Julia Robinson Mathematics Festival

التعليم فوق الجميع | education above all

# RIGHT ANGLE POLYGONS WITH STICKS

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| **Level** | 2 (Age group 8-11) |
| **Resources Required** | Twigs or sticks (at least 20 per pair of players) |
| **Alternate Options for the Resources** | Instead of twigs or sticks, the teacher can use popsicle sticks, pencils, or any group of objects that are straight and thin.<br><br>Alternatively, students can play this game by drawing shapes using paper and pencil. |
| **Strand Covered** | Shapes & Measurements |
| **Targeted Skills** | Identify angles and simple properties of squares, rectangles, and parallelograms. |
| **Inspired by** | Third Space Learning, Julia Robinson Mathematics Festival - Gordon Hamilton |
| **Time Required** | 15 minutes<br>5 minutes (setup) |
| **Previous Learning Required** | Knowledge of right angles |
| **Support Required** | Low supervision |

Rules of the Game:

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| **Goal** | The pair with the most points at the end of the game wins. |

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| **Steps** | Step 1: The teacher splits students into pairs.<br><br>Step 2: The teacher hands out sticks or twigs (at least 20) to each pair.<br><br>Step 3: The teacher tells students that they will be creating shapes with right angles out of their sticks and twigs. Students will receive 1 point for every shape that has a unique number of right angles. Students will receive an additional 1 point for every shape they can name.<br><br>For example, if a pair makes a square, rectangle, and right triangle, the pair would receive at most 5 points: 1 point for making at least one shape with one right angle (unique number of right angles), 1 point for making at least one shape with four right angles (not unique so only 1 point is given), and 3 points if the pair can name all three shapes. See Images/Illustrations for a list of common shapes with right angles.<br><br>Step 4: When the teacher says “start,” each pair tries to make as many right-angled shapes as they can. If not enough twigs or sticks are available, learners are allowed to reuse sticks after drawing the shape they made using twigs, on paper. Once the shape is drawn the twigs can be reused.<br><br>Step 5: After 10 minutes, the teacher says “stop.”<br><br>Step 6: Each pair takes turns describing the shapes that they made.<br><br>Step 7: The teacher awards each pair points according to Step 3. The pair who earns the most points wins. If more than one pair earns the most number of points, they are all the winners of this game. |
| **Images or Illustrations** | |

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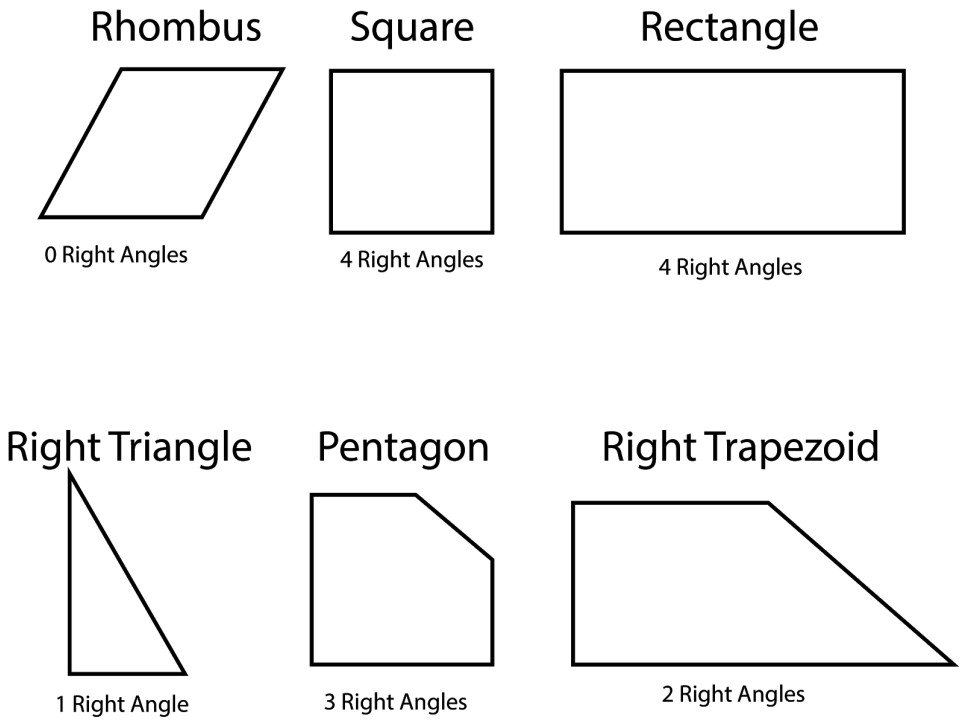
| |  |
| **Enrichment** | • Instead of right angles, assign points for shapes with a certain number of acute angles (smaller than 90 degrees) or obtuse angles (larger than 90 degrees).<br>• If students have protractors available to them, play this game with a specific angle measurement, like 30 degrees. |
| **Simplification** | • Give students a list of shapes to make, like in the Images/Illustrations section. The pair who makes the most number of shapes in a given time frame wins. |