

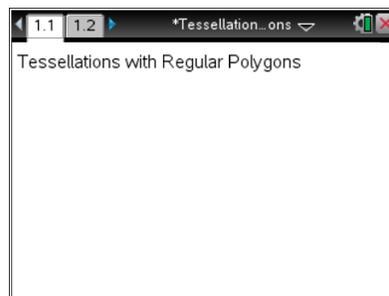
Tessellations with Regular Polygons Geometry – Creating A Document

Activity Overview:

This activity guides you through the steps to create a document that will use the **Regular Polygon** tool and **Reflection** tool to help students explore the question, “Which regular polygons form a monohedral tessellation of a plane and why?”

Materials

- *Technology needed (TI-Nspire™ handheld, computer software)*



Step 1 Preparing the document

1. Open a new document by clicking on

 **on** > **New Document** > **Add Notes**.

2. Type **Tessellations with Regular Polygons**.

Note: To obtain capital letters, press the  key, then the letter.

3. Press  > **File** > **Save As ...**

Type **Tessellations_with_Regular_Polygons**.

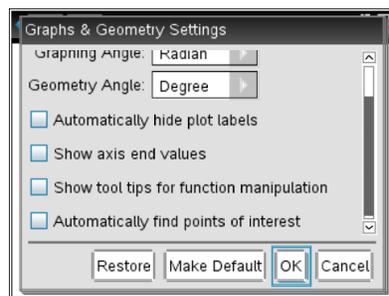
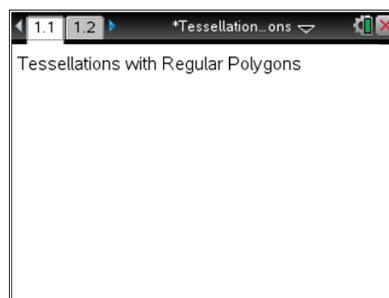
Tab to  and press .

Note: To obtain the underscore, press  .

4. To add a new page, press   > **Add Geometry**.

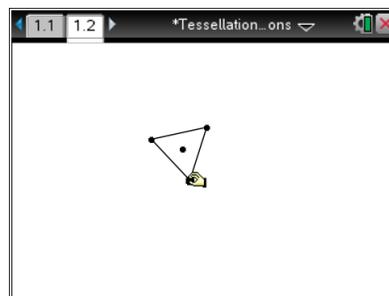
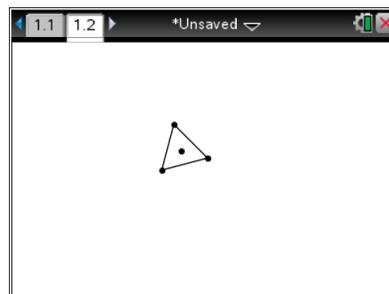
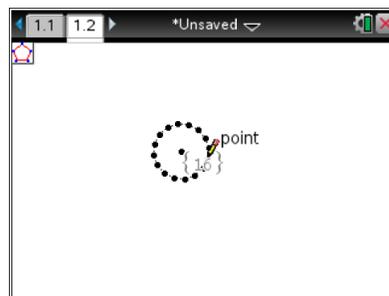
5. To hide the scale in the upper right corner of the screen, select **Menu > View > Hide Scale**.

6. Press **Menu > Settings**. Press  to move from one field to the next, and press  to uncheck all the boxes. Tab to OK and press  or .



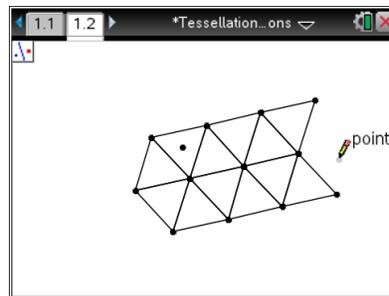
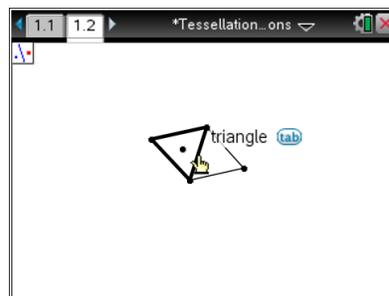
Step 2 Creating an equilateral triangle

1. Press **Menu > Shapes > Regular Polygon**. (Note: All regular polygons are constructed in a circle, so think about drawing a circle by constructing the center and then moving away to establish the radius of the circle.)
2. Move the cursor to a location near the center of the screen and press  to establish the center of the regular polygon.
3. Move the cursor away from this center point and you will see the regular polygon form on the screen.
4. Move the cursor far enough from the center point to construct a moderately sized regular polygon. Once the desired radius is reached, press  to set the radius. (This can easily be changed later, if necessary.)
5. Move the cursor in the clockwise direction around the “circle” of the regular polygon. As the cursor is moved, the number of sides in the polygon will decrease. Move the cursor until the number of sides is 3 for an equilateral triangle.
6. Press  or **enter** to select 3 sides. Press **esc** to exit the **Polygon** tool.
7. Grab and drag a side of the triangle to reposition the figure on the screen, if needed.
8. Grab and drag the center or any of the vertices to change the radius of the regular polygon if needed.



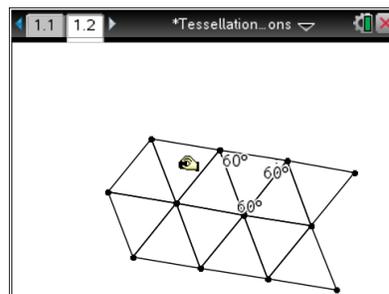
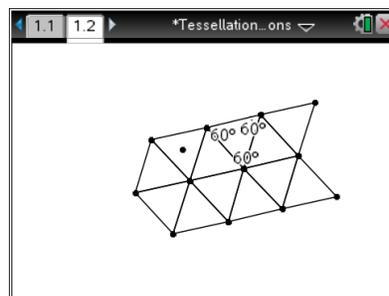
Step 3 Tessellating the equilateral triangle

1. Press **Menu > Transformation > Reflection** to select the **Reflection** tool from the Transformation menu.
2. Move the pointer to a side (not a vertex) of the triangle and press  twice. (The first click selects the entire regular polygon as the pre-image for the reflection. The second click selects the side of the polygon as the line of reflection.)
3. The **Reflection** tool is still active. Continue clicking twice on any side of the original regular triangle or on any side of a reflected image.



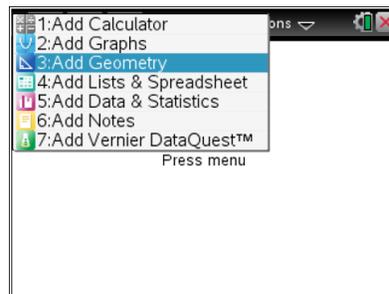
Step 4 Measuring the interior angles

1. Press **Menu > Measurement > Angle**.
2. Move to a vertex of any triangle and press **enter** or .
3. Move to a second vertex of the same triangle, and press **enter** or .
4. Move to the third vertex of that same triangle, and press **enter** or .
5. Repeat the process for the remaining angles in that triangle.
6. Press **esc** to exit the **Measurement** tool.
7. Move the angle measurements if needed. Also, the triangles can be enlarged by grabbing the original “center” point and moving it to make the triangles the preferred size.



Step 5 Inserting a new Geometry page

1. Press **ctrl** **doc**, and select **Add Geometry**.
2. Press **Menu > View > Hide Scale**.



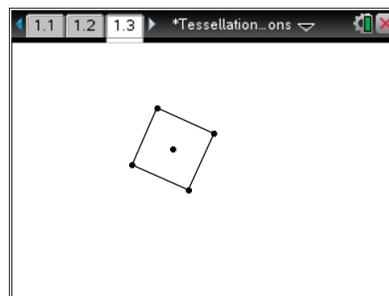


Tessellations with Regular Polygons

Geometry – Creating A Document

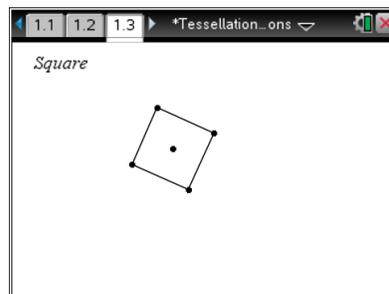
Step 6 Creating a square

1. Press **Menu > Shapes > Regular Polygon**.
2. Move the cursor to a location near the center of the screen and press  to establish the center of the regular polygon.
3. Move the cursor away from this center point until the desired radius is reached. Then, press .
4. Move the cursor in the clockwise direction around the “circle” to choose 4 as the number of sides in the polygon.
5. Press  or **enter** to choose 4 sides.
6. Press **esc** to exit the **Polygon** tool.



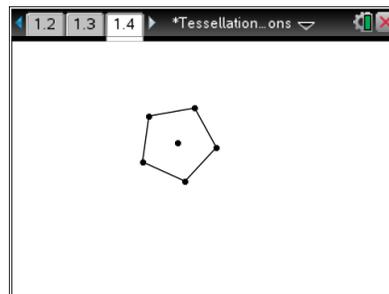
Step 7 Creating text

1. Press **Menu > Actions > Text**.
2. Move the cursor to the top left of the screen, and press **enter**.
3. Type **Square**, and then press **enter**.
4. Press **esc** to exit the **Text** tool.



Step 8 Creating other regular polygons

1. Repeat steps 5 and 6 to create pages for a pentagon, a hexagon, a heptagon, and an octagon.



Step 9 Saving the document

1. Press **ctrl S**.