



## PEF Summer, *At Home Edition* – Lesson Plan

Class: 3D Printing	Grade Band: 6th-8th
Teacher: Dr. Brooks	Lesson: Designing A Chess Pawn
Objectives: This video tutorial will guide students through 3D designing a chess pawn. Students will utilize their skills in placing, resizing, rotating, and aligning each of the objects that will eventually group together to make the chess pawn.	Materials: CPU Access Website <a href="https://www.tinkercad.com/">https://www.tinkercad.com/</a>
<p>Process:</p> <ul style="list-style-type: none"> <li>-Place a cylinder shape to the workplane.</li> <li>-Scale it smaller to a height of 3mm.</li> <li>-Place a Workplane to the top of the cylinder. (Shortcut = W)</li> <li>-Place a cone shape to the top of the cylinder.</li> <li>-Scale the shape shorter to a height of 11mm.</li> <li>-Place a sphere shape to the workplane.</li> <li>-Scale the sphere to a diameter of 18mm.</li> <li>-Squish it! Scale it shorter to a height of 5mm.</li> <li>-Move it to the target area in orange.</li> <li>-Place a cone shape to the workplane.</li> <li>-Scale it to a height of 28mm.</li> <li>-Scale it smaller to a diameter of 14mm.</li> <li>-Move the cone to the target orange area.</li> <li>-Lift the the cone 3mm off the workplane.</li> <li>-Place another cone to the target area in orange.</li> <li>-Scale it to a diameter of 12mm.</li> <li>-Scale it taller to a height of 19mm.</li> <li>-Rotate the cone 180 degrees.</li> <li>-Move it to the target area in orange.</li> <li>-Place a workplane to the top of the cone</li> <li>-Place a sphere shape to the workplane.</li> <li>-Scale the sphere to 8x8x8mm.</li> <li>-Place a workplane to the original location of the workplane.</li> <li>-Select all the shapes.</li> <li>-Click the Align button on the menu.</li> <li>-Align the shapes to the middle on the front and side.</li> <li>-Select all the shapes.</li> <li>-Click the Group button on the menu.</li> </ul>	
<p>Vocabulary:</p> <p>Placing, resizing, rotating, and aligning</p>	



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