

# PLATO<sup>®</sup>

## Foundational Mathematics

**Grade Level:** 1 – 6  
**Target Audience:** High School/Adult  
**Audio Support:** Yes

### Product Features

- 123 discrete learning objectives
- Tutorials tailored for presentation of declarative and procedural knowledge
- Scaffolded instruction and practice
- Engaging interactions, graphics, and offline activities that support and reinforce mathematical objectives
- Math Tools (virtual manipulatives), journal, mathematics glossary, and online calculator that support instruction
- Engaging audio featuring mentor think-alouds
- Simple and consistent navigation

### Product Benefits

- Aligns to national standards, including NCTM and McREL
- Provides instruction for basic number and operations concepts and introductory geometry and measurement concepts
- Enriches instruction using real-world examples, journal activities, and explorations
- Encourages communicating mathematically
- Encourages problem solving in daily life
- Promotes individual accountability for learning

### Online Tools and Learning Aids

Calculator—available to help the learner solve problems using basic operations

Glossary—defines over 200 mathematical terms and provides examples and illustrations as appropriate

Journal—available for the learner to take notes while working through a tutorial or practice activity; integrated into the instruction in many tutorials

Math Tools—a set of virtual manipulatives that aid the learner in exploring mathematical concepts, principals, and processes; integrated into the instruction in many tutorials

Transcript—displays the instructional audio in a text window

Review topics and vocabulary—provides the learner with mathematical topics and terms that are relevant to the current topic; activates the learner's existing mathematical knowledge

### Interface Features and Menu Icons

Progress bar—helps the learner track progress in a tutorial, practice activity, or mastery test; allows the learner to navigate to previously completed sections in the tutorial

Exit—allows the learner to exit the activity

Menu—allows the learner to return to the lesson menu

Audio controls—allows the learner to pause, stop, and restart audio during the tutorial

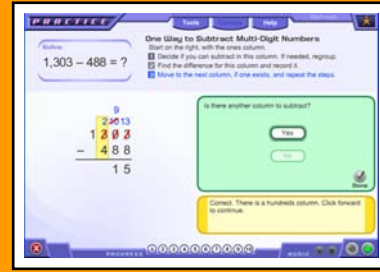
Backward arrow—allows the learner to move backward to the previous screen

Forward arrow—allows the learner to move forward to the next screen

### Reference Materials (Refer to PLATO Documentation CD)

PLATO Curriculum Guide—Foundational Mathematics

PLATO Curriculum Guide—Foundational Mathematics—Offline Activities



## Getting Started

- Refer to the PLATO Curriculum Guide—Foundational Mathematics to review the curriculum structure, content, and offline activities.
- Use the Scope and Sequence in the PLATO Curriculum Guide to identify learning objectives and targeted skill levels.
- Preview the PLATO Foundational Mathematics courseware.

## Lesson Progression

- Tutorial—teaches mathematics concepts and procedures (not scored)
- Practice activity—allows the learner to practice math skills with immediate feedback and step-by-step support (scored)
- Offline activity—provides the learner with additional opportunities to practice skills learned in a module (answer key included)
- Mastery test—allows the learner to demonstrate mastery of an objective by answering ten questions; questions are drawn from a pool of possible test items (scored)

## Assessment

- Use course-level assessments as pre-tests to prescribe modules that target skill gaps.
- Use mastery tests as pre-tests to allow learners to “test out” of particular modules.
- After the learner completes a course, use course-level assessments as post-tests. The learner repeats modules until all objectives are mastered.
- After the learner completes a module, use the mastery test as a post-test.
- Use printed-out journal exercises and offline activities as part of a portfolio-based assessment plan.
- Use state or local assessments to further identify and prioritize instructional needs.

## Implementation Strategies

- Use the courseware as a vehicle for individual support within a problem-solving classroom.
- Encourage collaborative explorations and discussions using the courseware Math Tools.
- Encourage peer-tutoring by assigning pairs of learners to work through a tutorial and practice together.
- Project the courseware onto a screen for class demonstrations and discussions.
- Align the courseware modules with state and district standards and classroom instruction.

## Evaluation

- Generate selected reports to track learner progress and measure gains.
- Evaluate and discuss report data with the learner to determine the next steps.
- Printed-out journal activities and offline activities provide instructors an opportunity to evaluate how well the learner understands the mathematical content taught in the courseware.

## Extension Exercises

- Assign individual lessons to small groups; have each group teach the lesson content to the whole group.
- Develop journal prompts that encourage the learner to further extend their mathematical knowledge and make connections.
- Align courseware modules with textbooks and district objectives.

For more information, please call 800.44.PLATO or visit [1Hwww.plato.com](http://1Hwww.plato.com)

**Real learning. Real results.™**

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Curriculum  
Structure

Curriculum

Foundational  
Mathematics

Course

Understanding  
Fractions

Module

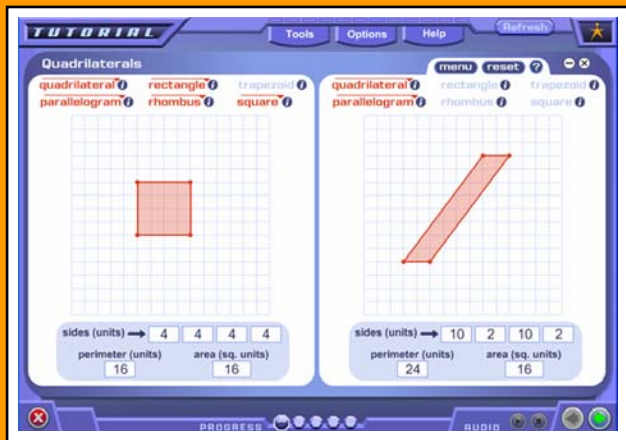
Finding  
Equivalent  
Fractions

Tutorial

Practice

Offline Activity

Mastery Test



## Math Tools

Math Tools are virtual mathematics manipulatives that aid learners in exploring mathematical concepts, principles, and processes.

These Math Tools are included in this courseware:

- |                          |                         |
|--------------------------|-------------------------|
| Counters                 | Decimal Place Value     |
| Whole Number Place Value | Fraction Comparison     |
| Addition                 | Fraction Models         |
| Subtraction              | Fraction Multiplication |
| Multiplication           | Coplanar Lines          |
| Division                 | Quadrilaterals          |
| Decimal Multiplication   | Triangles               |

## Overview of Tutorials and Practice Activities

Activity	Description
Tutorials	<p>Tutorials are tailored to teach particular kinds of knowledge:</p> <ul style="list-style-type: none"> <li>▪ <i>Declarative tutorials</i> teach facts, concepts, and principles, enabling learners to build and refine their mental models. These tutorials also highlight connections among and between mathematical ideas and real-world knowledge.</li> <li>▪ <i>Procedural tutorials</i> teach computational algorithms and mathematical processes. These tutorials facilitate understanding of procedures and the underlying declarative knowledge.</li> <li>▪ <i>Hybrid tutorials</i> blend the declarative and procedural approaches.</li> <li>▪ <i>Story problem tutorials</i> promote a six-step process for solving story problems.</li> </ul>
Practice activities	Practice activities support learners as they begin to solidify their new knowledge. The environment provides independent practice when the learner is ready.

## Preview of Courses

Course	Mathematics Topics
Understanding Whole Numbers 1	Place value through hundreds; comparing whole numbers; working with ordinal numbers; translating between numeric form, word form, and models
Understanding Addition and Subtraction 1	Addition and subtraction on a number line and using a hundreds chart; finding the missing number in addition and in subtraction sentences
Adding and Subtracting Whole Numbers 1	Basic addition and basic subtraction facts; adding 1- and 2-digit numbers with and without regrouping; subtracting 1- and 2-digit numbers with and without regrouping
Understanding Whole Numbers 2	Place value through billions; translating between standard form, word form, and expanded form
Understanding Addition and Subtraction 2	Addition and subtraction fact families; checking subtraction by addition; using the properties of addition (identity property, commutative property, associative property)
Adding and Subtracting Whole Numbers 2	Adding and subtracting multi-digit numbers; subtracting numbers with consecutive regrouping; subtracting across zeros; solving addition and subtraction story problems

Course	Mathematics Topics
Understanding Multiplication	Multiplication as repeated addition and as an array; finding the missing number in multiplication; using the properties of multiplication (identity property, commutative property, associative property, distributive property)
Multiplying Whole Numbers	Multiplication basic facts; multiplying multi-digit numbers; solving multiplication story problems
Understanding Division	Division as repeated subtraction and as fair sharing; multiplication and division fact families
Dividing Whole Numbers	Division basic facts; dividing by 1- and by 2-digit numbers; dividing multiples of 100; writing a quotient as a mixed number; multiples, common multiples, and least common multiples
Understanding Fractions	Fractions as equal parts of an object and as equal parts of a collection; identifying proper fractions and improper fractions; renaming improper fractions as whole or mixed numbers, and vice versa; finding equivalent fractions; simplifying fractions; working with common denominators and least common denominators; comparing fractions; ordering fractions
Adding and Subtracting Fractions	Adding and subtracting fractions with like denominators and with unlike denominators; adding and subtracting mixed numbers
Multiplying and Dividing Fractions	Multiplying and dividing fractions; multiplying and dividing whole numbers and mixed numbers; solving fraction story problems
Understanding Decimals	Understanding decimal place value through ten-thousandths; relating decimals, fractions, and mixed numbers; comparing and ordering decimals
Performing Operations with Decimals	Adding and subtracting decimals; multiplying decimals; dividing decimals; dividing 2-digit numbers by 10 or 100; rounding decimals; solving decimal story problems
Working with Percents	Translating between percents, fractions, and decimals; finding a percent of a whole number; finding a percent of a decimal number
Understanding Ratio and Proportion	Translating between ratios and models; identifying equivalent and non-equivalent ratios; solving proportions; solving ratio, proportion, and percent story problems
Plane and Solid Figures	Identifying lines, parts of lines, angles, lines in a plane; identifying line symmetry in plane figures; introduction to studying triangles, quadrilaterals, circles, and solid figures; exploring congruent figures and similar figures
Using Geometry	Counting square units; calculating the areas of rectangles, squares, and triangles; calculating the volume of a rectangular prism
Measurement	Measuring length in metric units and in customary units; telling time to the minute; measuring temperature in Fahrenheit and in Celsius; solving measurement story problems

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