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| Ms. Nieto, Ms. Harty, Ms. Baker, Ms. Phillips |
| **Date:** October 15th, 2015 |
| **Subject / grade level:** Math, 4th grade |
| **Materials:**   1. Pencils 2. Pattern Block symmetry sheet (one per student) 3. Pumpkin Jumble game board (one per group) 4. Evaluation sheet (one per student) 5. Pattern blocks 6. Die cuts of pattern blocks on construction paper (one per student) 7. Dice (one per group) |
| **TEKS:** Geometry and measurement. The student applies mathematics process standards to analyze geometric attributes in order to develop generalizations about their properties. The student is expected to: (D) 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. (B) Identify and draw one or more lines of symmetry, if they exist, for a two-dimensional figure.  **Key Vocabulary**: symmetry, line of symmetry, reflection, polygon, trapezoid, parallel, perpendicular, obtuse angle, acute angle, right angle, line segment |
| **ENGAGEMENT: (5 minutes)**   1. Play a **video on YouTube called Introduction to symmetry free school: https://www.youtube.com/watch?v=YFzktJNmnPU** 2. Ask students:    1. What is an example of reflective symmetry?    2. Can a figure have more than one line of symmetry?   **Transition Statement: In the next activity, we will further explore pattern block symmetry.** |
| **EXPLORATION: (10-15 minutes)**   1. Provide students with the Pattern Block symmetry handout. 2. Student teacher will model one questions for the students on the smartboard. 3. As a group, students will go through the pattern block symmetries worksheet. 4. Use the cut out shapes to determine the lines of symmetry. 5. Draw the line(s) of symmetry on the shape and write the number in the blank space below the shape. 6. Color parallel lines, use a different color for each pair of parallel lines. 7. Label the angles, O for obtuse, A for acute, and R for right. 8. Ask students to complete the exit slip before they leave the classroom. 9. Give students about 10-15 minutes to work individually.   **Transition Statement: In the next activity we will review the answers for the worksheet.**  **EXPLANATION: (15 minutes)**   1. Student teacher will review the answers with students. 2. Student teacher will model and provide clarification where needed. 3. Make sure that students understand that perpendicular lines always form a right angle. 4. Ask students what quadrilateral other than a square would form a right angle. 5. Ask students:    1. Is there a shape that would have more lines of symmetry than you can count? (a circle)    2. Are there shapes that don’t have any lines of symmetry? (an example would be a scalene triangle or any irregular polygon where the sides are not congruent.   **KEY UNDERSTANDING: A regular polygon will have as many lines of symmetry as it has sides.**  **Transition statement: Next, we will play a pumpkin jumble game.** |
| **ELABORATION: (10-15 minutes)**   1. Students will complete the pumpkin sheet with their groups. 2. Provide answers and explanation to any questions provided. 3. Clarify any misconceptions about the picture or definition of vocabulary words. 4. If students got the answer wrong, have them correct their answer on their paper. 5. Guide students (but do not tell them) that they could use smaller shapes to form the larger ones (for examples, two trapezoids make a hexagon, three triangles make a trapezoid). 6. Teachers will circulate and ask students:  **What part of the pumpkin's face has one line of symmetry?****What part of the pumpkin's face has three lines of symmetry?****What part of the pumpkin's face has six lines of symmetry?**  1. Provide 4-5 minutes for students to clean up.   **Transition statement: Lastly, we will evaluate how well you understand lines of symmetry as well as angles, parallel and perpendicular lines.** |
| **EVALUATION: Exit (10 minutes)**   1. Pass out evaluation sheet handout. 2. Students will name that polygon based on its attributes |