Math Fact Fluency

Teacher’s Guide
# Table of Contents

Why Math Fact Fluency?......................................................................................................................... 1
  What is Math Fact Fluency .................................................................................................................. 1
  The Call for Math Fact Fluency ....................................................................................................... 1
  Learning and Memory ....................................................................................................................... 2

Activities .............................................................................................................................................. 3
  Welcome Lesson ............................................................................................................................... 4
    Head............................................................................................................................................. 7
    Body ........................................................................................................................................... 11
  The Math Fact Matrix ...................................................................................................................... 15
  Placement Test ............................................................................................................................... 16
  Pretest ........................................................................................................................................... 19
  Lessons .......................................................................................................................................... 21
    New Facts .................................................................................................................................... 22
    The Commutative Property ........................................................................................................ 24
    Practice on Recent Facts ......................................................................................................... 25
    Quiz ............................................................................................................................................ 26
    Scoring ...................................................................................................................................... 27
  Posttest.......................................................................................................................................... 28
  Review Lesson ............................................................................................................................... 29
  Benchmark Test ............................................................................................................................. 31
  Final Test ...................................................................................................................................... 33

Arcade .................................................................................................................................................. 35
  Random Game ................................................................................................................................ 36
  Character Maker ............................................................................................................................ 36
  Number Splash .............................................................................................................................. 36
  Math-jong ....................................................................................................................................... 38
  Learning Links ................................................................................................................................ 40
    Par ............................................................................................................................................... 40
    Levels ......................................................................................................................................... 43
      Easy ......................................................................................................................................... 43
      Medium .................................................................................................................................... 44
      Hard .......................................................................................................................................... 45
  Shutterbug ...................................................................................................................................... 47

Reports ................................................................................................................................................ 49
  Math Fact Matrix Report ............................................................................................................... 49
  Math Fact Assessment Report ...................................................................................................... 51
  Calendar Report ............................................................................................................................ 53

Scope and Sequence .......................................................................................................................... 55
  Addition ......................................................................................................................................... 55
  Subtraction ..................................................................................................................................... 56
  Multiplication .................................................................................................................................. 57
  Division .......................................................................................................................................... 58

At-A-Glance ....................................................................................................................................... 61
Why Math Fact Fluency?

What is Math Fact Fluency?
SkillsTutor Math Fact Fluency is an on-line instructional and practice aide that helps students achieve automaticity in the basic facts of addition, subtraction, multiplication and division. Because it is internet-based, students can practice at home or at school and all work is recorded and viewable by the teacher.

Math Fact Fluency is modern, personalized and fully adaptive. Based on students’ actual performance, it provides practice where it helps most. It tracks multiple practice sessions and determines which facts are mastered. A fact is mastered when it is performed correctly and within a certain time threshold multiple times. Reports that provide an overview of each student’s performance on all math facts are handy for Parent Teacher conferences, end-of-quarter reports, etc.

Math Fact Fluency is not intended to teach conceptual understanding of basic math facts. It is a product intended to help students instantly recall basic facts from long-term memory.

Salend (1994) recommended that new math concepts be introduced through everyday situations as opposed to worksheets. With everyday situations as motivators, students are more likely to recognize the importance and relevance of a concept. Carpenter, Fennema, Peterson, Chiang & Loef (1989) further this. Contextualizing instruction can make seemingly mundane computation exercises fascinating to children. In response to this, at the beginning of each lesson is an authentic, “real-world” scenario in which a student would actually use basic math facts.

The Call For Math Fact Fluency
Math Fact Fluency was designed in response to the National Council of Teachers of Mathematics’ (NCTM) Curriculum Focal Points, which outlines three key skills each student should master at each grade level. In each of grades 1 through 4, the Focal Points define critical skills in all four basic operations, including the ability to instantly recall those basic facts.

The National Math Panel was created in 2006. Supporting much of the research that has existed regarding automaticity of basic facts, the Panel also found that automatic recall of facts is paramount to student success in mathematics:

A focused, coherent progression of mathematics learning, with an emphasis on proficiency with key topics, should become the norm in elementary and middle school mathematics curricula...By the term “proficiency,” the Panel means that students should understand key concepts, achieve automaticity as appropriate (e.g., with addition and related subtraction facts), develop flexible, accurate, and automatic execution of the standard algorithms, and use these competencies to solve problems…
Computational proficiency with whole number operations is dependent on sufficient and appropriate practice to develop automatic recall of addition and related subtraction facts, and of multiplication and related division facts.... It also requires a solid understanding of core concepts, such as the commutative, distributive, and associative properties."

**Learning and Memory**

The rationale behind our approach to fact memorization is derived from the information processing model of the human brain. It is familiar to most people in the concepts of short-term memory (i.e., working memory) and long-term memory.

When first exposed to a new fact, the data is called into working memory. The Oxford Dictionary defines working memory as “temporary storage of information while one is working with it or attending to it.” Working memory has limited storage capacity, with material being retained only as long as it is being consciously practiced.

Conversely, long-term memory is intended to store information for a long period of time. A study by Semb, Ellis & Araujo (1993) showed content studied for four months or eleven months will be well-retained for about one year after the last practice, with most of the content forgotten by end of three or four years without further practice. Bahrick (1984) and Bahrick & Hall (1991) found that if material is studied for three or four years, the information may be retained for as long as 50 years after the last practice. The key component in the long-term retention in the Bahrick study is the additional practice completed by the student.

There are two memory systems in long-term memory: declarative knowledge and procedural knowledge. Declarative knowledge can be thought of as “knowing that,” and procedural knowledge can be thought of as “knowing how.” If a student is asked, “What is 8 x 7,” the difference lies between responding immediately with “56” (declarative), or thinking “8 groups of 7 items” (procedural). When a student is able to quickly and accurately retrieve the answer to a math fact, the student has a strong declarative knowledge system for that fact.

With Math Fact Fluency, students practice basic number facts over many sessions to build and reinforce their declarative understanding of those facts. It is through repeated exposure that math facts are stored and automatically recalled. Facts are considered memorized only when they can be recalled instantly.

The National Council of Teachers of Mathematics. (2007). Research brief: What are the characteristics of students with learning difficulties in mathematics?
Activities

In all, there are seven types of activities that can be recommended:
- Welcome Activity
- Placement Test
- Pretest and Posttest
- Lesson
- Review Lesson
- Benchmark Test
- Final Test

Login as a student at myskillstutor.com and select a class to view the subjects created for that class.

Select a subject to view activities in that subject area. In this case, the student clicked Math Fact Fluency: Addition.
Welcome Lesson

In the Welcome Lesson, each student creates a character. Although it is not a requirement, students might be encouraged to approximate their appearance and interests. The character is shown on screens throughout each activity, but it will never appear where it might pose a distraction and be a detriment to student performance.

Click Welcome Lesson: Addition, and click past the title screen. The two welcome screens appear.
Click **Go On** to reveal the Character Maker.

There are six areas of the Character Maker screen:

1. The character is on the left side of the screen.

2. To the right and at the top of the screen are tabs for selecting features, clothes and accessories to the head or body.
3: To the left of the tabs is a slider. Use the slider to toggle between the head tabs and the body tabs. Toggle back and forth from head to body to see the associated tabs change.

4: Below the tab for a selected body part are the options students have to choose from for that body part.

5: To the right of the body part features is a coloring palette that can be used to shade portions of that selected feature (e.g., eyes).

Use the ✗ at the top, right of the color palette to “undo” the last color change and return the shade to its previous color.

6: Below the character are controls for manipulating the size and orientation of the features. Only the controls that are applicable to a specific feature will be shown below the character.
Head

The default tab is the *Head* tab, but students can alter the parts of the character’s head in any order they like. To alter the shape of the head, click one of the three head shapes. In this case, the shape round head is selected.

To alter the eyes, click the *Eye* tab at the top of the screen, and select an eye shape.

To see more eye types, Click **More** above the current list of eye types.

Use the palette on the right of the screen to select the color of the eyes. Use the controls below the character to shift the eyes right or left, up or down, and closer or further apart.
To select eyebrows, click the *Eyebrow* tab at the top of the screen and select an eyebrow type. As the student clicks on each eyebrow type, the eyebrow changes on the character.

As with the eyes, use the palette on the right of the screen to select the eyebrow color and the controls beneath the character to alter the orientation of the eyebrows.

Click the *Mouths* tab to select and alter the shape, color and orientation of the lips in the same way as the other facial parts.
Click the *Nose* tab. Here, a new shape and orientation of the nose has been selected. Notice the controls below the character indicate the nose is narrower than its original size.

Similarly, select a new style, color, and orientation of the character’s hair.
Glasses or “facial marks” can also be added to the character. The size and location can be adjusted using the controls below the character.

Only one feature may be added from the list of features under the Glasses tab. Students may not add both glasses and another facial feature.

Click the Accessories tab to select from a among a variety of accessories to adorn the character’s head.

Students can click the Back or More buttons to see all the items available for a particular feature/tab.

For Glasses and Accessories, an ✗ is one of the first nine items students can select. If an item in this feature has been added, use the ✗ to remove the item from the character.
Body

To alter body features, click-and-drag the yellow slider to switch focus from the head to the body. The tabs along the top of the screen will change. The body tabs allow the student to alter the character's shirts, pants, hats, and more accessories. The default body tab is *Shirts & Dresses*.

There are a variety of shirts to choose from. Some have special features. Click a jersey with a number on it. Click-and-drag the yellow slider that is below the character to select a meaningful number between 0 and 99.

Students can select any meaningful number from 0 to 99 to display on their Avatar's jersey.
Click More to see more shirts. Click a shirt with a logo on it. Use the + and – below the character to click through and select from a variety of logos.

On some shirts students can select their own logo.

Click More to see even more shirts. In this case, the character is wearing a shirt selected from among the third set of shirts and dresses. The shirt has been shaded purple.
Next, click the *Pants* tab. Select from among a variety of pants and skirts.

Click **More** to see more pants and skirts to choose from.

Click the *Shoes* tab to choose shoes.
Additional accessories are available to accent the character.

Students will take the Welcome Activity only one time. After completing the activity, students will never be prompted to create a character in any other Math Fact Fluency subject. However, opportunities to modify their characters are available at the end of any Lesson or the Review Lesson.

Upon completing the character, click Save to save the character and see a quick overview about practicing math facts with speed.
The Math Fact Matrix

The Math Fact Matrix provides an overview of students’ performance on individual math facts. Students will see the matrix at the end of every activity.

Performance on a specific math fact is only displayed on the Math Fact Matrix if students have been presented with the math fact over at least 3 sessions. A session consists of exposure to the same math fact at least three times. The three sessions do not include the lesson in which the math fact is first presented.

The Math Fact Matrix uses complex algorithms to present students performance on individual math facts. Performance on individual math facts is weighted based on speed, frequency and other indicators of proficiency. The data is presented using a simple three color scheme that allows teachers and students to identify problem areas at a glance.

The Math Fact Matrix is constantly being updated, incorporating the most recent data. If students begin to struggle with math facts it appeared they had already mastered, then the cell that represents that math fact might change from green to yellow. Similarly, as students improve their performance on specific math facts, the associated cell in the matrix might change from red to yellow or green.

Teachers can also use the Reports link to see the report. The teacher’s view of the report provides more features that allow teachers to customize mastery time for each student. With the report, teachers can also view the matrix for each operation assigned to any individual student.
The Placement Test is the initial assessment of where the students should be placed within the scope and sequence of Math Fact Fluency. It is a timed test and may be taken only one time; however, students who quit the test before it ends can retake the test from the beginning.

Teachers must specifically assign the Placement Test for it to appear in the list of activities. It is a good idea to assign only the Placement Test and allow it to prescribe pretests.

After closing the Welcome Activity, the student returns to the Select an activity screen. Click Placement Test: Addition, and then click Go On until presented with the first question in the test.

The Placement Test poses approximately 100 questions. During the test students will not know if they have answered a question correctly or incorrectly. The test ends the moment the student performs below the Mastery percentage for a given unit.

The Mastery percentage is the percentage of total questions in a math fact unit that the student must answer correctly to “test out” of that unit. The default Mastery % is 80. When logged in as a teacher, teachers can navigate to Classes>Class Properties>Modify Assignment to change the default Mastery % for an assignment. It may be changed at anytime.
Test questions are determined to be correct if they are answered correctly and within the allotted Mastery Time. Mastery time is different from Mastery percent. Students who consistently complete a math fact within the mastery time frame are considered able to recall the math fact with automaticity. Teachers can set Mastery Time in the Fact Matrix Report (p. 49).

Both questions that are mathematically incorrect and questions that are not answered within the preset Mastery Time (but that might be mathematically correct) are considered incorrect.

Math facts are presented by unit. If more than 10 facts are presented for a given unit, then they are divided into multiple groups (e.g., 2 groups of 6). There is a pause after each group of math facts has been completed.

Click Go On to continue the test. The test ends as soon as a student demonstrates a lack of proficiency with a given fact unit. In this case, the test ended after only 48 questions.
Click **Go On** to see the Math Fact Matrix. (See page 52.) With the *Placement Test* students “place out of” entire units they have mastered. For each unit a student masters, all corresponding math facts are also considered mastered and their corresponding cells are colored green in the Math Fact Matrix.

The Placement Test will not prescribe individual lessons. Instead it recommends the pretest of the math fact unit that is a good starting point for the student. Students are only prescribed Pretests of units they have not mastered. For example, if a student demonstrates mastery of basic addition facts with 0, then the Pretest for that unit will not be prescribed.

It is also important to note that the Placement Test will not override a teacher’s assignment. Students who “test out” of a particular unit may still need to complete an activity in that unit if the teacher has specifically assigned the activity.

Click **Go On** to return to the *Select an Activity* screen.
Individual lessons in a unit are prescribed based on performance on related questions in the Pretest for that unit.

There is no feedback of any form during the course of a Pretest.

**Pretest**

Unless otherwise assigned by the teacher, a *Pretest* is the next recommended activity after the *Placement Test*. *Pretests* assess students’ proficiency in an entire unit of math facts. Individual lessons in the unit are prescribed based on performance on related questions in the *Pretest*.

In this case, the next recommended activity is *Adding 1 and Adding 2 Pretest*. Click the *Pretest*, and click through the title screens to get to the introductory screen.

This *Pretest* assesses all math facts in the Adding 1 and Adding 2 unit. As with the *Placement Test*, after the countdown, students step through sets of questions. Here, the student is on the tenth of the first 10 questions in the *Pretest*.

At their own pace, students can continue to the next set of questions. There is no audio or visual feedback that indicates if questions are correct or incorrect or if math facts were completed quickly enough.
Contrary to the Placement Test, students must complete every math fact in the Pretest regardless of their performance. In this unit, 18 math facts are addressed. Each fact is presented three times. This is known as a session. A score screen displays the overall results for the 18 sessions.

The Math Fact Matrix is displayed after completing the Pretest. (See page 56.) There is no difference between this matrix and the state it was in after the Placement Test. Recall that a math fact must be presented a cumulative total of at least nine times (3 sessions) to be represented in the Math Fact Matrix. Including the Placement Test, to this point, the student has not been exposed to any individual math facts enough times to affect the matrix.
Lessons

From the Math Fact Matrix, click Go On. Based on pretest results, deficiencies are diagnosed and lessons are prescribed accordingly. If a teacher has already assigned a lesson, the lesson will appear even if the student has “tested out” of it. Therefore, it is a good idea to assign only the Placement Test and allow it to diagnose and prescribe the activities students need most.

Click the next recommended activity (in this case, 8+1 and 8+2), and then click through the title screens to get to the introductory screen.

Lessons have five basic segments:
1: New Facts
2: Commutative Property (where applicable)
3: Practice of Recent Facts
4: Quiz
5: Scoring
New Facts
Click Go On. Each lesson presents two *new* facts in a multi-screen real-world scenario. Each scenario is specially designed to present values in real, age-appropriate scenarios. In this lesson, students explore the 8+1 and 8+2 math facts.

New Fact Practice
Click Go On. Following the real-world observation, students practice one session (three questions) of each *new* fact.

Speed is monitored during practice and is indicated to the student, but session data is not incorporated into the Math Fact Matrix.
Every practice exercise provides three forms of feedback:

Correct Answer—Quick: Students completing math facts correctly and below the mastery time will see a ✔️. The default mastery time for completing a math fact is two seconds. It can be changed in the Math Fact Fluency Report (p. 49).

Correct Answer—Slow: Correct answers not answered within the mastery tolerance, receive a ✔.

Incorrect Response: Generic incorrect response feedback lists the correct number sentence in a pop-up region above the incorrect response. This provides students the opportunity to compare their responses to the correct answer. A faint red X is displayed in the background of the incorrect response feedback.

For reinforcement, audio feedback restates the math fact.
Incorrect Response—Common Error. Specific feedback is provided when students make a common error. In this case, the feedback addresses the common error and presents the correct math fact both visually and audibly.

3-Second Audio Rule
The 3-second audio rule provides math fact reinforcement when needed most. Students who recall a math fact within three seconds will hear only the sum read aloud before continuing to the next math fact. Students requiring more than three seconds to recall the math fact will hear the entire number sentence before advancing to the next practice item. The extended audio is provided to reinforce the math skill.

The Commutative Property
In Window 2, students might see the two new math facts and the commutative form of those math facts.

Students are exposed to the commutative form of a math fact only if they already have seen it in an earlier lesson.
lesson 8+1 and 8+2 because the student has already been exposed to it (1+8=9) in an earlier lesson.

If they have seen the commutative form of only one new math fact (as in this lesson), the lesson presents two instances of that math fact, two instances of its commutative form and four instances of the remaining new fact. If students have seen commutative forms of BOTH new facts, they will see two of each new math fact and two of each commutative form.

To get a sense of their speed and accuracy after completing each math fact, students will see a ✔ or ✔+, or a faint X displayed in the background of the incorrect response feedback. This information is not recorded in the Math Fact Matrix.

**Practice of Recent Facts**

A transition screen separates the Commutative Window from the Practice Window.

The Practice Screen provides students the opportunity to practice the two new math facts from the current lesson and the math facts presented in the two previous lessons.
A maximum of 18 questions is presented during Practice of Recent Facts, one session (3 questions) for each math fact. Two facts are from each lesson. Session questions are interleaved such that students will not be exposed to the same questions three times in succession.

Speed is not recorded for any practice session. Incorrect responses are incorrect and correct responses are correct, regardless of speed. As they practice, students will still receive a ✔ or ✔+, or a faint X displayed in the background of the incorrect response feedback. This gives them a sense of their speed and accuracy, but the information is not included in the Math Fact Matrix.

The Quiz

Another transition screen separates the Practice from the Quiz.

In the Quiz speed and accuracy are monitored. The Quiz assesses the two new math facts and nine previously learned math facts. One session of each math fact is tested in a quiz for a total of 33 questions.

The nine facts that are tested are prioritized based on:
- The facts that reflect the student’s worst performance.
- Facts for which not enough data has been collected
- The facts students have not been exposed to in a long time.
- Recently studied facts, a spiral back to facts presented in recent lessons.
Generic feedback is provided during the Quiz. Click Go On to dismiss the feedback and advance to the next question.

**Scoring**

In each lesson students are repeatedly exposed to two new math facts and nine previously learned math facts. In this lesson, the two new math facts were $8+1=9$ and $8+2=10$. The likelihood of proficiently completing these new facts during the quiz is very high. It is difficult, however, to determine if the math fact is being recalled from long-term memory or if it is simply “left over” in working memory earlier practice in the lesson. Therefore students are presented with two score screens.

After the Quiz is complete, the first screen shows students’ performance on only the new math facts and their commutative forms. (In this case, only the commutative form of $8+1=9$ is shown because the student has not seen the commutative form of $8+2=10$) The results on this screen are provided for the students benefit only. The data is not written to the Math Fact Matrix.
Because Quiz results for *new* math facts from a given lesson can skew the presentation of data in the Math Fact Matrix, no data about the *new* facts are recorded in the Math Fact Matrix.

Click **Go On** to see the Math Fact Matrix.

Though the data on the two new math facts is limited to the first score screen, all data about the nine previously-learned facts that were addressed in the *Quiz* are recorded in the Math Fact Matrix.

**Posttest**

Each unit has a *Posttest*. Students take the *Posttest* to measure advances in their proficiency with the math facts that are presented in the unit.

The *Posttest* has the same structure and functionality as the *Pretest* (pp. 19-20).
Unlike the Pretest, with the exception of the new facts introduced in the lesson, performance on all questions is assessed based on speed and accuracy and is incorporated into the overall Math Fact Matrix (pp. 49-50). Notice how the matrix has changed from its state after the lesson (p. 28).

Posttest results are recorded in the Math Fact Matrix.

Review Lesson

The Review Lesson is available at the end of each subject (e.g., Addition, Subtraction, etc.). It is similar to the Quiz that appears at the end of a lesson. It presents recently-learned facts on which students have had little practice and facts that proved difficult for the student. It presents 9 sessions of math facts (27 questions) and is intended to help fill the gaps in the Math Fact Matrix. The Review Lesson contains no new facts.

The Review Lesson contains no new facts.
Feedback is provided at the end of each question in the same way it is for lesson quizzes. Based on their performance, students receive a ✔, ✔+, or a faint X displayed in the background of the incorrect response feedback.

Performance on all questions in the Review Lesson is assessed based on speed and accuracy.

The Review Lesson does not prescribe activities, but performance on all questions is assessed based on speed and accuracy and is represented in the overall Math Fact Matrix (pp. 49-50). Upon completing the Review Lesson, students have the option of going to the Arcade (pp. 35-48).
Benchmark Tests

Benchmark Tests are useful tools that provide a snapshot of students’ progress at different points throughout the year. Teachers can assign Benchmark Tests for any month or months they choose. Some teachers might track progress every month and others near the end of a marking period or before parent/teacher conferences. Benchmark Tests do not prescribe activities.

Students who are assigned a Benchmark Test for a particular month will be prompted to take the test the first time they login that month.

Click August Addition Benchmark to launch the test. Each Benchmark Test has approximately 100 math facts.

Click Go On through each screen to reach the first question of the test. Math facts are presented by unit. If more than 10 facts are presented for a given unit, then they are divided into multiple groups (e.g., 2 groups of 6).

Click Go On after each question to continue to the next one.
The test ends as soon as a student fails to master the facts from a math fact unit. The default mastery level is 80 percent. The results screen is presented at the end of Benchmark Test. In this case, the student completed 48 math facts.

All math facts that are completed incorrectly or that are not completed within the mastery time are counted as incorrect. Of the math facts that were presented, this student completed every math fact correctly. Six questions, however, were answered too slowly to be considered correct. Because each of the six questions were from the same unit, the student’s mastery level for that unit fell below 80 percent.

Click Go On to view the Math Fact Matrix. It is important to note that data from Benchmark Tests is not recorded in the Math Fact Matrix. After reviewing the Math Fact Matrix, click Go On to return to the Select an activity screen.
Final Test

The Final Test is much like the Placement and Benchmark Tests and has the same functionality as the quiz at the end of a lesson.

The Final Test assesses performance on ALL math facts in a subject. It has approximately 100 questions. Students must answer all questions in the test. The test does not end if a student demonstrates a lack of mastery of a particular unit.

Scroll down to and click Final Test: Addition.

If more than 10 facts are presented for a given unit, then they are divided into multiple groups (e.g., 2 groups of 6). After completing the Final Test, students will see their overall score.
Click Go On to see the Math Fact Matrix. Performance on all questions is assessed based on speed and accuracy and is incorporated into the overall Math Fact Matrix (pp. 49-50).

If the student has completed all activities for a given subject/operation, then every cell in the matrix should be filled. If the student has not completed all the activities before taking the Final Test, then it is likely some cells will not be colored.

To reinforce their skills, students may retake any activity except for the Placement Test. Or, students might choose to move on to the Placement Test for another subject/operation.
The Arcade

Regardless of performance, the Arcade serves as a reward for completing a Lesson. It reinforces math facts and provides an opportunity to relax before the next activity. No data from the Arcade games are recorded. All math facts are provided solely for reinforcement.

There are six options at the Arcade:
- Random Game
- Character Maker
- Number Splash
- Math-jong
- Learning Links
- Shutterbug

The bottom of the screen in each game has some combination of the following buttons and displays:

*Time Left*—Students have five minutes to play at the Arcade. In that time, they may play as many games as they like. View the clock in the lower left of the window to monitor much time remains at the Arcade.

*Score*—View the overall score across all games played in the five-minute session.

*Games*—At any point, click **Games** to leave the current game and return to the Arcade’s Main Screen.

*Help*—Click **Help** for game instructions.

*Sound On/Off*—Click **Sound On** or **Sound Off** to turn sound on and off.

*Go On*—Click **Go On** to advance from the Arcade’s main screen to a game’s title screen and to launch a game from its title screen.
Random Game

When a student clicks *Random Game*, one of the five games is chosen at random.

Character Maker

Students can modify their character with the *Character Maker*. The *Character Maker* has all the same features and functionality as are available in the *Welcome Activity*. On the main Arcade screen, click *Character Maker* and then click *Go On*.

If time remains after students have finished using the *Character Maker*, they can return to the *Arcade* to select another option.

Number Splash

*Number Splash* is an exciting game that integrates practice with math facts. On the main *Arcade* screen, click *Number Splash* and then click *Go On*. 
Click on a level (Easy, Medium, or Hard), then click **Go On** to begin the game.

An incomplete math fact is shown at the top of the screen. A clock in the upper, right portion of the screen allows students approximately one minute to complete the game. The clock in the lower, left indicates the time the student has remaining in the **Arcade**. Both clocks begin when the student clicks **Go On** from the title screen.

Various items flip up along two rows in the middle portion of the screen. Each item displays a number. One of the numbers completes the math fact. The numbers are displayed only briefly before they flip down.

There are seven balloons. The object is to throw a balloon at the number that completes the math fact. If a number flips down too quickly, wait for it to flip back up in a different location. There are seven balloons to complete five math facts. For each correct “hit,” one star at the top of the screen lights up.

Click on an item to throw the balloon. Depending on the level, students score 10, 20 or 30 points. No star lights up and no points are awarded for an incorrect response.
At the end of the game, students can click **Play Again** to play the game again at the same level. At any point during **Number Splash**, students may click **Games** to return to the **Arcade**. If they decide to return to **Number Splash**, they will have to restart the game from the beginning.

**Math-jong**

*Math-jong* is a solitaire game that uses tiles.

There are three *Math-jong* levels. Each level has six games. Click either of the two games in any column, or click the yellow arrow at the bottom of a column to see more games at that level.
The object of the game is to clear the playing area of tiles by matching and removing pairs of tiles. Only tiles that have at least one side (left or right) free and no other tiles are placed on top can be paired. In Math-jong students pair tiles that match identical characters or that complete a math fact.

In this screen, the two dark gray tiles on the left portion of the screen (the 8+1 tile and the 9 tile) were matched because they complete a math fact. If a match is correct, the tiles disappear from the board and the score increases by 30.

Because the playing areas are randomly generated, it is possible to get a game board that is unsolvable. Most often, however, the playing area can be cleared if the proper tiles are paired in the proper sequence.

**Hint**
At any point during the game, students may ask for a hint. The hint matches and removes two tiles. This usually opens up options that the student may not have otherwise seen in the playing area.

**Undo**
Click **Undo** to undo matches of one or more pairings in the reverse sequence that they were matched. This is especially important in the Hard Level where particular pairings and sequences may lead students to a dead end. Clicking **Undo** and taking a different sequence may lead them to completing the board.

The game is over when all tiles are cleared from the board, the Arcade time runs out or the student clicks **Games** to leave Math-jong.
**Learning Links**

Learning Links is a computerized miniature golf course. Click **Go On** at the main screen of the *Arcade*.

Click **Go On** to see the three levels of difficulty.

Each level has 6 distinct holes of golf. Use the yellow arrow below each column to see other holes within a given level. Students may play holes in any order and as many times as they like. Some students might prefer choosing one hole and mastering it before moving on. Others might want to complete each hole one at a time and in order, while others might prefer to randomly work choose the holes they want to play.

**Par**

The object of the game is to get the ball into the hole with as few “strokes” (shots) as possible. Each hole has a Par. Par is the number of strokes the average skilled player takes to “sink” the ball in the hole.
Certain terms are used based on the number of strokes under par or over par that a golfer takes. It might be helpful to know the terms used in the feedback at the end of a hole.

- **Hole in one**—sinking a shot in one stroke
- **Eagle**—completing the hole in two strokes fewer than par
- **Birdie**—completing the hole in one stroke fewer than par
- **Bogey**—completing the hole in one stroke more than par
- **Double Bogey**—completing the hole in two strokes more than par

Every hole has these common elements.

- **Putting Green**—every putting green has:
  - **Tee**—represented by a gray rectangle, the starting area of the first stroke
  - **Arrows**—indicate the “lie,” or slope of the putting green.
  - **Hole**—represented by a black circle, the golfer's goal to sink the ball into the hole with as few strokes as possible.
- **Power Meter**—indicates how hard to hit the ball.
- **Scoreboard**—displays the level and number of a given hole, the par for the whole and the overall score the student accumulated for the hole.

To take a shot, slide the mouse pointer over the ball and click. Holding the mouse down, slowly drag it away from the ball. As the mouse pointer moves further from the ball, a yellow line stretches in the opposite direction. This indicates the direction the ball will begin to travel.

The length of the yellow line is also a rough indicator of how hard the ball will be hit. The Power Meter in the lower, left of the screen should also be used for this purpose.

Once the power and direction are set, release the mouse button to “strike” the ball. The starting direction, the power, and the lie of the green all affect the path of the ball.
The “lie” of the green is indicated by yellow arrows. Arrows always point toward a lower elevation. This significantly affects the path of a shot. What might seem like a straight shot may not be if it is on a skewed slope. Compensations must be made to account for the lie of the course (pages 50-55).

After each shot students must complete a math fact they have already been exposed to. Students can only progress to the next shot of the hole by answering the math fact correctly.

When the ball is hit into the hole, a transition screen appears that sums up the student’s performance on the hole.
The message students receive varies based on students’ performance with respect to par.

After seeing the feedback, students return to the list of holes. They may select another hole or return to the Arcade.

Levels

Easy

An Easy hole is Par 2 or Par 3 with no slopes on the putting green. Notice that there are no arrows on this putting green.
**Medium**

A Medium hole ranges from Par 2 to Par 4. In this hole, all the arrows point away from the hole. This indicates the area all around the hole slopes down. The hole is on a mound.

To be successful at this hole, hit with a little more force than it would require if the hole were on level ground. If the ball is not hit hard enough, it will simply roll back down the mound.

On this hole, the top and bottom portions of the green have arrows pointing in opposite directions. The right portion of the green has arrows point inward towards each other. This indicates there is a hill. The arrows at the right point towards a lower elevation, forming a trough.
**Hard**

In the *Hard* level, holes will range from Par 3 to Par 5 and the slopes are much more challenging than for Medium-level holes. Slopes may rise or fall in multiple directions at one time.

This screen is tricky. A trough is directly in front of the tee. The entire corner slopes down toward the water, and the area to the left of the hole has a flat region and also slopes down toward the water. These slopes from varying angles will affect the course of the ball in ways different from easy- or medium-level holes.

In this screen, the direction and power of the ball would likely send the ball up the hill and back down into the water.

In this case, the student used high power to take a shot straight along the lower portion of the green near the water. The ball moved across the lower portion, the higher region towards the upper left corner and avoiding the river. The ball then traveled up the hill above the river and ricocheted to the right onto the flat portion near the hole.
This level 3 hole is Par 5. The difficulty is in control over the power and angle of the shots rather than in playing the slopes. Every bridge has an upward slope, and it is important to hit the ball with power. If too much power is used, the ball will bounce off the wall into the water. One way to avoid this is to angle the shot to the left with the proper amount of power. The ball will travel farther, slowing down and stopping instead of falling into the water.

From there, position the ball so all shots can be made to go diagonally from one corner of a bridge to the opposite corner of the bridge.

The student is prompted when Arcade time has run out.

The screen will close and the Select an activity screen will appear.
Shutterbug

The object of Shutterbug is to find the five differences between two seemingly identical photos as quickly as possible.

Click Go On to view a pair of photos.

Below the photos are the time bar and six unique ovals:

*Time bar* – Students start with approximately 60 seconds. After the starting the game, the time bar drops steadily. Students must locate all differences between the pictures before time runs out. Students gain an extra point for every five seconds that remain on the time bar.

*Round* – This indicates the current round of Shutterbug.

*Spots* – This indicates the number of differences the student has spotted between the pictures. Students score 30 points for each spot.
**Freebies** – Each student has up to 4 free “spots.” No points are scored for a Freebie. After each free spot, student’s maximum potential points drops.

**Clocks** –
- **Bonus counter** – 15 points are awarded for making all five spots, 10 points for four spots, and 5 points for three spots. No bonus points are awarded for two spots or one spot.
- **Score** – View the cumulative total of points for spots, bonus points and points for time remaining.

**Gold Coins**

Occasionally a gold coin randomly appears on the photos. For extra points, click on the coin before it disappears.

Students click regions of the photo where they identify differences. A rectangle appears around each region that is correct. A rectangle also appears around the exact same region of the corresponding photo. (This is to avoid confusion regarding what regions have already been selected.) The game is over when all items have been identified or when time has run out.
Reports

In addition to the traditional reports offered on SkillsTutor.com, there are three additional reports that are unique to Math Fact Fluency: Fact Matrix Report, Math Fact Assessment Report, Calendar Report.

Fact Matrix Report

The Math Fact Matrix provides an overview of students’ performance on individual math facts. Students will see only the matrix at the end of every activity. The teacher’s view of the report provides more features. It allows teachers to customize each student’s mastery time for recalling math facts and to immediately view individual student performance on math facts by subject/operation.

Mastery Time

*Slide Bars*—Mastery Time is the time students have to complete a math fact. The default setting for all students is two seconds. Use the slide bars at the top of the *Mastery Time* column to change the *Mastery Time* for ALL students (except those students with a red lock beside them). Or, use the slide bars beside individual students to change the Mastery times for those individual students.

*Untimed Checkbox*—Some students do not perform well under pressure. Click the *Untimed* checkbox to turn off *Mastery Time* for individual students or for all students.

*Locks*—Click to lock and unlock *Mastery Time* for individual students. When Mastery Time is locked, it may not be altered individually or globally. A student record must be unlocked to make a change.

The *View Pane* is on the right side of the screen. For each student, there are +, −, ×, ÷, and *View* buttons in the *View Pane*. Click either +, −, ×, ÷, and then click *View* to view students’ performance on math facts for that subject/operation. The Math Fact Matrix that students see at the end of lessons and tests will open (p. 50).

Click *Restore Settings* to restore settings to the original defaults. Click *Save Settings* to save changes to the report settings.
The Math Fact Matrix uses complex algorithms to present students' performance on individual math facts. Performance on individual math facts is weighted based on speed, frequency and other indicators of proficiency. The data is presented using a simple three-color scheme that allows teachers and students to identify problem areas at a glance. The color key is at the top of the report:

- Green: Excellent
- Yellow: Good
- Red: Needs Work

The Math Fact Matrix is constantly being updated, incorporating the most recent data. If students begin to struggle with math facts it appeared they had already mastered, then the cell that represents that math fact might change from green to yellow. Similarly, as students improve their performance on specific math facts, the associated cell in the matrix might change from red to yellow or green.

Every basic math fact for a given operation is displayed in matrix form. Performance on a specific math fact is only displayed on the Math Fact Matrix if students have been presented with the math fact over at least 3 sessions. A session consists of exposure to the same math fact at least three times. The three sessions do not include the lesson in which the math fact is first presented.
Math Fact Assessment

With the Math Fact Assessment Report, teachers can view results of student performance on the Placement Test. Student names are listed down the left column. The units that are assessed in the Placement Test are listed along the gray top row.

Recall the Placement Test ends as soon as a student demonstrates a lack of proficiency in a unit. Proficiency is based on an 80% mastery. Data is displayed for each unit that each student has demonstrated proficiency. In this report, Brian mastered every unit up to Sums 12 to 13. Rupert, however, failed to demonstrate proficiency in the first unit, Adding 0. The Placement Test ended there.

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Activity Date</th>
<th>Total Score</th>
<th>Adding 0</th>
<th>Adding 1 and 2</th>
<th>Adding 5</th>
<th>Doubles +1</th>
<th>Sums 9 to 11</th>
<th>Sums 12 and 13</th>
<th>Sums 14 to 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griffin, Brian</td>
<td>08/08/08</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Griffin, Rupert</td>
<td>07/29/08</td>
<td>30</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Griffin, Stewie</td>
<td>07/23/08</td>
<td>92</td>
<td>100</td>
<td>94</td>
<td>100</td>
<td>100</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each unit score indicates the mastery of facts within the unit. Mastery is based on both speed and accuracy. If a score is not given for all units in a Placement or Benchmark test, the program stopped the test based on student performance.
Calendar Report

With the Calendar Report teachers can view how much work individual students have completed in a given month. Only one month at a time may be viewed.

A calendar for the selected month is displayed for each student. For each day, the number of activities completed and the total amount of time on task is displayed on each day. Time playing in the Arcade is not included in the total time on task.

If a student did no work on a given day, then no information is displayed on that day of the calendar. For example, there is no information in the cells for August 25th or 28th or for any weekend.
Scope and Sequence

Addition

Placement Test: Addition

Lessons

Adding 0
- T1: Adding 0 Pretest
  Lesson 1: 0 + 0 through 9 + 0
  T2: Adding 0 Posttest

Adding 1 and Adding 2
- T1: Adding 1 and Adding 2 Pretest
  Lesson 1: 1 + 1 and 1 + 2
  Lesson 2: 2 + 1 and 2 + 2
  Lesson 3: 3 + 1 and 3 + 2
  Lesson 4: 4 + 1 and 4 + 2
  Lesson 5: 5 + 1 and 5 + 2
  Lesson 6: 6 + 1 and 6 + 2
  Lesson 7: 7 + 1 and 7 + 2
  Lesson 8: 8 + 1 and 8 + 2
  Lesson 9: 9 + 1 and 9 + 2
  T2: Adding 1 and Adding 2 Posttest

Adding 5
- T1: Adding 5 Pretest
  Lesson 1: 5 + 0 and 5 + 1
  Lesson 2: 5 + 2 and 5 + 3
  Lesson 3: 5 + 4 and 5 + 5
  T2: Adding 5 Posttest

Doubles
- T1: Doubles Pretest
  Lesson 1: 2 + 2 and 4 + 4
  Lesson 2: 3 + 3 and 6 + 6
  Lesson 3: 5 + 5 and 7 + 7
  Lesson 4: 8 + 8 and 9 + 9
  T2: Doubles Posttest

Doubles + 1
- T1: Near Doubles Pretest
  Lesson 1: 1 + 2 and 2 + 3
  Lesson 2: 3 + 4 and 4 + 5
  Lesson 3: 5 + 6 and 6 + 7
  Lesson 4: 7 + 8 and 8 + 9
  T2: Near Doubles Posttest

Final Facts I: Sums 9 to 11
- T1: Final Facts I: Sums 9 to 11 Pretest
  Lesson 1: 2 + 7 and 6 + 5
  Lesson 2: 2 + 8 and 2 + 9
  Lesson 3: 3 + 6 and 8 + 3
  Lesson 4: 3 + 7 and 3 + 8
  Lesson 5: 4 + 6 and 4 + 7
  Lesson 6: 6 + 3 and 6 + 4
  Lesson 7: 7 + 3 and 7 + 4
  T2: Final Facts I: Sums 9 to 11 Posttest

Final Facts II: Sums 12 and 13
- T1: Final Facts II: Sums 12 and 13 Pretest
  Lesson 1: 3 + 9 and 6 + 7
  Lesson 2: 4 + 8 and 4 + 9
  Lesson 3: 5 + 7 and 5 + 8
  Lesson 4: 8 + 4 and 8 + 5
  Lesson 5: 9 + 3 and 9 + 4
  T2: Final Facts II: Sums 12 and 13 Posttest

Final Facts III: Sums 14 to 17
- T1: Final Facts III: Sums 14 to 17 Pretest
  Lesson 1: 5 + 9 and 7 + 9
  Lesson 2: 6 + 8 and 6 + 9
  Lesson 3: 8 + 6 and 8 + 7
  Lesson 4: 9 + 5 and 9 + 6
  Lesson 5: 9 + 7 and 9 + 8
  T2: Final Facts III: Sums 14 to 17 Posttest

Review Addition
- Lesson 1: Review: Addition

Benchmark Tests
- B1: January Addition Benchmark
- B2: February Addition Benchmark
- B3: March Addition Benchmark
- B4: April Addition Benchmark
- B5: May Addition Benchmark
- B6: June Addition Benchmark
- B7: July Addition Benchmark
- B8: August Addition Benchmark
- B9: September Addition Benchmark
- B10: October Addition Benchmark
- B11: November Addition Benchmark
- B12: December Addition Benchmark

Final Test: Addition
PLACEMENT TEST: SUBTRACTION

LESSONS

Subtraction with 0
T1: Subtraction with 0 Pretest
Lesson 1: 0 – 0 through 9 – 0 and 1 – 1 through 9 – 9
T2: Subtraction with 0 Posttest

Subtract 1 and 2
T1: Subtract 1 and 2 Pretest
Lesson 1: 2 – 1 and 2 – 2
Lesson 2: 3 – 1 and 3 – 2
Lesson 3: 4 – 1 and 4 – 2
Lesson 4: 5 – 1 and 5 – 2
Lesson 5: 6 – 1 and 6 – 2
Lesson 6: 7 – 1 and 7 – 2
Lesson 7: 8 – 1 and 8 – 2
Lesson 8: 9 – 1 and 9 – 2
Lesson 9: 10 – 1 and 10 – 2
Lesson 10: 11 – 2 and 1 – 1
T2: Subtract 1 and 2 Posttest

Subtract Number Neighbors
T1: Subtract Number Neighbors Pretest
Lesson 1: 3 – 1 and 3 – 2
Lesson 2: 4 – 2 and 4 – 3
Lesson 3: 5 – 3 and 5 – 4
Lesson 4: 6 – 4 and 6 – 5
Lesson 5: 7 – 5 and 7 – 6
Lesson 6: 8 – 6 and 8 – 7
Lesson 7: 9 – 7 and 9 – 8
Lesson 8: 10 – 8 and 10 – 9
Lesson 9: 11 – 9 and 2 – 1
T2: Subtract Number Neighbors Posttest

Subtracting with Doubles
T1: Subtracting with Doubles Pretest
Lesson 1: 4 – 2 and 6 – 3
Lesson 2: 8 – 4 and 10 – 5
Lesson 3: 12 – 6 and 14 – 7
Lesson 4: 16 – 8 and 18 – 9
T2: Subtracting with Doubles Posttest

Final Facts I: Differences 3 and 4
T1: Final Facts I: Differences 3 and 4 Pretest
Lesson 1: 7 – 3 and 7 – 4
Lesson 2: 8 – 5 and 10 – 6
Lesson 3: 9 – 5 and 9 – 6
Lesson 4: 11 – 7 and 11 – 8
Lesson 5: 12 – 8 and 12 – 9
Lesson 6: 10 – 7 and 13 – 9
T2: Final Facts I: Differences 3 and 4 Posttest

Final Facts II: Differences 5 through 7
T1: Final Facts II: Differences 5 through 7 Pretest
Lesson 1: 8 – 3 and 9 – 3
Lesson 2: 9 – 4 and 12 – 7
Lesson 3: 10 – 3 and 10 – 4
Lesson 4: 11 – 4 and 11 – 5
Lesson 5: 11 – 6 and 12 – 5
Lesson 6: 13 – 6 and 13 – 7
Lesson 7: 13 – 8 and 14 – 8
Lesson 8: 14 – 9 and 16 – 9
Lesson 9: 15 – 8 and 15 – 9
T2: Final Facts II: Differences 5 through 7 Posttest

Final Facts III: Differences 8 and 9
T1: Final Facts III: Differences 8 and 9 Pretest
Lesson 1: 11 – 3 and 16 – 7
Lesson 2: 12 – 3 and 12 – 4
Lesson 3: 13 – 4 and 13 – 5
Lesson 4: 14 – 5 and 14 – 6
Lesson 5: 15 – 6 and 15 – 7
Lesson 6: 17 – 8 and 17 – 9
T2: Final Facts III: Differences 8 and 9 Posttest

REVIEW: SUBTRACTION
Lesson 1: Review: Subtraction

BENCHMARK TESTS

B1: January Subtraction Benchmark
B2: February Subtraction Benchmark
B3: March Subtraction Benchmark
B4: April Subtraction Benchmark
B5: May Subtraction Benchmark
B6: June Subtraction Benchmark
B7: July Subtraction Benchmark
B8: August Subtraction Benchmark
B9: September Subtraction Benchmark
B10: October Subtraction Benchmark
B11: November Subtraction Benchmark
B12: December Subtraction Benchmark

FINAL TEST: SUBTRACTION
PLACEMENT TEST: MULTIPLICATION

LESSONS

Multiplying by 1 and 0

T1: Multiplying by 1 and 0 Pretest
Lesson 1: 0 x 1 through 12 x 1 and 0 x 0 through 12 x 0
T2: Multiplying by 1 and 0 Posttest

Multiplying by 2

T1: Multiplying by 2 Pretest
Lesson 1: 1 x 2 and 2 x 2
Lesson 2: 3 x 2 and 4 x 2
Lesson 3: 5 x 2 and 6 x 2
Lesson 4: 7 x 2 and 8 x 2
Lesson 5: 9 x 2 and 10 x 2
Lesson 6: 11 x 2 and 12 x 2
T2: Multiplying by 2 Posttest

Multiplying by 5

T1: Multiplying by 5 Pretest
Lesson 1: 1 x 5 and 2 x 5
Lesson 2: 3 x 5 and 4 x 5
Lesson 3: 5 x 5 and 6 x 5
Lesson 4: 7 x 5 and 8 x 5
Lesson 5: 9 x 5 and 10 x 5
Lesson 6: 11 x 5 and 12 x 5
T2: Multiplying by 5 Posttest

Multiplying by 10

T1: Multiplying by 10 Pretest
Lesson 1: 1 x 10 and 2 x 10
Lesson 2: 3 x 10 and 4 x 10
Lesson 3: 5 x 10 and 6 x 10
Lesson 4: 7 x 10 and 8 x 10
Lesson 5: 9 x 10 and 10 x 10
Lesson 6: 11 x 10 and 12 x 10
T2: Multiplying by 10 Posttest

Multiplying by 4

T1: Multiplying by 4 Pretest
Lesson 1: 1 x 4 and 2 x 4
Lesson 2: 3 x 4 and 4 x 4
Lesson 3: 5 x 4 and 6 x 4
Lesson 4: 7 x 4 and 8 x 4
Lesson 5: 9 x 4 and 10 x 4
Lesson 6: 11 x 4 and 12 x 4
T2: Multiplying by 4 Posttest

Multiplying by 3

T1: Multiplying by 3 Pretest
Lesson 1: 1 x 3 and 2 x 3
Lesson 2: 3 x 3 and 4 x 3
Lesson 3: 5 x 3 and 6 x 3
Lesson 4: 7 x 3 and 8 x 3
Lesson 5: 9 x 3 and 10 x 3
Lesson 6: 11 x 3 and 12 x 3
T2: Multiplying by 3 Posttest

Multiplying by 9

T1: Multiplying by 9 Pretest
Lesson 1: 1 x 9 and 2 x 9
Lesson 2: 3 x 9 and 4 x 9
Lesson 3: 5 x 9 and 6 x 9
Lesson 4: 7 x 9 and 8 x 9
Lesson 5: 9 x 9 and 10 x 9
Lesson 6: 11 x 9 and 12 x 9
T2: Multiplying by 9 Posttest

Multiplying by 6

T1: Multiplying by 6 Pretest
Lesson 1: 1 x 6 and 2 x 6
Lesson 2: 3 x 6 and 4 x 6
Lesson 3: 5 x 6 and 6 x 6
Lesson 4: 7 x 6 and 8 x 6
Lesson 5: 9 x 6 and 10 x 6
Lesson 6: 11 x 6 and 12 x 6
T2: Multiplying by 6 Posttest

Multiplying by 7

T1: Multiplying by 7 Pretest
Lesson 1: 1 x 7 and 2 x 7
Lesson 2: 3 x 7 and 4 x 7
Lesson 3: 5 x 7 and 6 x 7
Lesson 4: 7 x 7 and 8 x 7
Lesson 5: 9 x 7 and 10 x 7
Lesson 6: 11 x 7 and 12 x 7
T2: Multiplying by 7 Posttest

Multiplying by 8

T1: Multiplying by 8 Pretest
Lesson 1: 1 x 8 and 2 x 8
Lesson 2: 3 x 8 and 4 x 8
Lesson 3: 5 x 8 and 6 x 8
Lesson 4: 7 x 8 and 8 x 8
Lesson 5: 9 x 8 and 10 x 8
Lesson 6: 11 x 8 and 12 x 8
T2: Multiplying by 8 Posttest

Multiplying by 11

T1: Multiplying by 11 Pretest
Lesson 1: 1 x 11 and 2 x 11
Lesson 2: 3 x 11 and 4 x 11
Lesson 3: 5 x 11 and 6 x 11
Lesson 4: 7 x 11 and 8 x 11
Lesson 5: 9 x 11 and 10 x 11
Lesson 6: 11 x 11 and 12 x 11
T2: Multiplying by 11 Posttest

Multiplying by 12

T1: Multiplying by 12 Pretest
Lesson 1: 1 x 12 and 2 x 12
Lesson 2: 3 x 12 and 4 x 12
Multiplication (cont.)

Lesson 3: 5 x 12 and 6 x 12
Lesson 4: 7 x 12 and 8 x 12
Lesson 5: 9 x 12 and 10 x 12
Lesson 6: 11 x 12 and 12 x 12
T2: Dividing by 12 Posttest

REVIEW: MULTIPLICATION
Lesson 1: Review: Multiplication

BENCHMARK TESTS: MULTIPLICATION
B1: January Multiplication Benchmark
B2: February Multiplication Benchmark

FINAL TEST: MULTIPLICATION

Division

PLACEMENT TEST: DIVISION

LESSONS

Dividing by 1
T1: Dividing by 1 Pretest
Lesson 1: 1 ÷ 1 through 12 ÷ 1
T2: Dividing by 1 Posttest

Dividing by 2
T1: Dividing by 2 Pretest
Lesson 1: 2 ÷ 2 and 4 ÷ 2
Lesson 2: 6 ÷ 2 and 8 ÷ 2
Lesson 3: 10 ÷ 2 and 12 ÷ 2
Lesson 4: 14 ÷ 2 and 16 ÷ 2
Lesson 5: 18 ÷ 2 and 20 ÷ 2
Lesson 6: 22 ÷ 2 and 24 ÷ 2
T2: Dividing by 2 Posttest

Dividing by 3
T1: Dividing by 3 Pretest
Lesson 1: 3 ÷ 3 and 6 ÷ 3
Lesson 2: 9 ÷ 3 and 12 ÷ 3
Lesson 3: 15 ÷ 3 and 18 ÷ 3
Lesson 4: 21 ÷ 3 and 24 ÷ 3
Lesson 5: 27 ÷ 3 and 30 ÷ 3
Lesson 6: 33 ÷ 3 and 36 ÷ 3
T2: Dividing by 3 Posttest

Dividing by 4
T1: Dividing by 4 Pretest
Lesson 1: 4 ÷ 4 and 8 ÷ 4
Lesson 2: 12 ÷ 4 and 16 ÷ 4
Lesson 3: 20 ÷ 4 and 24 ÷ 4
Lesson 4: 28 ÷ 4 and 32 ÷ 4
Lesson 5: 36 ÷ 4 and 40 ÷ 4
Lesson 6: 44 ÷ 4 and 48 ÷ 4
T2: Dividing by 4 Posttest

Dividing by 5
T1: Dividing by 5 Pretest
Lesson 1: 5 ÷ 5 and 10 ÷ 5
Lesson 2: 15 ÷ 5 and 20 ÷ 5
Lesson 3: 25 ÷ 5 and 30 ÷ 5
Lesson 4: 35 ÷ 5 and 40 ÷ 5
Lesson 5: 45 ÷ 5 and 50 ÷ 5
Lesson 6: 55 ÷ 5 and 60 ÷ 5
T2: Dividing by 5 Posttest

Dividing by 6
T1: Dividing by 6 Pretest
Lesson 1: 6 ÷ 6 and 12 ÷ 6
Lesson 2: 18 ÷ 6 and 24 ÷ 6
Lesson 3: 30 ÷ 6 and 36 ÷ 6
Lesson 4: 42 ÷ 6 and 48 ÷ 6
Lesson 5: 54 ÷ 6 and 60 ÷ 6
Lesson 6: 66 ÷ 6 and 72 ÷ 6
T2: Dividing by 6 Posttest

Dividing by 7
T1: Dividing by 7 Pretest
Lesson 1: 7 ÷ 7 and 14 ÷ 7
Lesson 2: 21 ÷ 7 and 28 ÷ 7
Lesson 3: 35 ÷ 7 and 42 ÷ 7
Division (cont.)

Lesson 4: 49 ÷ 7 and 56 ÷ 7
Lesson 5: 63 ÷ 7 and 70 ÷ 7
Lesson 6: 77 ÷ 7 and 84 ÷ 7
T2: Dividing by 7 Posttest

Dividing by 8
T1: Dividing by 8 Pretest
Lesson 1: 8 ÷ 8 and 16 ÷ 8
Lesson 2: 24 ÷ 8 and 32 ÷ 8
Lesson 3: 40 ÷ 8 and 48 ÷ 8
Lesson 4: 56 ÷ 8 and 64 ÷ 8
Lesson 5: 72 ÷ 8 and 80 ÷ 8
Lesson 6: 88 ÷ 8 and 96 ÷ 8
T2: Dividing by 8 Posttest

Dividing by 9
T1: Dividing by 9 Pretest
Lesson 1: 9 ÷ 9 and 18 ÷ 9
Lesson 2: 27 ÷ 9 and 36 ÷ 9
Lesson 3: 45 ÷ 9 and 54 ÷ 9
Lesson 4: 63 ÷ 9 and 72 ÷ 9
Lesson 5: 81 ÷ 9 and 90 ÷ 9
Lesson 6: 99 ÷ 9 and 108 ÷ 9
T2: Dividing by 9 Posttest

Dividing by 11
T1: Dividing by 11 Pretest
Lesson 1: 11 ÷ 11 and 22 ÷ 11
Lesson 2: 33 ÷ 11 and 44 ÷ 11
Lesson 3: 55 ÷ 11 and 66 ÷ 11
Lesson 4: 77 ÷ 11 and 88 ÷ 11

Lesson 5: 99 ÷ 11 and 110 ÷ 11
Lesson 6: 121 ÷ 11 and 132 ÷ 11
T2: Dividing by 11 Posttest

Dividing by 12
T1: Dividing by 12 Pretest
Lesson 1: 12 ÷ 12 and 24 ÷ 12
Lesson 2: 36 ÷ 12 and 48 ÷ 12
Lesson 3: 60 ÷ 12 and 72 ÷ 12
Lesson 4: 84 ÷ 12 and 96 ÷ 12
Lesson 5: 108 ÷ 12 and 120 ÷ 12
Lesson 6: 132 ÷ 12 and 144 ÷ 12
T2: Dividing by 12 Posttest

REVIEW: DIVISION
Lesson 1: Review: Division

BOOKMARK TESTS
B1: January Division Benchmark
B2: February Division Benchmark
B3: March Division Benchmark
B4: April Division Benchmark
B5: May Division Benchmark
B6: June Division Benchmark
B7: July Division Benchmark
B8: August Division Benchmark
B9: September Division Benchmark
B10: October Division Benchmark
B11: November Division Benchmark
B12: December Division Benchmark

FINAL TEST: DIVISION
At-A-Glance

Use the At-A-Glance for a quick overview of the flow and functionality of Math Fact Fluency.

1: Set up a class
   a. Create a faux student.
   b. Create a faux class.
   c. Enroll the student in the class.
   d. Assign Math Fact Fluency: Addition
   e. Give the student the assignment.

2: Login using the user name and password of the student.

3: Click Math Fact Fluency: Addition.
4. Click the next recommended activity: Welcome Lesson: Addition.

5. Create a character that best expresses your appearance and personality.
6. Click the next recommended activity. (See pages 16-34 for details about all activities.)

7. A score screen is shown at the end of an activity. It is followed by the Math Fact Matrix Report.
8. Close the *Math Facts Matrix* and return to the *Select an activity* screen.

9. Select and complete a *Pretest* followed by any prescribed *Lesson.*
10. Explore the *Arcade* at the end of the lesson.

11. From the *select an activity* screen, select from among Review Lessons, Posttests and Benchmark Tests to preview as desired.

12. After reviewing all of the activities, click **Log Out** on the *select an activity* screen.