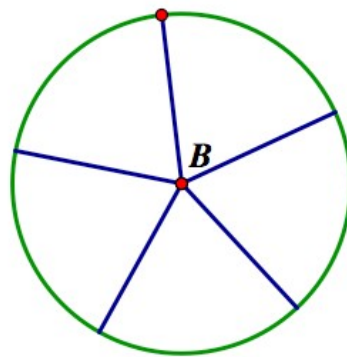
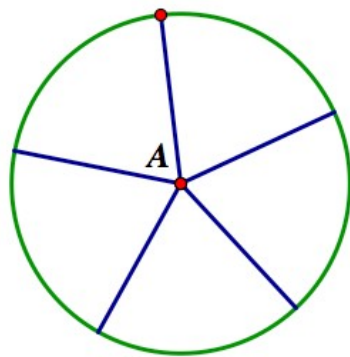


Constructing a Bicycle Using Geometric Transformations

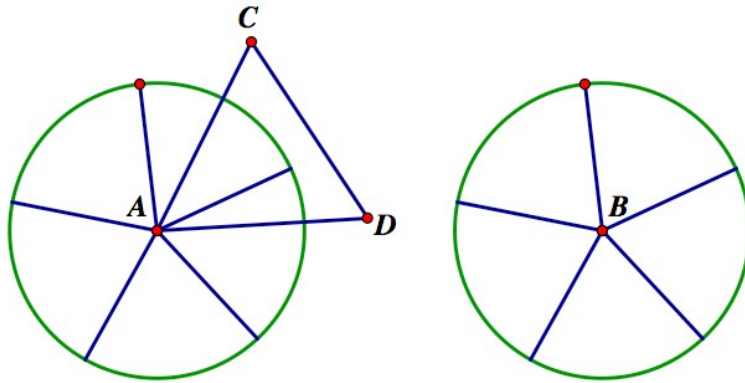
To often high school students wonder when and how are they going to use the mathematics they learn in school. This activity demonstrates how geometry is used to construct a bicycle.

Follow the instruction to construct your bicycle:

1. Open the sketch *BicycleActivity.gsp*.
2. Using the pointer tool, draw a point and label it A. Point A will be the center of the rear wheel of the bicycle.
3. Using point A, construct a circle with center A. The length of the radius will determine the length of the spokes of the wheel.
4. A bicycle wheel has multiple spokes. To construct the first spoke, construct a point on the circle and connect it with the center of the circle.
Hint: Before continuing animate that point clockwise around the circle.
5. Using the center of the circle as the center of rotation and rotate the radius of the circle multiple times to create the spokes of the wheel use your previous knowledge of measures of interior angles of regular polygons. You might select the number of spokes you want the wheel to have.
6. Once the rear wheel has been constructed, translate the circle 12.5 cm. Label the center of the translated circle as point B (see picture).



7. Using A as one of its vertices, construct triangle ACD to be equilateral with sides equal to 6 cm.



8. Using Segment CD as the base, construct triangle CDE to be isosceles.

9. Create segment BE segment BE

10. The last step to have your bicycle completed is to merge the seat and the handlebar. To do that select, in order, C' and C. Go to Edit → Merge Points. Do the same with points E' and E to merge the handlebar.

Your final product should look similar to the following picture:

Animate Spokes

