Pre-Algebra and Geometry and Measurement 1

Curriculum Guide

Canadian Edition
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Overview

PLATO Learning’s computer-based training allows you to meet today’s educational challenges as you prepare learners for tomorrow’s world. PLATO uses competency-based, mastery-model instruction to provide flexible, individualized lessons for a wide variety of learners. PLATO® courseware is ideally suited to diverse learning situations, including accelerated education for students, dropout prevention and recovery programs, workplace training, adult basic education, GED preparation, developmental studies, and employment preparation programs.

PLATO continually updates curriculum content to meet contemporary educational objectives. Constant revisions also ensure that content is relevant for learners and teaches real-life examples. Animated graphics and individualized responses encourage concentration, maintain motivation, and increase mastery.

INSTRUCTIONAL STRATEGIES

PLATO® curricula use an individualized, competency-based mastery model to accommodate learner needs. These instructional strategies

- encourage the learner to study at his or her level and move at his or her pace.
- help the learner master each topic.
- provide precise measurement of the learner’s progress.
- promote individual accountability.

Individualized Instruction

Everyone learns at a different rate. What takes one person only an hour to learn may take another up to six. Learners with a clear grasp of a concept can move quickly through the learning activities. However, if a learner is having trouble with a particular concept, he or she can repeat an activity.

PLATO® provides immediate feedback when the learner answers a question, stating whether the answer is correct. If the answer is incorrect, PLATO® identifies common errors and provides helpful hints to steer learners in the right direction. PLATO® further personalizes each learner’s experience by using his or her name and the current date in some of the learning activities.

It is common for learners to have different goals, particularly in an individualized setting. PLATO® caters to every learner’s needs. In PLATO® curricula, learning activities are sequential to reinforce skills previously learned. In Pre-Algebra and Geometry and Measurement 1, the modules build upon each other; thus, it is strongly recommended that learners take them in order. This unique modularity allows the instructor to plan individual programs based on specific needs.
Competency-based Instruction

PLATO’s competency-based instruction focuses on active learning. Learners concentrate on fulfilling specific outcomes or objectives. Each objective describes a particular, measurable behavior. For example, this competency-based curriculum design states the objectives for identifying the receiver of a short message as the following:

Given a short message, learners will be able to

- determine if the receiver is named.
- identify the named receiver.
- identify the implied receiver.

These objectives suggest an exact way to measure learning.

Every curriculum has objectives at many different levels, ranging from knowledge acquisition (simple remembering of a fact) to the analysis of ideas and the synthesis of concepts into new knowledge. As the learner progresses through a curriculum, he or she builds upon previous knowledge. Tutorials, or topic-learning activities, provide in-depth instruction. Application learning activities encourage critical thinking, reasoning, and problem solving using previously acquired information.

The Mastery Model

Achievement in a traditional instructional setting occurs in varying degrees. In the mastery model, all learners become proficient in the objective by mastering the test.

The mastery model has two basic principles.

- The learner must master all prerequisite objectives.
- The learner continues to study the given objective until he or she has fully mastered it and is ready to go on to the next objective.

In PLATO’s mastery-based instruction, achievement is held constant; only instructional time varies. Learners who do not understand a concept may continue to study an objective on their own without slowing down other learners. For example, some learners may be ready to take the mastery test after completing a tutorial, while others may want additional practice before proceeding to the test. Those learners can study the application for the module and repeat all or part of the tutorial.

IMPLEMENTATION

Effective programs using computer-based education (CBE) involve careful planning, support for learners, and the monitoring of individual progress. There are three ways to use CBE within an instructional program.

- As a primary means of delivering instruction, PLATO® provides concept learning, practice, application, and testing opportunities.
- As a supplement to instruction, PLATO® presents alternative instructional activities for specific topics.
• As a complement to instruction, PLATO® delivers instructional activities that are difficult to do in other ways. For example, learners can refresh their prerequisite skills using PLATO® while trainers teach specific procedures in a class setting.

The trainer’s or instructor’s role is different for each of the three instructional approaches.

• **Primary** application changes the role the most. Because PLATO® does much of the initial instruction, the full-time presence of trainers is not necessary.

• **Supplemental** application changes the role the least. The instructor performs familiar teaching activities using the computer as an alternate resource.

• **Complementary** application slightly changes the role. CBE allows learners to refresh or learn skills beyond the scope of the specific training topic. The computer courseware is typically only a part of the training initiative.

**PLATO® PATHWAYS**

PLATO® Pathways combines instruction, testing, and reporting capabilities. These capabilities allow you to construct and administer individualized learning programs. For more information, refer to the PLATO® Pathways User’s Guide, P/N 99600206.

**PLATO® TOOLS AND NAVIGATION**

PLATO® curricula have some features that make individualized learning easy. These features include:

• **Speed Bar**

• **Navigation Bar**

**Speed Bar**

The speed bar displays at the top of the screen throughout the activity and provides access to the tools in the activity. Depending on where the learner is in the activity, some buttons may not be available. For example, during a test the glossary is not available. Buttons that are not available are either absent or they appear dimmed out on the speed bar.

<table>
<thead>
<tr>
<th>ACTIVITY TYPE</th>
<th>ACTIVITY TITLE</th>
<th>4.2.3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Print</td>
<td>Notebook</td>
</tr>
</tbody>
</table>
For descriptions of the speed bar’s tools, from left to right review the following:

Print—Click the Print button to print the screen on which you are working. The bottom section of your printout (where the navigation bar is located on-screen) will display information about the specific screen that you printed. If you need help with PLATO®, PLATO® Support Services may request this information. For more about help with PLATO®, refer to the section PLATO® Support Services, on page 1-14.

Notebook—Click the Notebook button or press the F3 key to open the notebook. The notebook allows learners to type and print messages, as needed. To move the notebook, click and drag the notebook by the caption bar. To learn more about the notebook, learners can click the notebook’s Help button. Click the Close button when you are done.

Glossary—Click the Glossary button or press the F6 key to open the glossary. The glossary contains definitions of terms essential to understand the activity. These terms are highlighted in yellow the first time that they appear in the activity. To use the glossary, follow the prompts, and click the Close button when done.
Dictionary—Click the Dictionary button or press the F4 key to open the dictionary. To move the dictionary, click and drag the dictionary by the caption bar. To learn more about how to use the dictionary, click the dictionaries’ Help button. Click the Close button when you are done.

Calculator—Click the Calculator button or press the Alt+C keys to open the calculator. For more information, refer to the section Calculator on page 1-10.

Hint—Click the Hint button or press the F5 key to open the hint dialog box. If there is a hint for a question, learners can review information in a hint dialog box to answer a question.

Data—Click the Data button or press the F9 key to display information. If there is data for a question, learners can choose to review it in order to answer the question.
Help—Click the Help button or press the F1 key to open a help menu similar to the one shown here.

<table>
<thead>
<tr>
<th>Key</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTER</td>
<td>Goes forward</td>
</tr>
<tr>
<td>PgUp</td>
<td>Goes backward</td>
</tr>
<tr>
<td>MENU</td>
<td>Goes to the menu</td>
</tr>
<tr>
<td>EXIT</td>
<td>Exits the lesson</td>
</tr>
<tr>
<td>Print</td>
<td>Prints the screen</td>
</tr>
<tr>
<td>Note</td>
<td>Displays the Notebook</td>
</tr>
<tr>
<td>Help</td>
<td>Helps with answers</td>
</tr>
<tr>
<td>Data</td>
<td>Displays information</td>
</tr>
<tr>
<td>Help</td>
<td>Describes key actions</td>
</tr>
<tr>
<td>Gloss</td>
<td>Explains words</td>
</tr>
<tr>
<td>Dict</td>
<td>Displays the Dictionary</td>
</tr>
<tr>
<td>Calc</td>
<td>Displays the Calculator</td>
</tr>
</tbody>
</table>

The help menu gives a brief description of each item on the speed and navigation bars, as well as the shortcut key to press to execute each item. The help menu indicates which navigational keys are available in the activity. Although the End and Esc keys do not appear on the help menu, they are active throughout the activity. These keys as well as the F10 key allow you to exit the activity.
About PLATO®—The About PLATO® button is located at the bottom of the help menu. Click the About PLATO® button to open an About PLATO® dialog box similar to the one shown here. (The names here are examples shown in the location that the real names will appear. Your screen will have real names taken from the actual lesson.)

If you call PLATO® Support Services for help with PLATO®, to help expedite your service, please be ready to provide the following information most of which is found on the About PLATO® dialog box:

—Activity title
—Activity type (e.g., App., Tutorial, Mastery Test)
—File name, date, and time
—Screen number (e.g., Screen: 1.2.1)
—Version number
—What you did before the error occurred (e.g., pressed enter, exit, etc.)

For more about contacting PLATO® Support Services, refer to the section PLATO® Support Services on page 1-14.
Navigation Bar

The navigation bar displays at the bottom of the screen throughout the activity and provides access to the navigation functions of the activity. Depending on where the learner is in the activity, some buttons may not be available. For example, when you enter your name the Lesson menu and Backward buttons are not available. Buttons that are not available are either absent or they appear dimmed out on the navigation bar.

For descriptions of the navigation bar's functions, from left to right review the following:

Exit—Click the Exit button or press F2 to exit the activity.

Lesson menu—Click the Lesson Menu button or press F2 to go to the lesson menu. When an activity is divided into lessons, press F2 to display the lesson menu at any time within the tutorial or application. If you are in student mode, you must go through the lessons sequentially the first time that you take an activity. After completing an activity, all lessons are available for review in any order you choose. The lesson menu icons are color-coded to indicate whether they are available. Blue icons indicate lessons available for review; dark gray icons indicate lessons not currently available for review. If you are in administrator mode, all lessons of the activity are always available.

Backward arrow—Click the Backward arrow or press the PgUp key to go backward in the activity.

Forward arrow—Click the Forward arrow or press the Enter key to go forward in the activity.

ADMINISTRATOR MODE

Administrator mode allows you to browse through all activities, including tests, without having to answer the questions. You will see every item in a pool of test questions, providing an effective preview of entire mastery tests.

In addition, administrator mode enables a debug option that displays a frame identification number in the upper-right corner of each screen. This number is important if you have a question for the PLATO® Support Services and wish to refer to a particular screen.

For more about contacting PLATO® Support Services, refer to the section PLATO® Support Services on page 1-14.

To use administrator mode, follow these steps:

1. Sign on to PLATO® Pathways as an administrator an administrator equivalent. The main menu screen displays.
2. On the PLATO® Pathways main menu screen, click the Learning Resource Management icon. The Activities list displays.
3. From the Activities list on the Learning Resource Management screen, double-click the book icon with the name of the curriculum you want to open. A list of courses displays.

4. Double-click the course you want to run and, from the list of modules that displays, double-click the module you wish to open. A list of learning activity types (monitor icons) displays.

5. From the list of learning activity types, click once to highlight the monitor icon with the name of the learning activity you want to run. To launch the activity, click the Run button (shown below) at the right of your screen. The learning activity launches.

![Run button](image)

6. When the learning activity opens, click the Administrator Mode button. In this mode you may preview activities quickly without having to answer the questions. Read the on-screen instructions. Press the PgDn key to move from one question to the next. Administrator mode allows you to browse through all the questions in an item or mastery pool. If you ran the activity in learner mode, you would only see randomly selected items from these pools.

NOTE: To run an activity as a learner would see it, click the Student Mode button instead of the Administrator Mode button in Step 6.

**ORIENTING LEARNERS**

Many learners may not be familiar with CBE. You may want to introduce them to PLATO® to make them comfortable with the mechanics of the hardware and software and the instructional philosophy.

1. Orient learners to the PLATO® system.
   a. Explain how they learn at their own pace.
   b. Explain how the curriculum relates to each learner’s educational objectives. PLATO® will guide them through their studies.

2. Explain how to use the workstation.
   a. Describe the PLATO® Tool and Navigation bars and the function keys that correspond to them.
   b. Demonstrate how to sign on to PLATO® Pathways and how to begin the assigned learning activities.

3. Explain how to progress through the curriculum.

4. Explain how testing works. Point out that there are a tutorial, application, and test for each module. Explain to learners that they take tests to ensure the mastery of skills. Also let learners know that they can take the tests first if they think they know the material.
5. Describe the challenge activities. Explain that they provide whole-skill practice. The challenge activities are the only activity in the last module—learners are not tested on them as the challenge activities review all the objectives for the entire course.

6. Explain how PLATO® Pathways automatically keeps a record of their progress and describe the content of performance reports.

7. Define the terminology used (curriculum, course, module, test, mastery, etc.).

8. Describe the bookmarking feature. It allows learners to exit a tutorial without completing it, and then return to it at the beginning of the last section they were in or start the activity over.

SPECIAL MATH KEYS

Pre-Algebra and Geometry and Measurement 1 use the following four key combinations. You will learn more about the combinations in the activities that use these keys.

- **Alt** + **x** is used for multiplication (x)
- **Alt** + **d** is used for division (÷)
- **Alt** + **f** is used for fractions (\(\frac{1}{4}, \frac{1}{2}\))
- **Alt** + **e** is used for exponents (\(x^2\))

CALCULATOR

Pre-Algebra and Geometry and Measurement 1 comes with an on-line, 32-function calculator for solving math problems. It supports both business and trigonometric operations. All functions are supported by both mouse and keyboard input.

Click the **Calculator** button or press the **Alt+C** keys to open the calculator. The calculator will appear with trigonometric functions showing in the third and fourth rows. You can change to statistics functions by clicking the **Stat** button or pressing **Ctrl + Alt + S** keys. Change back to trig functions by clicking the **Trig** button or pressing the **Ctrl + Alt + T** keys. When you are finished with the calculator, press the **PgUp** key to return to the lesson.

The following chart shows how to access the various calculator functions using the keyboard.

<table>
<thead>
<tr>
<th>Function</th>
<th>Calc. Keys</th>
<th>Key Presses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition</td>
<td>+</td>
<td>Shift + +</td>
</tr>
<tr>
<td>Subtraction</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Equals</td>
<td>=</td>
<td>=</td>
</tr>
</tbody>
</table>
### Memory

<table>
<thead>
<tr>
<th>Function</th>
<th>Calc. Keys</th>
<th>Key Presses</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear All</td>
<td>CLR</td>
<td>(No keystroke available)</td>
<td>“delete” clear all</td>
</tr>
<tr>
<td>Clear Entry</td>
<td>CLX</td>
<td>Del</td>
<td>“delete” clear entry</td>
</tr>
<tr>
<td>Recall (memory)</td>
<td>RCL</td>
<td>Shift r</td>
<td>“r” for Recall memory</td>
</tr>
<tr>
<td>Store (memory)</td>
<td>STO</td>
<td>Shift m</td>
<td>“m” for Memory</td>
</tr>
</tbody>
</table>

### Algebra

<table>
<thead>
<tr>
<th>Function</th>
<th>Calc. Keys</th>
<th>Key Presses</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change sign</td>
<td>CHS</td>
<td>c</td>
<td>“c” for Change</td>
</tr>
<tr>
<td>Divide</td>
<td>÷</td>
<td>Alt d</td>
<td>“d” for Divide</td>
</tr>
<tr>
<td>Factorial</td>
<td>n!</td>
<td>f</td>
<td>“f” for Factorial</td>
</tr>
<tr>
<td>Multiply</td>
<td>x</td>
<td>Alt x</td>
<td>“x” for Multiply</td>
</tr>
<tr>
<td>pi</td>
<td>π</td>
<td>Alt p</td>
<td>“p” for pi</td>
</tr>
<tr>
<td>Power</td>
<td>y^x</td>
<td>Alt e</td>
<td>“e” for Exponent</td>
</tr>
<tr>
<td>Reciprocal</td>
<td>1/x</td>
<td>o</td>
<td>“o” for 1-Over</td>
</tr>
<tr>
<td>Square</td>
<td>x^2</td>
<td>s</td>
<td>“s” for Square</td>
</tr>
<tr>
<td>Square Root</td>
<td>√x</td>
<td>r</td>
<td>“r” for Root</td>
</tr>
</tbody>
</table>

### Logarithms

<table>
<thead>
<tr>
<th>Function</th>
<th>Calc. Keys</th>
<th>Key Presses</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to the x</td>
<td>10^x</td>
<td>x</td>
<td>“x” for 10 to the x</td>
</tr>
<tr>
<td>e to the x</td>
<td>e^x</td>
<td>Shift x</td>
<td>“x” for e eXponent</td>
</tr>
<tr>
<td>Log (base 10)</td>
<td>LOG</td>
<td>l</td>
<td>“l” for Log</td>
</tr>
<tr>
<td>Natural log</td>
<td>LN</td>
<td>n</td>
<td>“n” for Natural log</td>
</tr>
</tbody>
</table>
## Trigonometry

<table>
<thead>
<tr>
<th>Function</th>
<th>Calc. Keys</th>
<th>Key Presses</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arcosine</td>
<td>ACOS</td>
<td>Ctrl Shift c</td>
<td>“c” for arcCosine</td>
</tr>
<tr>
<td>Arcsine</td>
<td>ASIN</td>
<td>Ctrl Shift s</td>
<td>“s” for arcSine</td>
</tr>
<tr>
<td>Arctangent</td>
<td>ATAN</td>
<td>Ctrl Shift t</td>
<td>“t” for arcTangent</td>
</tr>
<tr>
<td>Cosine</td>
<td>COS</td>
<td>Ctrl c</td>
<td>“c” for Cosine</td>
</tr>
<tr>
<td>Degrees</td>
<td>DEG</td>
<td>Ctrl d</td>
<td>“d” for Degrees</td>
</tr>
<tr>
<td>Radians</td>
<td>RAD</td>
<td>Ctrl Shift d</td>
<td>“d” for raDians</td>
</tr>
<tr>
<td>Sine</td>
<td>SIN</td>
<td>Ctrl s</td>
<td>“s” for Sine</td>
</tr>
<tr>
<td>Tangent</td>
<td>TAN</td>
<td>Ctrl t</td>
<td>“t” for Tangent</td>
</tr>
</tbody>
</table>

## Statistics

<table>
<thead>
<tr>
<th>Function</th>
<th>Calc. Keys</th>
<th>Key Presses</th>
<th>Mnemonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add Sum of X</td>
<td>Σ+</td>
<td>Alt a</td>
<td>“a” for Add to sum</td>
</tr>
<tr>
<td>Average (mean)</td>
<td>∑</td>
<td>Alt v</td>
<td>“v” for aVerage</td>
</tr>
<tr>
<td>Number</td>
<td>n</td>
<td>Alt n</td>
<td>“n” for Number</td>
</tr>
<tr>
<td>Percent</td>
<td>%</td>
<td>Shift 5</td>
<td>“%” for percent</td>
</tr>
<tr>
<td>Percent Change</td>
<td>∆%</td>
<td>Alt 5</td>
<td>“alt %” for change</td>
</tr>
<tr>
<td>Standard Dev (n-1)</td>
<td>σ_{n-1}</td>
<td>Alt s</td>
<td>“s” for Standard deviation</td>
</tr>
<tr>
<td>Standard Dev (n)</td>
<td>σ_n</td>
<td>Alt b</td>
<td>“b” for Biased estimate</td>
</tr>
<tr>
<td>Subtract Sum of x</td>
<td>Σ−</td>
<td>Alt m</td>
<td>“m” for Minus from sum</td>
</tr>
</tbody>
</table>

### FRACTIONAL ENTRY

Some questions in Pre-Algebra and Geometry and Measurement 1 display a fractional entry tool. This tool allows learners to enter their answer in the form of a fraction the way you would normally see it printed. In many cases when this tool displays, the Hint button on the Speed Bar also becomes active. When this happens, it signals to the learner that he or she can click the Hint button to find out more about the fractional entry tool.

Here are some general guidelines for entering fractions using the fractional entry tool:

- If it is active, click the **Hint** button and follow the instructions.
• Click the button, or press the corresponding key(s), for the part of the fraction you want to enter.

<table>
<thead>
<tr>
<th>Button</th>
<th>Function</th>
<th>Keyboard</th>
<th>Alternate Keyboard Stroke</th>
<th>Alternate Keyboard Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA</td>
<td>base</td>
<td>ALT N</td>
<td>--</td>
<td>Ctrl ←</td>
</tr>
<tr>
<td>NU</td>
<td>numerator</td>
<td>ALT F</td>
<td>↑</td>
<td>Ctrl ↑</td>
</tr>
<tr>
<td>DE</td>
<td>denominator</td>
<td>/ (forward slash)</td>
<td>↓</td>
<td>Ctrl ↓</td>
</tr>
<tr>
<td>EX</td>
<td>exponent</td>
<td>ALT E</td>
<td>--</td>
<td>Ctrl →</td>
</tr>
<tr>
<td>π</td>
<td>pi</td>
<td>ALT P</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>+</td>
<td>addition</td>
<td>+</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>-</td>
<td>subtraction</td>
<td>-</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>X</td>
<td>multiplication</td>
<td>ALT X</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>÷</td>
<td>division</td>
<td>ALT D</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

• When entering a negative fraction, place the negative sign in front of the whole fraction.

\[
\begin{align*}
-\frac{1}{2} & \quad \text{Correct} \\
\frac{-1}{2} & \quad \text{Incorrect}
\end{align*}
\]

• Do not include parentheses where they are not needed. A mathematically correct answer may be judged incorrect due to the addition of unnecessary parentheses.

\[
\begin{align*}
3(X^2+1) & \quad \text{Correct} \\
(3)(X^2+1) & \quad \text{Incorrect}
\end{align*}
\]

ACCOUNTABILITY

PLATO® Pathways automatically records and stores the mastery of learning objectives for each learner. You can access and print performance reports using PLATO® Pathways. For more information, refer to the PLATO® Pathways User’s Guide, P/N 99600206.
HOW TO USE THIS GUIDE

The curriculum guide provides an overview of the curriculum structure and content. It is designed to assist you in its implementation. Because you play a key role in ensuring a positive learning experience for your learners, it is important to study this guide carefully.

Curriculum Guide Sections

Each curriculum guide consists of four major sections:

The **Overview** describes the PLATO® instructional philosophy and approach.

**Testing Strategies** describes the testing approaches available for learner assessment at various levels of the curriculum. Consult this section to acquaint yourself with PLATO’s approach to assessment and mastery testing.

**Scope and Sequence** outlines the courses, modules, and learning activities. Objectives are listed at the beginning of each module. It also contains information about estimated completion time for each course.

**Instructor Aids** include learner progress sheets and a skill-level chart, which lists the grade level for each module in the curriculum.

PLATO® SUPPORT SERVICES

Obtain help with PLATO® by accessing the PLATO® Support Services Web site at:

http://platosupport.plato.com

Or you may send an e-mail support request to:

platosupport@plato.com

Or you may call PLATO® Support Services.

When contacting PLATO® Support Services through any of these means, in addition to the information noted above, please be ready to provide:

—Your unique PLATO® ID number

—All the information listed previously on Page 1-7.

PLATO® ID Number

A unique PLATO® ID number is sent on a set of stickers to all new client sites. If you cannot locate your PLATO® ID number, request it by e-mail to platosupport@plato.com. Please allow one business day for a response. (If you do not have e-mail, you can fill out and submit a form on the PLATO® Support Services Web site at http://platosupport.plato.com.)
Testing Strategies

The PLATO® testing strategy includes assessment and mastery testing. These strategies allow the instructor to evaluate each learner’s needs and to prescribe the proper instructional sequence.

- **Assessment testing**, offered at the course level, determines how much knowledge the learner has before the initial study of the curriculum. Assessment testing exempts the learner from the modules of which he or she demonstrates prior knowledge. You also have the option to offer assessment testing after the learner has mastered individual module tests as a final course exam.

- **Mastery testing**, offered at the beginning or end of each module, evaluates the learner’s comprehension of the information presented in that module.

**ASSESSMENT TESTS**

The learner takes an assessment test before he or she begins to study a particular curriculum or course. Questions in the assessment tests use the same question pools as the mastery test for each module. The program randomly selects four questions from each mastery test question pool. The test questions cover the objectives listed in the Scope and Sequence section of this guide. The learner needs to master every objective in order to master a module. The learner must answer three out of four questions correctly in each test area to master the module.

After selecting the test from the course menu, the learner must complete the assessment test before entering any instructional activities. Assessment tests have a bookmarking feature similar to that found within the tutorials. At the end of a testing session, the learner can

- terminate testing with all unanswered questions scored as not mastered.
- exit the testing activity and complete the assessment during the next session.

Upon completion of the assessment test, the learner will be exempt from any PLATO® modules that he or she has mastered; however, the learner has the option to review mastered modules without affecting his or her exemption status.

**MASTERY TESTS**

Mastery tests monitor each learner’s progress and record performance at the module level. Each module contains one or more mastery tests. The learner must pass all tests to demonstrate mastery of each objective in the module.

Each test contains at least five out of a pool of at least ten questions. The learner who repeats tests receives similar, but not identical, questions each time he or she attempts to demonstrate mastery. The learner must answer 80 percent of the questions in each test correctly. Feedback appears after every answer. The learner knows immediately if he or she has answered a question correctly and receives a total score at the end of the test.
The test automatically terminates when the learner has answered 80 percent of the questions correctly or has answered too many questions incorrectly.

**Pretesting**

Taking mastery tests as pretests allows a learner to test out of material he or she already knows and move directly to new material. If a learner has difficulty passing the assessment test, he or she can have a second attempt to earn mastery by passing the mastery test for a module.

If the learner passes the test for a module, he or she has mastered that module. The learner may then proceed directly to the next module. Mastery tests give the learner only one opportunity to attempt each pretest. If the learner fails to pass the test for a module, he or she must complete the tutorial before retaking the test. Completion of additional learning activities is optional.

Pretesting has several advantages.

- It allows the learner to move more quickly through the material.
- It provides the learner with control over his or her learning experience.
- It allows the learner to test out of objectives that he or she has already mastered.

**NO PRE-INSTRUCTION ASSESSMENT**

An alternate strategy for the learner is to use the mastery tests only as posttests. The learner first completes a learning activity and then takes the mastery test. The learner repeats the process until he or she has mastered all objectives.

While more time-consuming than the pretest sequence, this approach is more appropriate for the learner whose skill or knowledge levels are low and who may experience frustration or anxiety with pretests.
Pre-Algebra Scope and Sequence

Pre-Algebra is a comprehensive instructional curriculum designed to cover material taught in seventh through tenth grade. It is divided into courses, and each course is divided into modules that contain learning activities. Each learning activity is based on one or more of the objectives listed at the beginning of the module. (See Figure 1.)

**LEARNING ACTIVITIES**

Pre-Algebra has five types of learning activities:

- **Tutorials** teach learners a specific skill—for example, classifying odd and even numbers.
- **Drills** help learners practice the skill taught in the tutorial.
- **Reviews** are a set of questions summarizing the preceding modules.
- **Applications** and **Practices** allow learners to apply their skill to real-life examples.
- **Mastery tests** evaluate a learner’s comprehension, monitor progress, and record performance at the module level. (See the Testing Strategies section for further information on the relationship of the tests to the instructional material.)

**LEARNING OBJECTIVES**

The objectives listed at the beginning of every module in this guide summarize the goals for the whole module. They can be further broken down to take the learner step-by-step through the learning activities. For example, the module objective of “Given a whole number, learners will be able to classify it as either an odd or an even number,” can be broken down into an objective for each activity.

- Given a whole number, learners will **study** how to classify it as either an odd or an even number. (Tutorial)
- Given a whole number, learners will **practice** how to classify it as either an odd or an even number. (Drill)
- Given a whole number, learners will **review** how to classify it as either an odd or an even number. (Review and Application)
- Given a whole number, learners will **check understanding** about how to classify it as either an odd or an even number. (Test)

Although the objectives are not broken down in the modules or the courseware, it may be helpful to do so.
Figure 1

This figure shows the structure and number of components for *Pre-Algebra*.

- Curriculum
- 4 Courses
- 23 Modules
- 102 Activities
- 177 Objectives
**ESTIMATED COMPLETION TIME**

*Pre-Algebra* is individualized; learners progress at their own pace. The average time required for a learner to complete the curriculum depends on a number of factors (e.g., individual reading levels and learning environment conditions).

Completion times vary in each learning environment. Until an average time becomes apparent in your environment, the following estimate of one hour per module may be helpful when scheduling.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Time to complete (in hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Number Ideas</td>
<td>7</td>
</tr>
<tr>
<td>Math Sentences, Part 1</td>
<td>7</td>
</tr>
<tr>
<td>Math Sentences, Part 2</td>
<td>4</td>
</tr>
<tr>
<td>Special Topics</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

Each curriculum consists of courses, modules, and learning activities. To build custom routing activities, consult the *PLATO® Pathways User’s Guide*.

The following section lists module titles, objectives, themes and activity types for each course in *Pre-Algebra*. 
Basic Number Ideas

Odd, Even, Prime, and Composite Numbers

Objective: Given a whole number, learners will be able to
- classify it as either an odd or an even number.
- classify it as either a prime or a composite number.

Theme: The introduction of the set of whole numbers demonstrates odd and even integers and prime and composite integers.

Activities:
- Odd, Even, Prime, and Composite Numbers: Tutorial
- Odd, Even, Prime, and Composite Numbers: Application
- Odd, Even, Prime, and Composite Numbers: Mastery Test 1
- Odd, Even, Prime, and Composite Numbers: Mastery Test 2

Exponents

Objective: Given a product of identical factors, learners will be able to
- write the product in exponential form.

Given a product expressed in exponential form, learners will be able to
- write the product in expanded form.

Given a product expressed in the form $a^m \times a^n$, learners will be able to
- write the product in its simplest form.

Given an expression in the form $(a^m)^n$, learners will be able to
- write the simplest form for this expression.

Theme: The basic ideas of exponents and how they are used help learners to identify and work with exponents and bases in expanded products.

Activities:
- Exponents: Tutorial
- Exponents: Application
- Exponents: Mastery Test 1
- Exponents: Mastery Test 2
- Exponents: Mastery Test 3
- Exponents: Mastery Test 4
**ADDING AND SUBTRACTING INTEGERS**

**Objective:** Given an integer, learners will be able to
- name its additive inverse.

Given a pair of integers, at least one of which is negative, learners will be able to
- find their sum.
- find their difference.

**Theme:** The number line helps learners add and subtract positive and negative integers.

**Activities:**
- Adding and Subtracting Integers: Tutorial
- Adding and Subtracting Integers: Application
- Adding and Subtracting Integers: Mastery Test 1
- Adding and Subtracting Integers: Mastery Test 2

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**MULTIPLYING AND DIVIDING INTEGERS**

**Objective:** Given a pair of integers, learners will be able to
- find their product.
- find their quotient.

**Theme:** The presentation of specific rules and examples helps learners multiply and divide positive and negative numbers.

**Activities:**
- Multiplying and Dividing Integers: Tutorial
- Multiplying and Dividing Integers: Application
- Multiplying and Dividing Integers: Mastery Test 1
- Multiplying and Dividing Integers: Mastery Test 2
**SQUARE ROOTS**

**Objective:** Given a perfect square that is less than 100, learners will be able to

- find its square root.

Given a positive number that is not a perfect square, learners will be able to

- find the two consecutive integers that bound its square root.

**Theme:** The basic ideas about square roots teach learners how to find square roots of perfect squares that are less than 100 and of squares that are not perfect.

**Activities:**
- Square Roots: Tutorial
- Square Roots: Application
- Square Roots: Mastery Test 1
- Square Roots: Mastery Test 2

**COMMON FRACTIONS**

**Objective:** Given a pair of common fractions, learners will be able to

- find the sum or difference.
- find the product or quotient.

Given a pair of mixed numbers, the fractional parts of which are common fractions, learners will be able to

- find the sum or difference.
- find the product or quotient.

**Theme:** The special properties of the number 1 help learners learn about common fractions.

**Activities:**
- Common Fractions: Tutorial
- Common Fractions: Application
- Common Fractions: Mastery Test 1
- Common Fractions: Mastery Test 2
- Common Fractions: Mastery Test 3
- Common Fractions: Mastery Test 4
- Common Fractions: Mastery Test 5
Objective: Given a practical problem involving basic number ideas, learners will be able to
  • find its solution.

Theme: Problems concerning how much gas is used during a car trip, how much Ben can spend on snacks for each friend, the amount of change received at the grocery store, a plan to set up a budget, and special sales on work pants help learners practice mathematical skills involving basic number ideas.

Activities: Using Basic Number Ideas: Tutorial
Using Basic Number Ideas: Application
Using Basic Number Ideas: Mastery Test
**Math Sentences, Part 1**

**Variables**

**Objective:** Given an expression in one variable and a numerical replacement for the variable, learners will be able to
- find the value of the expression.

Given an expression in two variables and numerical replacements for the variables, learners will be able to
- find the value of the expression.

Given a first degree equation in one or two variables and numerical replacements for the variables, learners will be able to
- determine the truth value of the resulting statement.

**Theme:** Exploration of the basic ideas about variables, punctuation in mathematical statements, symbols of grouping, and the order of operations helps learners identify and use variables.

**Activities:**
- Variables: Tutorial
- Variables: Application
- Variables: Mastery Test 1
- Variables: Mastery Test 2
- Variables: Mastery Test 3

**Monomials**

**Objective:** Given a pair of monomials in one variable, learners will be able to
- find their sum.
- find their difference.
- find their product.
- find their quotient.

**Theme:** A brief comparison of monomials and binomials sets the stage to help learners add, subtract, multiply, and divide monomials.

**Activities:**
- Monomials: Tutorial
- Monomials: Application
- Monomials: Mastery Test 1
- Monomials: Mastery Test 2
- Monomials: Mastery Test 3
- Monomials: Mastery Test 4
**BINOMIALS**

**Objective:** Given a monomial and a binomial, learners will be able to

- find their sum.
- find their difference.
- find their product.
- find their quotient.

**Theme:** Learners expand their knowledge of monomials and binomials to help them add, subtract, multiply, and divide both mathematics expressions.

**Activities:**
- Binomials: Tutorial
- Binomials: Application
- Binomials: Mastery Test 1
- Binomials: Mastery Test 2
- Binomials: Mastery Test 3
- Binomials: Mastery Test 4

**LINEAR EQUATIONS IN ONE VARIABLE**

**Objective:** Given a linear equation in one variable that requires only one transformational move, learners will be able to

- find its solution.

Given a linear equation in one variable that requires two transformational moves, learners will be able to

- find its solution.

**Theme:** Explanations of mathematical sentences, variables, and linear equations help learners solve linear equations in one variable.

**Activities:**
- Linear Equations in One Variable: Tutorial
- Linear Equations in One Variable: Application
- Linear Equations in One Variable: Mastery Test 1
- Linear Equations in One Variable: Mastery Test 2
**Linear Inequalities in One Variable**

**Objective:** Given an inequality of the form $x + a < b$, learners will be able to
- find its solution set.

Given an inequality of the form $ax < b$ or $ax > b$, learners will be able to
- find its solution set.

Given an inequality of the form $ax - b > c$ or $ax - b < c$, learners will be able to
- find its solution set.

**Theme:** A two-step method helps learners solve linear inequalities; the number line is used to graph solutions.

**Activities:**
- Linear Inequalities in One Variable: Tutorial
- Linear Inequalities in One Variable: Application
- Linear Inequalities in One Variable: Mastery Test 1
- Linear Inequalities in One Variable: Mastery Test 2
- Linear Inequalities in One Variable: Mastery Test 3

**Special Quadratic Equations**

**Objective:** Given an equation in the form $x^2 - c^2 = 0$, learners will be able to
- find its solution set.

Given an equation with the form $ax^2 - bx = 0$, learners will be able to
- find its solution set.

**Theme:** Presentation of the special types of quadratic equations and methods of solving them help learners find solutions; solutions are represented on a graph.

**Activities:**
- Special Quadratic Equations: Tutorial
- Special Quadratic Equations: Application
- Special Quadratic Equations: Mastery Test 1
- Special Quadratic Equations: Mastery Test 2
Objective: Given a practical problem involving a linear math sentence in one variable, learners will be able to
  • find the solution.
Given a practical problem involving a quadratic math sentence in one variable, learners will be able to
  • find the solution.

Theme: Practical word problems involving cats and dogs in a kennel, construction of a patio, garden plot dimensions, the purchase of apples and oranges, and an order for red and blue pens allow learners to practice their problem-solving skills with math sentences in one variable.

             Using Math Sentences—Part 1: Application
             Using Math Sentences—Part 1: Mastery Test 1
             Using Math Sentences—Part 1: Mastery Test 2
**Math Sentences, Part 2**

**Coordinate Plane**

**Objective:** Given a point in a plane, learners will be able to
- name its coordinates.

Given an ordered pair, learners will be able to
- identify the corresponding point in a plane.

**Theme:** Demonstrations of plotting points on a graph help learners identify points on the coordinate plane.

**Activities:**
- Coordinate Plane: Tutorial
- Coordinate Plane: Application
- Coordinate Plane: Mastery Test 1
- Coordinate Plane: Mastery Test 2

**Linear Equations in Two Variables**

**Objective:** Given an ordered pair and a linear equation in two variables, learners will be able to
- determine if the ordered pair is a solution of the equation.

Given a line in a coordinate plane and a linear equation in two variables, learners will be able to
- determine whether the line is the graph of the equation.

**Theme:** Solution steps and graphing help learners solve linear equations in two variables and identify the correctness of their solutions.

**Activities:**
- Linear Equations in Two Variables: Tutorial
- Linear Equations in Two Variables: Application
- Linear Equations in Two Variables: Mastery Test 1
- Linear Equations in Two Variables: Mastery Test 2
**Systems of Linear Equations**

**Objective:** Given a system of two linear equations, learners will be able to
- determine whether a specified ordered pair is a solution of the system.

Given two equations in two variables, learners will be able to
- solve the problem by graphing or by using the addition-subtraction method.

**Theme:** Solution steps and graphing help learners solve system linear equations and determine the correctness of their solutions.

**Activities:**
- Systems of Linear Equations: Tutorial
- Systems of Linear Equations: Application
- Systems of Linear Equations: Mastery Test

**Using Math Sentences—Part 2**

**Objective:** Given a practical problem that can be solved using two variables, learners will be able to
- find its solution.

**Theme:** Practical word problems involving the break-even point for selling sculptures, the pair of points at the intersection of two lines, the lengths of two metal rods, the length of a rectangular garden, and the number of larger and smaller memo books to be ordered allow learners to practice their skills in solving problems algebraically.

**Activities:**
- Using Math Sentences—Part 2: Tutorial
- Using Math Sentences—Part 2: Application
- Using Math Sentences—Part 2: Mastery Test
SPECIAL TOPICS

PERCENTS, PART 1

Objective: Given a fractional percent $p$ or a graphic representation of a fractional percent $p$ such that $p < 1$, learners will be able to

- name $p$ as a decimal.

Given a decimal that names a fractional percent $p$ such that $p < 1$, learners will be able to

- name the percent $p$.

Given a whole number $n$ and a fractional percent $p$ such that $p < 1$, learners will be able to

- find $p$ percent of $n$.

Theme: Shading parts of pictures demonstrates percents that are less than one.

Activities: Percents, Part 1: Tutorial

Percents, Part 1: Application

Percents, Part 1: Mastery Test 1

Percents, Part 1: Mastery Test 2

Percents, Part 1: Mastery Test 3

Percents, Part 1: Mastery Test 4

PERCENTS, PART 2

Objective: Given a whole number percent greater than 100, learners will be able to

- name it as a decimal.

Given a decimal that names a whole number percent greater than 100, learners will be able to

- name the percent.

Given a number $n$ and a whole number percent $p$ such that $p > 100$, learners will be able to

- find $p$ percent of $n$.

Theme: Using a pie as an example, learners investigate percents that are greater than 100.

Activities: Percents, Part 2: Tutorial

Percents, Part 2: Application

Percents, Part 2: Mastery Test 1

Percents, Part 2: Mastery Test 2

Percents, Part 2: Mastery Test 3
### Mean, Median, and Mode

**Objective:** Given a series of numbers, learners will be able to
- find the mean, median, and mode.

**Theme:** Exploration of ways to describe a given set of data demonstrates the mean, median, and mode.

**Activities:**
- Mean, Median, and Mode: Tutorial
- Mean, Median, and Mode: Application
- Mean, Median, and Mode: Mastery Test

### Probability

**Objective:** Given the description of a simple experiment, learners will be able to
- determine the number of possible outcomes upon a trial of the experiment.
- Given a description of a simple event, learners will be able to
determine its probability.

**Theme:** Exploration of the element of chance in flipping coins, rolling dice, and other actions explains some basic ideas about probability.

**Activities:**
- Probability: Tutorial
- Probability: Application
- Probability: Mastery Test 1
- Probability: Mastery Test 2
**Objective:** Given a practical problem involving percents, learners will be able to
  • find its solution.

Given a practical problem involving the mean, median, and/or mode, learners will be able to
  • find its solution.

Given a practical problem involving probability, learners will be able to
  • find its solution.

**Theme:** Word problems about the amount of a mortgage, the average age of a
group of people, the mean and the mode of health fitness test scores,
game-playing strategies, and selling shares of stock allow learners to
practice mathematical skills involving percent, mean, median, mode, and
probability.

**Activities:** Using Special Topics: Tutorial
Using Special Topics: Application
Using Special Topics: Mastery Test 1
Using Special Topics: Mastery Test 2
Using Special Topics: Mastery Test 3
Geometry and Measurement 1
Scope and Sequence

Geometry and Measurement 1 is a comprehensive instructional curriculum designed to cover material taught in seventh through tenth grade. It is divided into courses, and each course is divided into modules that contain learning activities. Each learning activity is based on one or more of the objectives listed at the beginning of the module. (See Figure 1.)

LEARNING OBJECTIVES

The objectives listed at the beginning of every module in this guide summarize the goals for the whole module. They can be further broken down to take the learner step-by-step through the learning activities. For example, the module objective “Given the measure of an angle, learners will be able to determine the measure of its complement and its supplement,” can be rewritten to reflect an objective for each activity.

- Given the measure of an angle, learners will study how to determine the measure of its complement and its supplement. (Tutorial)
- Given the measure of an angle, learners will apply skills about how to determine the measure of its complement and its supplement. (Application)
- Given the measure of an angle, learners will check understanding about how to determine the measure of its complement and its supplement. (Test)

LEARNING ACTIVITIES

Geometry and Measurement 1 has three types of learning activities:

Tutorials teach a specific skill—for example, determining complements and supplements of angles.

Applications allow learners to apply the skill using real-life examples.

Mastery tests evaluate comprehension, monitor progress, and record performance at the module level. (See the Testing Strategies section for further information on the relationship of the tests to the instructional material.)
Figure 1

The following figure lists the number of curriculum components and their relationship for the entire Geometry and Measurement 1 curriculum.

- Curriculum
- 2 Courses
- 10 Modules
- 43 Activities
- 78 Objectives
ESTIMATED COMPLETION TIME

*Geometry and Measurement 1* is individualized; learners progress at their own pace. The average time required for a learner to complete the curriculum depends on a number of factors (e.g., individual reading levels and learning environment conditions).

Completion times vary in each learning environment. Until an average time becomes apparent in your environment, the following estimate of one hour per module may be helpful when scheduling.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Time to complete (in hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometry</td>
<td>5</td>
</tr>
<tr>
<td>Measurement</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>10</strong></td>
</tr>
</tbody>
</table>

Each curriculum consists of courses, modules, and activities to build custom routing activities, consult the *PLATO® Pathways User’s Guide*.

The following pages list module titles, objectives, themes, and activity titles for each course in *Geometry and Measurement 1*. The themes summarize the concept contained in each module, and the objectives list how the learner will be able to use this concept. This information is useful in deciding where to place learners based on their deficiencies.
**GEOMETRY (Course)**

**Special Angles, Part 1 (Module)**

**Objective:** Given the measure of an angle, learners will be able to
- determine the measure of its complement and its supplement.

Given a pair of intersecting lines and the measure of one of the angles formed, learners will be able to
- find the measure of any of the other three angles.

**Theme:** Learners study the relationships and measurements of special types of angles.

**Activities:**
- Special Angles – Part 1: Tutorial
- Special Angles – Part 1: Application
- Special Angles – Part 1: Mastery Test 1
- Special Angles – Part 1: Mastery Test 2

**Special Angles, Part 2 (Module)**

**Objective:** Given a pair of parallel lines cut by a transversal and the measure of one of the angles formed, learners will be able to
- find the measures of the other angles.

Given a triangle and the measure of two of its angles, learners will be able to
- find the measure of the third angle.

**Theme:** Learners study more about the relationships and measurements of special types of angles.

**Activities:**
- Special Angles – Part 2: Tutorial
- Special Angles – Part 2: Application
- Special Angles – Part 2: Mastery Test 1
- Special Angles – Part 2: Mastery Test 2
CIRCLES, ARCS, AND CIRCUMFERENCES (MODULE)

Objective: Given a circle and the length of its radius, learners will be able to
- find the length of its circumference.

Given a circle, the length of its radius, and the measure of a central angle, learners will be able to
- find the measure of the intercepted arc.

Given a circle and the measure of an arc intercepted by a central angle, learners will be able to
- find the measure of the central angle.

Theme: Basic ideas and formulas concerning circles help learners study about circles and their measurements.

Activities:
- Circles, Arcs, and Circumferences: Tutorial
- Circles, Arcs, and Circumferences: Application
- Circles, Arcs, and Circumferences: Mastery Test 1
- Circles, Arcs, and Circumferences: Mastery Test 2
- Circles, Arcs, and Circumferences: Mastery Test 3

THE PYTHAGOREAN THEOREM (MODULE)

Objective: Given a right triangle and the lengths of two of its sides, learners will be able to
- find the length of the third side.

Given the lengths of three sides of a triangle, learners will be able to
- determine if the triangle is a right triangle.

Theme: Exploration of the Pythagorean Theorem helps learners discover how to recognize right triangles and determine the lengths of their sides.

Activities:
- The Pythagorean Theorem: Tutorial
- The Pythagorean Theorem: Application
- The Pythagorean Theorem: Mastery Test
**Using Geometry (Module)**

**Objective:** Given a practical problem involving the Pythagorean Theorem, learners will be able to

- find the solution.

Given a practical problem involving special angles, learners will be able to

- find the solution.

Given a practical problem involving circles, arcs, and circumferences, learners will be able to

- find the solution.

Given a practical problem involving similar or congruent triangles and given information about these special triangle relationships, learners will be able to

- find the solution.

**Theme:** Word problems involving geometry allow learners to practice their mathematical skills in measuring the length of a section of a bridge, measuring the length of the rim (arc) of a piece of pie, measuring the height of a flagpole, determining if a large round platform can fit through a doorway, calculating the cable needed to anchor a radio tower, and determining the width of a swamp.

**Activities:**
- Using Geometry: Tutorial
- Using Geometry: Application
- Using Geometry: Mastery Test 1
- Using Geometry: Mastery Test 2
- Using Geometry: Mastery Test 3
- Using Geometry: Mastery Test 4
OBJECTIVE:
Given a metric prefix, learners will be able to
• identify its definition.

Given a measurement in a specified metric unit, learners will be able to
• convert it to another metric unit.

THEME:
Handy tables and guides help learners use the metric system and its measurements.

ACTIVITIES:
Metric Measurements: Tutorial
Metric Measurements: Application
Metric Measurements: Mastery Test 1
Metric Measurements: Mastery Test 2

OBJECTIVE:
Given the length and width of a rectangle, learners will be able to
• determine its area.

Given the measures of the base and height of a parallelogram, learners will be able to
• determine its area.

THEME:
Use of square units in measuring areas helps learners find the areas of squares, rectangles, and parallelograms.

ACTIVITIES:
Area – Part 1: Tutorial
Area – Part 1: Application
Area – Part 1: Mastery Test 1
Area – Part 1: Mastery Test 2
**Area – Part 2 (Module)**

**Objective:** Given two measures of the bases and the measure of the altitude of a trapezoid, learners will be able to

- find its area.

Given a circle and the measure of either its diameter or its radius, learners will be able to

- find the area of the circle.

Given the measures of the base and height of a triangle, learners will be able to

- determine its area.

**Theme:** Transforming triangles and trapezoids into parallelograms helps learners determine the areas of these shapes. Formulas further aid learners in finding the areas of triangles, trapezoids, and circles.

**Activities:** Area – Part 2: Tutorial  
Area – Part 2: Application  
Area – Part 2: Mastery Test 1  
Area – Part 2: Mastery Test 2  
Area – Part 2: Mastery Test 3

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**Volume (Module)**

**Objective:** Given the measures of the length, width, and height of a rectangular solid, learners will be able to

- find its volume.

Given the measures of the radius of the base of a cylinder and its height, learners will be able to

- find its volume.

Given the measures of its radius, learners will be able to

- find the volume of a cylinder.

**Theme:** Manipulations of rectangular and cylindrical solids help learners determine the volumes of solid shapes.

**Activities:** Volume: Tutorial  
Volume: Application  
Volume: Mastery Test 1  
Volume: Mastery Test 2
**Using Measurement (Module)**

**Objective:** Given a practical problem involving a plane figure, and given the appropriate measures, learners will be able to

- find the area of the plane figure.

Given a practical problem involving a three-dimensional figure and given the appropriate measures, learners will be able to

- find the volume of the figure.

**Theme:** Problem-solving steps allow learners to practice their mathematical skills in practical word problems involving tiling a swimming pool, insulating an attic, determining the costs of different-sized lots, finding the volume of water in a cylindrical tank, determining the size of an air conditioner for a given room, measuring the capacity of a sphere-shaped water tower, and comparing the amount of water needed to fill a queen-sized and a single-sized waterbed.

**Activities:**
- Using Measurement: Tutorial
- Using Measurement: Application
- Using Measurement: Mastery Test 1
- Using Measurement: Mastery Test 2
STUDENT PROGRESS SHEETS

Student: ____________________    Instructor: ____________________

PRE-ALGEBRA CURRICULUM

Basic Number Ideas

Odd, Even, Prime, and Composite Numbers

Tutorial _____
Application _____
Mastery Test 1____
Mastery Test 2____

Exponents

Tutorial _____
Application _____
Mastery Test 1____
Mastery Test 2____
Mastery Test 3____
Mastery Test 4____

Adding and Subtracting Integers

Tutorial _____
Application _____
Mastery Test 1____
Mastery Test 2____

Multiplying and Dividing Integers

Tutorial _____
Application _____
Mastery Test 1____
Mastery Test 2____

Square Roots

Tutorial _____
Application _____
Mastery Test 1____
Mastery Test 2____

Common Fractions

Tutorial _____
Application _____
Mastery Test 1____
Mastery Test 2____
Mastery Test 3____
Mastery Test 4____
Mastery Test 5____

Using Basic Number Ideas

Tutorial _____
Application _____
Mastery Test _____

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# PRE-ALGEBRA CURRICULUM

## Math Sentences, Part 1

### Variables
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___
- **Mastery Test 3**: ___

### Monomials
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___
- **Mastery Test 3**: ___
- **Mastery Test 4**: ___

### Binomials
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___
- **Mastery Test 3**: ___
- **Mastery Test 4**: ___

### Linear Equations in One Variable
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___

### Linear Inequalities in One Variable
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___
- **Mastery Test 3**: ___

### Special Quadratic Equations
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___

### Using Math Sentences—Part 1
- **Tutorial**: ___
- **Application**: ___
- **Mastery Test 1**: ___
- **Mastery Test 2**: ___
STUDENT PROGRESS SHEETS

Student: ____________________    Instructor: ____________________

PRE-ALGEBRA CURRICULUM

Math Sentences, Part 2

Coordinate Plane
Tutorial _____
Application _____
Mastery Test 1_____
Mastery Test 2_____

Linear Equations
in Two Variables
Tutorial _____
Application _____
Mastery Test 1_____
Mastery Test 2_____

Systems of Linear
Equations
Tutorial _____
Application _____
Mastery Test _____

Using Math Sentences—
Part 2
Tutorial _____
Application _____
Mastery Test _____

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STUDENT PROGRESS SHEETS

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PRE-ALGEBRA CURRICULUM

Special Topics

Percents, Part 1
Tutorial ______ Application ______
Mastery Test 1______
Mastery Test 2______
Mastery Test 3______
Mastery Test 4______

Percents, Part 2
Tutorial ______ Application ______
Mastery Test 1______
Mastery Test 2______
Mastery Test 3______

Mean, Median, and Mode
Tutorial ______ Application ______
Mastery Test ______

Probability
Tutorial ______ Application ______
Mastery Test 1______
Mastery Test 2______

Using Special Topics
Tutorial ______ Application ______
Mastery Test 1______
Mastery Test 2______
Mastery Test 3______

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STUDENT PROGRESS SHEETS

Student: ____________________    Instructor: ____________________

GEOMETRY AND MEASUREMENT 1

Geometry

Special Angles, Part 1
Tutorial ______
Application ______
Mastery Test 1 ______
Mastery Test 2 ______

Special Angles, Part 2
Tutorial ______
Application ______
Mastery Test 1 ______
Mastery Test 2 ______

Circles, Arcs, and Circumferences
Tutorial ______
Application ______
Mastery Test 1 ______
Mastery Test 2 ______
Mastery Test 3 ______

The Pythagorean Theorem
Tutorial ______
Application ______
Mastery Test ______

Using Geometry
Tutorial ______
Application ______
Mastery Test 1 ______
Mastery Test 2 ______
Mastery Test 3 ______
Mastery Test 4 ______

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STUDENT PROGRESS SHEETS

Student: ____________________    Instructor: ____________________

GEOMETRY AND MEASUREMENT 1

Measurement

Metric Measurements
Tutorial    ______  
Application  ______  
Mastery Test 1  ______  
Mastery Test 2  ______  

Area—Part 1
Tutorial    ______  
Application  ______  
Mastery Test 1  ______  
Mastery Test 2  ______  

Area—Part 2
Tutorial    ______  
Application  ______  
Mastery Test 1  ______  
Mastery Test 2  ______  
Mastery Test 3  ______  

Volume
Tutorial    ______  
Application  ______  
Mastery Test 1  ______  
Mastery Test 2  ______  

Using Measurement
Tutorial    ______  
Application  ______  
Mastery Test 1  ______  
Mastery Test 2  ______  

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