6–12 Instructional Design

Imagine IM® is IM® v.360 optimized for engagement, accessibility, and usability.

The instructional design of Imagine IM supports all learners through a dynamic and engaging instructional experience. Students develop deep conceptual understanding through a coherent progression of the mathematics based on the standards and research-based learning trajectories.

A focused, rigorous, and coherent progression across each unit, lesson, and activity

Universal Design for Learning (UDL)

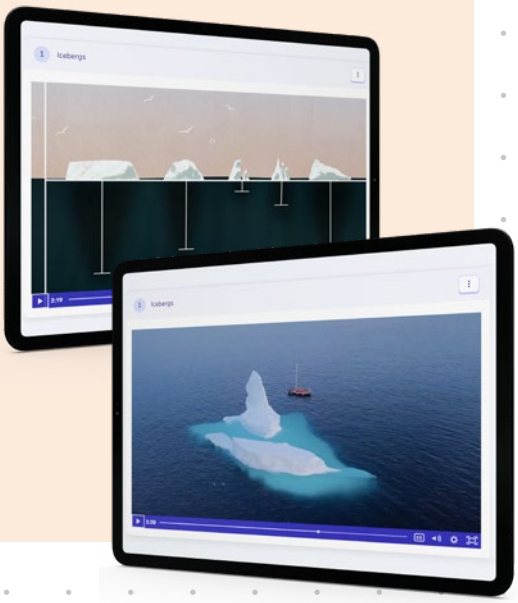
The invitation to the mathematics follows a multidimensional approach to learning to ensure every student develops positive habits of mind to engage in and contribute to mathematical conversations. This offers all students access to content as it builds on prior knowledge and encourages the use of their own language to make sense of ideas before formal language is introduced.

	Invitation to the mathematics	Deep study of concepts and procedures	Consolidating and applying
Unit level	Introductory lesson	Instructional lessons	Culminating lesson
Lesson level	Warm-up	Activities	Synthesis and cool-down
Activity level	Launch	Work time	Synthesis

Each **unit** starts with an invitation to the mathematics. The first few lessons provide an accessible entry point for all students and offer teachers the opportunity to observe students' prior understandings.

Each **lesson** starts with a learning goal and a warm-up, followed by problem-based instructional activities facilitated by the teacher (including individual and small-group worktime), and concludes with a synthesis and cool-down to solidify and apply student learning.

Inspire Math videos are designed to provide real-world context, spark curiosity, and increase engagement as students are introduced to each unit.



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An IM K–12 Math™ Curriculum

Instructional Design at the Lesson Level

Invitation to the mathematics → Deep study of concepts and procedures → Consolidating and applying

Overall DNA of the instructional design.

Upon starting a unit, the **unit overview** provides teachers with a **full unit narrative** that includes the previously learned concepts associated with the unit, as well as the learning goals. Each activity and lesson are part of a mathematical story across units and grade levels. This coherence allows students to view mathematics as a connected set of ideas that makes sense.

Lessons

A problem-based instructional framework supports teachers in structuring lessons, so students are the ones doing the problem solving to learn the mathematics. The activities and routines give teachers opportunities to see what students already know and what they can notice before having concepts and procedures explained to them.

Warm-up → Activities → Synthesis and cool-down

Each lesson starts with a **warm-up** to activate prior knowledge, set up the day's work, and strengthen number sense and procedural fluency. The instructional routines create structure so all students can engage with and contribute to mathematical conversations.



Unit 7.4, Lesson 1, Warm-up

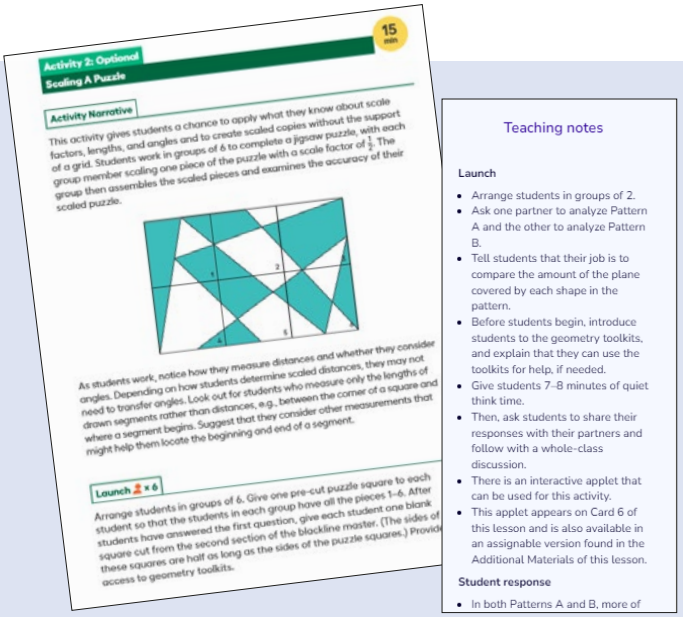
Unit 6.1, Lesson 1, Warm-up



Grades 6–12

The **activities** of the lesson introduce students to new concepts, procedures, contexts, or representations, or make connections between them. After the activity launch, students have independent work time that allows them to grapple with problems individually before collaborating in small groups. Each activity concludes with an opportunity for students to consolidate their learning.

*Reflection questions, curriculum narratives, instructional strategies, common misconceptions, and digital tool integration are all embedded supports at point-of use in the **Teaching Notes**.*



Activity 2: Optional — 15 min

Scaling A Puzzle

Activity Narrative

This activity gives students a chance to apply what they know about scale factors, lengths, and angles and to create scaled copies without the support of a grid. Students work in groups of 6 to complete a jigsaw puzzle, with each group member scaling one piece of the puzzle with a scale factor of $\frac{1}{2}$. The group then assembles the scaled pieces and examines the accuracy of their scaled puzzle.

As students work, notice how they measure distances and whether they consider angles. Depending on how students determine scaled distances, they may not need to transfer angles. Look out for students who measure only the lengths of drawn segments rather than distances, e.g., between the corner of a square and where a segment begins. Suggest that they consider other measurements that might help them locate the beginning and end of a segment.

Launch — Arrange students in groups of 6. Give one pre-cut puzzle square to each student so that the students in each group have all the pieces 1–6. After students have answered the first question, give each student one blank square cut from the second section of the blackline master. (The sides of these squares are half as long as the sides of the puzzle squares.) Provide access to geometry toolkits.

Teaching notes

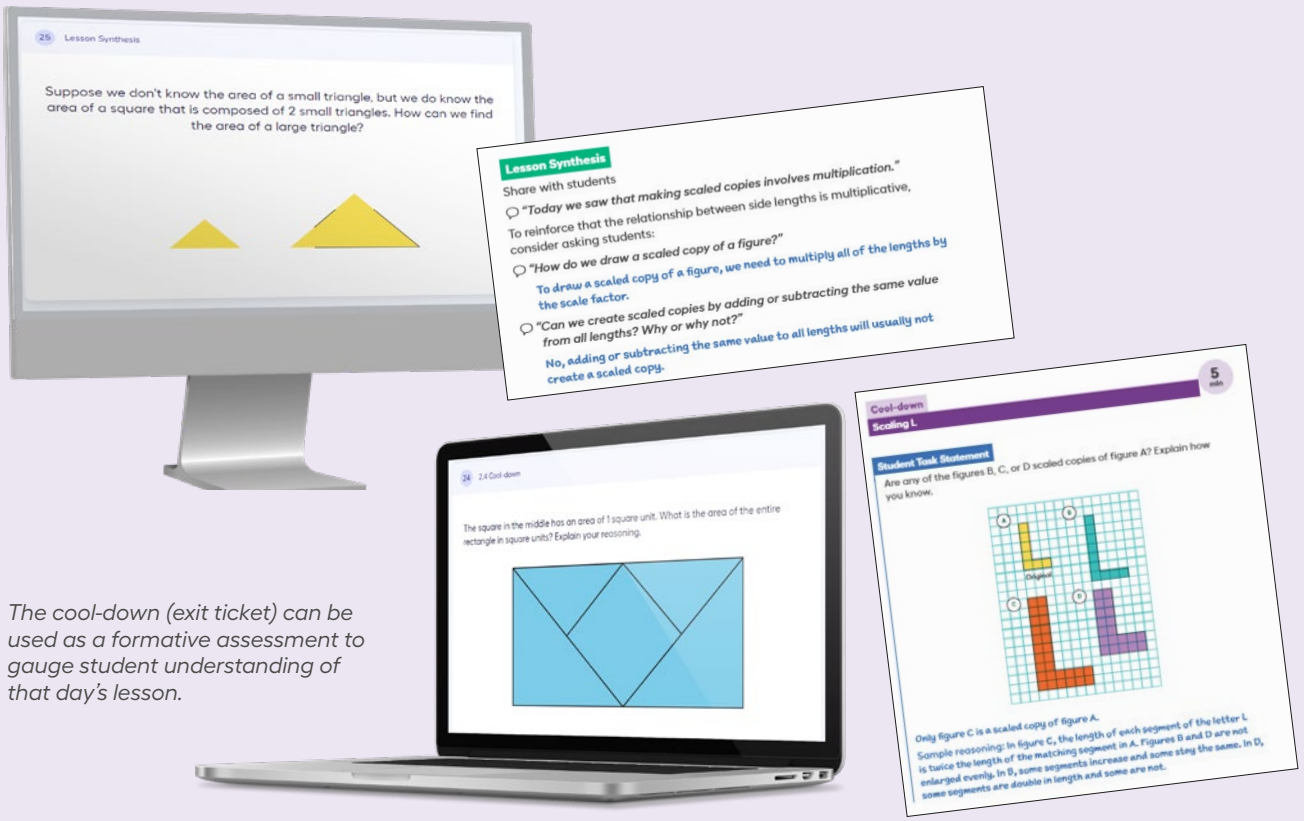
Launch

- Arrange students in groups of 2.
- Ask one partner to analyze Pattern A and the other to analyze Pattern B.
- Tell students that their job is to compare the amount of the plane covered by each shape in the pattern.
- Before students begin, introduce students to the geometry toolkits, and explain that they can use the toolkits for help, if needed.
- Give students 7–8 minutes of quiet think time.
- Then, ask students to share their responses with their partners and follow with a whole-class discussion.
- There is an interactive applet that can be used for this activity.
- This applet appears on Card 6 of this lesson and is also available in an assignable version found in the Additional Materials of this lesson.

Student response

- In both Patterns A and B, more of

The lesson ends with a **synthesis** to solidify understanding and make the learning goals of the lesson explicit, followed by a **cool-down** (similar to an exit-ticket) to apply what was learned.



25 Lesson Synthesis

Suppose we don't know the area of a small triangle, but we do know the area of a square that is composed of 2 small triangles. How can we find the area of a large triangle?

Lesson Synthesis

Share with students

"Today we saw that making scaled copies involves multiplication."

To reinforce that the relationship between side lengths is multiplicative, consider asking students:

"How do we draw a scaled copy of a figure?"

To draw a scaled copy of a figure, we need to multiply all of the lengths by the scale factor.

"Can we create scaled copies by adding or subtracting the same value from all lengths? Why or why not?"

No, adding or subtracting the same value to all lengths will usually not create a scaled copy.

24 2.4 Cool-down

The square in the middle has an area of 1 square unit. What is the area of the entire rectangle in square units? Explain your reasoning.

Cool-down — 5 min

Scaling L

Student Task Statement

Are any of the figures B, C, or D scaled copies of figure A? Explain how you know.

Only figure C is a scaled copy of figure A.

Sample reasoning: In figure C, the length of each segment of the letter L is twice the length of the matching segment in A. Figures B and D are not enlarged evenly. In B, some segments increase and some stay the same. In D, some segments are double in length and some are not.

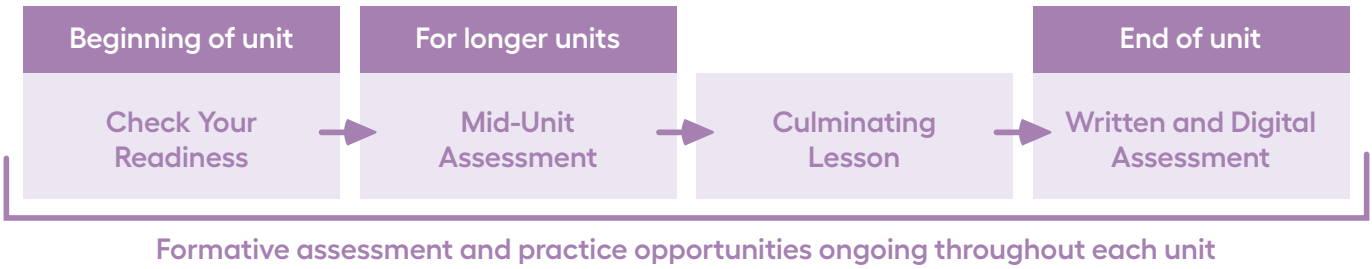
The cool-down (exit ticket) can be used as a formative assessment to gauge student understanding of that day's lesson.

Assessment in Imagine IM

Imagine IM for grades 6–12 offers both formative and summative assessments that empower teachers to measure student understanding and progress of learning goals within the instructional design. The program includes a number of features to make this process easier:

- Teachers can provide timely feedback through assignable items and better inform instruction.
- Students have tools that promote ownership and accountability for learning.
- Assessments are available in print and digital formats for equity and access in all instructional models.

Embedded options for assessment are provided throughout each unit, section, and lesson.



Formative Assessment Opportunities

- Check Your Readiness diagnostic assessment
- Learning targets for self-assessment of written reflections
- Instructional tasks
- Cool-downs (exit tickets)
- Practice problems



Summative Assessment Opportunities

- Mid-unit assessment
- End-of-unit assessment (written and digital)
- End-of-course assessment
- Performance tasks



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