Unit 3 Lesson 8: Relating Area to Circumference

1 Irrigating a Field (Warm up)
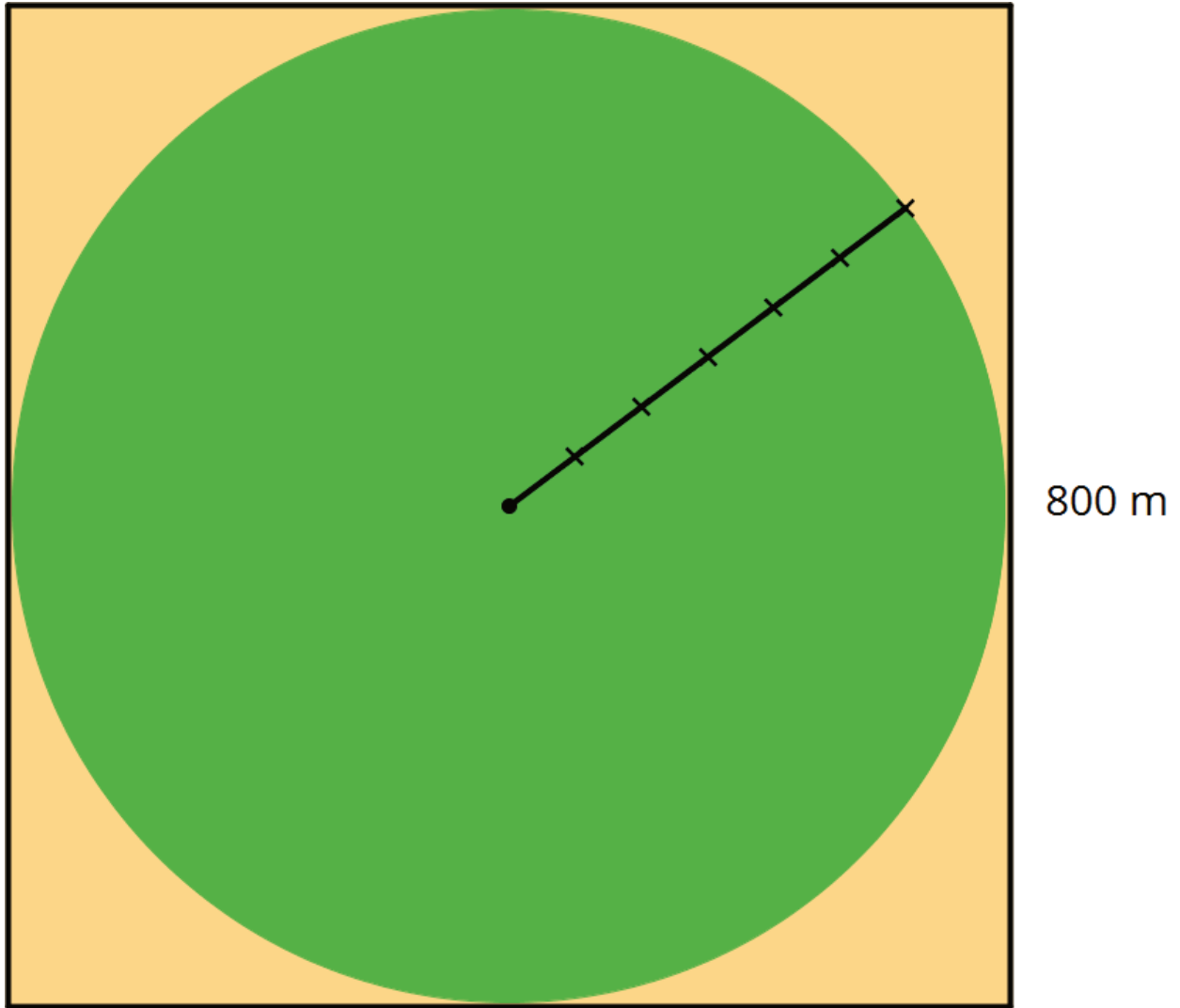
Images for Launch

Student Task Statement

A circular field is set into a square with an 800 m side length. Estimate the field's area.

800 m

- About 5,000 m^2
- About 50,000 m^2
- About 500,000 m^2
- About 5,000,000 m^2
- About 50,000,000 m^2

2 Making a Polygon out of a Circle

Student Task Statement

Your teacher will give you a circular object, a marker, and two pieces of paper of different colors.

Follow these instructions to create a visual display:

1. Using a thick marker, trace your circle in two separate places on the same piece of paper.

2. Cut out both circles, cutting around the marker line.

3. Fold and cut one of the circles into fourths.

4. Arrange the fourths so that straight sides are next to each other, but the curved edges are alternately on top and on bottom. Pause here so your teacher can review your work.

5. Fold and cut the fourths in half to make eighths. Arrange the eighths next to each other, like you did with the fourths.

6. If your pieces are still large enough, repeat the previous step to make sixteenths.

7. Glue the remaining circle and the new shape onto a piece of paper that is a different color.

After you finish gluing your shapes, answer the following questions.

1. How do the areas of the two shapes compare?

2. What polygon does the shape made of the circle pieces most resemble?

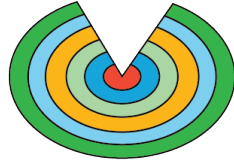3. How could you find the area of this polygon?

Activity Synthesis

3 Making Another Polygon out of a Circle (Optional)
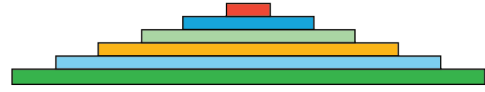
Student Task Statement

Imagine a circle made of rings that can bend, but not stretch.

A circle is
made of rings.

The rings
are unrolled.

The circle has been made
into a new shape.

1. What polygon does the new shape resemble?

2. How does the area of the polygon compare to the area of the circle?

3. How can you find the area of the polygon?

4. Show, in detailed steps, how you could find the polygon's area in terms of the circle's measurements. Show your thinking. Organize it so it can be followed by others.

5. After you finish, trade papers with a partner and check each other's work. If you disagree, work to reach an agreement. Discuss:

   ○ Do you agree or disagree with each step?

   ○ Is there a way to make the explanation clearer?

6. Return your partner's work, and revise your explanation based on the feedback you received.

4 Tiling a Table

Images for Launch
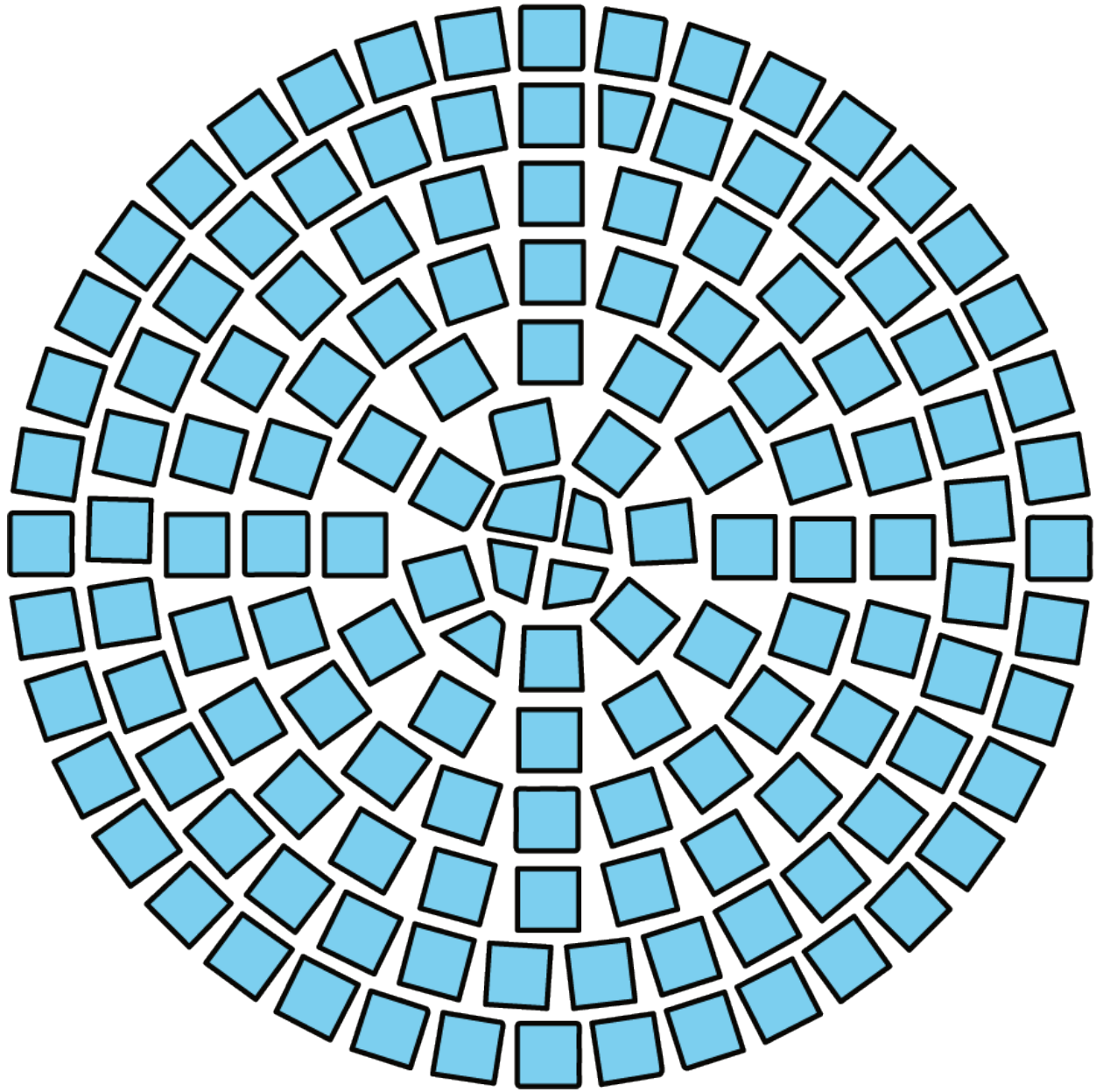
Student Task Statement

Elena wants to tile the top of a circular table. The diameter of the table top is 28 inches. What is its area?