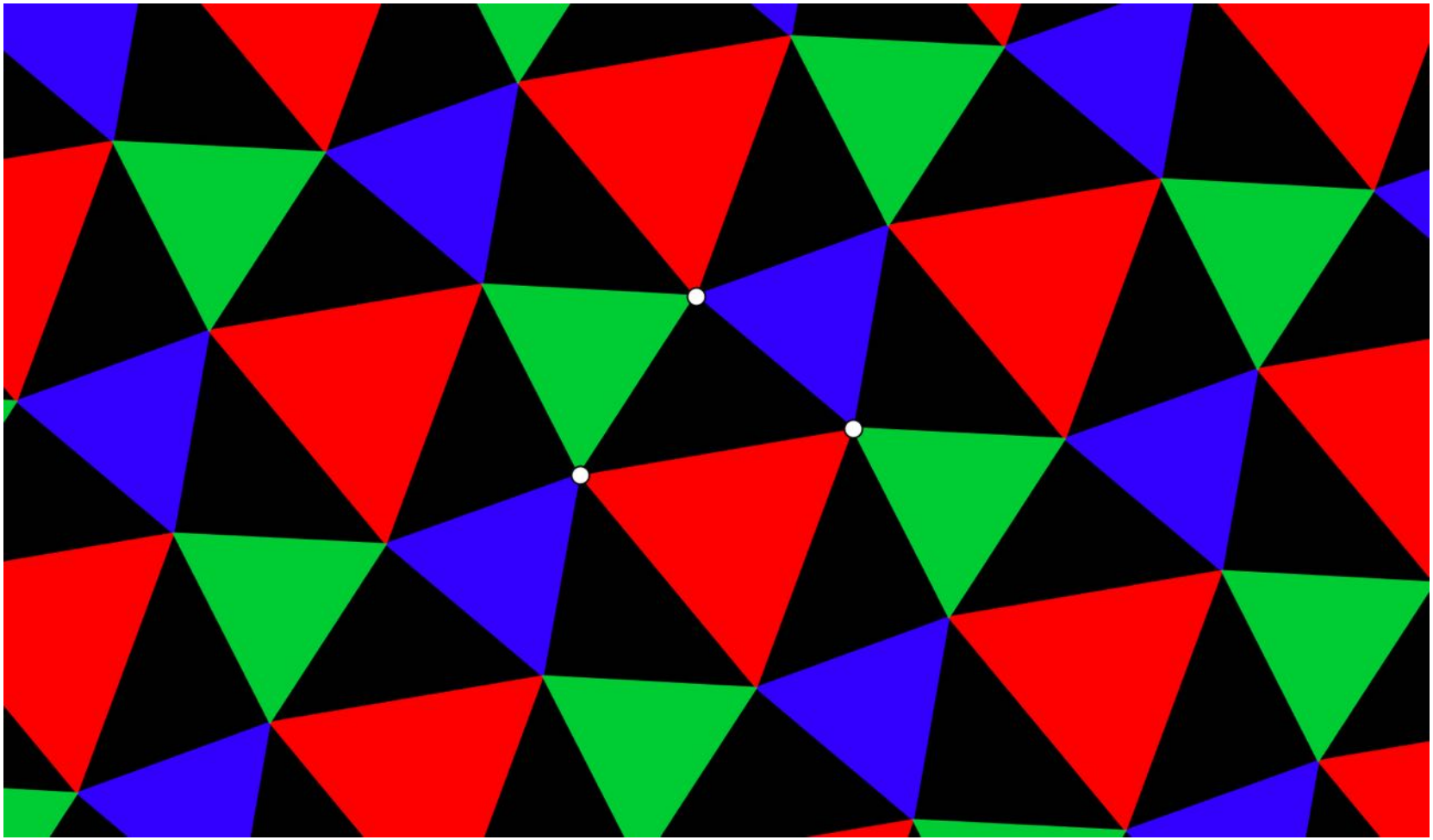


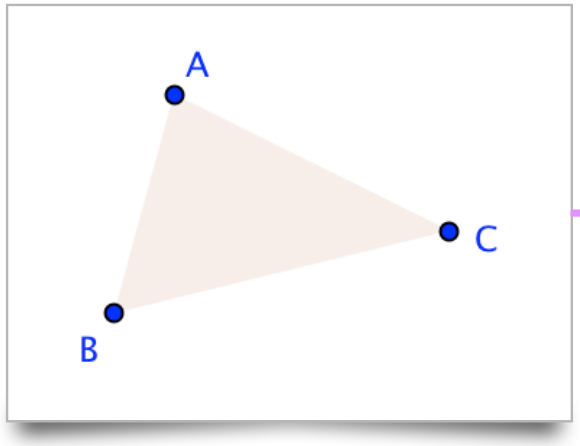
napoleontile

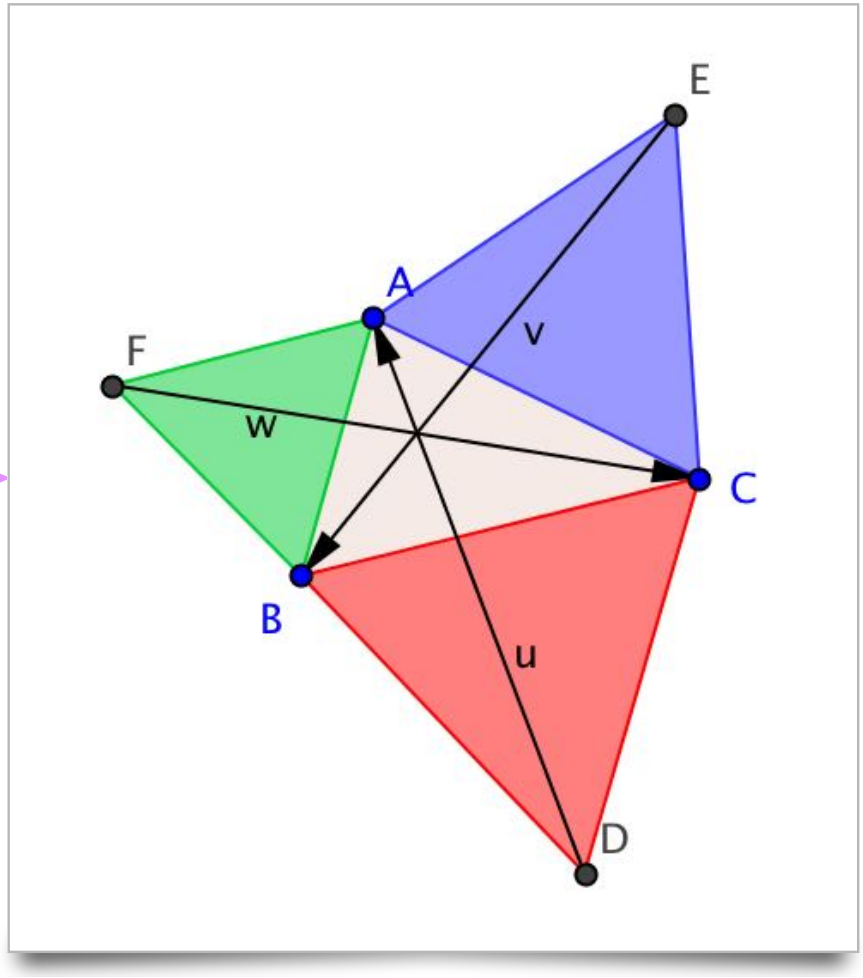
https://dl.dropbox.com/u/4210789/dg/napoleontile.html

Start with any triangle ABC.
Construct equilateral triangles on each side.
Construct 3 vectors.

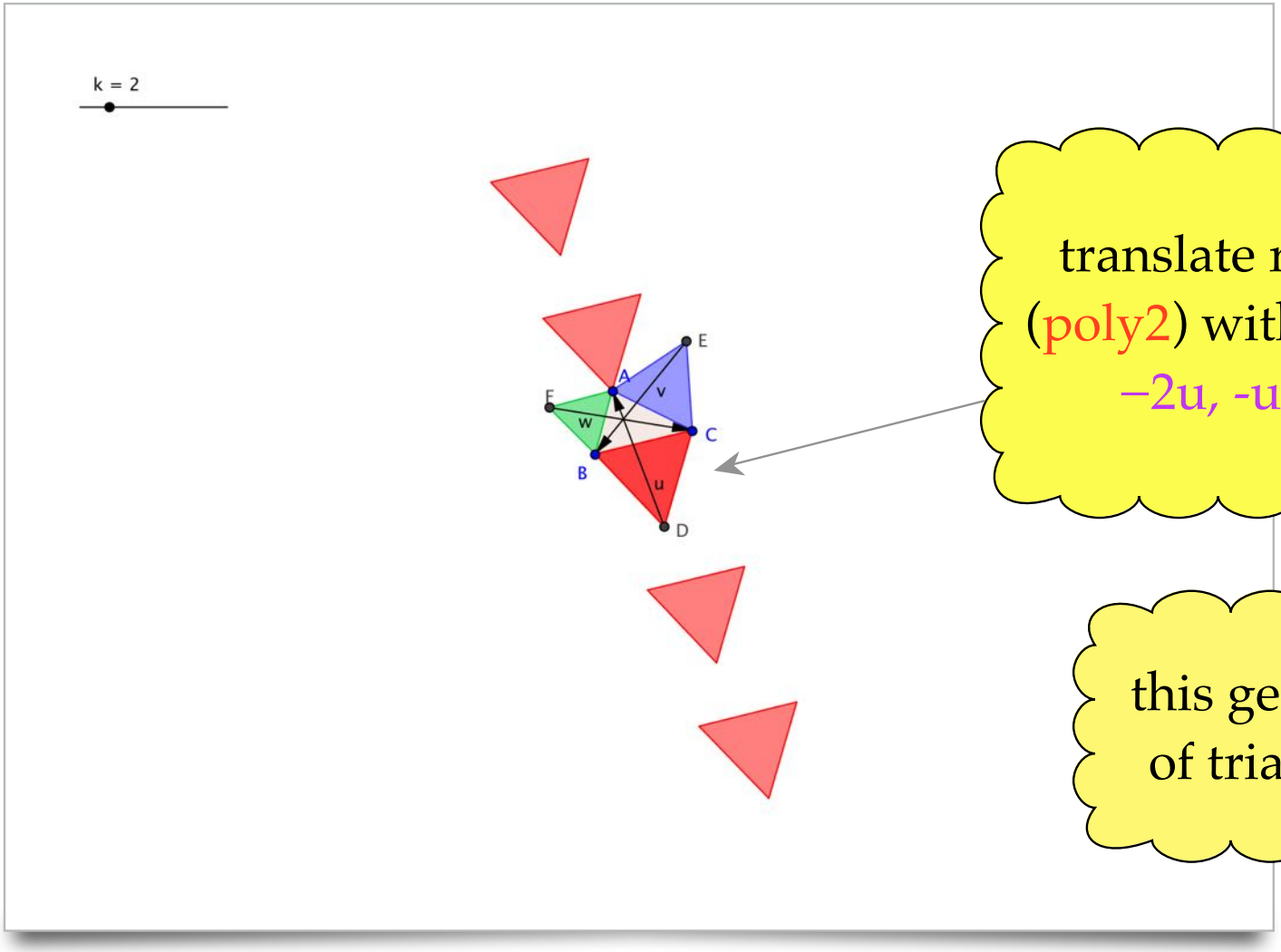
try this construction

napoleon3





Insert slider k (in this figure, k=2).
Create a sequence of triangles by translation with the vectors.



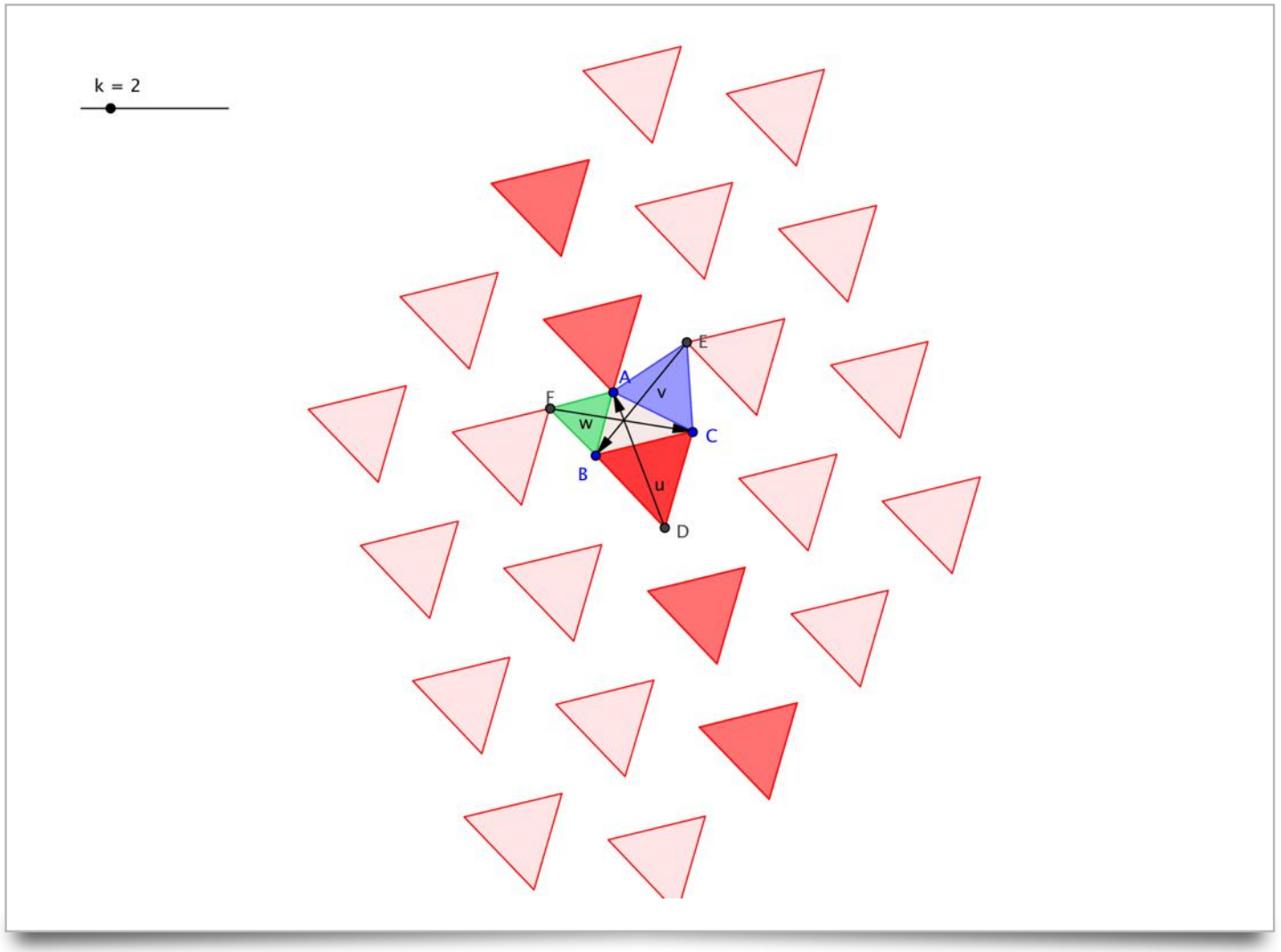
translate red triangle (poly2) with the vectors –2u, -u, 0, u, 2u

this generates a list of triangles (list1)

INPUT ->

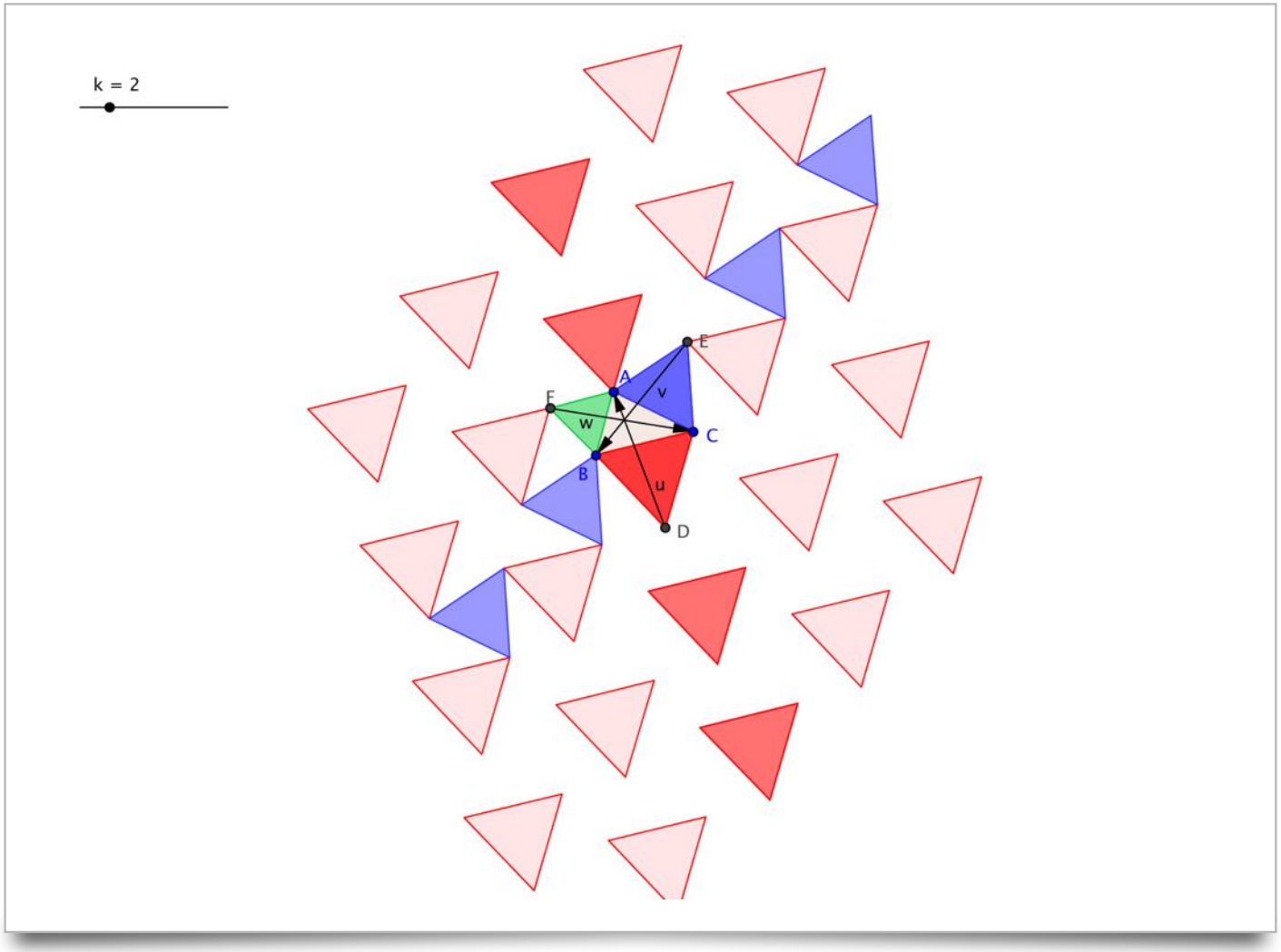
```
list1=Sequence[Translate[poly2, Vector[n*u]], n, -k, k]
```

Translate list1 with the vectors −2v, -v, 0, v, 2v.



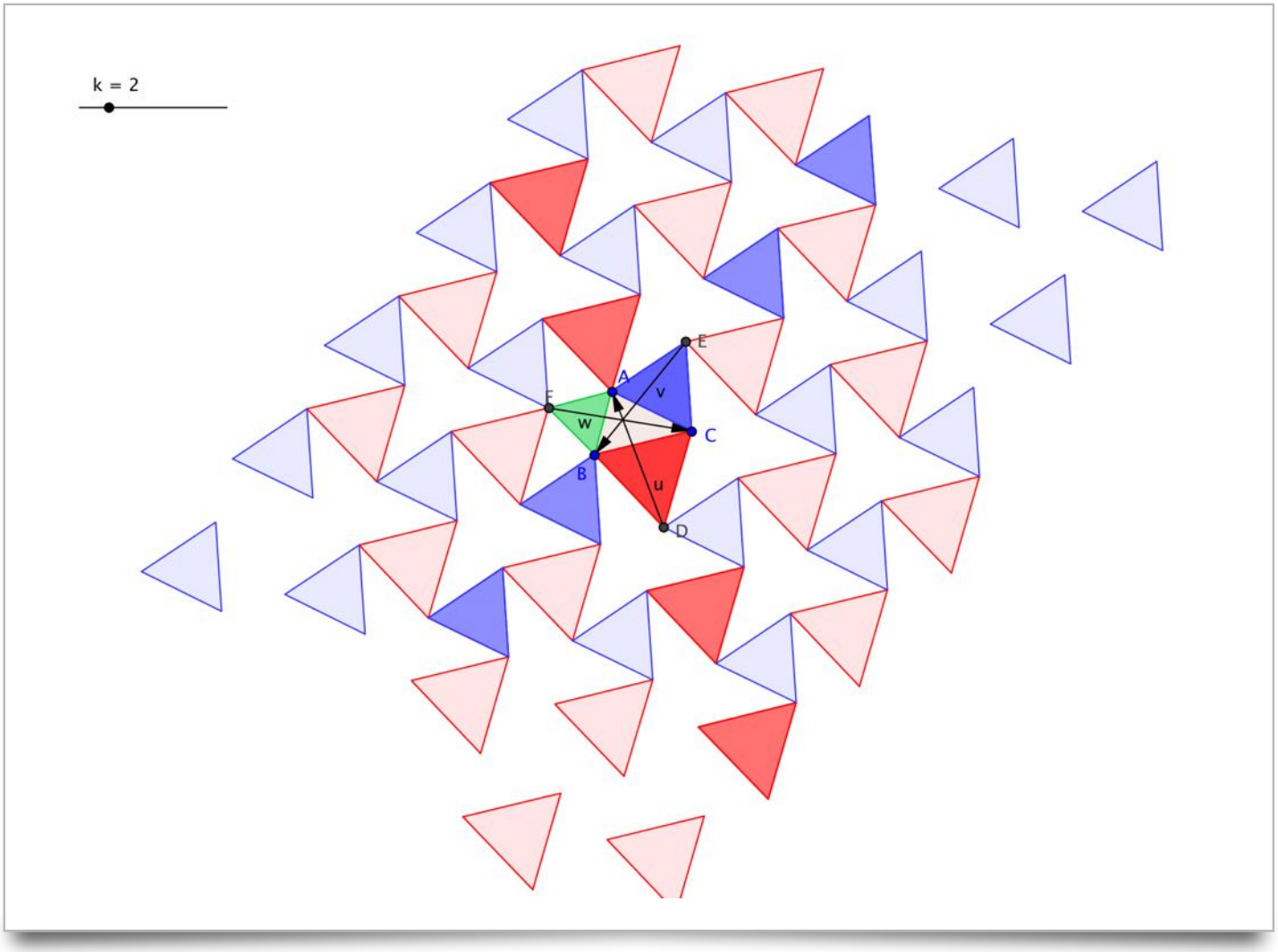

```
list2=Sequence[Translate[list1, Vector[n*v]], n, -k, k]
```

Generate a list of triangles (list3) by translating blue triangle (poly3) with the vectors −2v, -v, 0, v, 2v.

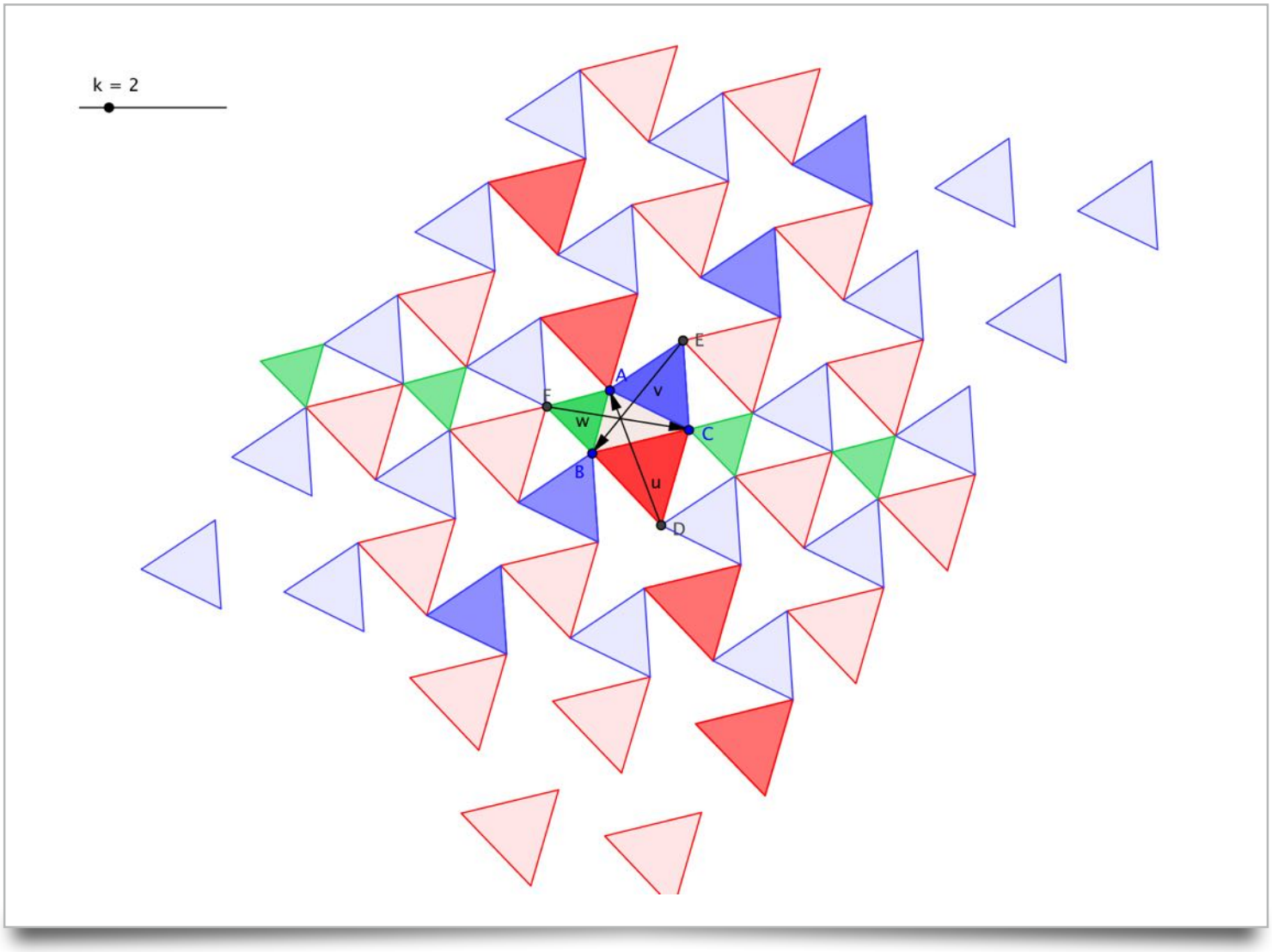



```
list3=Sequence[Translate[poly3, Vector[n*v]], n, -k, k]
```

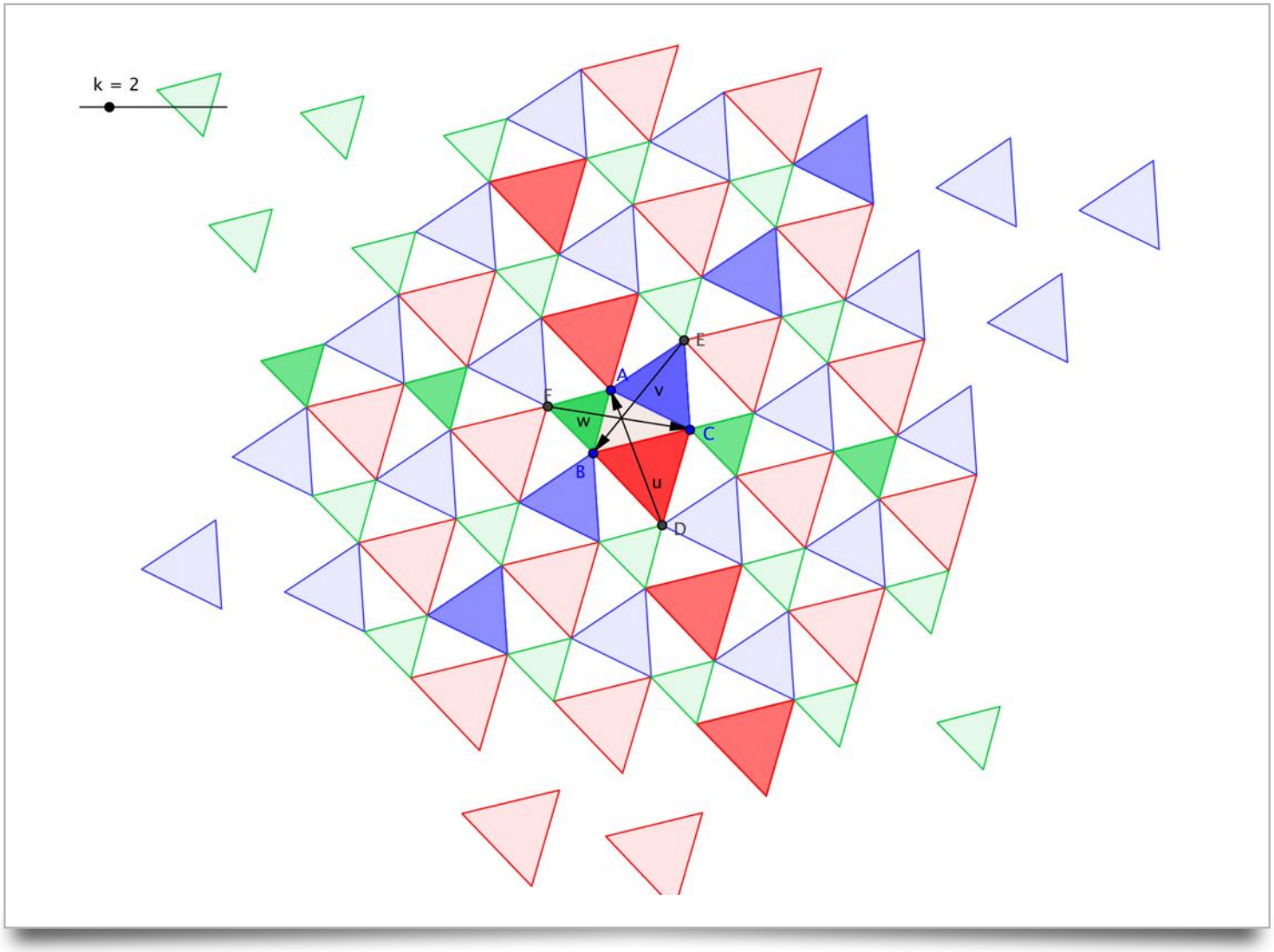
Translate list3 with the vectors −2w, -w, 0, w, 2w.




```
list4=Sequence[Translate[list3, Vector[n*w]], n, -k, k]
```

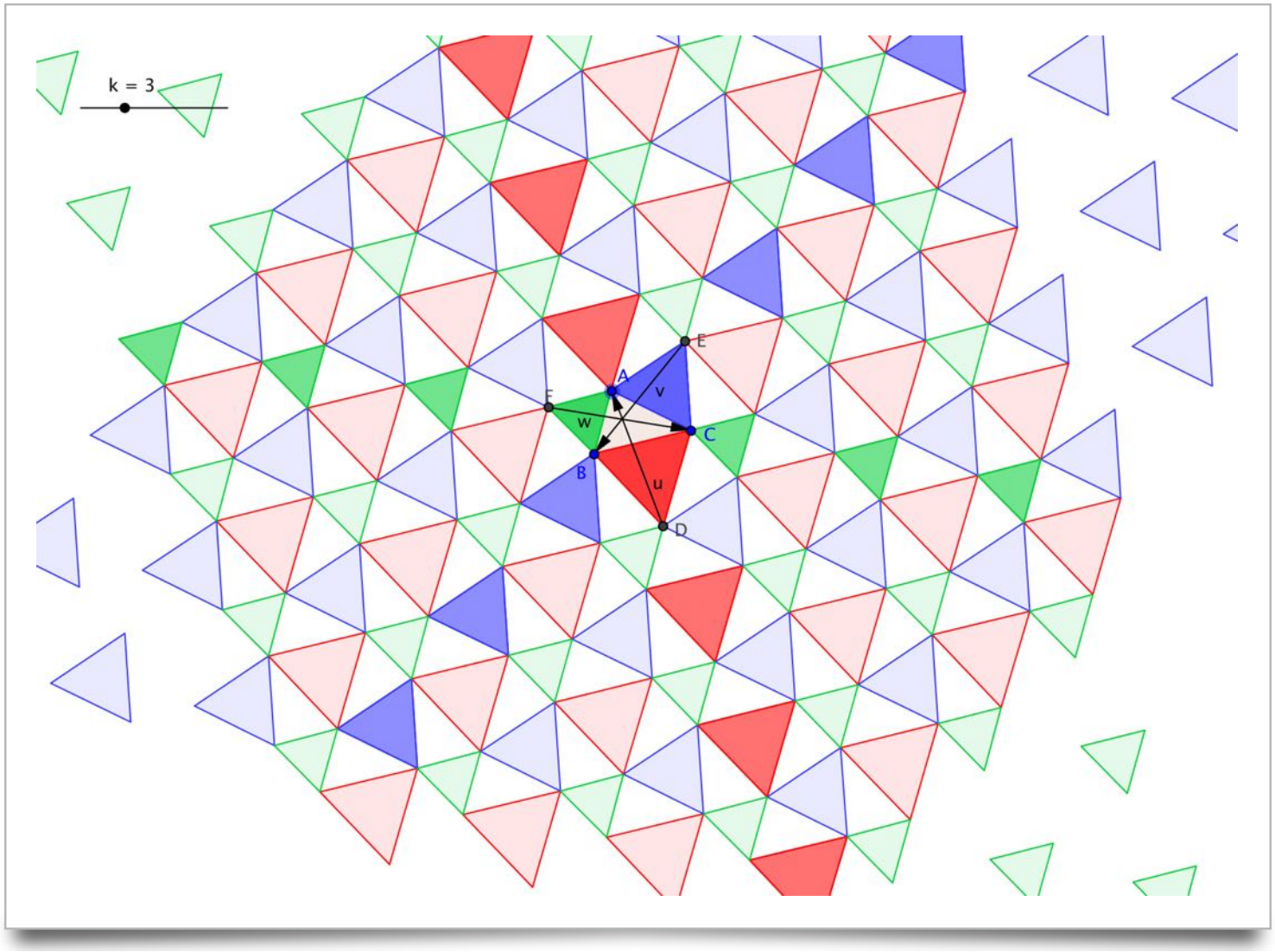



```
list5=Sequence[Translate[poly4, Vector[n*w]], n, -k, k]
```

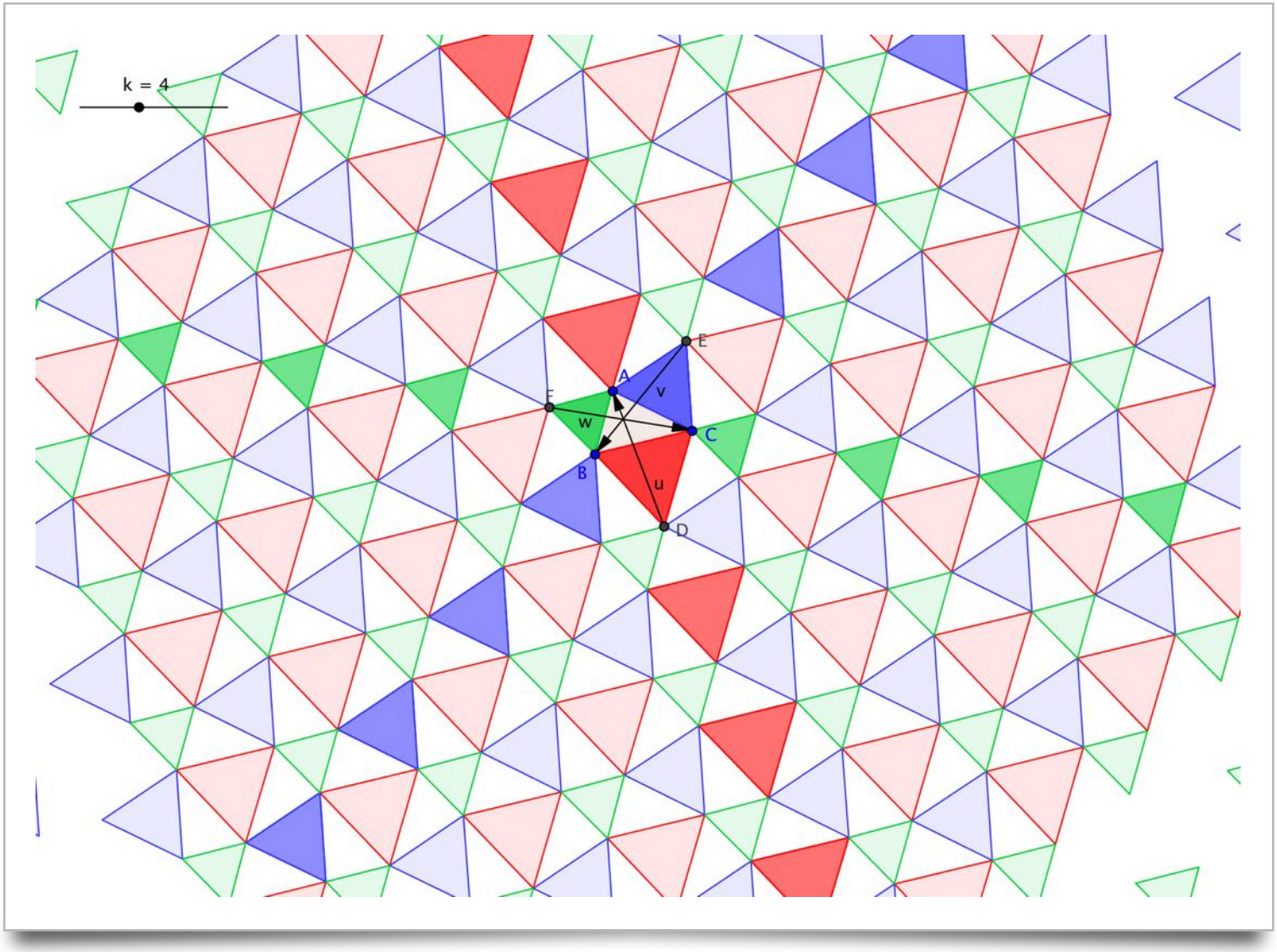



```
list6=Sequence[Translate[list5, Vector[n*u]], n, -k, k]
```

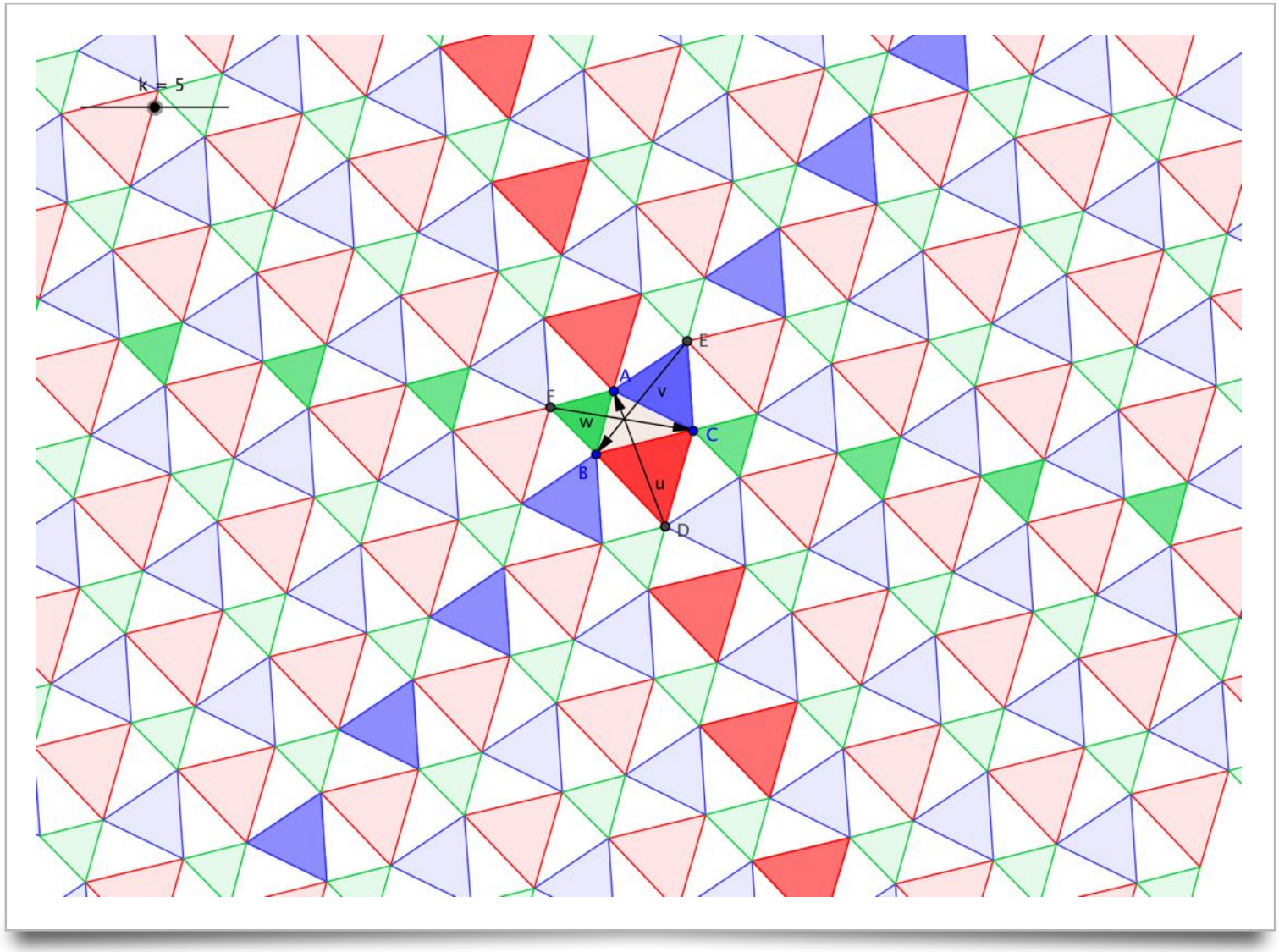
Increase the value of k. (k=3 in this figure)



Increase the value of k. (k=4 in this figure)

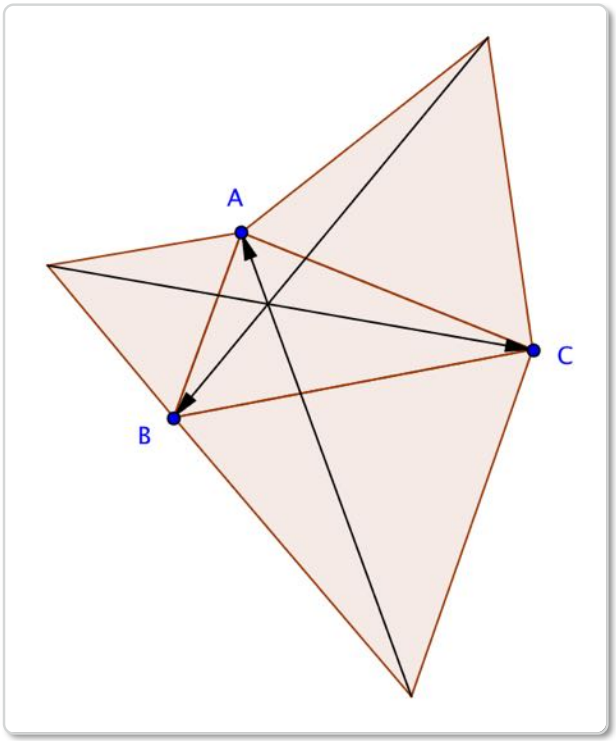


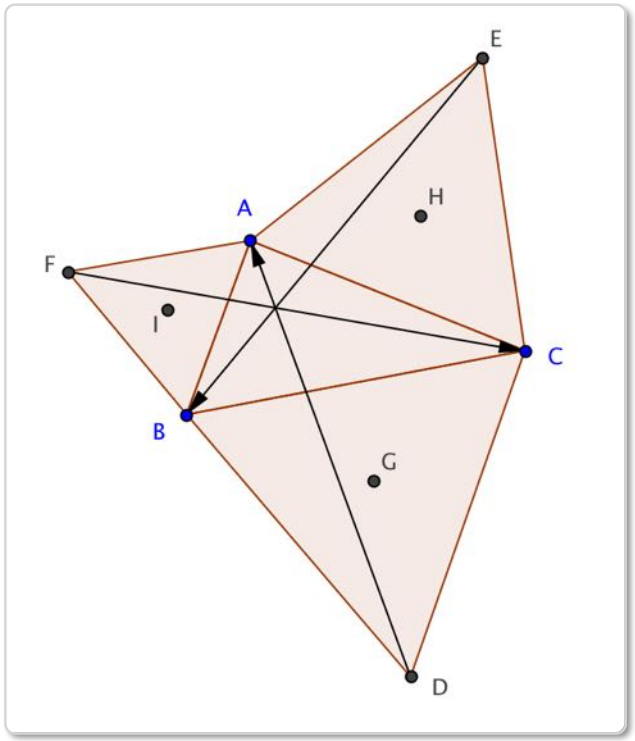
Increase the value of k. (k=5 in this figure)

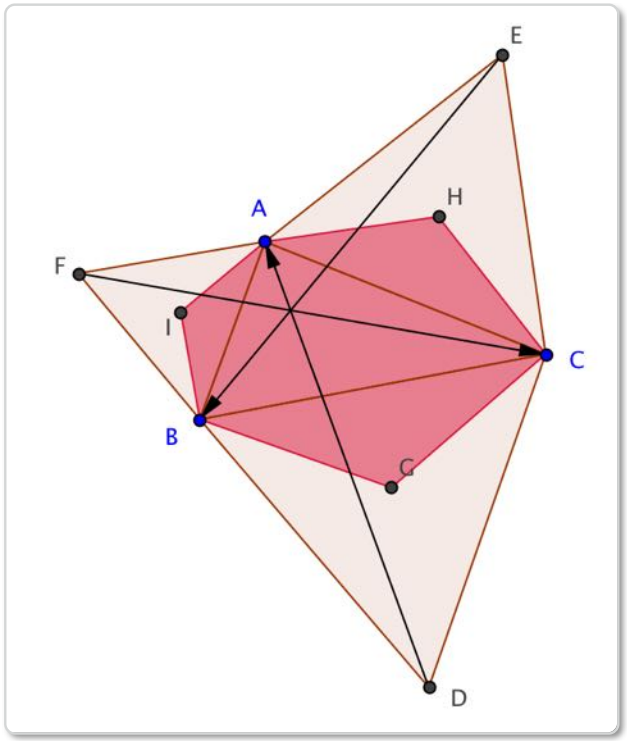


Create an irregular hexagon that tessellates

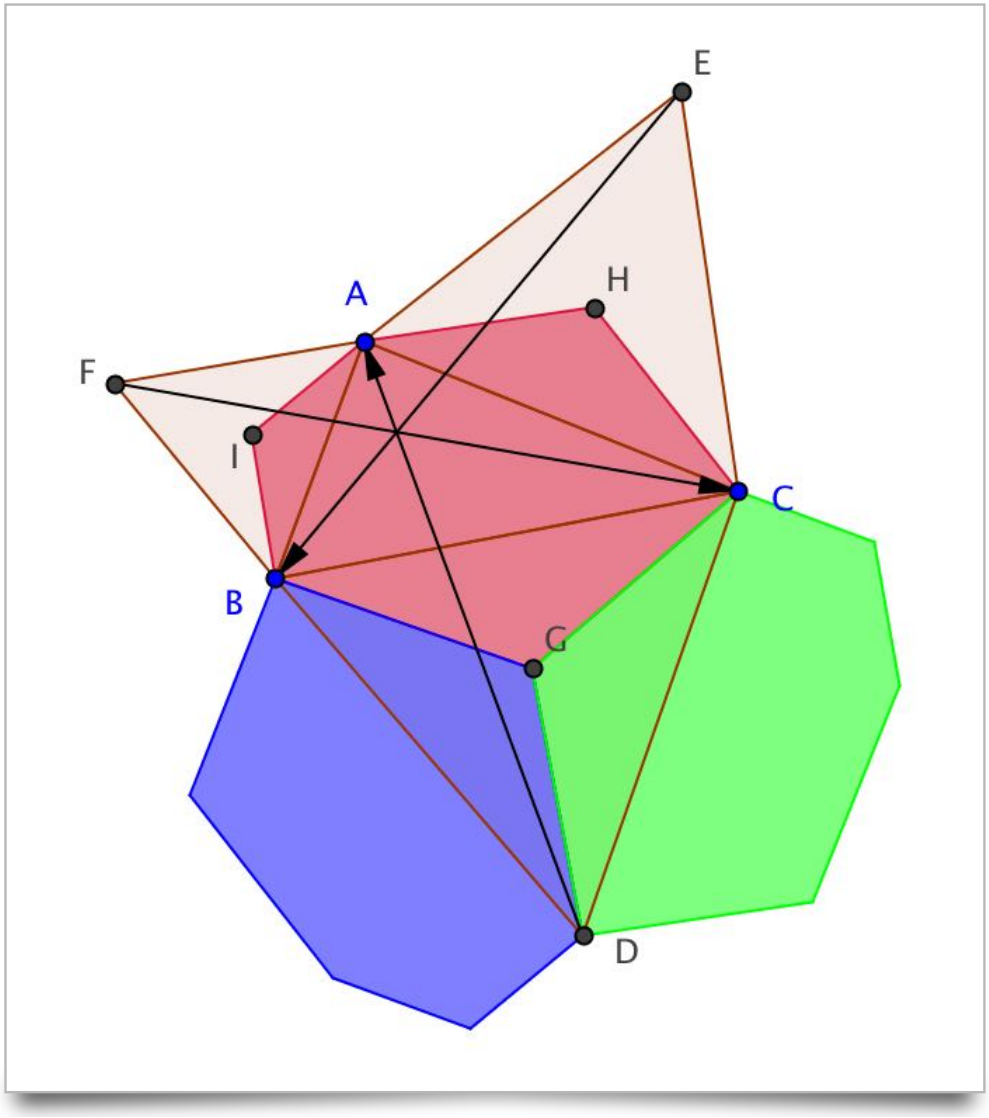
Start with the same configuration of a triangle and 3 equilateral triangles on its sides. Create the centroid of the equilateral triangles. Join the centroids and the 3 vertices of the first triangle to make a hexagon.





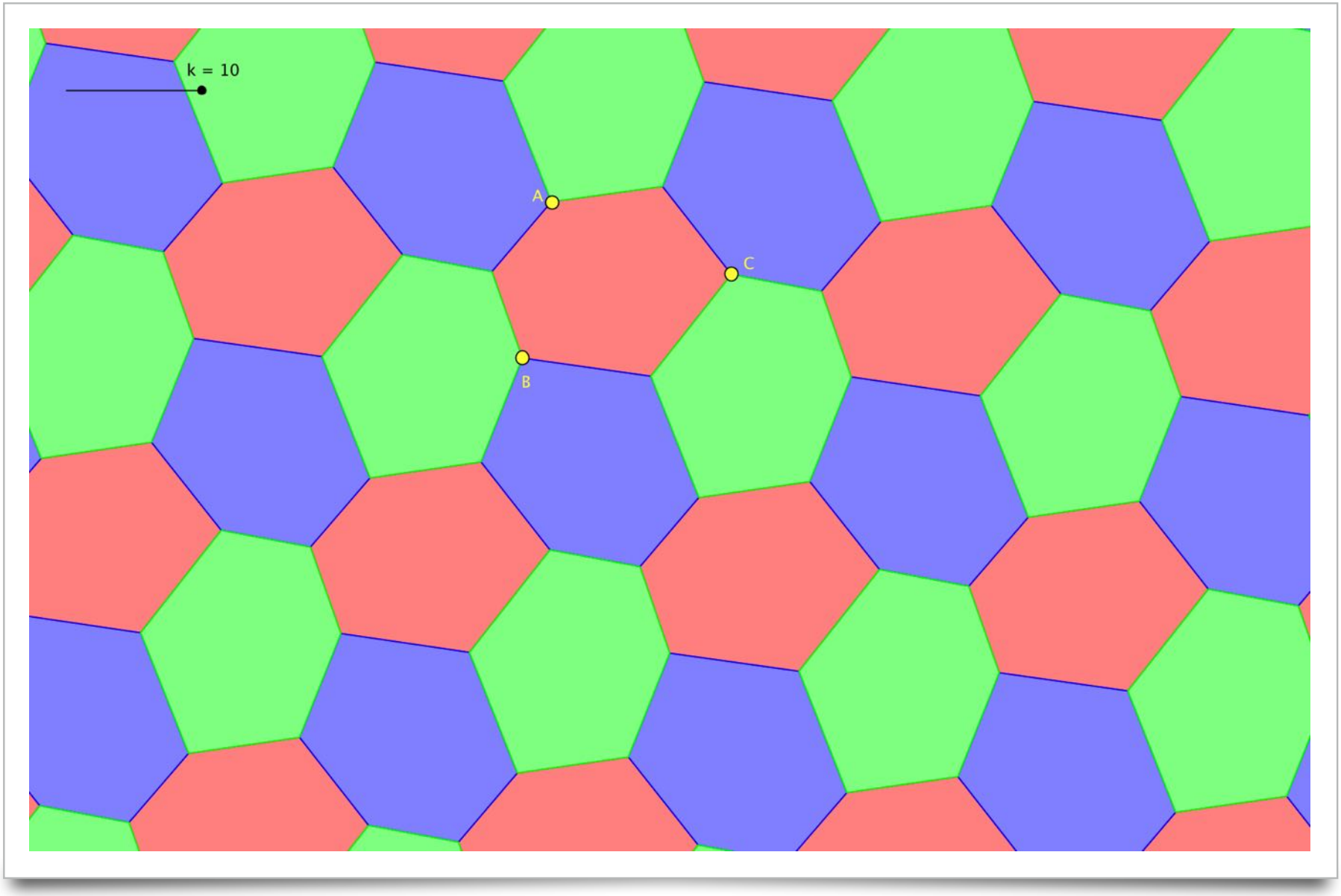


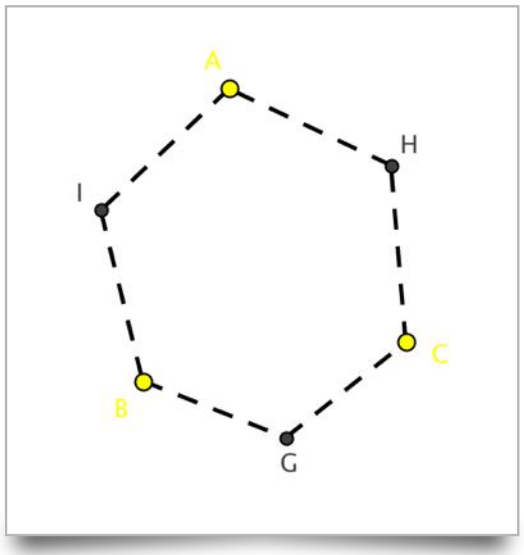
Rotate the hexagon about one of the centroids by 120 degrees to make 2 more copies. Translate these 3 hexagons with the same vectors u, v, w in the same way as before to make the tessellation.

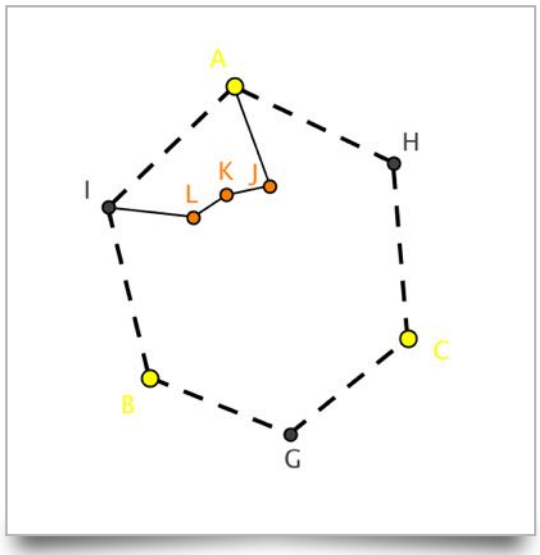


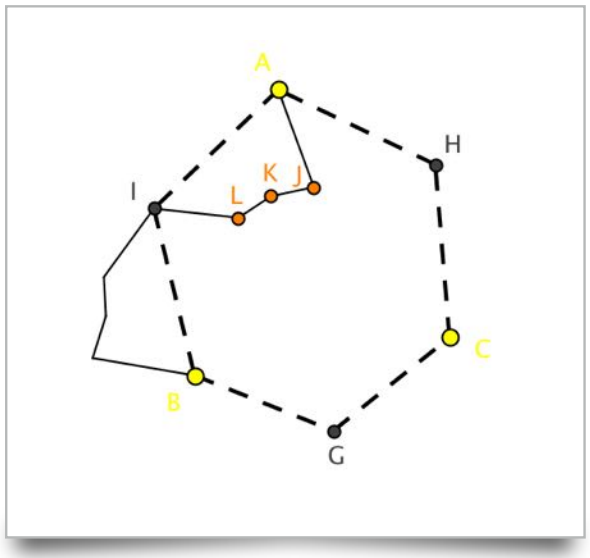
hextile2

Drag A, B, C to vary the shape of the hexagon.

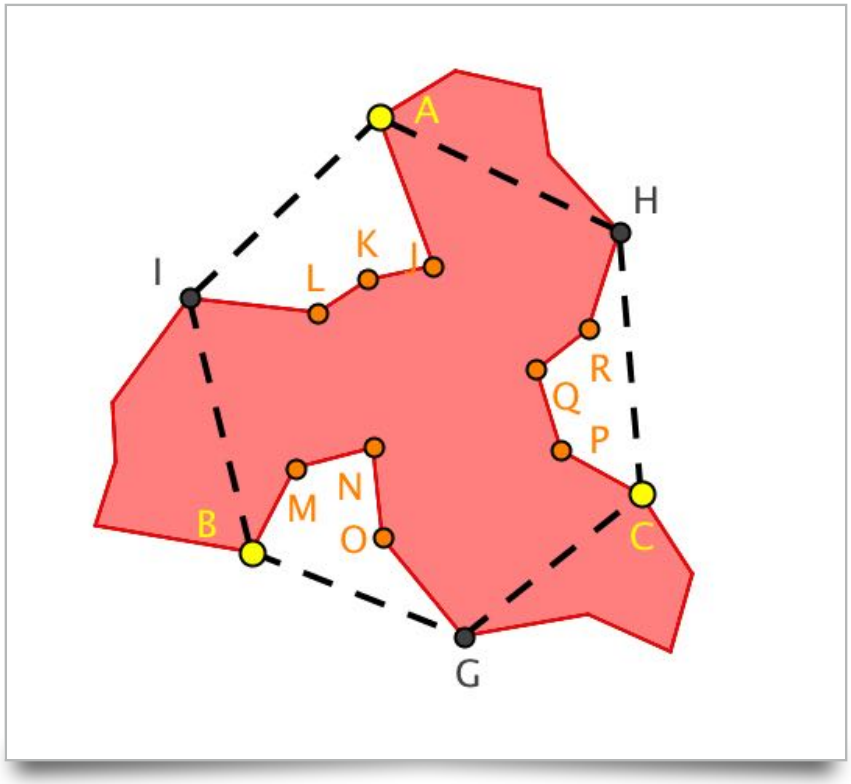




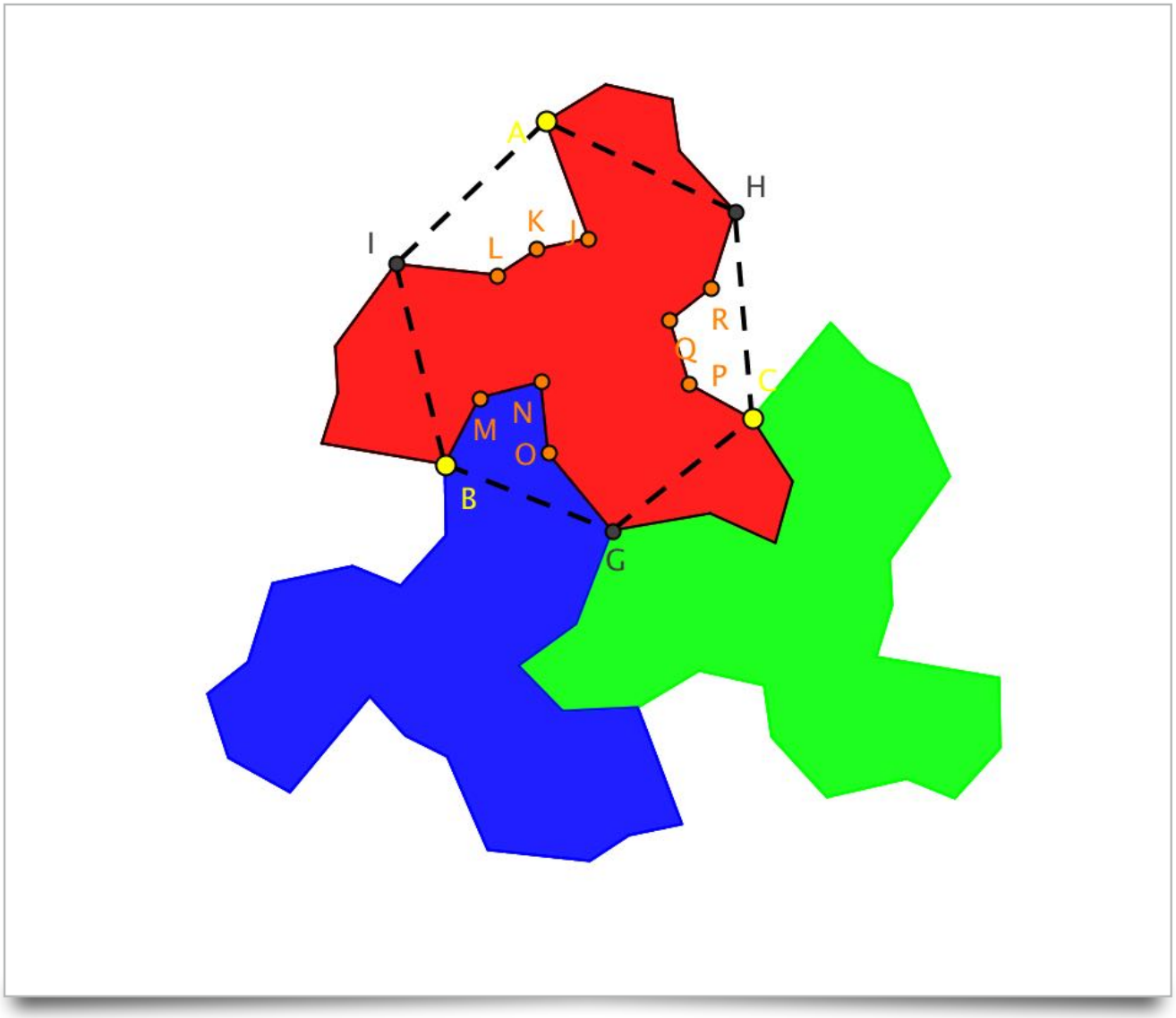




From the hexagon, add new vertices between A and I. Rotate new segments about I. Do the same for BG and CH. Create a new polygon that tessellates in the same way.

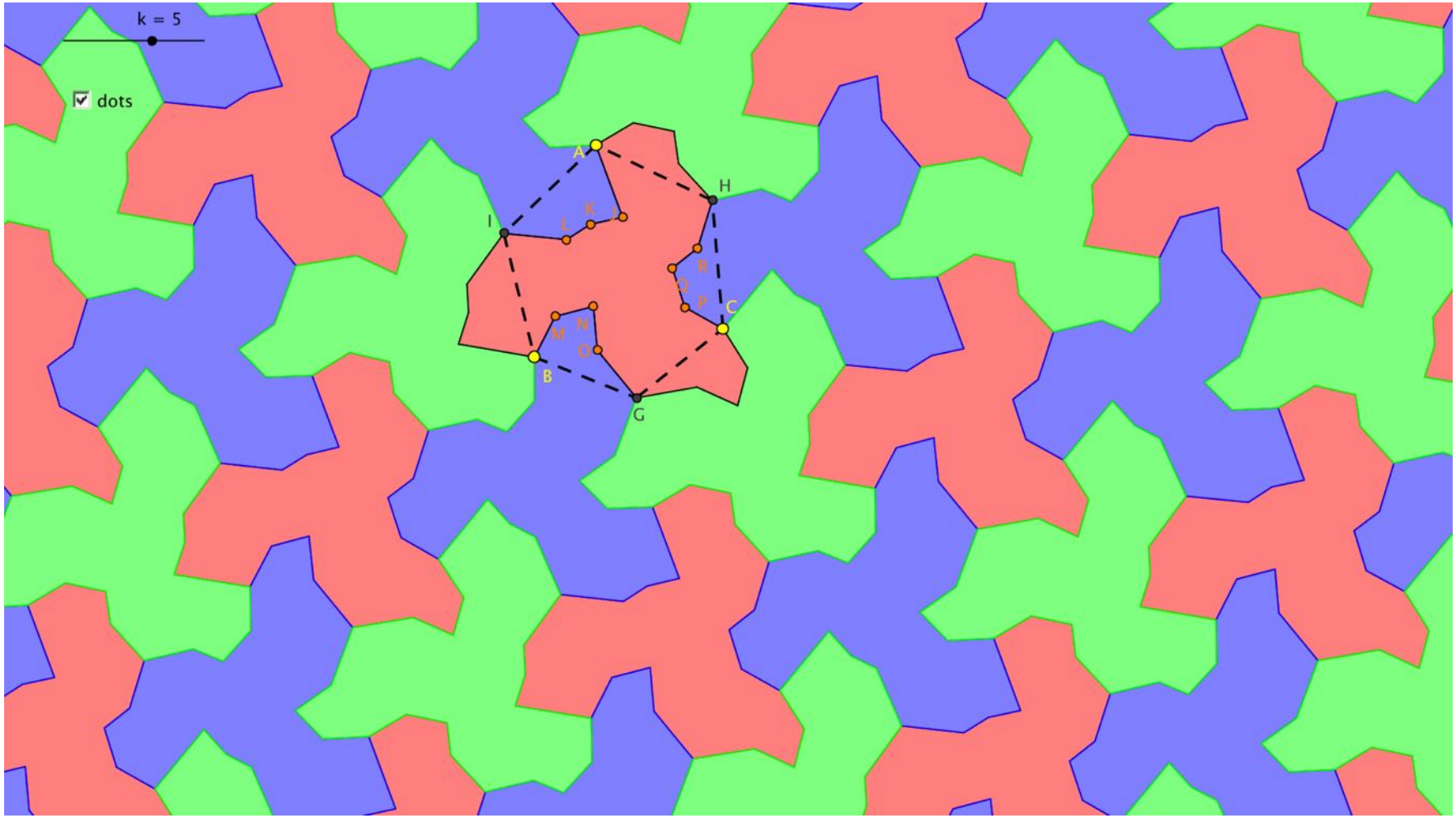


Rotate the new polygon about G to make 2 more copies. These shapes could then be translated in the same way like the hexagons.



Escherian Tessellation

escher

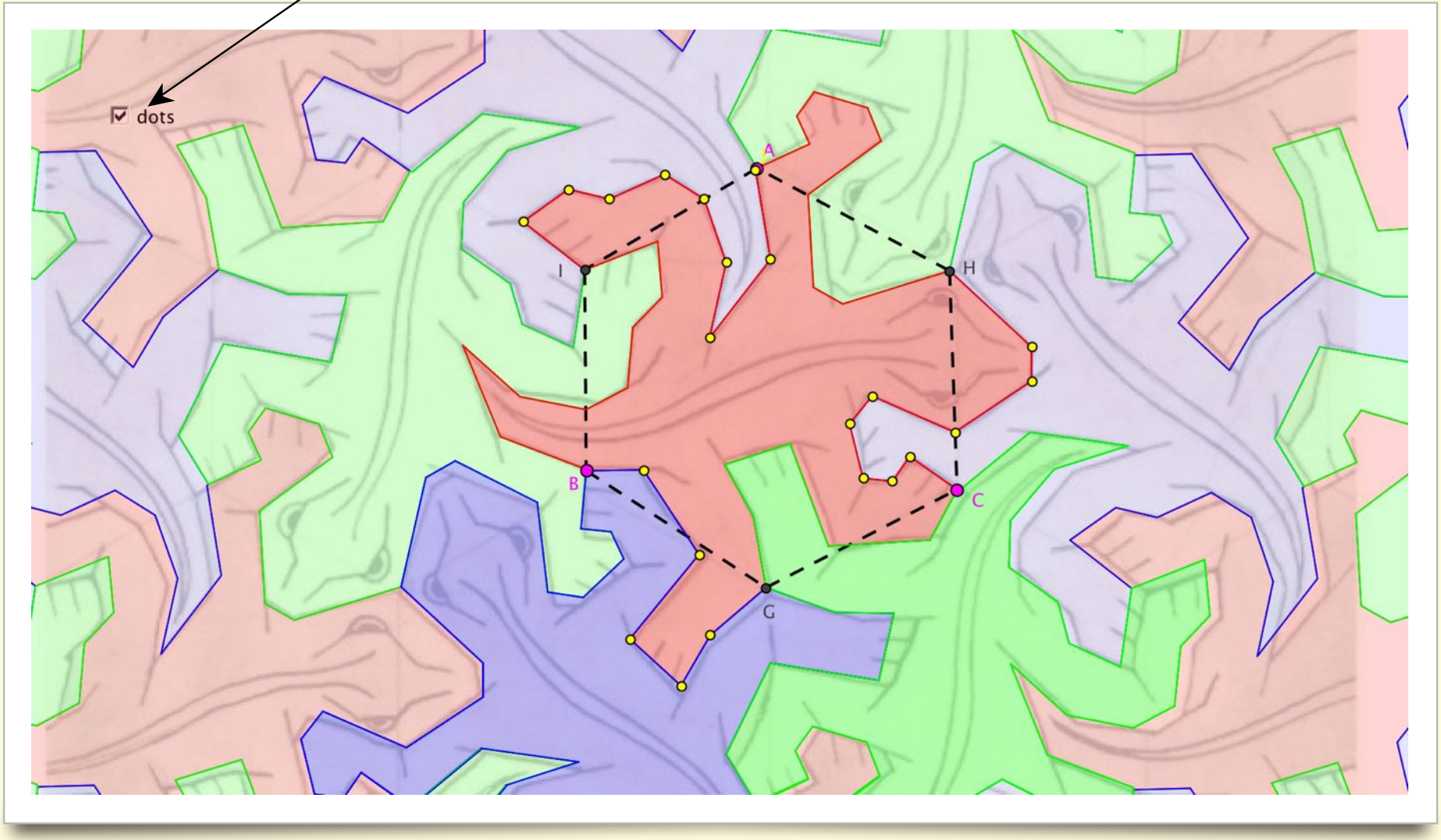


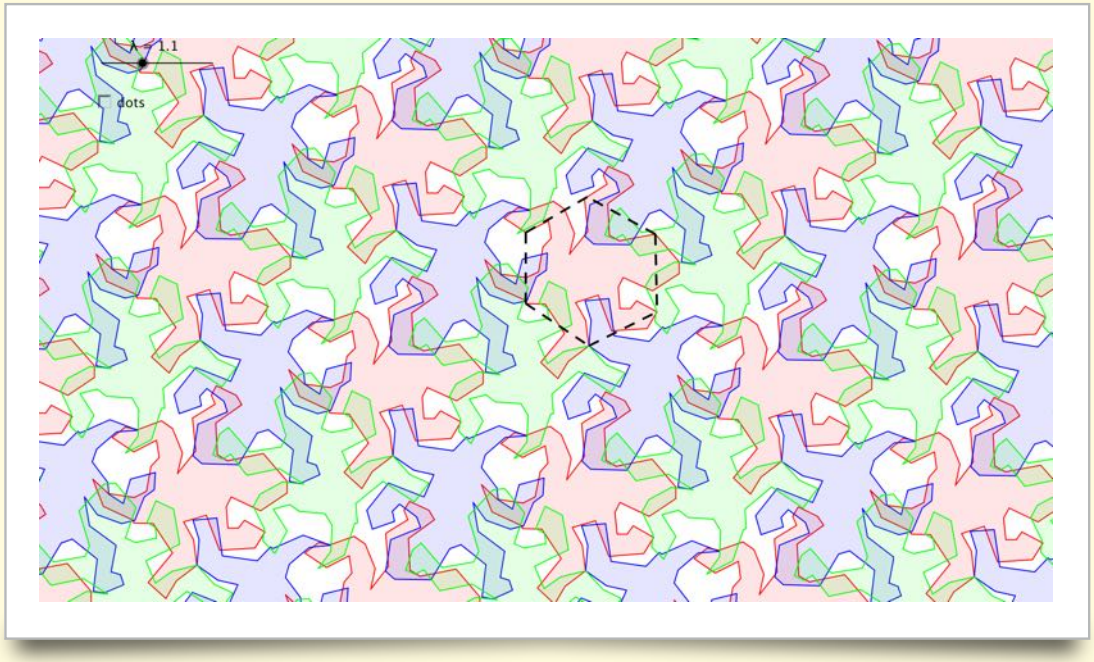
http://euler.slu.edu/escher/index.php/Tessellations_by_Recognizable_Figures

Drag the yellow or pink dots to alter the shape and study its symmetry.

show or hide the dots

reptile3





reptile4

reptile5

use the slider or the play button to rotate (reptile4) or translate (reptile5) the shapes