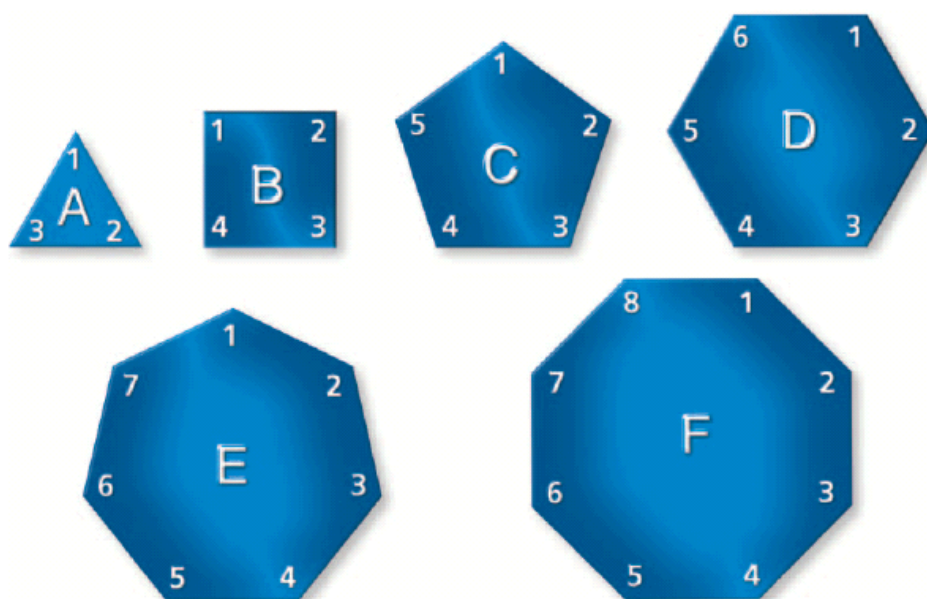


Problem 1.3: Tiling a Beehive

Mathematical Goals:

- Decide which shapes will tile a surface and what common properties these shapes may have

A regular polygon is a polygon in which all the sides are the same length and all the angles have the same measure. In an **irregular polygon**, all sides are *not* the same length or all the angles are *not* the same measure. The shapes below are regular polygons.



You can find an interesting pattern of regular hexagons on the face of a honeycomb. The hexagons fit together like tiles on a floor.

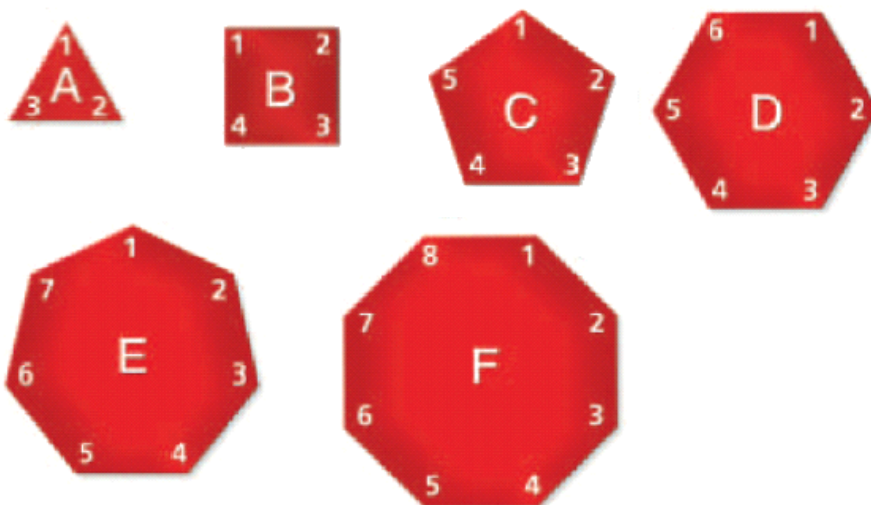


What do you notice about the honeycomb and the shapes that are formed?

Are there any other regular polygons that the bee could have used?

Tiling means covering a flat surface with shapes that fit together without any gaps or overlaps.

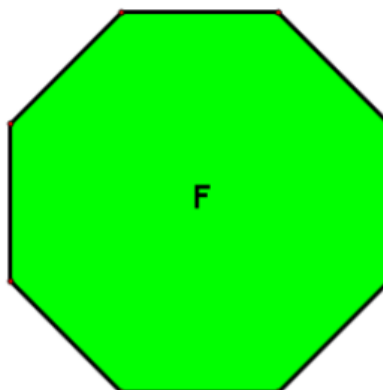
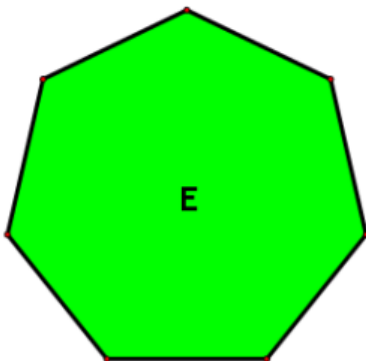
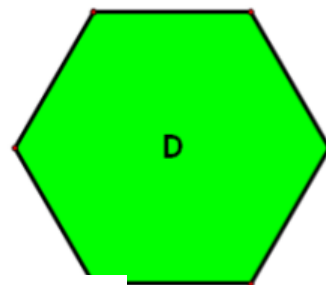
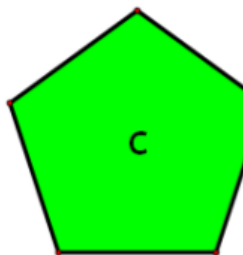
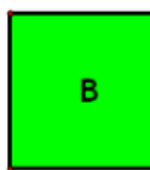
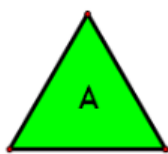
Which regular polygons can be used to tile a surface?

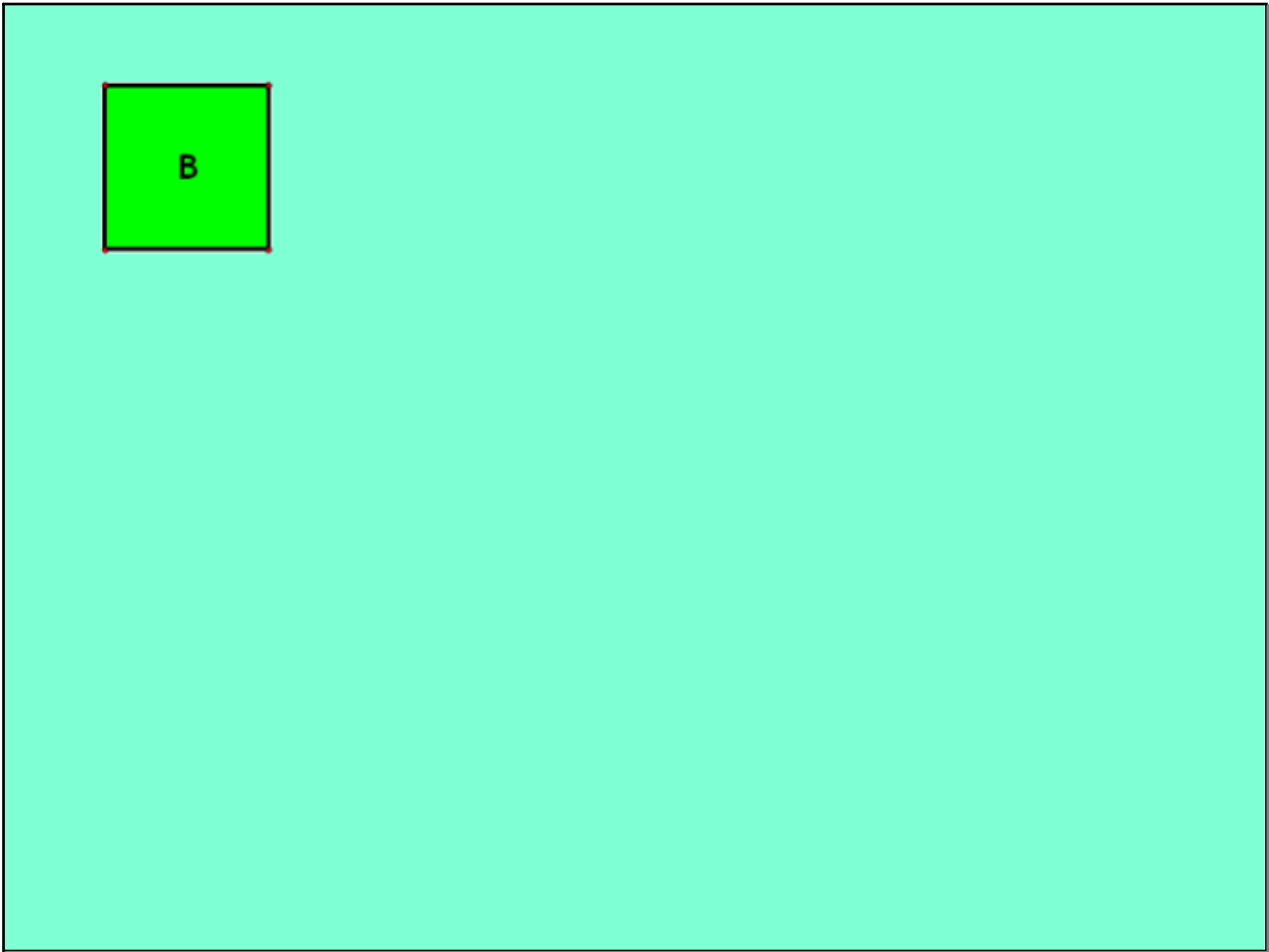
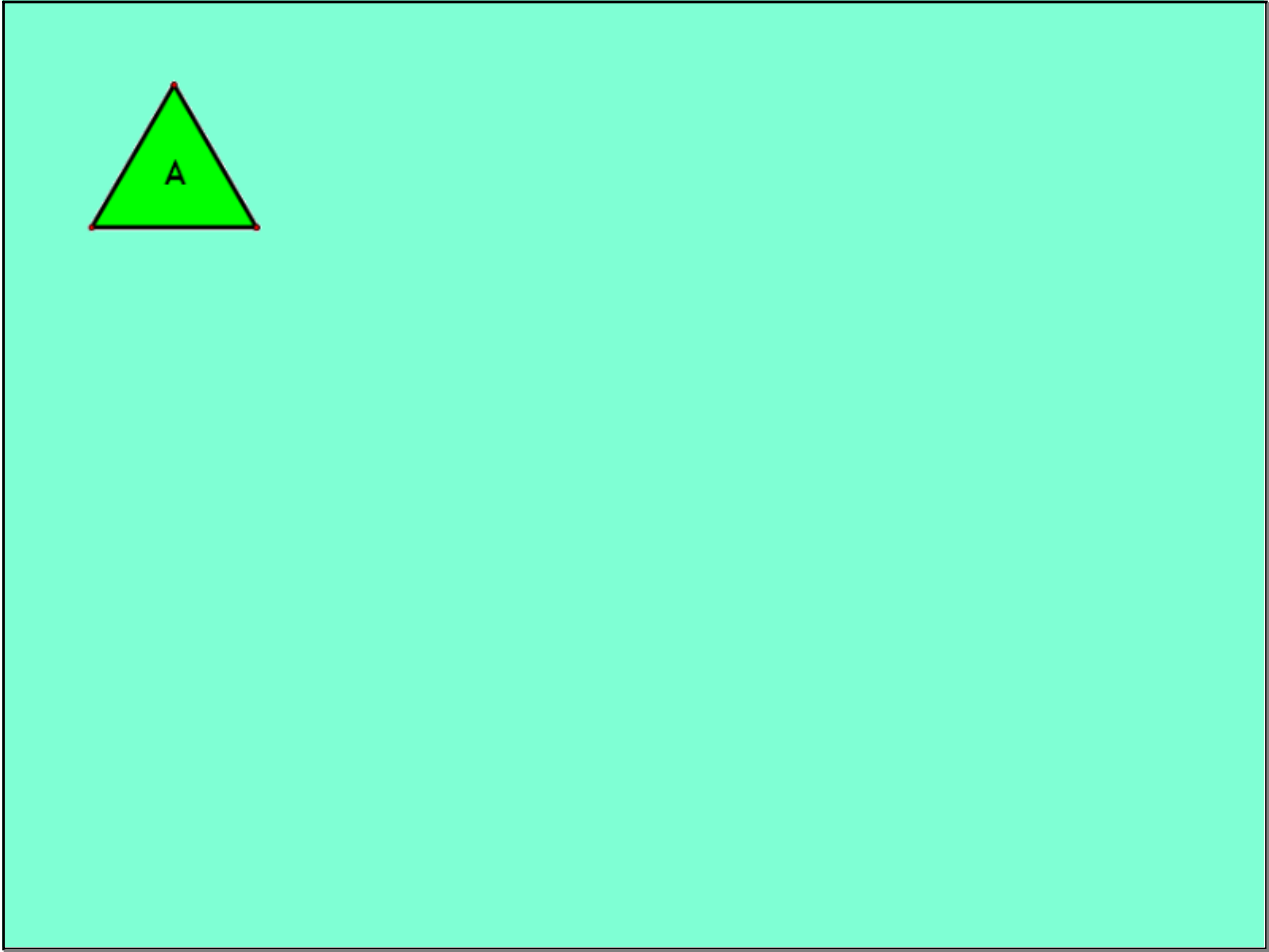


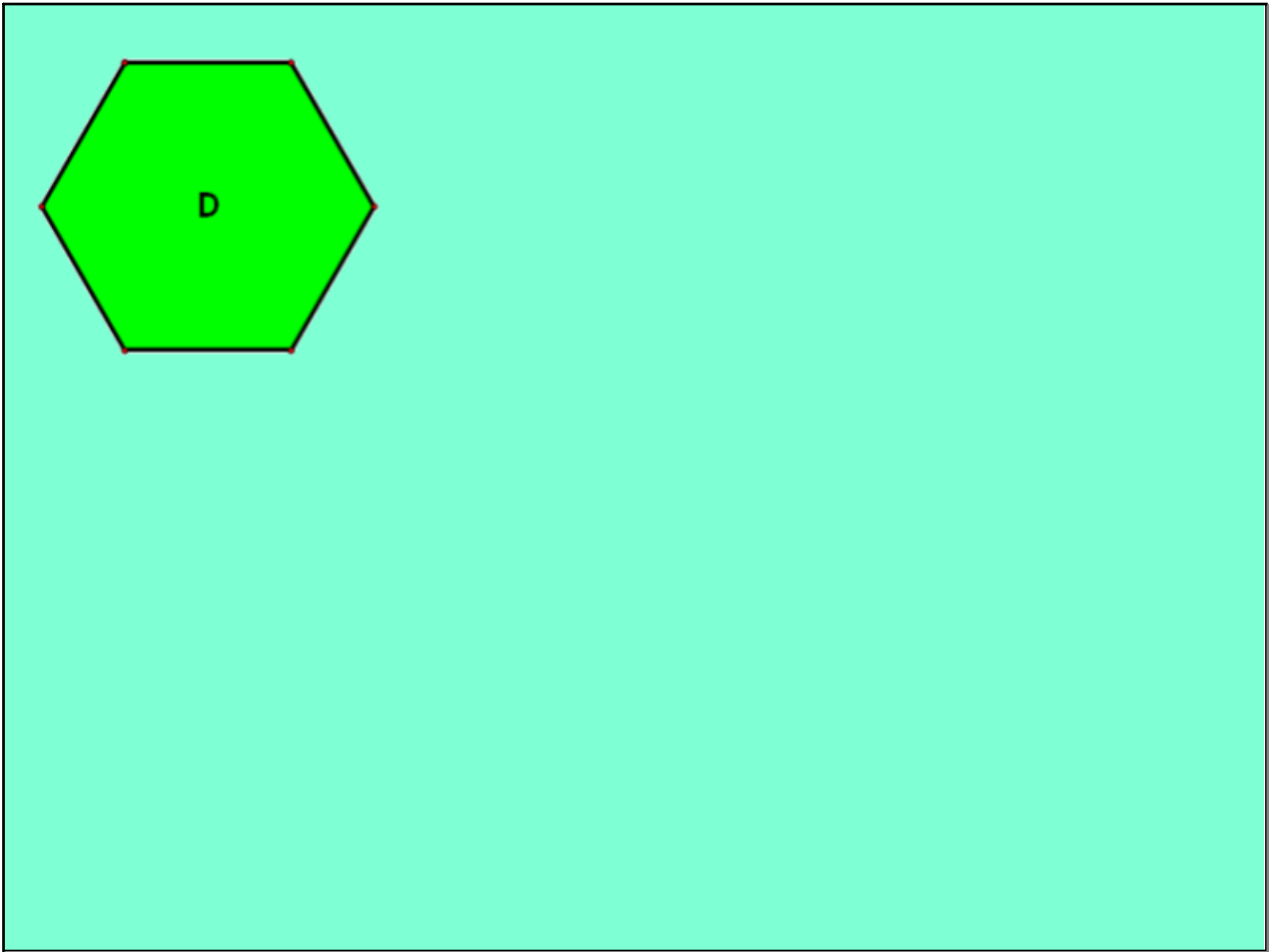
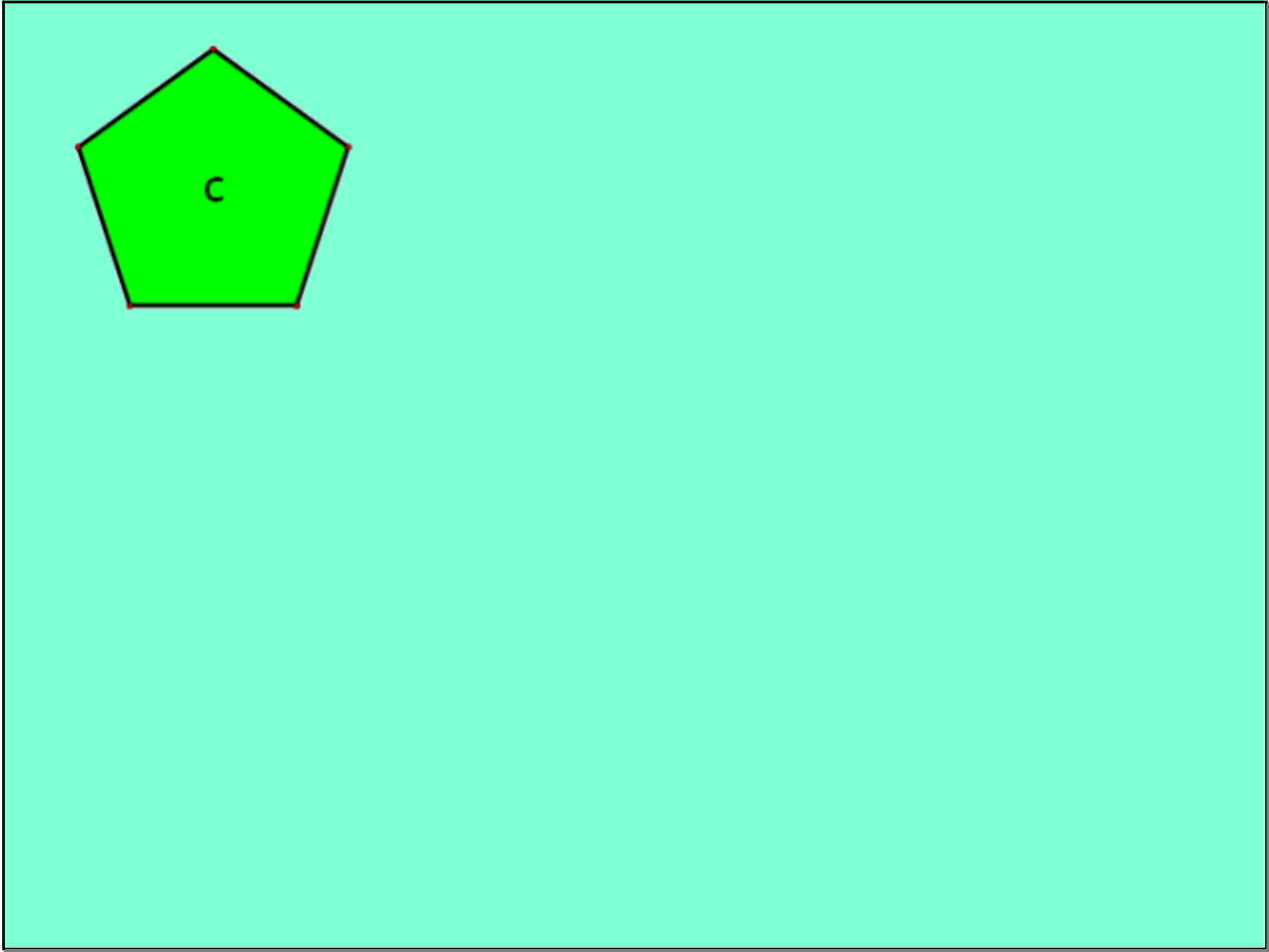
Work with your group:

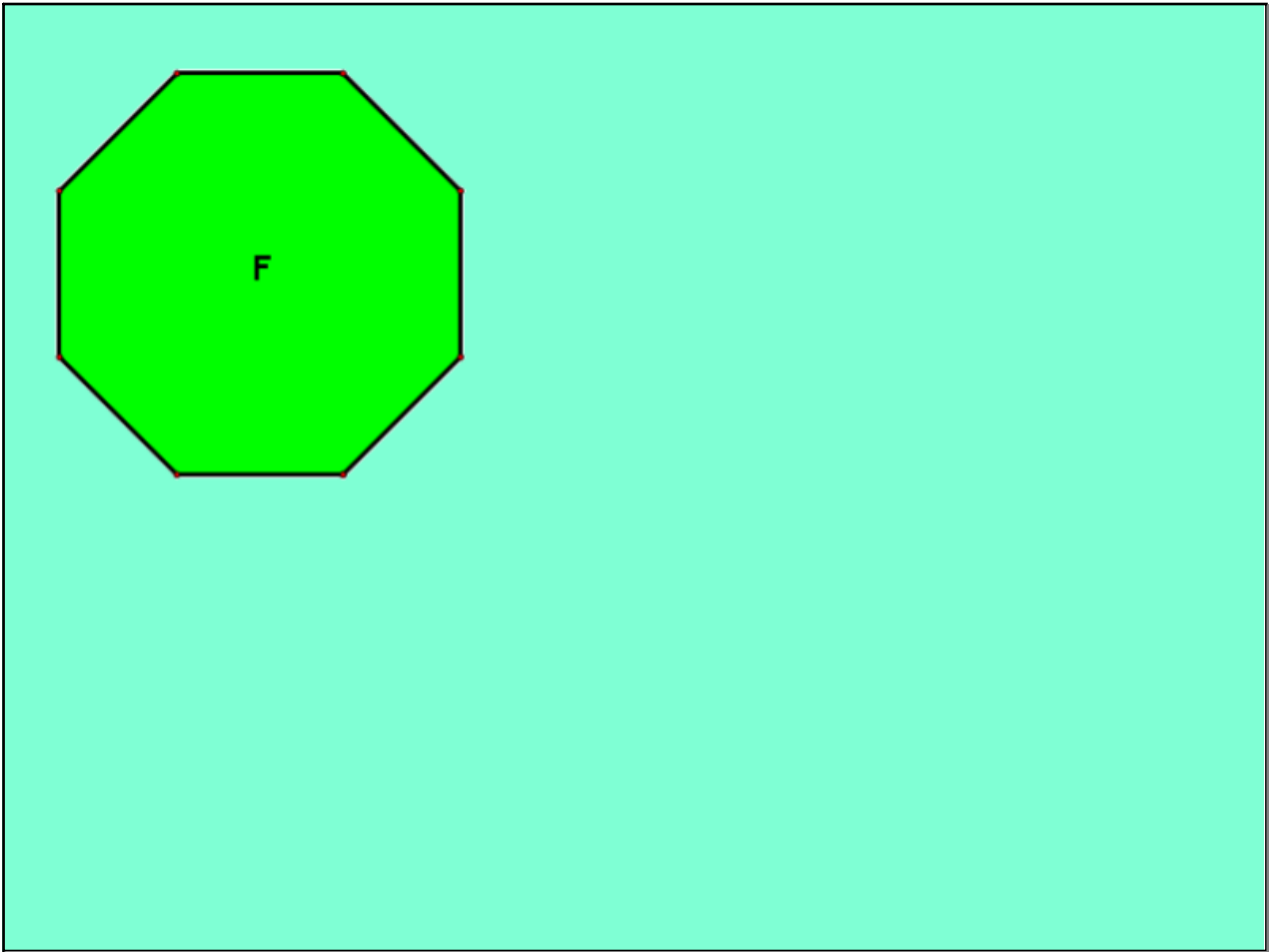
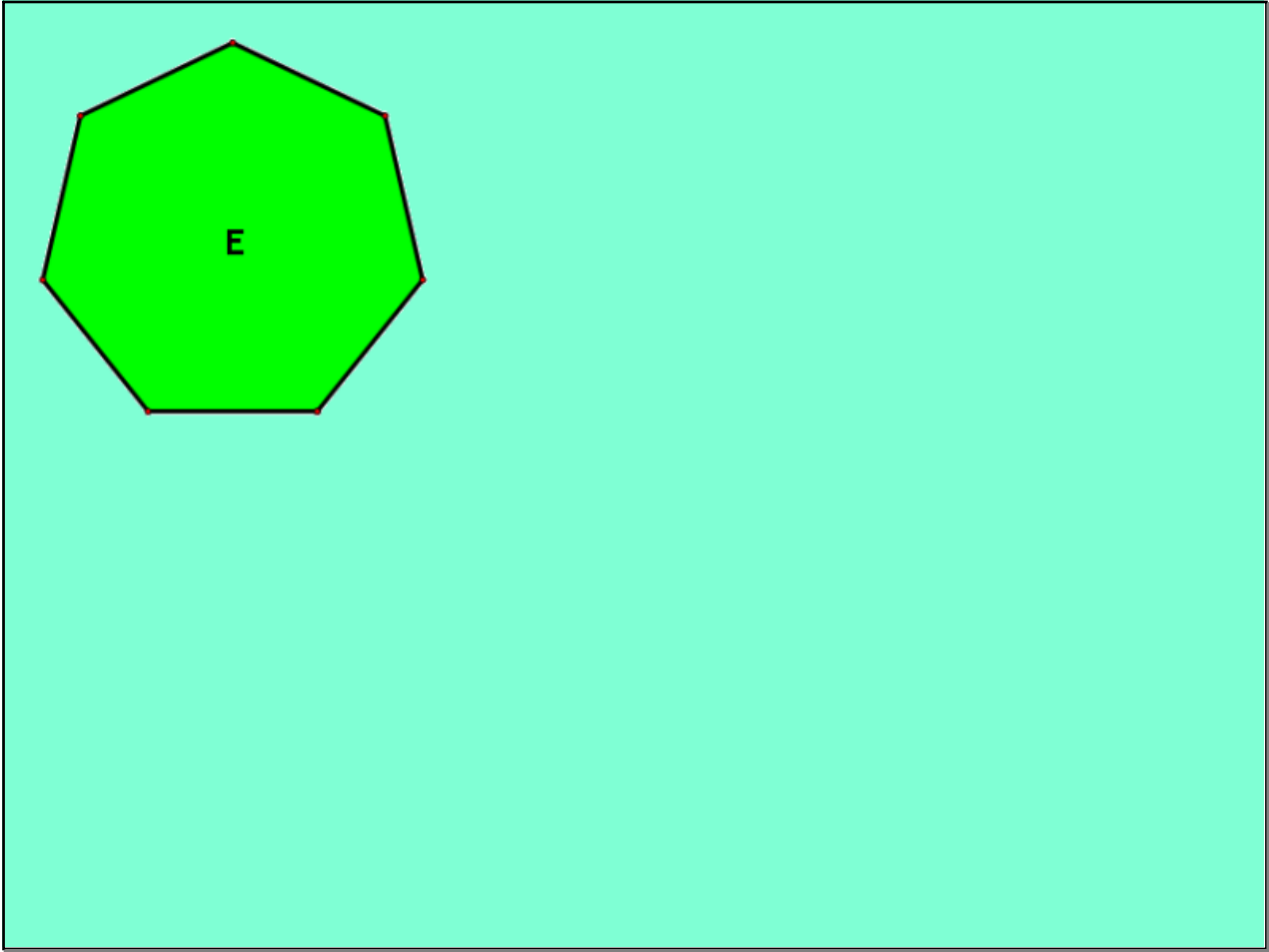
Page 15, A-C

- A. 1.** First, form tile patterns with several copies of the *same* polygon. Try each of the regular polygons. Sketch your tilings.
- 2.** Which regular polygons fit together without gaps or overlaps to cover a flat surface?

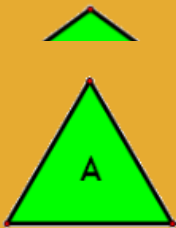
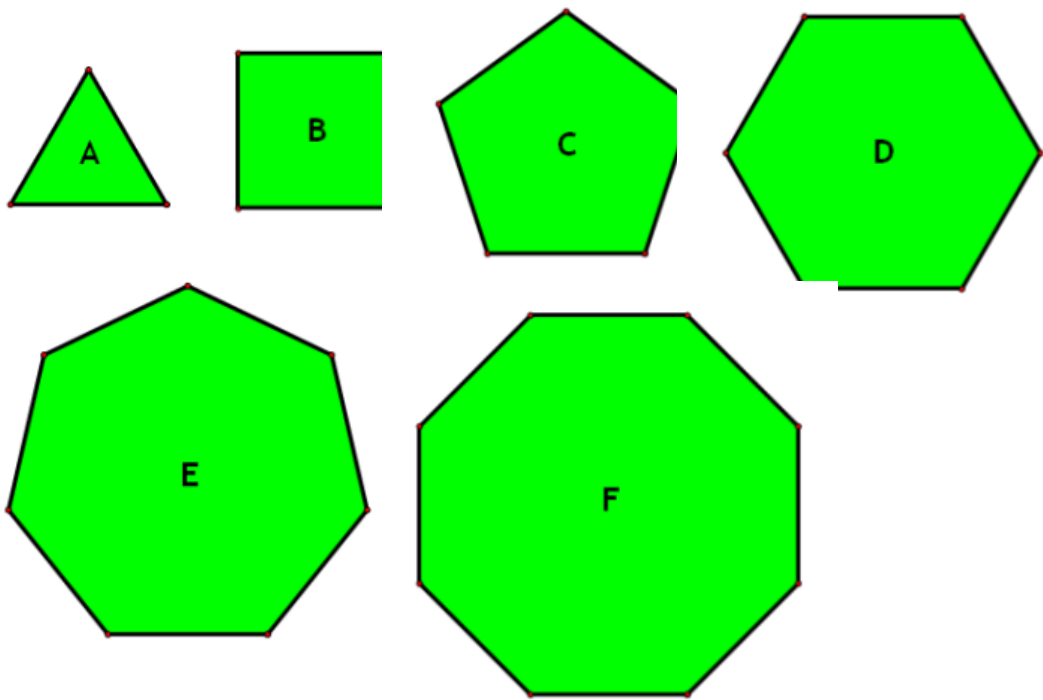




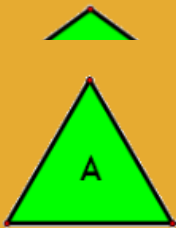




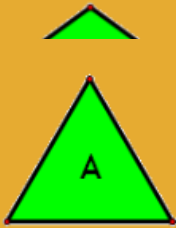
B. Next, form tile patterns using combinations of two or more different shapes. Sketch your tilings.



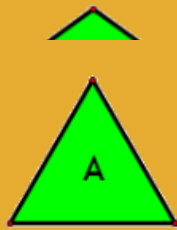
Type Group Name Here...you can use my laptop...just double click on this text



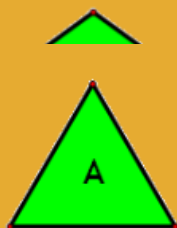
Type Group Name Here...you can use my laptop...just double click on this text



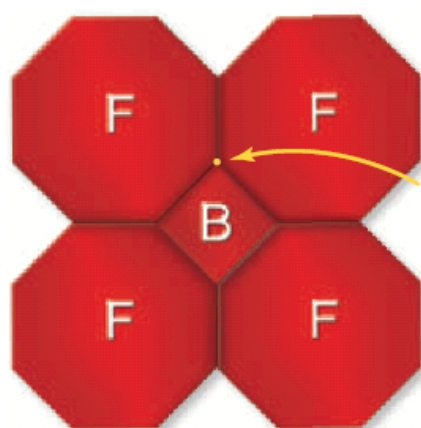
Type Group Name Here...you can use my laptop...just double click on this text



Type Group Name Here...you can use my laptop...just double click on this text



- C. The following tiling may be one that you found. Look at a point where the vertices of the polygons meet.



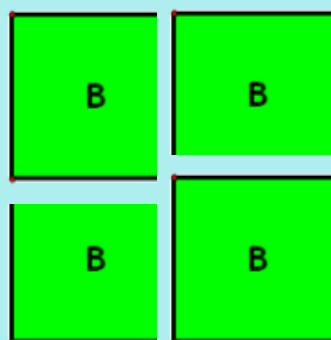
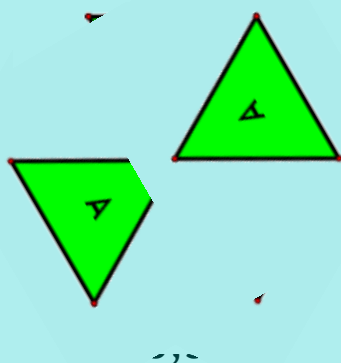
At this vertex, two octagons and one square fit together.

active math
online

For: Tessellation Activity
Visit: PHSchool.com
Web Code: amd-3103

1. Look back at each tiling you made. Find a point on the tiling where the vertices of the polygons meet.
2. Describe exactly which polygons fit around this point and the pattern of how they fit together.
3. Is this pattern the same for all other points where the vertices of the polygons meet in this tiling?

Short hand notation for describing the shapes and combinations of shapes used to tessellate:



4,4,4,4

Homework:p.19-20, #13-16