



The
Anatomy of an
Imagine Math Lesson

Table of Contents

At a Glance: Imagine Math Activities.....	4
Pre-Quiz.....	5
Warm Up.....	6
Guided Learning.....	7
Problem Solving Process.....	8
Practice.....	10
Post-Quiz.....	11



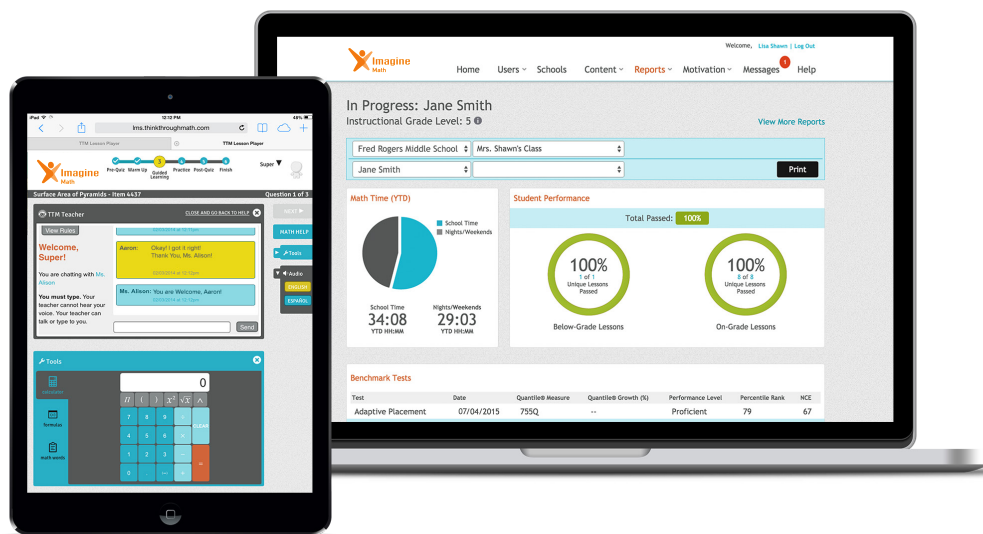
Overview

Imagine Math lessons are designed to be instructional learning experiences that engage students in meaningful exploration of understanding mathematics. In an Imagine Math lesson, students will:

- Engage in thinking and reasoning about mathematics
- Investigate mathematical concepts and practices
- Explore mathematical ideas through a problem solving approach
- Work through problems using a variety of interactions, such as drag-and-drop to create a table and select from a drop-down list to complete a statement
- Solve problems using multiple representations of mathematical relationships
- Learn to look at a problem in different ways and reason about its solutions

Students receive instructional support throughout the lesson in 3 main ways:

1. Feedback that is designed to address misconceptions and redirect thinking in response to student work
2. Math Help that is designed to provide direct instruction on the math concepts behind a particular problem, available upon student request
3. Live Help that allows students to work directly with a certified math teacher on their math problem, also available upon student request



At a Glance: Imagine Math Activities



Imagine Math lessons are designed to be instructional learning experiences that engage students in meaningful exploration of understanding mathematics. In an Imagine Math lesson, students will:

Activity	Overview
Pre-Quiz	Students have the opportunity to demonstrate their understanding of the content within the lesson.
Warm Up	Students practice procedures and recall facts that may be helpful in the lesson.
Guided Learning	Students engage in meaningful instructional tasks designed to facilitate understanding of the learning objectives of the lesson. Students choose their level of instruction through corrective feedback, math helps, and live teacher support.
Problem Solving Process	Students work through and begin to internalize a problem solving process that can be applied to complex problems.
Practice	Students review, extend, and synthesize the ideas from the Guided Learning, continuing to receive corrective feedback.
Post-Quiz	Students demonstrate their understanding of the content within the lesson.

Pre-Quiz



Goals

- Assess student understanding of the content within the lesson
- Provide a data point to measure growth

Instructional Features

- Students are able to see which parts of the problem they answered correctly or incorrectly

Characteristics

- Nearly all lessons include a Pre-Quiz.
- Students who demonstrate mastery of the content (at least 80%) may be allowed to skip the rest of the activities in that lesson and move on to the next lesson in their pathway.
- Students can receive partial credit for problems on the quiz.
- Pre-Quizzes generally consist of 7 problems.

Adding Time - Item 30424 Question 5 of 7

Jamelia starts her homework at 5 minutes to 5. She knows it will take her 30 minutes to do her homework.

What time will she be done?

CLEAR CHECK

<input type="radio"/>		<input type="radio"/>	
<input type="radio"/>		<input type="radio"/>	

Warm Up



Imagine Math games prime students for the lesson by allowing them to practice procedures and recall facts that may be helpful in the lesson. Imagine Math games build fluency and skills so students can better see relationships in new content. Imagine Math games are designed so that success in the game is based on success with the math—not just success in mastering the game play.

Goals

- Practice procedures, recall facts, and build fluency
- Prime students for their lesson
- Engage students—this is a fun way to hook the student into the lesson
- Practice skills—students are able to complete more problems in a game setting and therefore have increased opportunities for practice

Instructional Features

- Imagine Math games provide dynamic, in-game feedback for students
- Opportunities for revision that allow students to learn and deepen math skills and understanding

Characteristics

- Most lessons include a Warm Up
- Warm Up games are approximately 3 minutes



Guided Learning



This is the activity in which students begin to engage in meaningful instruction that facilitates their learning of the lesson's skills, concepts, and goals. The problems in Guided Learning are designed to address student misconceptions head-on in order to provide opportunities for learning. Students can make the most of the learning opportunities in the Guided Learning activity by carefully reading feedback and helps and taking notes in their Imagine Math journal.

Goals

- Provide instruction on a standard, concept, and/or skill
- Allow students to learn by doing

Instructional Features

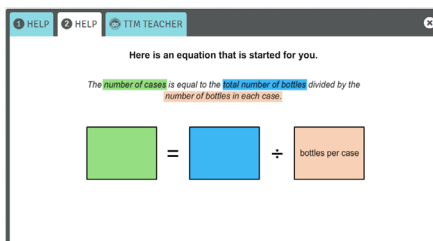
- Feedback allows students to review why their work was correct or incorrect
- Selecting Math Help allows students access to instruction on the item and/or concept at any time
- After attempting the problem, students can connect to an Imagine Math Teacher for individualized instruction
- Students are able to make multiple attempts
- Students benefit from using their journal to take notes during this activity

Characteristics

- Nearly all lessons include this instructional component.
- The Guided Learning activity typically consists of 2-4 problems.
- This activity provides learning opportunities for concepts and skills that will be practiced and assessed later in the lesson

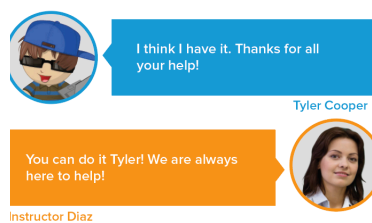
LEVEL 1

Automated, customized corrective feedback



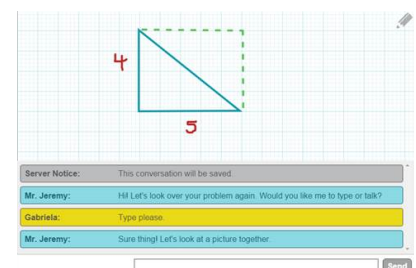
LEVEL 2

Type or talk with expert online math teachers



LEVEL 3

Two-way virtual whiteboard environment



Problem Solving Process

Imagine Math's original learning activity is the Problem Solving Process. Also referred to as PSP, this activity supports students in working through a process for solving real-world problems. As with Guided Learning, students will receive feedback and also have access to Math Help and the Imagine Math Teachers.

Goals

- Situate the mathematics of the lesson in meaningful and appropriately complex problems
- Pose real world application problems
- Guide students through a problem solving process that can be used in other situations and that includes reflection on their thinking
- Help students move between multiple representations of a problem situation including context, diagram, word equation, and numeric representation

Item Preview - Item 70627 Question 1 of 1

PROBLEM SOLVING STEPS: ANALYZE PLAN **SOLVE** JUSTIFY EVALUATE

Your school wants to have 5 computers for every 12 students. There are now 125 computers and 924 students. **How many more computers are needed to have a ratio of 5 to 12?**

The final ratio of computers to students is the total number of computers divided by the total number of students.

Use the buttons below to build an equation with words and symbols.

CHECK

final ratio of computers to students

number of students

number of computers now

number of additional computers

+	-	×	÷
(-)	x^2	x^3	y^x
$\frac{a}{b}$	\sqrt{x}	$\sqrt[3]{x}$	$\sqrt[y]{y}$
π	()	=
DELETE		CLEAR	

Numbers ▼

Instructional Features

- Feedback allows students to review why their work was correct or incorrect.
- Students are supported in solving problems via a 5-step process.
- While working in the Solve Step, students can select Math Help. Selecting Math Help allows students access to instruction on the item and/or concept at any time. After an attempt in the Solve Step, students can connect to an Imagine Math Teacher for individualized instruction.

Characteristics - The Five Steps

The 5 steps in Imagine Math’s problem-solving model are grounded in research in cognitive thinking processes and intervention methods for struggling students. The steps guide students all the way from breaking down a problem to reflecting on the process itself:

1. **Analyze the problem situation**
 - a. Identify what the problem is asking.
 - b. Identify the quantities in the problem.
 - c. Select a diagram that models the problem situation.
2. **Plan to solve the problem**
 - a. Think about why writing an equation is a useful strategy for solving the problem.
 - b. Describe how the quantities in the problem are related.
3. **Solve the problem**
 - a. Build a word equation to represent the problem situation.
 - b. Solve the equation.
 - c. Interpret the solution.
4. **Justify your solution—explain why the solution makes sense**
5. **Evaluate the problem solving process—think about how writing an equation helped you solve the problem.**

Practice



At this point in the lesson, students have explored and had the opportunity to learn the math concepts of the lesson with the intensive support of feedback, helps, and live Imagine Math teachers. Now, students will practice what they've learned independently.

Goals

- Provide students the opportunity to practice what they have learned in Guided Learning
- Allow students to extend what they have learned while still having access to corrective feedback

Instructional Features

- Feedback allows students to review why their work was correct or incorrect.
- Students are encouraged to refer back to and add to their journal.

Characteristics

- All lessons include this instructional component.
- The Practice activity typically consists of 5-10 problems.
- This activity provides practice to prepare students for the Post-Quiz.

Identifying and Generating Equivalent Expressions - Item 884450 Question 5 of 9

Drag each expression to show whether it is equivalent to $12(m + 4)$, $12m + 4$, or neither.

CLEAR CHECK

PREVIOUS NEXT CLOSE

This expression does not belong in this category.

This expression has terms with a common factor.

$12m + 16$

Identifying a common factor can help you find an equivalent expression.

These terms share a common factor.

$12m + 4$

$12(m + 4)$	$12m + 4$	Neither
$12m + 48$ ✓	$12m + 6$ ✗	$2(6m + 2)$ ✗
$(12 \cdot m) + (12 \cdot 4)$ ✓	$4(3m + 1)$ ✓	$(12 + m) + (12 + 4)$ ✓

Post-Quiz



Goals

- Assess student understanding of the content
- Provide a data point to measure growth

Instructional Features

- Students are able to see which parts of the problem were answered correctly or incorrectly

Characteristics

- All lessons include a Post-Quiz.
- Students who demonstrate mastery of the content (at least 70%) will pass the lesson.
- Students can receive partial credit for problems on the quiz.
- Post-Quizzes generally consist of 7 problems.
- The results of the Post-Quiz may determine the next lesson on the student's pathway.

Adding Fractions with Denominators of 10 or 100 - Item 992099 Question 3 of 7

Drag each expression to show if it is less than, equal to, or greater than $\frac{62}{100}$.

CLEAR CHECK

Less than $\frac{62}{100}$	Equal to $\frac{62}{100}$	Greater than $\frac{62}{100}$
$\frac{4}{100} + \frac{12}{100} + \frac{1}{10}$ ✓	$\frac{60}{100} + \frac{2}{10}$ ✗	$\frac{17}{100} + \frac{9}{10}$ ✓
	$\frac{25}{100} + \frac{1}{10} + \frac{27}{100}$ ✓	$\frac{2}{10} + \frac{57}{100} + \frac{3}{10}$ ✓
	$\frac{4}{10} + \frac{22}{100}$ ✓	

This student will receive credit for the 5 expressions that were correctly categorized.

