



Fraction Nation Software Manual

For use with *Fraction Nation* version 2.6 or later
and Student Achievement Manager version 2.6 or later



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Overview

About *Fraction Nation*

Fraction Nation is a program designed to help students in Grades 4 to 8 build proficiency and fluency with fractions and decimals by developing students' skills in rational number comparison, estimation, equivalence, addition, and subtraction.

Topics and Lessons

Fraction Nation divides instruction into 64 lessons grouped into nine topic areas:

- **Topic A:** Introduction to Fractions (Lessons 1–7)
- **Topic B:** Learning About Fractions (Lessons 8–15)
- **Topic C:** Number Lines and Other Models (Lessons 16–20)
- **Topic D:** Learning About Decimals (Lessons 21–27)
- **Topic E:** Introduction to Equivalence (Lessons 28–36)
- **Topic F:** Equivalent Fractions (Lessons 37–46)
- **Topic G:** Equivalent Decimals (Lessons 47–52)
- **Topic H:** Adding and Subtracting (Lessons 53–57)
- **Topic I:** More Adding and Subtracting (Lessons 58–64)

Each lesson focuses on one key concept or skill. Lessons are presented in a 3-step sequence—Learn, Practice, and Perform—in which students receive instruction and guided practice, then demonstrate what they have learned.

The program requires students to complete each topic before moving on to the next one. *Fraction Nation* is adaptive to student performance—students who demonstrate excellence may accelerate through the program, and those who need additional instruction receive scaffolded feedback and targeted practice. Students progress through *Fraction Nation* at their own pace.

When students first log in to *Fraction Nation*, they take the Placement Assessment that measures their baseline fraction fluency. Based on this assessment, the program starts students at either Lesson 1 (Introduction to Unit Fractions) or Lesson 28 (Express Whole Numbers as Equivalent Fractions).

When students successfully complete all topics, they take the Final Assessment. When students finish the Final Assessment, teachers may print the Placement and Final Assessment Report in the Student Achievement Manager (SAM) to compare the scores from the two assessments. See [SAM Settings and Reports for *Fraction Nation*](#) for more information on viewing and printing reports in SAM.



About This Manual

This manual covers how to use the *Fraction Nation* program. For information on *Fraction Nation* program settings and reports in SAM, see [SAM Settings and Reports for Fraction Nation](#). For information on installing the *Fraction Nation* software, see the [Fraction Nation Installation Guide](#). For other information, see the table below. All manuals are available at the [Fraction Nation Product Support](#) website or the SAM Product Support website (page 29).

For information on:	Download this manual:
<i>Fraction Nation</i> program settings and generating reports in SAM	SAM Settings and Reports for Fraction Nation
Installing <i>Fraction Nation</i> software	Fraction Nation Installation Guide
Getting started with SAM and setting up accounts at the district and school levels	Getting Started With Student Achievement Manager
Adding and enrolling students in SAM	Enrolling and Managing Students Using Student Achievement Manager
Using SAM Resources	Using Resources in Student Achievement Manager
Using the Book Expert	Using the Book Expert in Student Achievement Manager
Using SAM Connect	SAM Connect User's Guide
Managing SAM functions and data.	SAM Data Movement Manual
Using Hosting Services	Hosting Services User's Guide



Student Accessibility

Fraction Nation provides accessibility features that can enable some visually impaired students to use the application. The contrast setting, for example, will help a student who has trouble reading black text on a white background.

Fraction Nation requires students to view images and videos, speak into a microphone, and use a mouse. Students who have difficulty with these requirements will need assistance when using the program.

Fraction Nation does not provide textual equivalence to bitmap-rendered content. Students who are dependent on a Braille or text-to-speech device will be unable to use the application. Also, though closed captions are available for the hearing-impaired, the application does not provide a description of the video, nor does it provide the closed-caption text in text format (it is only available as a display).

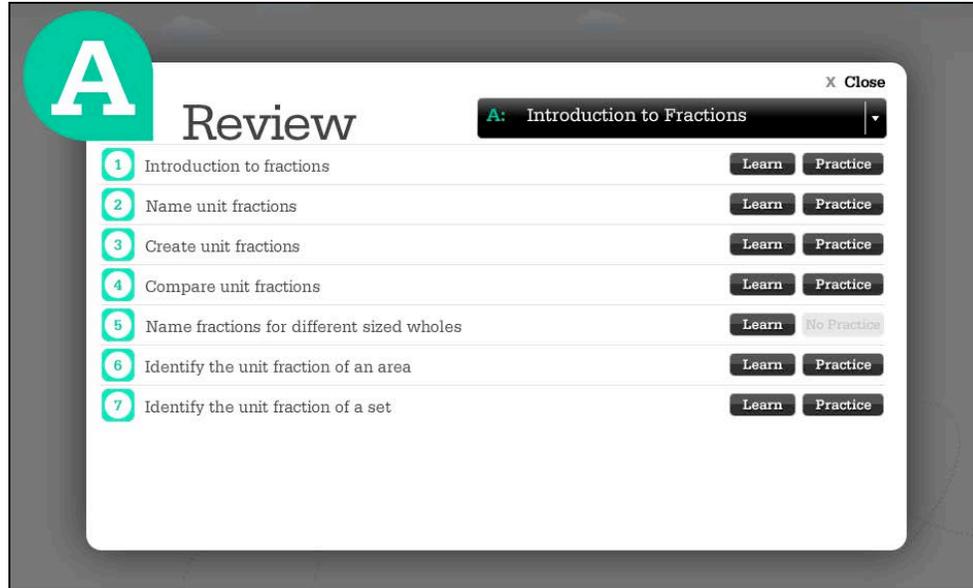
Browser-based accessibility features, such as screen and font magnifiers, are not tested by Houghton Mifflin Harcourt Intervention Services Group and may not be compatible with *Fraction Nation*. Even in cases when the features may work with the program, the input focus is not set to allow students using screen magnifiers to follow the onscreen changes. Similarly, changing display settings may render the program unusable. Students needing to see larger text should use an external screen magnifier rather than changing display settings or using a feature of the browser program.

Mac OS X and Windows operating systems, as well as Internet Explorer, Firefox, and Safari browser programs, offer a range of accessibility features that may enable users with disabilities to, among other things, perform basic navigation with a keyboard instead of a mouse by using the Tab key.



Previewing the Program

Teachers may preview *Fraction Nation* by accessing the Lesson Review Library.



The Lesson Review Library displays the Learn and Practice Activities of all 64 lessons in the program. To access the Lesson Review Library, log in to *Fraction Nation* (page 8) with this username and password:

- Username: educator
- Password: fractions



Teacher Tip

Have the school's SAM administrator set up a sample student account to view the entire *Fraction Nation* student experience.

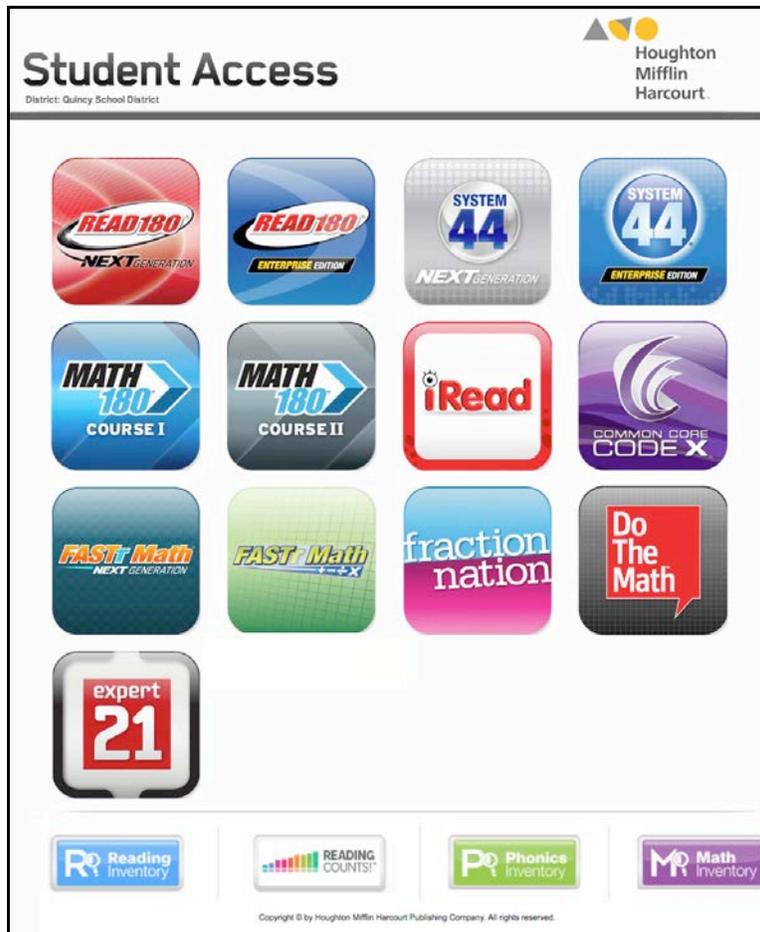


Logging In

Student Access Screen

Students are enrolled in *Fraction Nation* through Student Achievement Manager (SAM). See [Enrolling and Managing Students Using Student Achievement Manager](#) for detailed instructions on enrolling students.

Once students are enrolled in *Fraction Nation*, they may log in to *Fraction Nation* through the Student Access screen on the student workstation. To open the Student Access screen, open the workstation's browser program and use the Student Access screen bookmark (see the [Fraction Nation Installation Guide](#) for help with bookmarking the Student Access screen).

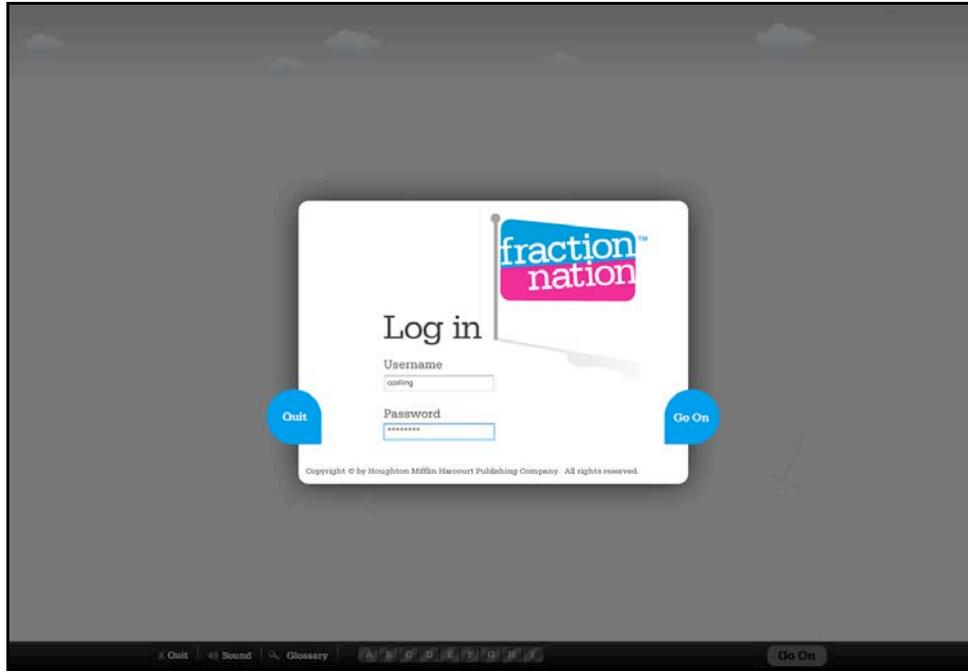


To open the *Fraction Nation* Login screen, click the *Fraction Nation* icon.



Fraction Nation Login Screen

The *Fraction Nation* Login screen opens from the Student Access screen.



Enter your username and password and click **Go On**.

Students logging in to *Fraction Nation* for the first time go to the Introduction to *Fraction Nation* screen to take the Placement Assessment. Students who have previously logged in to *Fraction Nation* go to the Student Roadmap screen (page 15).



Placement Assessment

Placement Assessment occurs automatically the first time a student logs in to *Fraction Nation*. The Assessment determines whether students should begin the program at either Lesson 1 (for students ready to begin instruction and practice with unit fractions) or Lesson 28 (for students ready for instruction and practice with equivalent fractions).

The Placement Assessment consists of:

- A warm-up exercise
- 20 Math Fact screener questions, made up of 10 addition questions and 10 multiplication questions
- 20 multiple-choice questions concerning quantity, equivalence, and addition and subtraction of fractions

Allow 30 minutes for students to complete the Placement Assessment. Students have one attempt at each question and they may not skip a question or return to a previously answered question. Assessment scores are based only on accuracy, not speed. Students who quit the program before finishing the assessment must restart the assessment the next time they log in.

Students who cannot use the mouse may use these keyboard shortcuts:

Keyboard shortcut	Description
Enter	Alternate for clicking the Next button. Advances student one screen when the Next button is enabled.
Esc	Exits the user from the program. On pressing Esc , the Quit confirmation dialog will appear.
Ctrl+Q (Windows) Cmd-Q (Mac)	Exits the user from the program. On pressing either combination, the Quit confirmation dialog should appear.

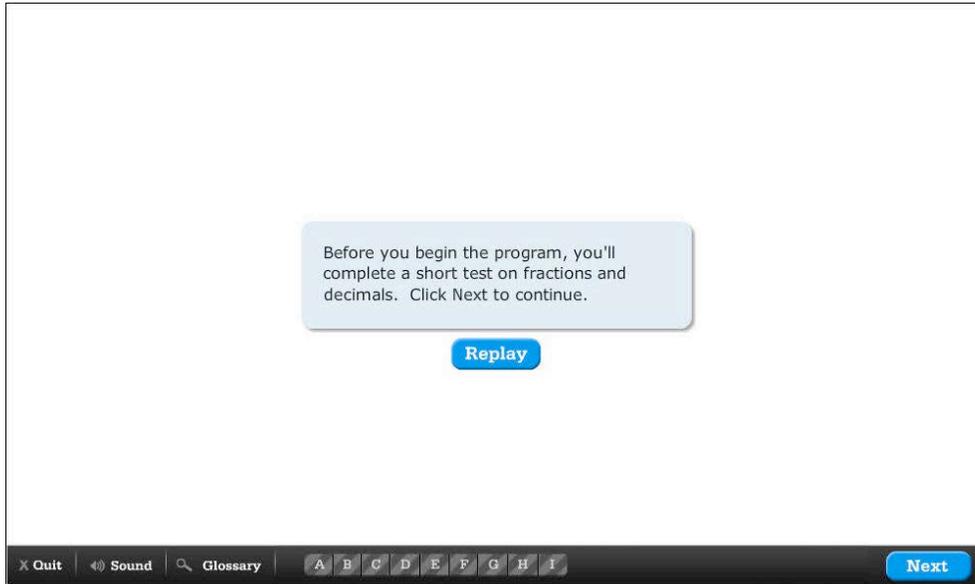
When students complete the Placement Assessment, teachers may review their scores in the Placement and Final Assessment Report, accessible in SAM. Teachers may also allow a student to take the Placement Assessment again by resetting the student’s settings in SAM. However, resetting students’ Placement Assessment removes all scores and information for that student.

For more information on resetting the Placement Assessment or viewing reports, see [SAM Settings and Reports for Fraction Nation](#).



Placement Assessment Overview Screen

The first screen that students see in the Placement Assessment is the Overview screen, which describes the content of the test.

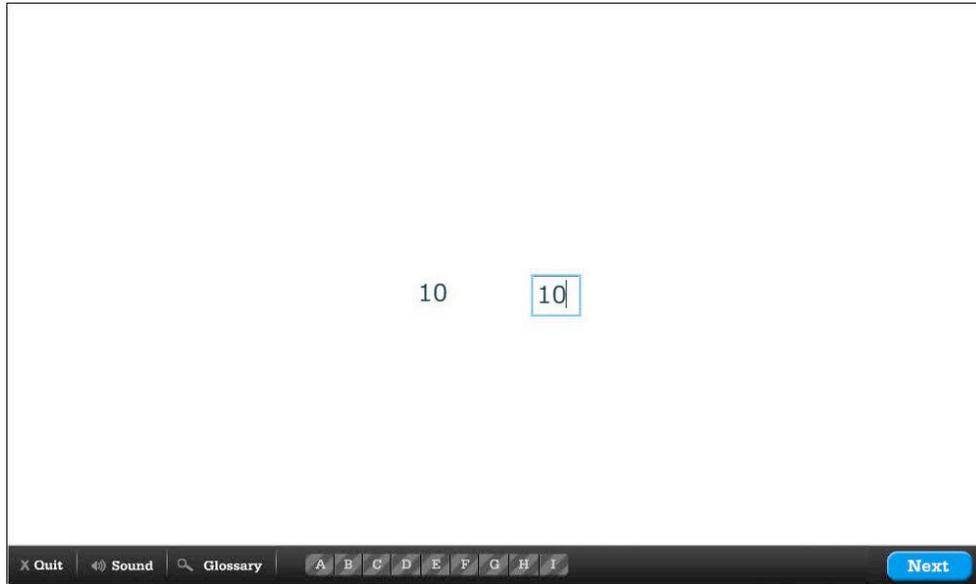


Students read the information and hear audio instructions. Students may click **Replay** to hear the instructions again. When they are ready to begin, they click **Next**. To turn the audio on or off, click **Sound**. Click **Quit** to exit the program.



Warm-Up Exercise

The Warm-Up Exercise prepares students for the Fact Screener Questions by measuring their keyboard skills, response time, and knowledge of numbers.

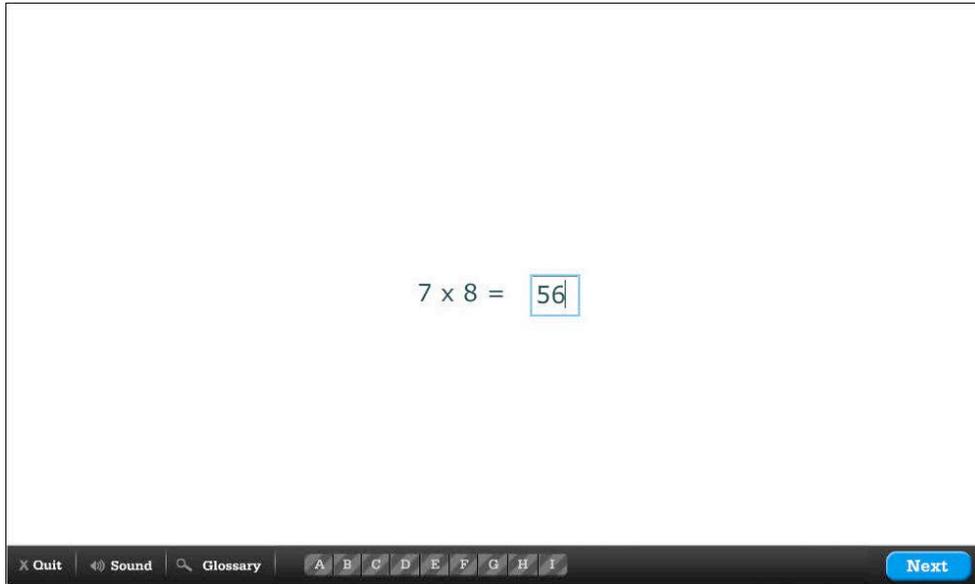


Students view a screen that introduces the Warm-Up Exercise and then click **Next** to begin. The exercise shows students a number, and students must type the number in the blank field as fast as they can, then click **Next** or hit the Enter (or Return) key. Students' answers in the Warm-Up Exercise are not scored.



Math Fact Exercise

The Math Fact Exercise consists of 10 addition and 10 multiplication questions, presented one at a time.



Students view a screen that introduces the Math Fact Exercise and then click **Next** to begin. Students are then presented with questions and must type in the answer in the blank field as fast as they can and then click **Next** or hit the Enter (or Return) key to go on to the next problem.

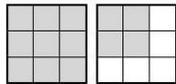
Students have five seconds to answer the question correctly to receive credit for the answer. After 10 seconds, the program goes on to the next question.

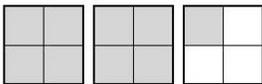


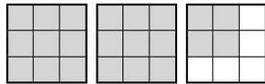
Multiple-Choice Exercise

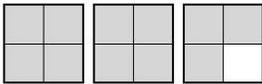
The **Multiple-Choice Exercise** consists of 20 separate questions related to fractions and decimals, presented one at a time, to assess students' knowledge and skills with fractions.

Which model shows $\frac{9}{4}$? This is one whole.

(A) 

(B) 

(C) 

(D) 

Navigation: Quit, Sound, Glossary, A, B, C, D, E, F, G, H, I, Next

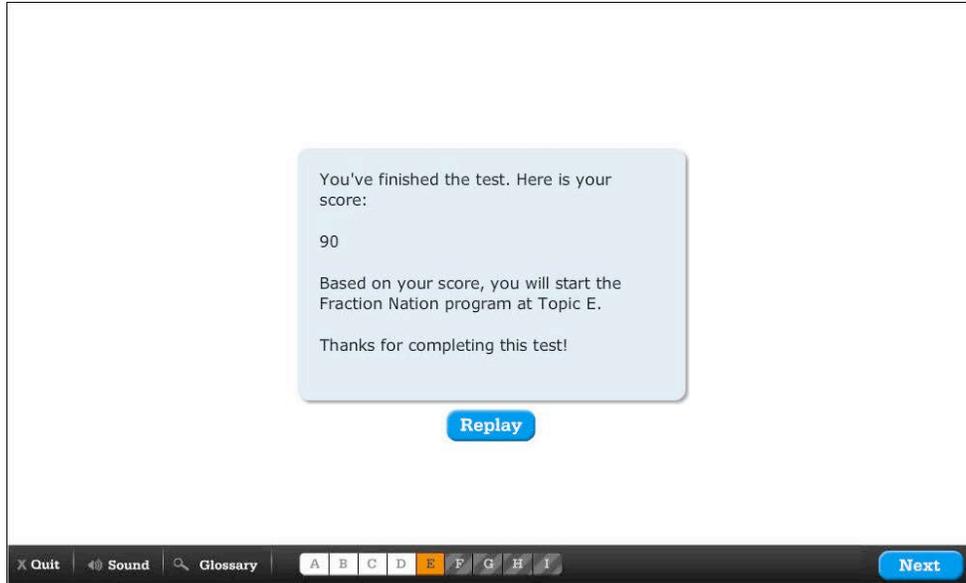
Students view screens that introduce the Multiple-Choice Exercise and then click **Next** to begin. Questions are presented to students in random order. Each screen presents one question and four answer choices. Students click one of the four choices to select the correct answer and then click **Next**.

There is no time limit on answering the questions, and students do not view feedback on their answers until the test is finished.



Results Screen

The Results screen displays students' Placement Assessment scores.



Students' scores in the Placement Assessment are based on accuracy only and determine whether the students begin *Fraction Nation* at Lesson 1 (for students ready to begin instruction and practice with unit fractions) or Lesson 28 (for students ready for instruction and practice with equivalent fractions). There is no manual placement for students.

At the end of the Placement Assessment, students click **Quit** to log out. To start working in *Fraction Nation*, students must log in again (*pages 7–8*).



The Student Roadmap

When students finish the Placement Assessment, they go to the Student Roadmap when they log in. The Roadmap shows each topic in order along a road through *Fraction Nation*.



The Roadmap tracks students' progress through the program. Students also use the Roadmap to review lessons and survey their results.

Progress through the nine topics is displayed over two screens: the first displays Topics A–D; the second displays Topics E–I. The current topic is highlighted and called out with arrows. Each completed topic is colored; uncompleted topics are grayed out.

Students may scan through the topics by clicking the **Slide Right** and **Slide Left** buttons at the bottom of the screen.

Click **Go On** to begin the current lesson.



The Navigation Bar



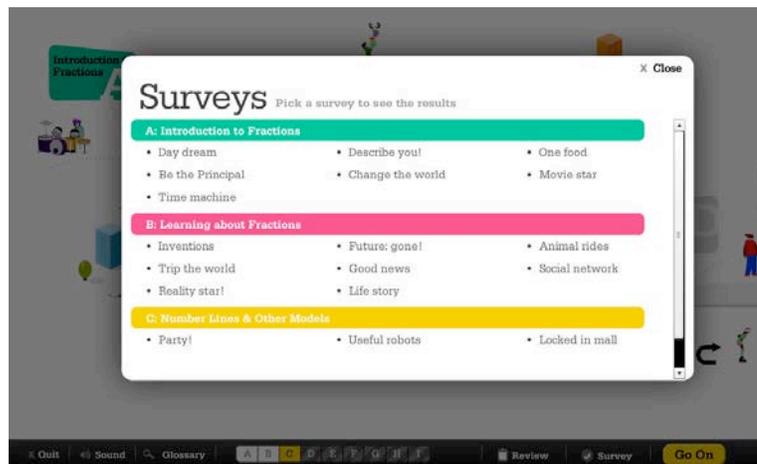
At the bottom of the Student Roadmap and most lesson screens is the Navigation Bar. The Navigation Bar contains the following commands:



- Topics:** The Topics Bar shows progress in the program. Completed topics are shown in white. The current topic is shown in the topic's color from the Student Roadmap. Topics to be completed are in gray.



- Survey:** The **Survey** button opens the Surveys screen (page 20) in a separate window. This screen provides access to each of the surveys students have completed so far.



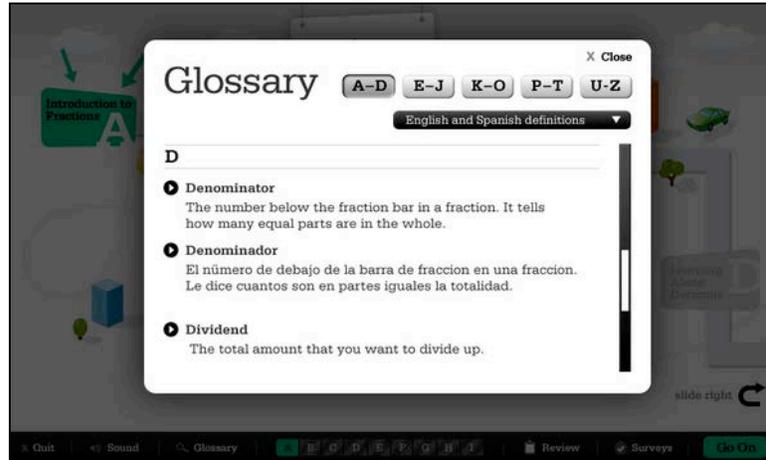
Clicking the name of a survey opens the corresponding Survey Review screen.



- Sound:** This turns the audio off or on.



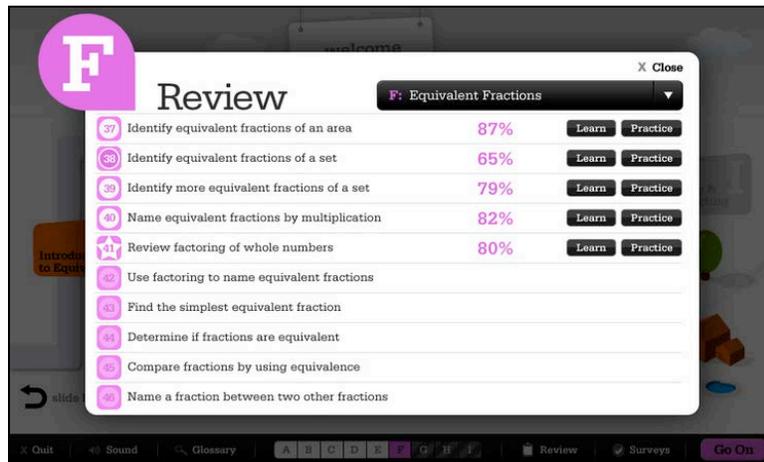
- **Glossary:** The **Glossary** button opens the interactive glossary.



Use the scroll bar to scroll through the word list. Click the letter buttons to access other sections of the glossary. Click the audio button in front of each word to hear the definition aloud. Use the language selection pull-down menu to select English or Spanish definitions, or both. Selecting Spanish definitions also enables the Spanish audio.



- **Review:** The **Review** button opens the Review screen, which displays students' scores for every completed lesson. Students may also review any Learn or Practice activity that they've already completed.



The current lesson is marked by a star. Successfully completed lessons are marked by a solid white circle. Lessons that need to be repeated (page 26) are marked by a dark circle with a white outline. Lessons not yet completed are grayed out. Completed lessons show the **Learn** and **Practice** buttons. Clicking these buttons opens the Learn or Practice activity for that lesson in review mode. Filter the lesson list by selecting a different topic from the pull-down menu.

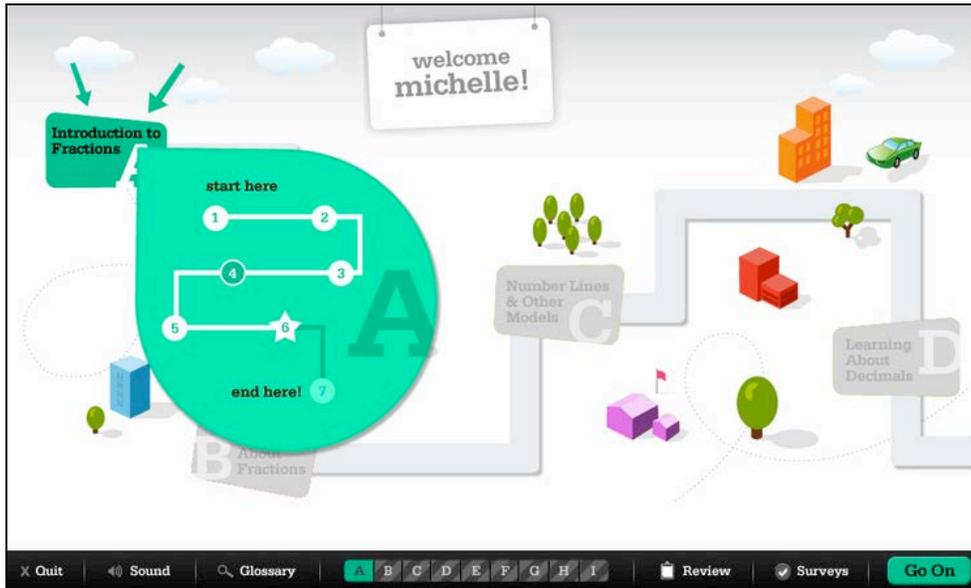


- **Quit:** Clicking the **Quit** button pauses the current activity and opens a new window confirming that students want to exit the program.



Lesson Detail Bubbles

On the Student Roadmap, students may use the mouse to roll over a topic and view the Lesson Detail Bubbles for that topic. The Lesson Detail Bubbles show the number of lessons in the topic as well as students' progress and current position.



The current lesson is marked by a star. Successfully completed lessons are marked by a solid white circle. Lessons that need to be repeated (page 26) are marked by a dark circle with a white outline. Lessons not yet completed are grayed out.

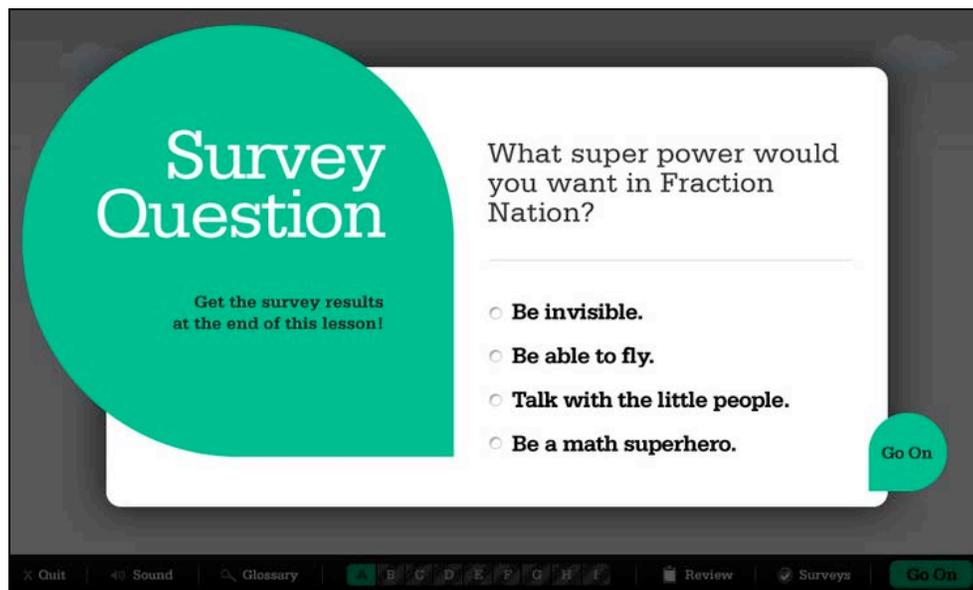
Students may click **Go On** to access their current lesson.



Lesson Flow

Each of the 64 lessons in *Fraction Nation* teaches a specific concept or skill. Most students should be able to complete a lesson in one 15-minute session, though there is no time limit. Students may complete more than one lesson in a session, or they may do less than a complete lesson. If a student has to stop midway through a lesson activity (for example, in the middle of Practice), the program will bookmark the location and return the student to the beginning of that lesson activity.

Survey Question



At the beginning of each lesson, students answer a survey question. The question surveys all the students in the school who are working on the particular lesson. When they finish the lesson's Perform activity students see the results of the survey. Surveys engage students' interest while also demonstrating real-world uses of fractions.

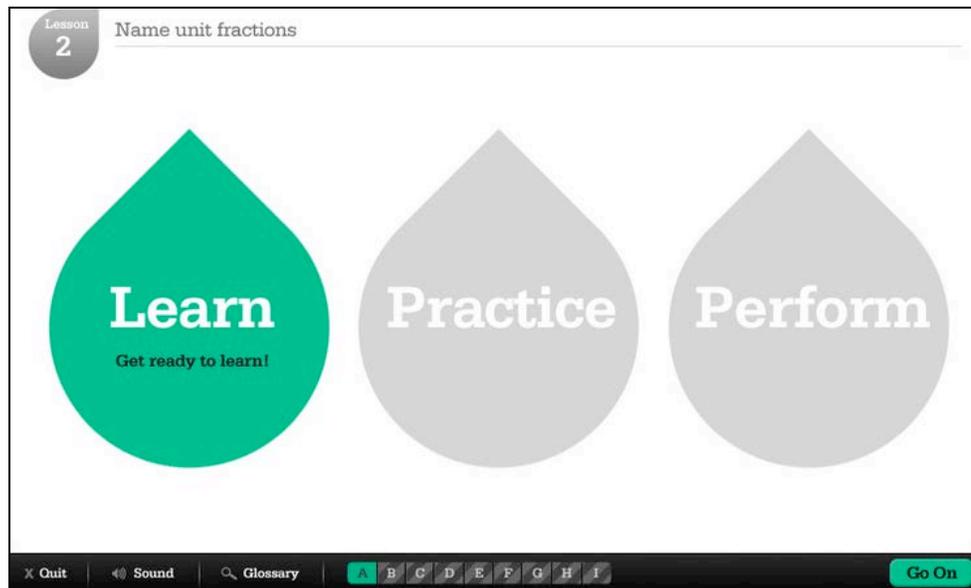
To answer the survey students click the button next to the desired choice and then click **Go On** to go to the Lesson screen.

Students may click the **Survey** button on the Navigation bar to see the Survey Results screen (*page 27*).



Lesson Home Screen

The Lesson Home screen displays the number and title of the current lesson and highlights the activity in progress.



Each lesson has three activities:

- **Learn:** In the Learn activity, an instructional animation with an audio voice-over teaches the main concept of the lesson.
- **Practice:** Practice provides guided interactive activities, which allow students to explore visual models in a hands-on manipulative environment. **NOTE:** Some lessons do not include a Practice activity, in which case the Practice teardrop is grayed out and displays the words “No practice today!”
- **Perform:** Perform is a performance assessment that tracks students’ level of mastery in each lesson.

Proceeding through each activity from left to right completes the lesson, which takes approximately 15 minutes.

Click **Go On** to move to the Learn activity.



Learn

Each of the program’s 64 lessons begins with a 1- to 4-minute instructional animation. The animation uses visual models to introduce or extend the lesson’s fraction and decimal concepts.



Most instructional animations have stopping points. Students may stop and continue playback after thinking about a concept or question.

Every Learn activity animation displays a set of playback controls:



- **Progress bar:** Drag the slider or click anywhere in the bar to move to that point in the animation. Students may not advance past the farthest frame that they have seen.
- **Pause/Play button:** Click the Pause button to pause an animation. This turns the Pause button into the Play button. Click the Play button to resume the animation.
- **Replay button:** Click the Replay button to replay the entire animation.
- **Captions:** Click **Captions** to show or hide captions for the audio. The default setting hides the captions.



- **Play-by-Play button:** Click this button to step through the animation, one scene at a time, with captions. Clicking this button turns the Pause/Play and Replay buttons to Back, Repeat, and Next buttons. Click the Play-by-Play button again to return to normal Play mode.
- **Full Screen:** Click the Full screen button to see the animation in full screen mode. Use the Esc button to return to normal mode.

The **Go On** button appears when the animation is finished. Click **Go On** to move to the Practice activity.



Practice

In the Practice activity, students answer three to eight questions that closely follow the instruction. Practice questions do not count towards students' Lesson Results score.

Lesson 1

How many make 1 whole?

Here is 1 whole.

$\frac{1}{1}$

2 halves = 1 whole

$\frac{1}{2}$ $\frac{1}{2}$

Use fourths to build a whole.

Build with fourths

$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$

Your fraction pieces

$\frac{1}{4}$

Quit Sound Glossary A B C D E F G H I Replay Movie Hint Go On

In the Practice activity, students interact with the visual questions in a variety of ways. Students may construct fraction strips, use denominator words to segment fraction strips, show specific shading on fraction strips, identify equivalent numbers on a number line, and do so much more. Each question has narrated instructions.

After selecting an answer, the **Check It!** button appears. Students may click **Check It!** for feedback. If their answer is incorrect, students see a series of scaffolded responses. If the response is correct, the **Go On** button is activated. Students then receive positive feedback and may click **Go On** to go on to the next problem.

Students may click **Replay Movie** to review the animation or **Hint** for extra help.

When students complete the Practice activity, they may click **Quit** to exit the program or click **Go On** to move on to the Perform activity, where they may demonstrate what they have learned.

Practice questions adapt to student performance. The program determines each problem to be presented and how many problems a student must solve.

Some lessons, those that briefly review a prerequisite skill or a short consolidation of prior lessons, do not have a Practice activity. In these lessons, the screen displays a “No Practice Today!” message and students go on to the Perform activity.



Perform

The Perform activity evaluates students' understanding of the lesson's concept. Each Perform activity consists of 20 questions divided into two rounds.

Students use the mouse to answer the questions. Incorrect answers receive corrective feedback and, depending on the question, students may try again to answer the question. Students who respond correctly on their first attempt receive full credit for the question.

Students click **Go On** to move to the next question. Once students go on to the next question, they may not go back and review or change responses.

The Perform activity consists of two rounds of questions. When students complete the first round of 10 questions, they automatically advance to the second round. However, students who correctly answer all the questions in the first round may choose to skip the second round of the assessment.

When all questions are answered, students click **Go On** to see the Lesson Results.



Lesson Results

The Lesson Results screen shows students' scores from the Perform activity.



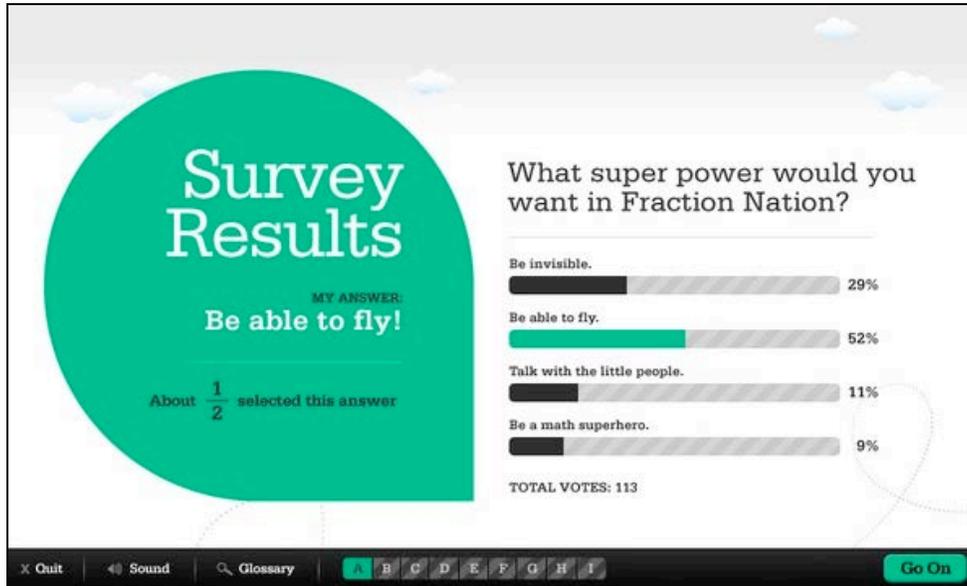
Students who score above 75 percent pass the lesson and may choose a new citizen to appear on the Student Roadmap. Students who score 75 percent or lower may try the lesson later to achieve a better score.

If *Fraction Nation* determines that a student must repeat a lesson, that student may try a lesson three times for a passing score. If the student fails the lesson on the third try, the program provisionally promotes the student and sends an alert message to the teacher through SAM.

Click **Go On** to move to the Survey Results screen.

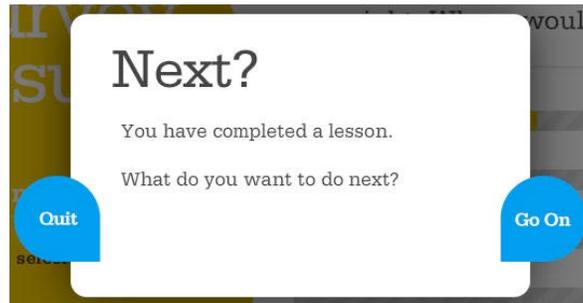


Survey Results



The Survey Results screen is the final screen of every lesson. It displays the results of all the students' responses to the survey question presented at the beginning of the lesson. Results are dynamic, changing as more students in the class answer the question.

Click **Go On** to leave the Survey Results and move to the What's Next screen.



Here students may click **Quit** to exit the program or **Go On** to return to the Student Roadmap and go on to the next lesson.



Program Completion

At the end of the last lesson in *Fraction Nation*, students see the Program Completion screen, which includes some of the citizens they selected to populate their nation. The screen congratulates students on finishing all the lessons and celebrates their accomplishment.



From the Program Completion screen, students click **Go On** to advance to the Final Assessment.

Final Assessment

The Final Assessment is the same test students took in the Placement Assessment. The purpose of the Final Assessment is to measure how well students have mastered the lessons in the program. It must be completed in one sitting and should take about 30 minutes to complete.

Teachers may review students' Final Assessment results and compare them to students' Placement Assessment scores in the Placement and Final Assessment Report in SAM (see [SAM Settings and Reports for Fraction Nation](#)). This report provides an overview of students' growth by displaying the two scores side by side.



Technical Support

For questions or other support needs, visit the [Fraction Nation Product Support](http://hmhco.com/fractionnation/productsupport) website at hmhco.com/fractionnation/productsupport.

The screenshot shows the 'FRACTION NATION PRODUCT SUPPORT' page. At the top, there's a navigation bar with 'EDUCATION PRODUCT SUPPORT' and links for 'Programs', 'Notices', 'FAQs', 'Contact Us', and 'Live Help'. Below this, the 'fraction nation' logo is on the left. The main heading is 'FRACTION NATION PRODUCT SUPPORT'. A paragraph explains that users can find technical information, software updates, and manuals. A 'NEED HELP?' box offers 'Contact Us >>' for those who can't find what they're looking for. Below this, there are tabs for 'PRODUCT INFORMATION', 'SOFTWARE UPDATE', and 'MANUALS'. The 'MANUALS' tab is active, showing a table of documents to download. The table has columns for Title, Date, Version, Size, and Pages. Three documents are listed: 'Fraction Nation v2.4 Installation Guide' (1.3mb, 40 pages), 'Fraction Nation v2.4 Software Manual' (1.2mb, 29 pages), and 'SAM Settings & Reports for Fraction Nation v2.4' (836kb, 26 pages). Each row has a 'Download Now >>' link. On the left side of the page, there's a 'FREE MONTHLY TECHNICAL WEBINARS' section with details about webinars for premium support customers and an upcoming webinar on May 17 at 1:00PM EST.

At the site, users will find program documentation, manuals, and guides, as well as Frequently Asked Questions and live chat support.

For specific questions regarding the *Fraction Nation*, contact customer service to speak to a Houghton Mifflin Harcourt technical support representative at:

- 1-800-283-5974 (current version of *Fraction Nation*)
- 1-800-927-0189 (other versions)

For specific questions about using SAM with *Fraction Nation* programs, click **Help** in the Quick Links along the top of any screen in SAM.