Student Teacher Candidate: Olivia Stone
Lesson Subject(s)/Title: Geometry-Folding for Angles
Lesson Date(s): April 11, 2019
Course & Grade(s): ECE 334- 3rd-4th Grade

INSTRUCTIONAL MATERIALS:
A teacher model of the folded construction paper (use the Folding for Common Angles worksheet), two pieces of plain copy paper per student, a protractor, poster illustrations of angles with labeled lines and vertices. Include the following degrees: 0, 45, 90, and 180

ESSENTIAL QUESTIONS/ SUBSIDIARY QUESTIONS:

PURPOSE: The purpose of this lesson plan is for students to begin to understand angles.

SPECIFIC LEARNING OBJECTIVES: (clear, observable): Students will solve angle addition sentences using a folded paper model.

STANDARDS:

- Common Core
  - 4.G.A.1- Draw points, lines, line segments, rays, angles, and perpendicular and parallel lines. Identify these in two-dimensional figures.
  - 4.G.A.2- classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.
  - 4.G.A.3- Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line- symmetric figures and draw lines of symmetry.

DIFFERENTATION STRATEGIES:
(See below)

ANTICIPATORY SET:

- Hold the folded paper teacher model up and ask your class to turn to a neighbor and tell what it reminds them of and why (i.e. typical ideas include "origami" or "paper airplane").
- Call on students to share their ideas with the class.
- Open your model, draw lines along the creases, and announce that the class will be exploring ways to add these angles.

APPLY/ DEEPEN NEW KNOWLEDGE:
(See below)

CLOSURE/ASSESSMENT:
(See below)

HOMEWORK: ***(optional)***

EVALUATION/ASSESSMENT OF STUDENTS:
(See below)

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

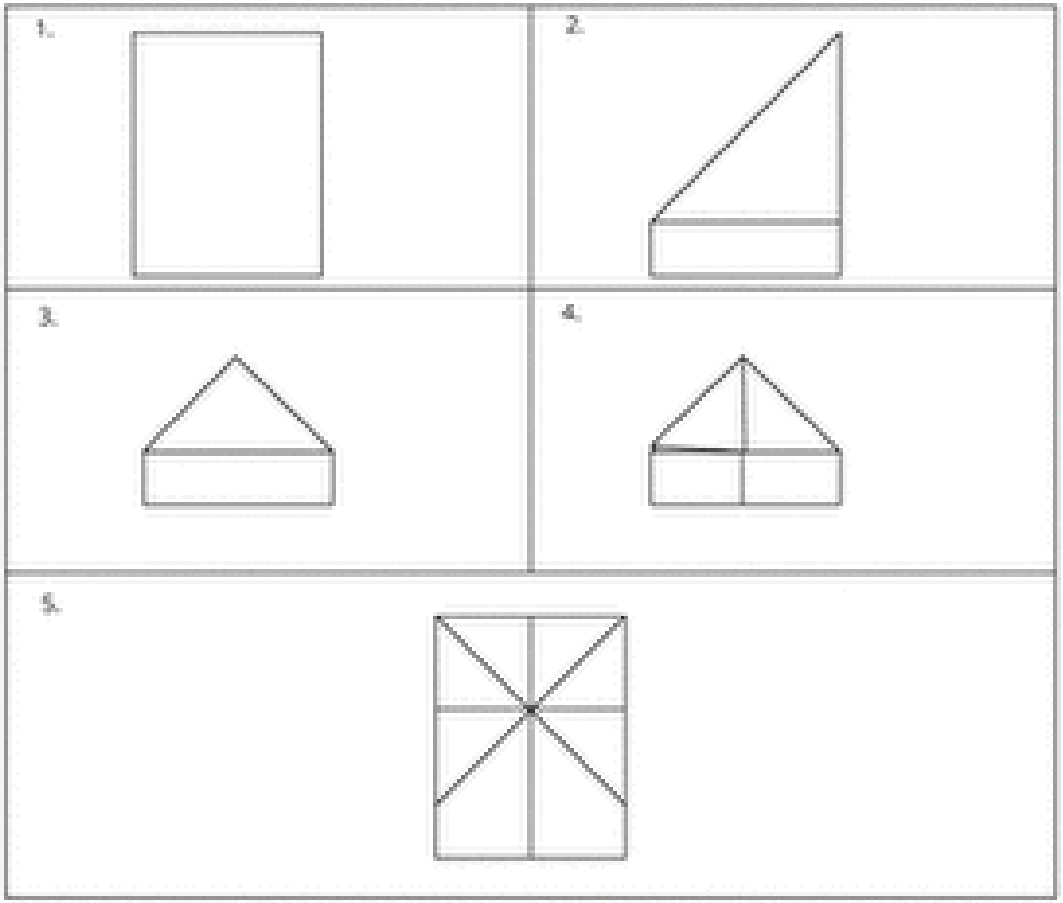
INSTRUCTIONAL PROCEDURES:

	Below Grade Level	On Grade Level	Above Grade Level
Main Lesson: *Geometry*	Same lesson as On Grade Level • Provide copies of the traced teacher model and have students label angle measurements.	Explicit Instruction • Pose the question "What's an angle?" and allow students to think, pair, and share a definition with their neighbor. • Allow for a few shared student responses and reveal that an **angle** is made at the intersection of two lines. • Explain that angles can be **wide** (greater than 90 degrees) or **narrow** (less than 90 degrees). Draw a small angle and a bigger angle. Remind students that they can measure angles in units called **degrees**, which are like very, very skinny slices of pizza. Draw a 5-degree angle in a magnified way, demonstrating each degree with he use of a protractor. • Preview the angle poser, sharing common angle models and amounts for: 0,45,90, and 180 degrees. • Demonstrate how you constructed the paper fold model in three folds and traced indentations. • Explain the lesson objective is for students to identify and add two angles using their own models. Guided Practice • Demonstrate line tracing: Instruct students to label lines by first turning their paper portrait-wise, with the longest line pointing up, and placing an "A" where all lines intersect. Then, going clockwise, label each line beginning with the longest line, B. Label lines C, D, E, F, G, H, and I.	Same as On Grade Level

		• Show your class angle labeleing with angle BAC and evaluate its measurement with the angle poster. Point out that the middle letter should always be the letter of the **vertex**. So, in this case, point A will always be the middle letter. • Give each student a paper and lead them through the three-fold sequence, fold tracing, line labeling, and angle labeling using the angle chart. • Share with your students that angles can be added by taking the measure of each and then adding their amounts. Demonstrate an addition equation with angle names. • Instruct students to pair with a neighbor and write an addition sentence of their own, share with the whole class, and correct any misconceptions. • Review the lesson objective: to add angles using their paper construction. Assign students to write five addition sentences on the back of their construction and answer any clarifying questions.	
Work Station	Same as On Grade Level • Post angle addition sentence frames on a poster for student reference.	• Pair students, allow for students to work independently, and release them to write their addition sentences. • Circulate around the class and assist by asking probing questions as needed.	• Students will work independently, and release them to write their addition sentences.
Game Station	The students will play Alien Angles independently on their iPads.		
Assessment	As you circulate, ask students to share one of their angle addition sentences and explain their reasoning. Check for use of academic language.		

A Folding for Common Angles

Name_____ Date_____



Paper model folding steps:

1. Fold upper left corner towards right side so that the top is parallel to the right side. (see example #2 above)
2. Fold the upper right tip, over to the left side triangle tip. (see example #3 above)
3. Fold the shape down the middle for a mirror image. (see example #4 above)
4. Open up the paper and trace the folded lines with a ruler. (see example #5)

education.com