
6. Cooperative Learning
7. Setting Objectives and Providing Feedback
8. Generating and Testing Hypotheses
9. Questions, Cues, and Advanced Organizers

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### ANTICIPATORY SET:

Students will draw this figure on a piece of paper and tape it to their desks. They will toss a penny onto the paper. I will then explain to them that finding how likely it is that the penny lands on the square requires geometric probability. This will be used as a form of **motivation** for the lesson. Students will **hypothesize** about how to go about finding the probability.

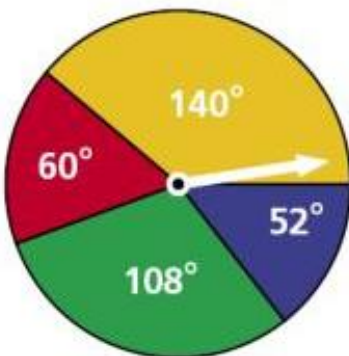


### INPUT/ ACQUIRE NEW KNOWLEDGE:

Students will take notes on examples that are **modeled** on the board and then practice selected problems individually through **shaping**.

### APPLY/ DEEPEN NEW KNOWLEDGE:

Students will make a spinner like the one in example problem 3. They will need a compass, protractor, ruler, paper, and colored pencils to color or label each area. They will cut out a pointer and attach it to a paper clip and attach it to the spinner. They will each spin the spinner 20 times, and then combine the class results and compare them to the calculated probabilities.



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**Facilitate:** The results of the activity will be discussed together as a class.

**CLOSURE/ASSESSMENT:** Now that students understand how to calculate geometric probability, they will **explain** how they would calculate the geometric probability of the penny landing on the square from the anticipatory set.

**HOMEWORK: (Purpose- Preparation, Practice, Expansion)**  
Students will **compare** theoretical probability and geometric probability and provide real-world examples of each through a written response.

### **INSTRUCTIONAL PROCEDURES:**

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<p>The teacher will:</p> <ol style="list-style-type: none"><li>1. Motivate students through the activity in the anticipatory set</li><li>2. Model examples on the board</li><li>3. Observe/answer questions while students practice problems independently</li><li>4. Explain the activity that students will complete to apply/deepen their understanding</li><li>5. Discuss the results of an experiment as a class</li><li>6. Ask students to explain how they would go about calculating the geometric probability of the figure in the anticipatory set</li></ol>	<p>The students will:</p> <ol style="list-style-type: none"><li>1. Complete the activity and hypothesize</li><li>2. Take notes</li><li>3. Complete practice problems independently</li><li>4. Design their own spinner and complete the activity</li><li>5. Share the results of their experiment</li><li>6. Use what they learned to verbally explain how they would solve the anticipatory set</li></ol>
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