Geometry Unit 6: Coordinate Geometry
Lessons 1–3: Transformations in the Plane

Note: If possible, give item 7 from the Check Your Readiness assessment prior to the start of the unit. If students do well on that item, they can move quickly through this section or skip to the second section.

Explore, Play, and Discuss

- I can prove triangles are congruent using coordinates.
- I can reflect, rotate, and translate figures in the coordinate plane.
- I can use coordinate transformation notation to take points in the plane as inputs and give other points as outputs.

Activity Suggestions: Students respond to questions in an online or paper journal, or talk them over with someone at home.

- ➢ Activity 1.3: Consider recording worked examples for Activity 1.1 and Activity 1.2, following the Americans with Disabilities Act (ADA) guidelines accessible.
- ➢ Lesson 2
  - Activity 2.1: invite students to share responses using online discussion. Use student responses to introduce the notation (x, y) → (x-4, y), and so on through a video.
  - Activity 2.2 and 2.3: complete per Activity Suggestions

Assessment Suggestions:

- ➢ Check Your Readiness assessment: Administer all 7 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 2 cool-down

Deep Dive

- I can determine whether a transformation produces congruent or similar images (or neither).

Activity Suggestions: Synchronous Discussion

- ➢ Activity 3.1: discuss as outlined in the teacher narrative
- ➢ Activity 3.3: Build from 3.1 to extend thinking to Questions 3 and 4 of this Activity in order to pull out some of the ideas from the Synthesis of the lesson.
- ➢ Activity 4.1: to prepare for the next section.

Assessment Suggestions:

- ➢ Lesson 3 cool-down

Synthesize and Apply

- I can use a table of ratios of side lengths of right triangles to estimate unknown angle measures.
- I can use a table of ratios of side lengths of right triangles to estimate unknown side lengths.

Activity Suggestions: Students respond to questions in an online or paper journal, use a tool that allows for asynchronous discussion if possible, or talk them over with someone at home.

- ➢ Activity 3.2
- ➢ Lesson 3 Practice Problems 4 and 7

Assessment Suggestions:

- ➢ Students use learning targets to decide what additional practice they need.
- ➢ Lesson 3 Practice Problems 4 and 7

Ongoing Practice

- Assign one or more of the distributed practice problem sets from Lessons 1–3 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 based on reflecting on learning targets.

Anytime Resources

- Delve into one of the culminating lessons from Unit 3.
- Optional Lessons 2 and 3 about special right triangles
- Delve into any of the Modeling Prompts 1–8.
- Teach and encourage students to study the lesson summaries (at the end of every lesson) and refer back to them.
- Emphasize the Are You Ready for More opportunities for students who want to explore the topics in more depth.

Lessons 4-8: Distances, Circles, and Parabolas

Explore, Play, and Discuss

- I can derive an equation for a circle in the coordinate plane.
- I understand how squared binomials relate to the equation of a circle.

Activity Suggestions: Students respond to questions in an online or paper journal, use a tool that allows for asynchronous discussion if possible, or talk them over with someone at home.

- ➢ Activity 4.2
- ➢ Activity 4.3: invite students to submit responses so that you can select student work to discuss at an upcoming synchronous session
- ➢ Lesson 5:
  - Activity 5.1 and 5.3: provide a worked example
  - Activity 5.2: students submit responses prior to the synchronous discussion

Assessment Suggestions:

- ➢ Lesson 4 cool-down
- ➢ Lesson 5 cool-down

Dive Deep

- I understand how squared binomials relate to the equation of a circle.
- I know that a parabola is the set of points equidistant from a given point and line.

Activity Suggestions:

- ➢ Activity 4.3: Sync discussion. Use responses from question 1 to engage students in a discussion about connections between the themes of this lesson and patterns they noticed when completing Activity 5.2.
- ➢ Activity 7.2 and Activity 7.3: Sync discussion
- ➢ Activity 8.2: Sync discussion

Assessment Suggestions:

- ➢ Lesson 7 cool-down

Synthesize and Apply

- I can complete the square to find the center and radius of a circle.
- I can derive an equation for a parabola in the coordinate plane given a focus and a directrix.

Activity Suggestions: Students respond to questions in an online or paper journal, use a tool that allows for asynchronous discussion if possible, or talk them over with someone at home.

- ➢ Lesson 6
  - Activity 6.1: provide worked example or recording
  - Activities 6.2 and 6.3
- ➢ Activity 8.1
- ➢ Activity 8.3: consider providing a digital version of a card sort

Assessment Suggestions:

- ➢ Lesson 6 cool-down
- ➢ Lesson 8 cool-down

Ongoing Practice

- Assign one or more of the distributed practice problem sets from Lessons 4-8 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 based on reflecting on learning targets.

Anytime Resources

- Delve into one of the culminating lessons from previous units. Applications from Unit 3 will come up again in Lesson 15.
- Delve into any of the Modeling Prompts 1–8
- Teach and encourage students to study the lesson summaries (at the end of every lesson) and refer back to them.
- Emphasize the Are You Ready for More opportunities for students who want to explore the topics in more depth.

Lessons 9-16: Proving Geometric Theorems Algebraically

Explore, Play, and Discuss

- I can use the definition of slope to write the equation for a line in point-slope form.

Activity Suggestions: Students respond to questions in an online or paper journal, use a tool that allows for asynchronous discussion if possible, or talk them over with someone at home. ➢ Lesson 9 ○ The term **point-slope form** is introduced in 9.2 which will come into play for 9.3. Consider how you may want to set this up to support concept development. ○ The goal is to connect this form of a linear equation to the reasoning used to build equations of circles and parabolas in earlier parts of the unit. ➢ Activity 10.1 and Activity 11.1: invite students to submit their responses prior to the synchronous session to build from.	**Assessment Suggestions:** ➢ Lesson 9 cool-down

Dive Deep

- I can prove that the slopes of parallel lines are equal.
- I can use slopes of parallel lines to solve problems.

Activity Suggestions: Sync discussion ➢ Activity 10.2 and Activity 10.3 ➢ Activity11.2 and Activity 11.3	**Assessment Suggestions:** ➢ Lesson 10 cool-down ➢ Lesson 11 cool-down

Synthesize and Apply

- I can use a graph to find the intersection points of a line and a circle.
- I can use coordinates of figures to prove geometric theorems.

Activity Suggestions: Students respond to questions in an online or paper journal, use a tool that allows for asynchronous discussion if possible, or talk them over with someone at home.

- ➢ Activity 13.1 and Activity 13.3
- ➢ Lesson 14
  - Activity 14.1 and Activity 14.3: set up a discussion
  - Activity 14.2: provide a worked example or recording

Assessment Suggestions:

- ➢ Lesson 13 cool-down
- ➢ Lesson 14 cool-down

Synthesize and Apply

- I can calculate the coordinates of a point on a line segment that partitions the segment in a given ratio.
- I can determine the point where the medians of a triangle intersect.

Activity Suggestions: Students respond to questions in an online or paper journal, use a tool that allows for asynchronous discussion if possible, or talk them over with someone at home.

- ➢ Activity 15.1 and Activity 15.2
- ➢ Activity 16.1 and Activity 16.2

Assessment Suggestions:

- ➢ Lesson 15 cool-down
- ➢ Lesson 16 cool-down

Ongoing Practice

- Assign one or more of the distributed practice problem sets from Lessons 9-16 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 based on reflecting on learning targets.

Anytime Resources	
	• Delve into one of the culminating lessons from previous units. Applications from Unit 3 will come up again in Lesson 15. • Delve into any of the Modeling Prompts 1–9 (Modeling Prompt 9 is appropriate after Lesson 14) • Teach and encourage students to study the lesson summaries (at the end of every lesson) and refer back to them. • Emphasize the Are You Ready for More opportunities for students who want to explore the topics in more depth.