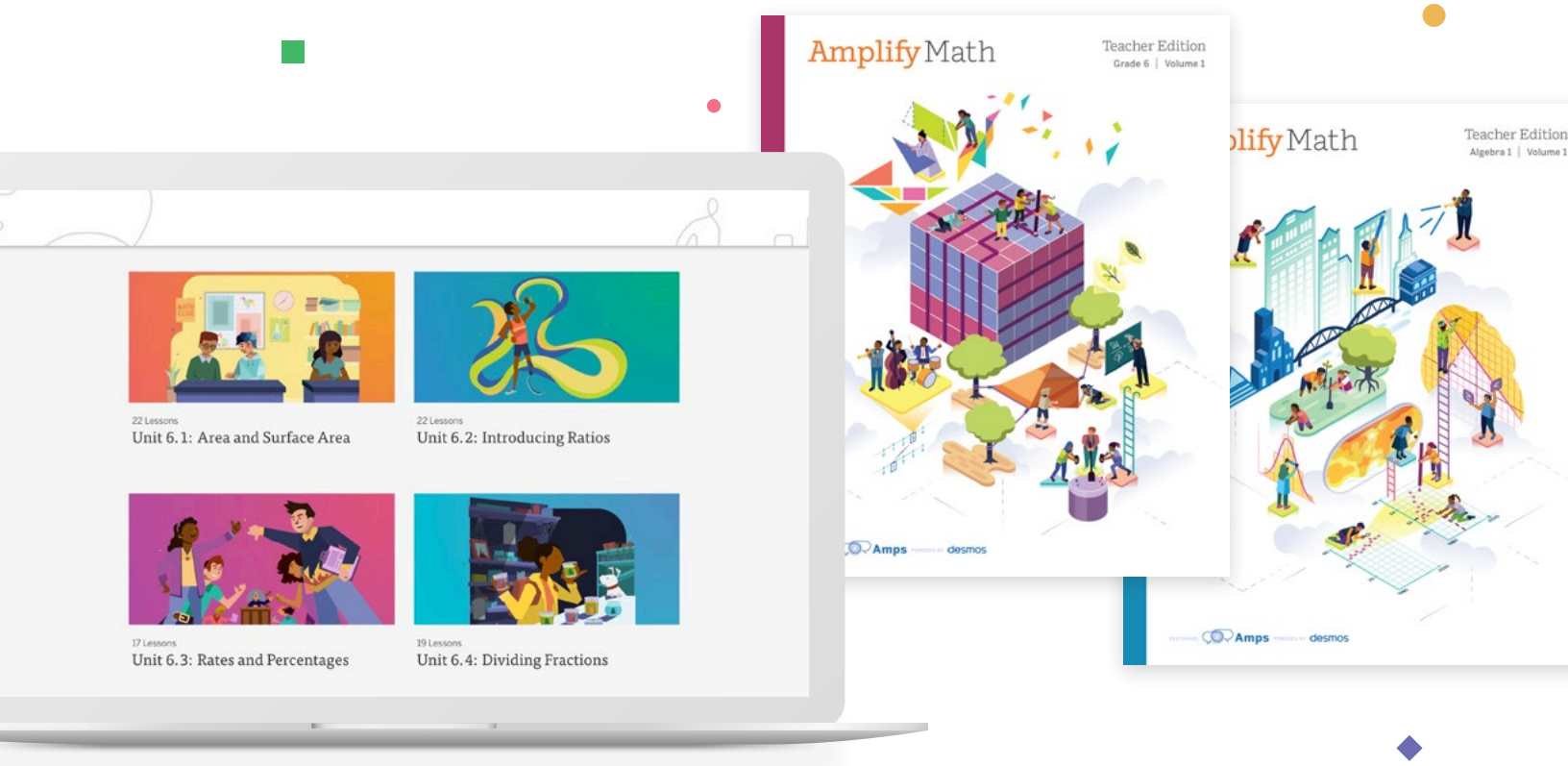
IDAHO

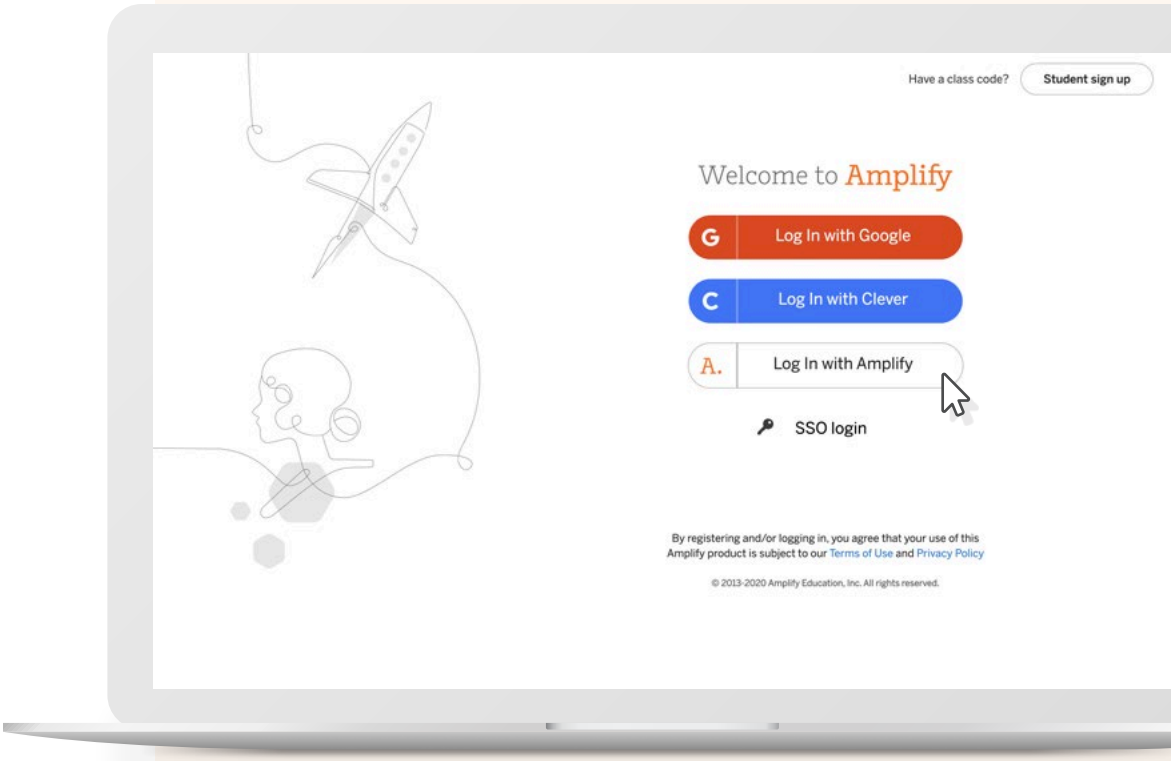
Navigation guide



FEATURING Amps POWERED BY desmos

Amplify. desmos

Log in



1. To review the digital program, visit **learning.amplify.com**.
2. Click ***Log in with Amplify***, and use the following credentials:

   Username: t1.idahomath8@demo.tryamplify.net

   Password: Amplify1-idahomath8

Navigating the print program

Amplify Math provides teachers with easy-to-follow instructional supports that make implementing the program easier and enjoyable for both you and your students.

Lesson Brief

UNIT 1 | **LESSON 3**

Symmetry and Reflection

Let's describe ways figures reflect on the plane.

Focus

Goals

1. **Language Goals:** Describe the movement of figures informally and formally using the terms *reflection*, *line of reflection*, *image*, and *preimage*. **(Speaking and Listening, Reading and Writing)**
2. **Language Goals:** Identify the features that determine a reflection. **(Speaking and Listening, Reading and Writing)**

Rigor

- Students build **conceptual understanding** of how figures can be flipped or reflected on a plane.
- Students build **fluency** in using precise mathematical vocabulary to describe reflections.

Coherence

- **Today**

  Students begin by studying different figures to review lines of symmetry **(MP7)**. They move into drawing and measuring reflected triangles, coming to understand that the line of reflection lies halfway between the two triangles and is perpendicular to the line segments that connect the corresponding vertices **(MP6)**.

- **< Previously**

  In Lesson 2, students described the features that identified translations and rotations.

- **> Coming Soon**

  In Lesson 4, students will translate, reflect, and rotate figures on a grid.

Standards

Addressing

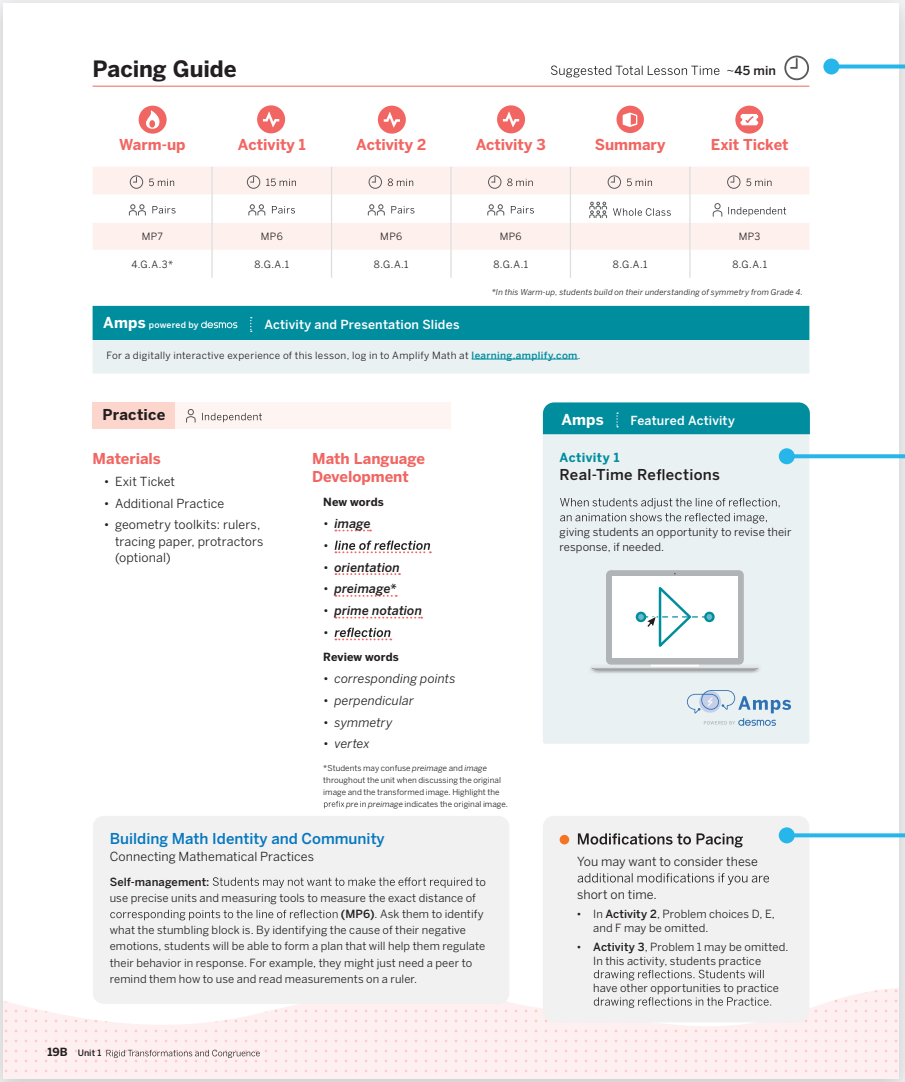
8.G.A.1
Verify experimentally the properties of rotations, **reflections**, and translations.

Building On	Building Toward
4.G.A.3	8.G.A.2
7.G.A	8.G.A.3
	8.G.A.4

Lesson goals, **coherence mapping**, and a breakdown for how **conceptual understanding**, **procedural fluency**, and **application** are addressed are included for each lesson.

The **standards** each lesson addresses, builds on, and builds toward are clearly outlined.

Lesson Brief | Warm-Up | Activities | Summary | Exit Ticket | Practice



Pacing Guide

Suggested Total Lesson Time ~45 min

Warm-up	Activity 1	Activity 2	Activity 3	Summary	Exit Ticket
5 min	15 min	8 min	8 min	5 min	5 min
Pairs	Pairs	Pairs	Pairs	Whole Class	Independent
MP7	MP6	MP6	MP6		MP3
4.G.A.3*	8.G.A.1	8.G.A.1	8.G.A.1	8.G.A.1	8.G.A.1

*In this Warm-up, students build on their understanding of symmetry from Grade 4.

Amps powered by desmos | Activity and Presentation Slides

For a digitally interactive experience of this lesson, log in to Amplify Math at learning.amplify.com.

Practice Independent

Materials
- Exit Ticket
- Additional Practice
- geometry toolkits: rulers, tracing paper, protractors (optional)

Math Language Development

New words
- *image*
- *line of reflection*
- *orientation*
- *preimage**
- *prime notation*
- *reflection*

Review words
- *corresponding points*
- *perpendicular*
- *symmetry*
- *vertex*

*Students may confuse *preimage* and *image* throughout the unit when discussing the original image and the transformed image. Highlight the prefix *pre* in *preimage* indicates the original image.

Amps | Featured Activity

Activity 1
Real-Time Reflections

When students adjust the line of reflection, an animation shows the reflected image, giving students an opportunity to revise their response, if needed.

Building Math Identity and Community
Connecting Mathematical Practices

Self-management: Students may not want to make the effort required to use precise units and measuring tools to measure the exact distance of corresponding points to the line of reflection **(MP6)**. Ask them to identify what the stumbling block is. By identifying the cause of their negative emotions, students will be able to form a plan that will help them regulate their behavior in response. For example, they might just need a peer to remind them how to use and read measurements on a ruler.

Modifications to Pacing

You may want to consider these additional modifications if you are short on time.
- In **Activity 2**, Problem choices D, E, and F may be omitted.
- **Activity 3**. Problem 1 may be omitted. In this activity, students practice drawing reflections. Students will have other opportunities to practice drawing reflections in the Practice.

19B Unit 1 Rigid Transformations and Congruence

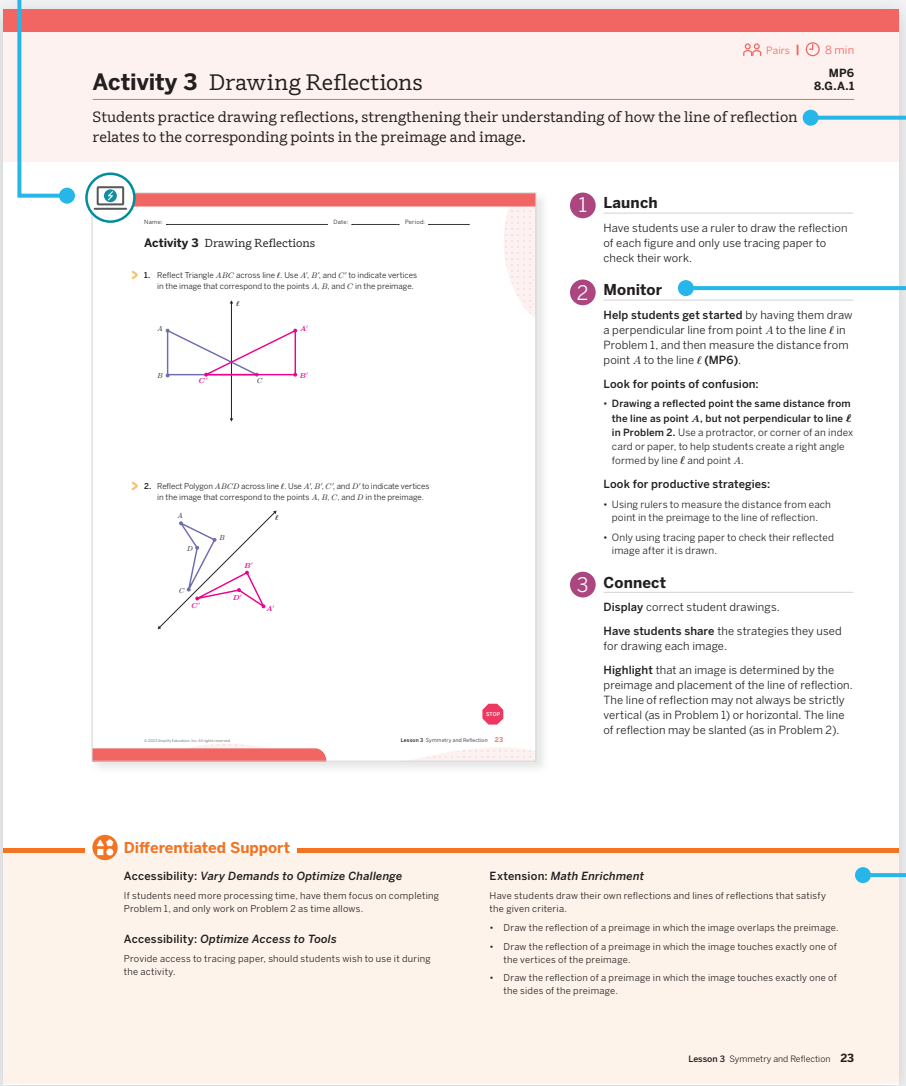
Suggested timing for the lesson and each activity is included for quick reference.

The benefits of teaching one or more of the activities **online** are outlined for each lesson.

Every lesson pacing guide includes **modification** suggestions.

Lesson

The **student-facing** content is presented to the left.



Pairs | 8 min

Activity 3 Drawing Reflections

MP6
8.G.A.1

Students practice drawing reflections, strengthening their understanding of how the line of reflection relates to the corresponding points in the preimage and image.

Name: _____ Date: _____ Period: _____

Activity 3 Drawing Reflections

1. Reflect Triangle ABC across line ℓ. Use A', B', and C' to indicate vertices in the image that correspond to the points A, B, and C in the preimage.

2. Reflect Polygon $ABCD$ across line ℓ. Use A', B', C', and D' to indicate vertices in the image that correspond to the points A, B, C, and D in the preimage.

STOP

1 Launch

Have students use a ruler to draw the reflection of each figure and only use tracing paper to check their work.

2 Monitor

Help students get started by having them draw a perpendicular line from point A to the line ℓ in Problem 1, and then measure the distance from point A to the line ℓ **(MP6)**.

Look for points of confusion:

- **Drawing a reflected point the same distance from the line as point A, but not perpendicular to line ℓ in Problem 2.** Use a protractor, or corner of an index card or paper, to help students create a right angle formed by line ℓ and point A.

Look for productive strategies:

- Using rulers to measure the distance from each point in the preimage to the line of reflection.
- Only using tracing paper to check their reflected image after it is drawn.

3 Connect

Display correct student drawings.

Have students share the strategies they used for drawing each image.

Highlight that an image is determined by the preimage and placement of the line of reflection. The line of reflection may not always be strictly vertical (as in Problem 1) or horizontal. The line of reflection may be slanted (as in Problem 2).

Differentiated Support

Accessibility: ***Vary Demands to Optimize Challenge***

If students need more processing time, have them focus on completing Problem 1, and only work on Problem 2 as time allows.

Accessibility: ***Optimize Access to Tools***

Provide access to tracing paper, should students wish to use it during the activity.

Extension: ***Math Enrichment***

Have students draw their own reflections and lines of reflections that satisfy the given criteria.

- Draw the reflection of a preimage in which the image overlaps the preimage.
- Draw the reflection of a preimage in which the image touches exactly one of the vertices of the preimage.
- Draw the reflection of a preimage in which the image touches exactly one of the sides of the preimage.

A short **description of the activity and its targeted goal** is outlined at the top.

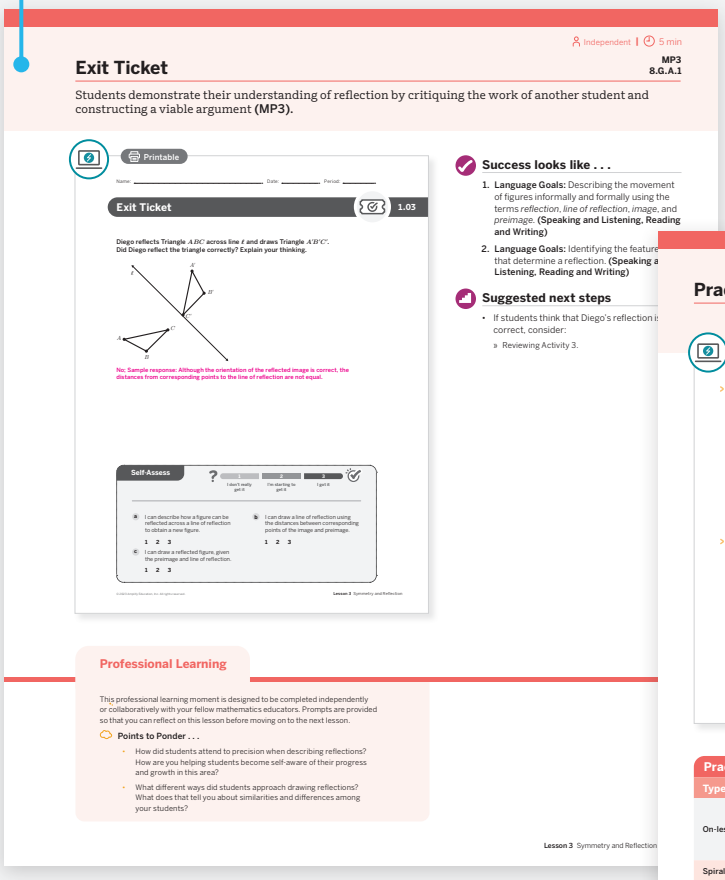
Easy 1-2-3 guidance for teachers shortens the amount of time required to plan. The "look for" prompts are helpful to scan while teaching.

Differentiation supports, including our just-in-time supports called Power-ups, provide practical guidance for scaffolding or extending the learning for all students.

Lesson Brief | Warm-Up | **Activities** | Summary | **Exit Ticket** | **Practice**

Each lesson ends with an **Exit Ticket** which includes a self-assessment for students.

A targeted set of **practice problems** are included online and in the print Student Edition. Each set includes at least one spiral review problem and one formative problem as a prerequisite check for the next lesson.



Independent | 5 min

Exit Ticket

MP3
8.G.A.1

Students demonstrate their understanding of reflection by critiquing the work of another student and constructing a viable argument **(MP3)**.

Printable

Exit Ticket 1.03

Diego reflects Triangle ABC across line ℓ and draws Triangle $A'B'C'$.
Did Diego reflect the triangle correctly? Explain your thinking.

No; Sample response: Although the orientation of the reflected image is correct, the distances from corresponding points to the line of reflection are not equal.

Self-Assess

I don't really get it | I'm starting to get it | I get it

a. I can describe how a figure can be reflected across a line of reflection to obtain a new figure. 1 2 3

b. I can draw a line of reflection using the distances between corresponding points of the image and preimage. 1 2 3

c. I can draw a reflected figure, given the preimage and line of reflection. 1 2 3

Success looks like . . .

1. **Language Goals:** Describing the movement of figures informally and formally using the terms *reflection*, *line of reflection*, *image*, and *preimage*. **(Speaking and Listening, Reading and Writing)**
2. **Language Goals:** Identifying the features that determine a reflection. **(Speaking and Listening, Reading and Writing)**

Suggested next steps

- If students think that Diego's reflection is correct, consider:
  - » Reviewing Activity 3.

Professional Learning

This professional learning moment is designed to be completed independently or collaboratively with your fellow mathematics educators. Prompts are provided so that you can reflect on this lesson before moving on to the next lesson.

Points to Ponder . . .

- How did students attend to precision when describing reflections? How are you helping students become self-aware of their progress and growth in this area?
- What different ways did students approach drawing reflections? What does that tell you about similarities and differences among your students?

Lesson 3 Symmetry and Reflection

Practice

Independent

Practice

1. Reflect Triangle ABC across line m. Use A', B', and C' to indicate the vertices in the image that correspond to the points A, B, and C in the preimage.

2. Polygon $ABCD$ is a reflection of Polygon $A'B'C'D'$. Draw the line of reflection and label it n. Explain your thinking.

Sample response: The line of reflection is located halfway between each pair of corresponding points.

Practice

3. Select all the ways Triangle A can map onto Triangle B.
   - A. Reflect Triangle A across a horizontal line.
   - B. Reflect Triangle A across a vertical line.
   - C. Translate Triangle A to the left.
   - D. Translate Triangle A to the right.
   - E. Rotate Triangle A 180° counterclockwise.
   - F. Rotate Triangle A 90° counterclockwise.

4. Write an operation in the box to make each equation true.
   - a. $12 \square (-8) = 20$
   - b. $-7 \square 5 = -35$
   - c. $-14 \square 18 = 4$
   - d. $24 \square (-29) = -5$

5. Draw a line connected to each line segment to form a right angle.
   Sample responses shown.

Practice Problem Analysis

Type	Problem	Refer to	Standard(s)	DOK
On-lesson	1	Activity 1	8.G.A.1	1
	2	Activity 2	8.G.A.1	1
	3	Activity 2	8.G.A.1	2
Spiral	4	Grade 7	7.NS.A.1.C	2
Formative	5	Unit 1 Lesson 4	4.G.A.1	1

Additional Practice Available

Grade 8 Additional Practice

For students who need additional practice in this lesson, assign the **Grade 8 Additional Practice**.

25–26 Unit 1 Rigid Transformations and Congruence

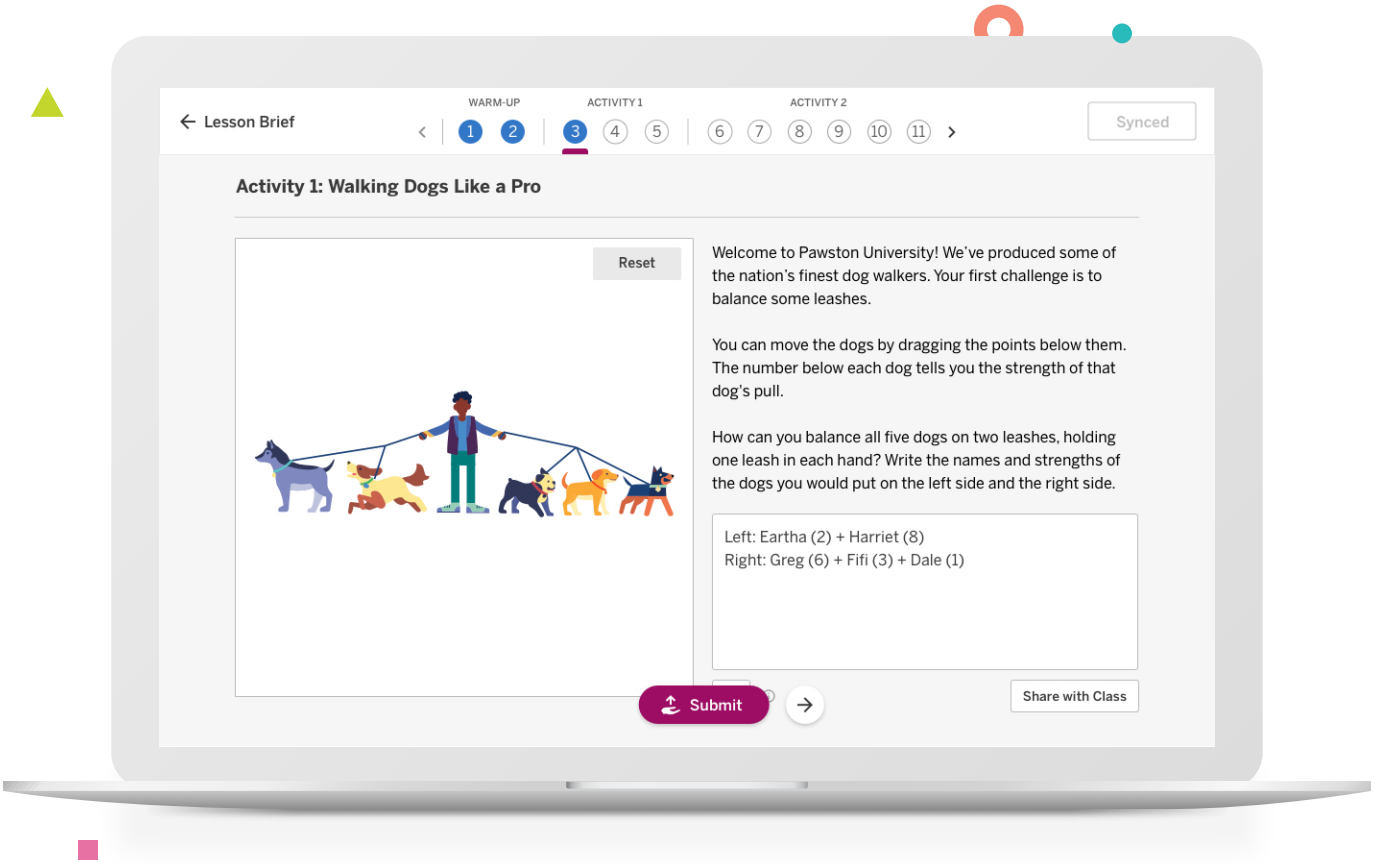
In the **Additional Practice book**, students will find a worked out example and four to eight practice problems per lesson.

Navigating the digital program

Digital lessons, when designed the right way, can be powerful in their ability to surface student thinking and spark interesting and productive discussions. To bring our vision of what digital lessons can and should be to life, we've partnered with Desmos to create our complete library of Amps—social, collaborative lessons powered by Desmos technology that make sense to students and work harder for teachers.

Intuitive and engaging student experience

The student experience is intuitive and engaging because the content and the tools are interesting and exciting. Students work together and interact with the mathematics in real time to quickly see that reasoning and revising are important parts of math class.

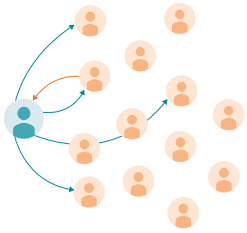


Classroom monitoring tools

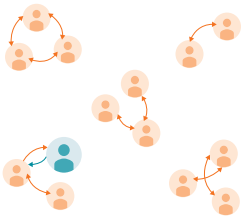
For students, Amplify Math's digital experience is fun and dynamic, with plenty of opportunities for students to talk through their reasoning, work with their peers, and gain new understanding. Teachers gain insight into student reasoning with real-time insights, data, and reporting the drive performance for all learners.

Amps
POWERED BY desmos

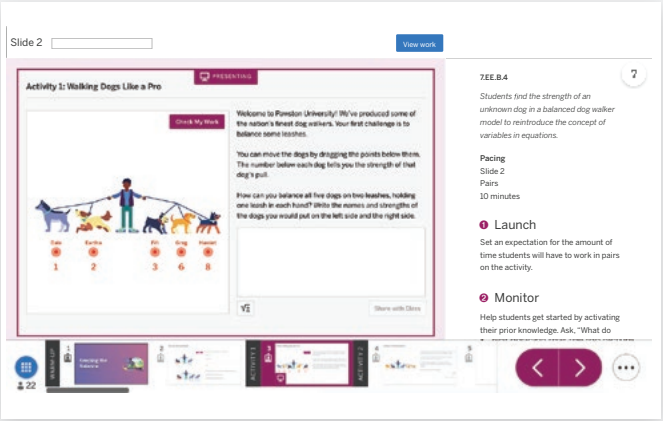
1 **Launch**
Teachers launch an activity and ensure students understand what's being asked.



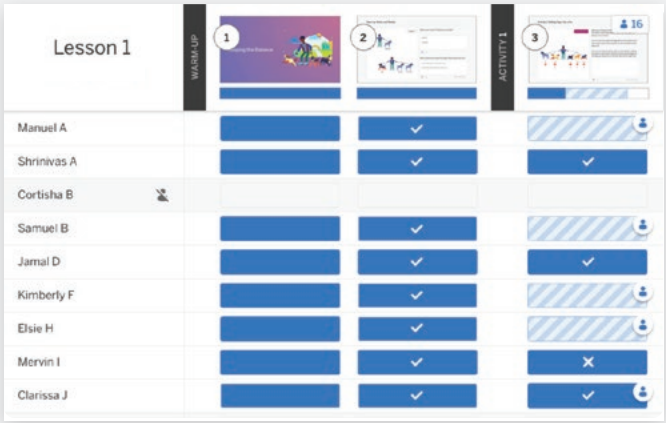
2 **Monitor**
Students interact with each other to discuss and work out strategies for solving a problem.



Teacher experience



When you launch a lesson, you'll have access to **easy-to-skim teacher notes and all of the controls necessary** to manage the lesson.



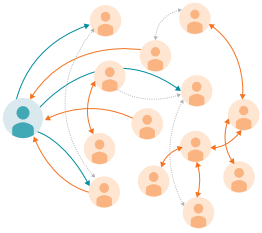
After students have started working you will access the Class Progress screen to **see where students are in the lesson and even control which problems they have access to**.

Collaborative problem-solving tools

When you launch an **Amp**, you will be kickstarting small group and whole class discussions where students can see how their thinking can impact a situation and learn how their peers are justifying their actions and decisions.

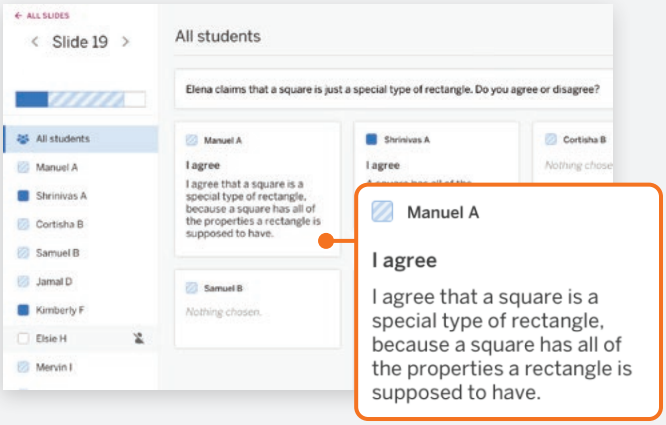
3 Connect

Students construct viable arguments and critique each other's reasoning, then synthesize with the teacher at the end.

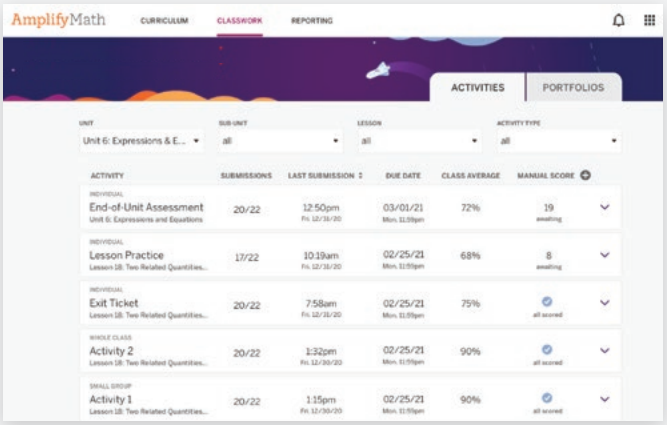


4 Review

After class, teachers can provide feedback on submitted student work and run reports.



All student responses can be viewed easily on the All Students screen. You can often view a composite view of responses and spotlight student work anonymously.

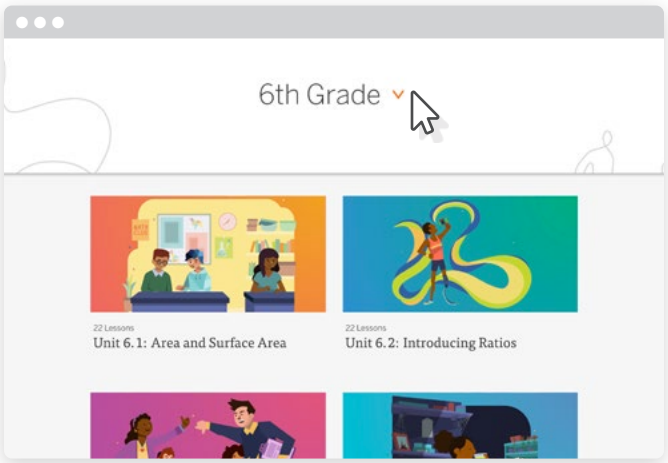


After students complete work that's ready for grading, you can head to Classwork to **quickly provide feedback**.

Once students have completed an Exit Ticket, a practice problem set, or an assessment, you can **run reports at the class, student, and standards levels to check in on student progress**.

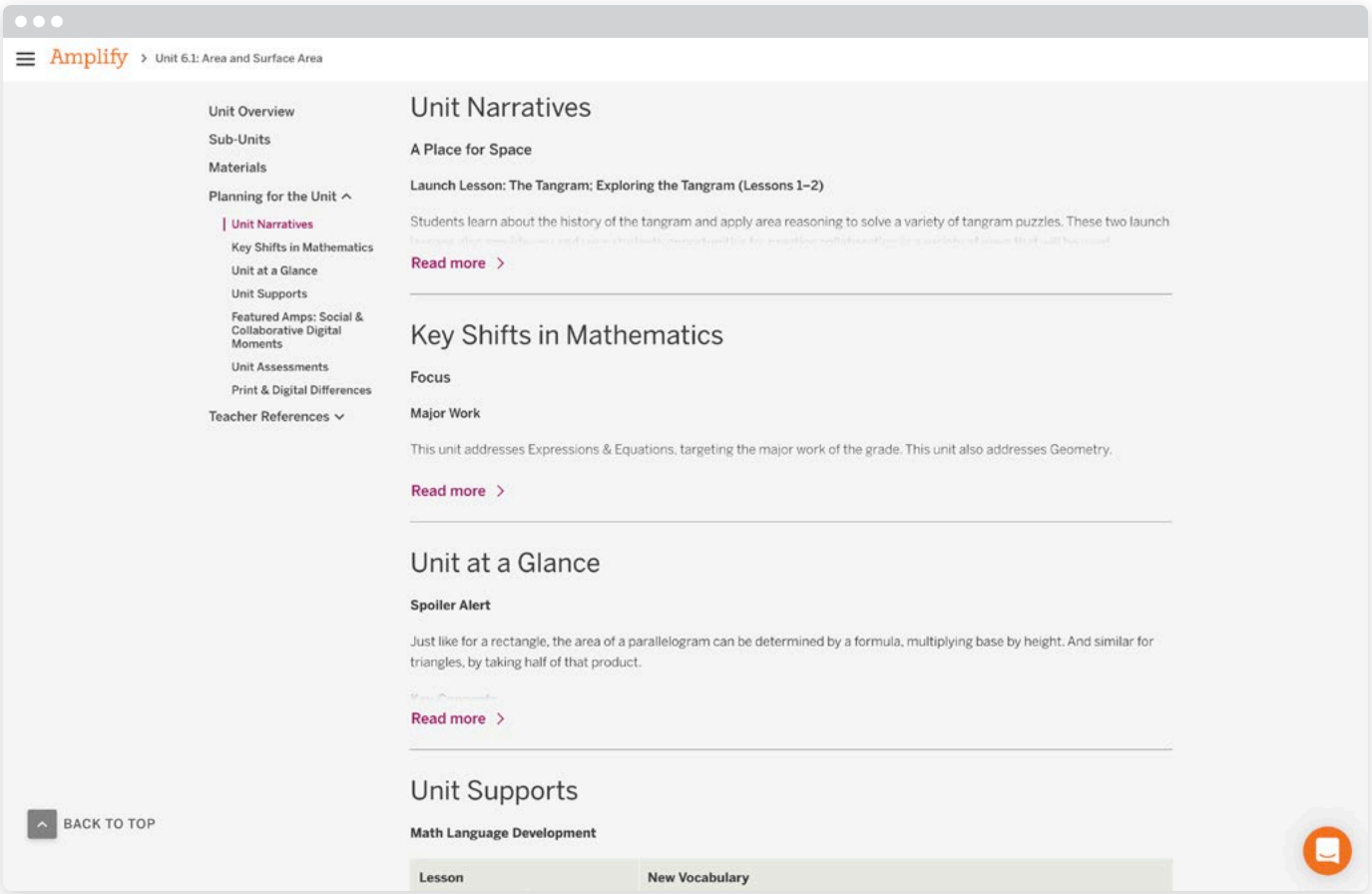
Navigating to a grade and unit

Once logged in, select your grade level from the dropdown menu and click on any unit.



Navigating to and teaching a lesson

After selecting a unit, review the unit's planning resources. These resources include the Unit Overview, Unit Narratives, Professional Learning, Differentiated Support, and unit materials.



Navigating to the lesson content

Lessons are found in the Sub-Unit. Each lesson contains all the resources needed to plan and teach.

Sub-Unit 1: Area of Special Polygons

11 Lessons

Sub-Unit 1: Area of Special Polygons

JUMP DOWN TO SUB-UNIT OVERVIEW

Lesson 3:
Tiling the Plane

Lesson 4:
Composing and Rearranging to Determine Area

Lesson 5:
Reasoning to Determine Area

Lesson 6:
Parallelograms

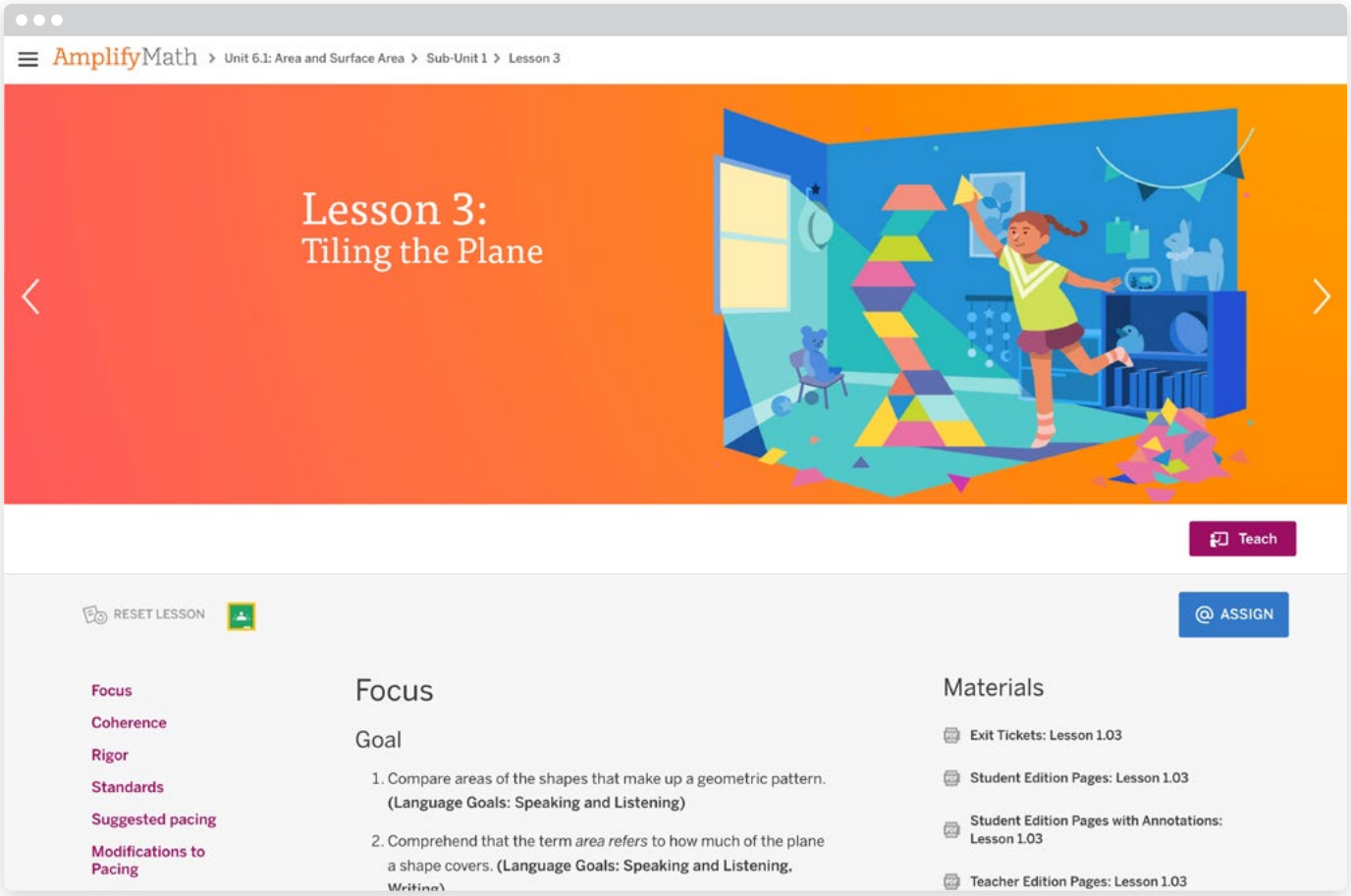
Lesson 7:
Bases and Heights of Parallelograms

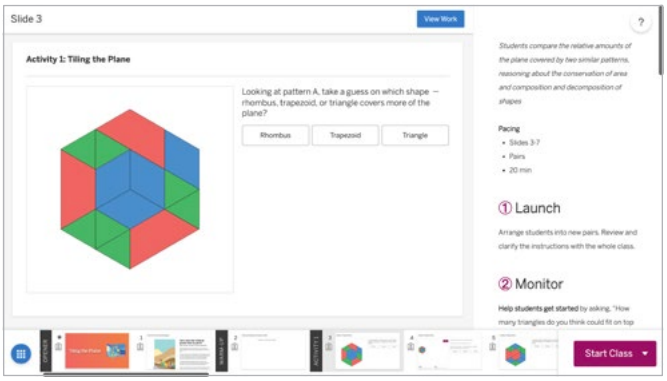
Lesson 8:
Area of Parallelograms

Teaching a lesson online

Similar to the unit level, here you can scroll down and learn more about the lesson. On the right side you'll find a list of downloadable resources.

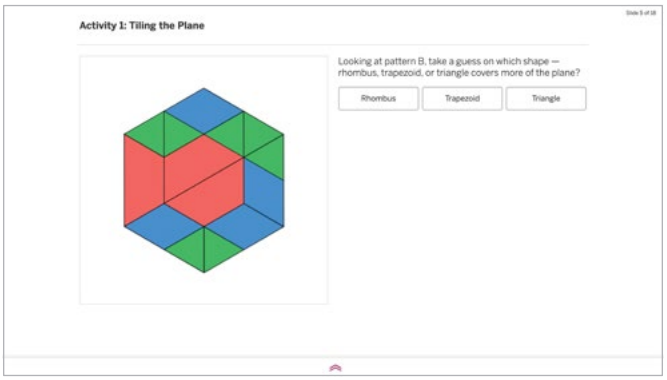
When you're ready, click the Teach button.



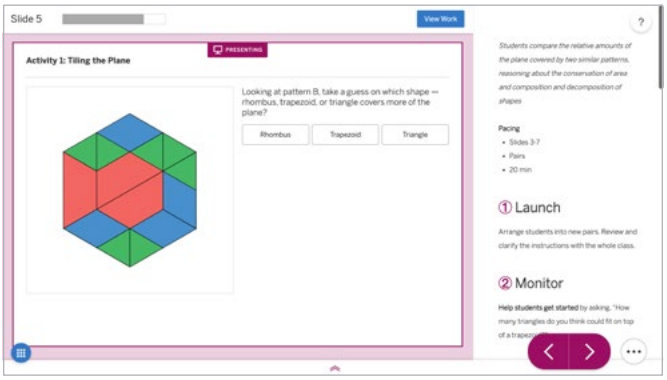


1 The tab that opens allows you to preview the lesson. You can look at any slide by scrolling the bottom carousel. Teacher notes are provided on the right. Your students will see anything in the large center portion of the screen.

Go ahead and click "**Start Class**" in the bottom right corner. You should see the class you already created.

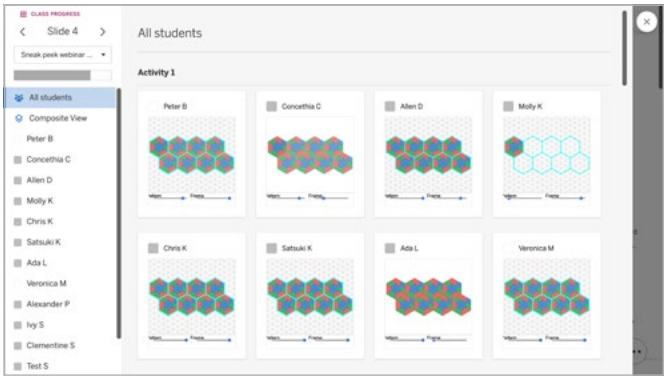


2 A new tab has opened. This is the tab you'd drag to the presenting screen if you were teaching. It will advance when you advance your Teacher Edition screen. For now, head back to the last tab.



3 You should notice that there's now a purple frame around the student-facing content. You're teaching! You can advance the lesson by clicking the arrows in the bottom right hand corner.

When you're ready, click "**View Work**" at the top.

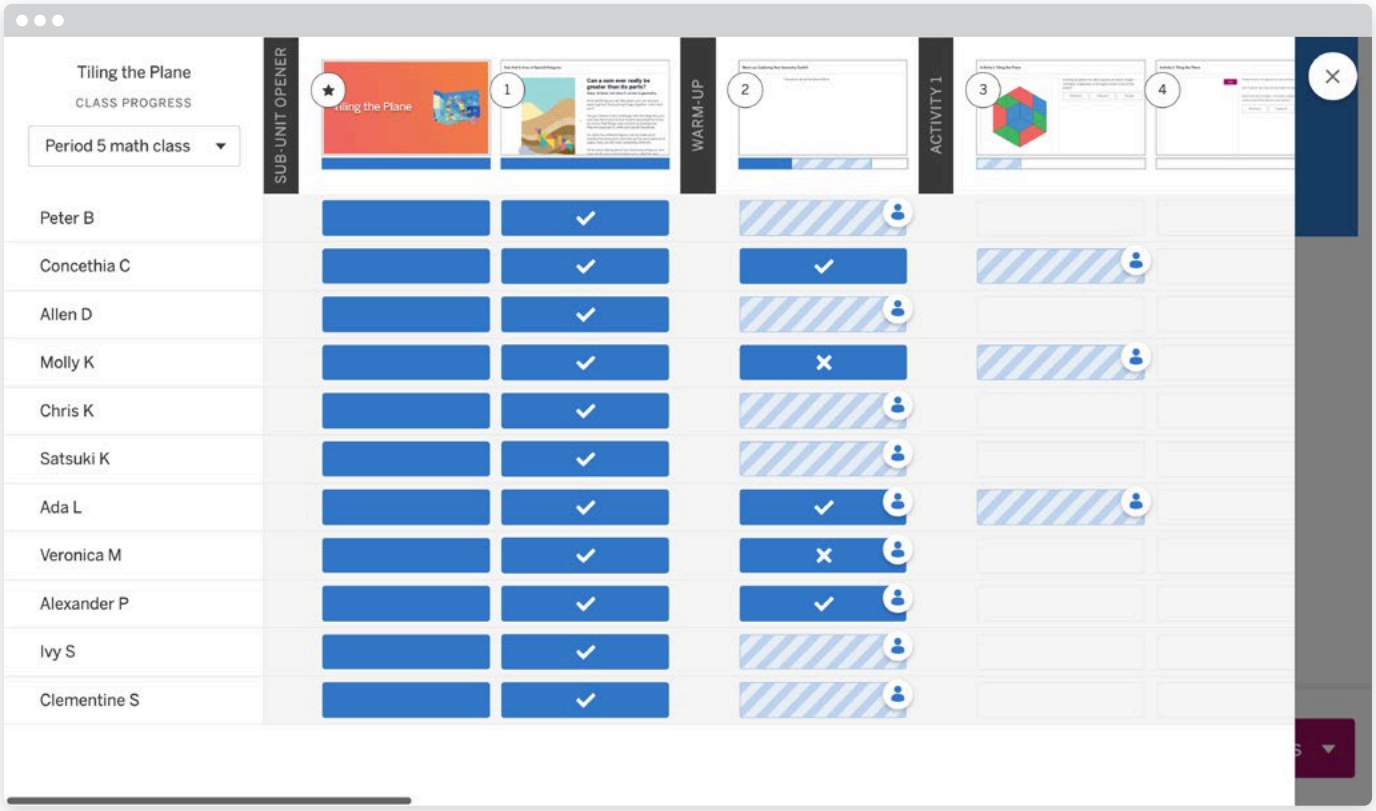


4 Here is where you'll be able to see your students' work in real time. There are two students in this class. Certain slides will let you see a composite view of student work. You can change slides by using the arrows in the upper left hand corner.

Select "**ALL SLIDES**" to view the **Class Progress View**.

5 Here you will see all of your students and their work in the lesson. If the system can check for a right or wrong answer, you'll see an "X" or a check under that slide. Semi-shaded rectangles mean students have started work, but not finished or submitted anything.

If you're having students go into the lesson ahead of time and work, their progress will be saved and you can review it here. If you're teaching synchronously, work will populate here as it's done.



Amps
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We've partnered with Desmos to create our complete library of Amps—social, collaborative digital lessons that recast technology from simply mirroring what can be done in a workbook to presenting captivating scenarios where students work together and see how their decisions change things in real time.

For more information on Amplify Math, visit **amplify.com/math-idaho-review**.

Amplify. desmos