Grade 7 Unit 3: Measuring Circles
Lessons 1–5: Circumference of a Circle

Explore, Play, and Discuss

- I can examine quotients and use a graph to decide whether two associated quantities are in a proportional relationship.
- I understand that it can be difficult to measure the quantities in a proportional relationship accurately.
- I can describe the characteristics that make a shape a circle.
- I can identify the diameter, center, radius, and circumference of a circle.

Activity Suggestions:

- ➢ Lesson 1: This lesson is for students to apply what they have learned about proportional relationships to describing geometric figures, specifically squares. *Activity 2 has a digital version, if needed.*
- ➢ Lesson 2: Focus on the idea that a circle is the set of points that are equally distant from the center, enclosing a circular region. Activity 2 may need to be modified for individuals instead of groups, therefore needing more slips for sorting. *There is a digital version of Activity 4.*

Assessment Suggestions:

- ➢ Check Your Readiness assessment: Administer all 6 items within the first day or two of this section. Use the guidance provided with each problem to adjust instruction so that students can access the math in the unit.
- ➢ Lesson 1 Cool-down
- ➢ Lesson 2 Cool-down

Deep Dive

- I can describe the relationship between circumference and diameter of any circle.
- I can explain what π means.

Activity Suggestions:

- ➢ Lesson 3: Focus on the proportional relationship between the diameter and circumference of a circle. *Activity 2 has a digital version.* In Activity 3, if there is not sufficient time to allow students to work through all of the calculations, consider dividing up the work, assigning one circle to each student or group of students.

Assessment Suggestions:

- ➢ Lesson 3 Cool-down

Synthesize and Apply

- I can choose an approximation for π based on the situation or problem.
- If I know the radius, diameter, or circumference of a circle, I can find the other two.

Activity Suggestions:

- ➢ Lesson 4: Focus on the equation $C = \pi d$ in a variety of contexts. Make the connection between $C = \pi d$ and $C = 2\pi r$ to help with future lessons. *There is a digital version of Activity 2. Activity 3 is optional.*
- ➢ Teach and encourage students to study the lesson summaries (at the end of every lesson) and refer back to them.

Assessment Suggestions:

- ➢ Lesson 4 Cool-down
- ➢ Optional Lesson 5 (if time)
- ➢ Revisions to previous assessment prompts
- ➢ Students use learning targets to decide what additional practice they need.

Ongoing Practice

- Assign one or more of the distributed practice problem sets from Lessons 1–5 to be completed over the time period that the section is being worked on.
- These could also be lagging, so that students are working on practice problems from the previous section or unit during this section or unit.
- Specify which problems students should submit, or let them choose.
- Note: Several existing platforms already have IM's practice problems loaded so that students can complete and submit them online. Some can be autoscored.

Anytime Resources

- Delve into one of the culminating lessons from Units 1 or 2.

Lessons 6–11: Area of a Circle

Explore

- I can calculate the area of a complicated shape by breaking it into shapes whose area I know how to calculate.
- If I know a circle's radius or diameter, I can find an approximation for its area.
- I know whether or not the relationship between the diameter and area of a circle is proportional and can explain how I know.

Activity Suggestions:

- Lesson 6: Focus on composing and decomposing irregular regions to calculate their area, in preparation for estimating the area of circles in Lesson 7. Make note of needed supplies for geometry toolkits for this lesson. Consider providing these for distance learners or using digital tool alternatives.
- Lesson 7: This lesson, in combination with Lesson 8, will develop the formula for the **area of a circle**. In this lesson, focus on how the area of a circle compares to the area of a square that has side lengths equal to the circle's radius so students can find an approximate formula. *There is a digital version of Activity 2. Activity 3 is optional.*

Assessment Suggestions:

- Lesson 6 Cool-down
- Lesson 7 Cool-down

Dive Deep

- I can explain how the area of a circle and its circumference are related to each other.
- I know the formula for area of a circle and can write exact answers in terms of π.

Activity Suggestions:

- Lesson 8: In Lesson 7, students found that it takes a little more than 3 squares with side lengths equal to the circle's radius to completely cover a circle. Students may have predicted that the area of a circle can be found by multiplying πr^2. In this lesson students derive that relationship through informal dissection arguments. *Activity 3 is optional and has a digital version.*

Assessment Suggestions:

- Lesson 8 Cool-down

Synthesize and Apply

- I can calculate the area of more complicated shapes that include fractions of circles.
- I can decide whether a situation about a circle has to do with area or circumference.
- I can use formulas for circumference and area of a circle to solve problems

Activity Suggestions:

- ➢ Lesson 9: Focus on applying the formula for a circle to solve problems involving area. Remind students that their calculations may require composition and decomposition strategies from Grade 6. *Activity 3 is optional.*
- ➢ Lesson 10: Activity 2 is a card sort. Make contents of cards available in online or paper journals for students to respond. *Activity 3 is optional.*

Assessment Suggestions:

- ➢ Lesson 9 Cool-down
- ➢ Lesson 10 Cool-down
- ➢ End-of-Unit Assessment
- ➢ Students use learning targets to decide what additional practice they need.

Ongoing Practice

- Assign one or more of the distributed practice problem sets from Lessons 6–10 to be completed over the time period that the section is being worked on.
- These could also be lagging, so that students are working on practice problems from the previous section or unit during this section or unit.
- Specify which problems students should submit, or let them choose.
- Note: Several existing platforms already have IM's practice problems loaded so that students can complete and submit them online. Some can be autoscored.

Anytime Resources

- Optional Lesson 11 if time.
- Delve into one of the culminating lessons from Units 1 or 2.