ST Math Online Training Guide

For use with the Self-Guided Online Courses with a Facilitator

Before the training:

- Ensure all teachers and administrators have ST Math accounts. They can be requested by submitting the account request form or contacting support@mindresearch.org or calling 888-491-6603.
- Check that all devices have been activated. You know the device has been activated if you see JiJi (the penguin) standing outside with "Welcome [School Name]" above JiJi's head.
- Confirm there is an ST Math schedule planned so teachers will know when and how to use the curriculum.

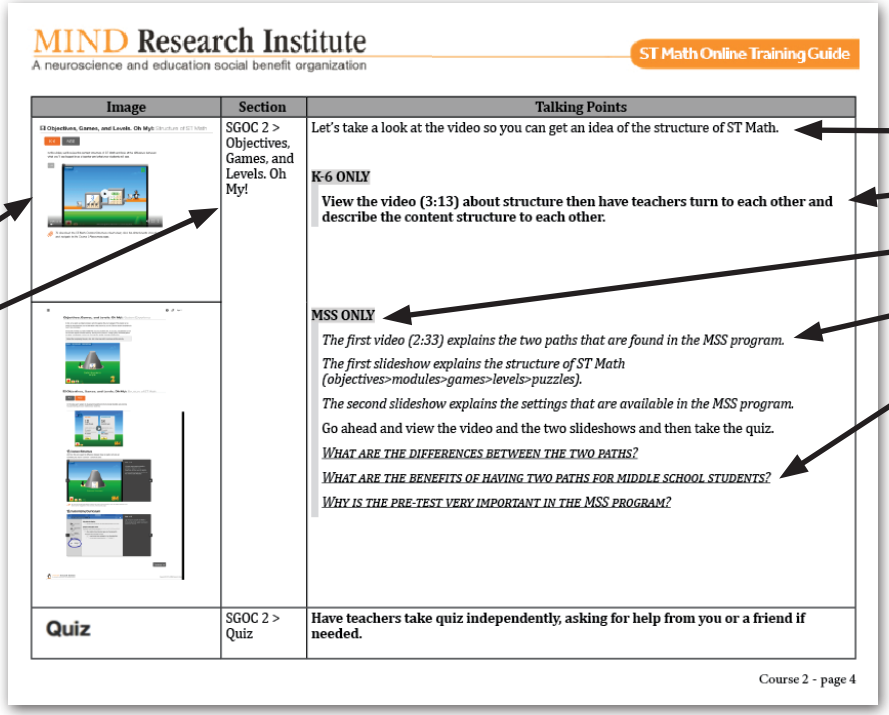
Training Tips:

- The Core Training on the SGOC (Self-Guided Online Courses) home page is conditioned for login types. That means that teachers will see the correct versions of each of the courses. If the presenter has MIND access, their screen may show several different versions of the courses.
- Many pages on ST Math Central, including Getting Started, are conditioned by login and user type. If the presenter has admin or school access, their screen may show tiles/links that teachers will not see. You might want to log in to a teacher account.
- To go to the next course, have teachers click on their name in the upper right corner and choose Go to next course. In some cases, they will need to select the course from the SGOC home page.
- Remember that you can pause any of the videos! It's very effective to pause the video after an important point and discuss it -- much better than having to remember what was said at the beginning of the video at the end.
- Don't read the slides!

Ideal logistics:

- Each teacher:
  - knows his/her ST Math username and password
  - is on his/her own internet-connected device logged into web.stmath.com in the Chrome browser
  - has headphones so you can differentiate by grade level
- Teachers sitting in grade-level groups
- Speakers, projector, and internet-connected device for the presenter
- Three hours of initial content; two-hour follow-up about two months later

How to use this Facilitator's Guide:



Course screenshot

Section title (from Table of Contents)

Talking Points

What to do

DIFFERENT PATHS

Comments or notes

REFLECTION QUESTIONS

Course 1: Learning w/out Words: An Introduction to ST Math

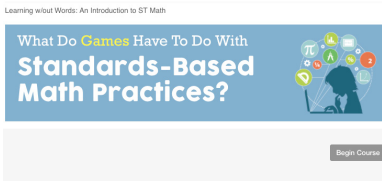
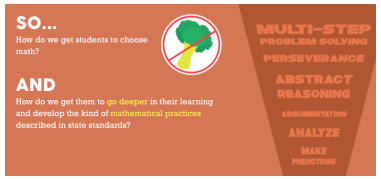
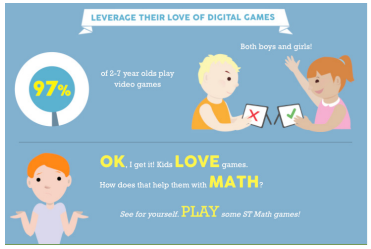
Image	Section	Talking Points
	SGOC 1 > Intro-duction	Welcome • Introductions • Overview of the day • Norms *THINK FOR A MINUTE ABOUT YOUR EXPERIENCE WITH GAMES ON YOUR PHONE OR COMPUTER. WHAT MAKES THEM SO ENGAGING (OR EVEN ADDICTIVE)?*
	SGOC 1 > Math or Broccoli?	How many of you, when you were kids, would have chosen the broccoli? But what if we could get students to choose to do math problems? AND what if they got better in math at the same time?
	SGOC 1 > Math or Broccoli?	Let's take a minute to remind ourselves of the ideas presented in the practice standards – they're on the right. They're those ideas that take time to teach and practice and, even if you do find the time, can be really hard for students.
	SGOC 1 > Math or Broccoli?	So what if we could use the power of games to help students with the practice standards – those goals that can be difficult to squeeze in while you're trying to teach everything else? Let's play some math!

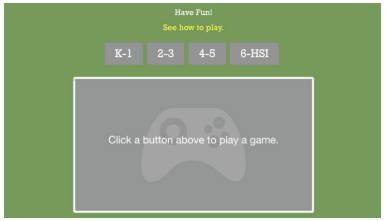
Image	Section	Talking Points
	SGOC 1 > Math or Broccoli?	**Play games.** Choose your grade level and jump right in. Instructions? Does your favorite phone or computer game come with instructions? Probably not. Give it a try! There is one thing I'll suggest since you're using the teacher view of the games, start with level 1 which will show you how the game works. And don't be afraid to try games from other grade levels. *Circulate among teachers and ask Reflection Questions.* *HOW IS THE GAME TEACHING YOU WHAT TO DO?* *WHAT MATHEMATICS IS INVOLVED?* *MAKE A MISTAKE AND SEE WHAT HAPPENS.* *HOW IS THE PUZZLE HELPING STUDENTS THINK ABOUT THE MATHEMATICS?* • *K-1 – Place Value (Alien Capture Mothership)* • *2-3 – Regrouping Concepts (Building Blocks)* • *4-5 – Which Parentheses* • *6-HSI – Wall Factory* Finish up the game you're working on but don't start another one. Stopping is the hardest part, isn't it? So let's talk for a minute about the experience you've just had in the light of a concept called Productive Struggle.

Image	Section	Talking Points
	SGOC 1 > Why Games?	In math class, students are told they're wrong with a red mark or a bad grade long after they did the work. They probably don't remember and don't really care about what they were thinking about at the time. In a game, however, making mistakes and getting feedback are part of the fun. You use that information to get better. *DID ANY OF YOU MAKE MISTAKES?* *DID IT MAKE YOU WANT TO STOP OR TRY AGAIN?* *HOW WAS YOUR REACTION TO MAKING A MISTAKE IN THE GAME DIFFERENT FROM GETTING AN ASSIGNMENT BACK WITH ERRORS MARKED (SEVERAL DAYS AFTER YOU DID THE ASSIGNMENT)?* Your struggle was productive. You made progress. You learned things and you kept going. Failing sometimes is part of it and it makes students stronger learners. *Point out the quote by Greg Toppo: ". . . Giving our kids ample opportunity to fail will turn them not into abject failures but into gritty, impassioned, self-reliant learners."* *Greg Toppo (a former teacher who is now USA Today's national K-12 education writer) is the author of the book The Game Believes in You: How Digital Play Can Make Our Kids Smarter.*
	SGOC 1 > Why Games?	The trick is finding something that combines math, productive struggle, and the power of games. **Give participants time to read the 5 points.** • Create a compelling world of problem-solving • Allow self-directed exploration • Deliver scaffolded, mastery-based learning • Provide data for players to monitor their own progress • Offer real-time feedback to help players adjust their solution path

Image	Section	Talking Points
	SGOC 1 > What's ST?	**Watch video on No Words.** *WHAT IS THE DIFFERENCE BETWEEN PRACTICE SOFTWARE AND INSTRUCTIONAL SOFTWARE?*
	SGOC 1 > What's ST?	The basis of ST Math is spatial-temporal reasoning. **Watch the video on spatial-temporal thinking.** *HOW IS THE THINKING SHOWN IN THE VIDEO DIFFERENT FROM THAT OF A STUDENT SOLVING NUMERICAL PROBLEM?* *Spatial-temporal reasoning: the ability to mentally move objects over space and time to solve multi-step problems.*
	SGOC 1 > What's Next?	**Walk through Future Training Slideshow.**

Image	Section	Talking Points
	SGOC 1 > What's Next?	*Share: Before 1997 JiJi was a kangaroo named Kiki; however, students didn't believe they needed to help Kiki because they thought she should be able to jump over obstacles* *JiJi is gender neutral (although children may decide it's a girl or boy).* *One of Dr. Peterson's degrees is in Chinese Literature, thus the Chinese name (he also has degrees in Neuroscience and Engineering).*
Quiz	SGOC 1 > Quiz	**Have teachers take quiz independently, asking for help from you or a friend if needed.**

Course 2: Ready, Set, Know: Examining Content and Structure

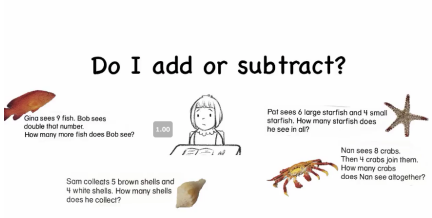
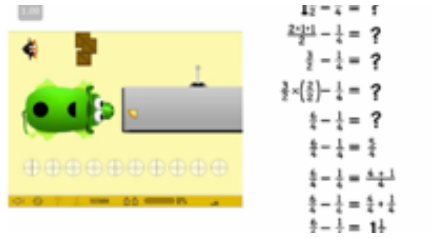
Image	Section	Talking Points
	SGOC 2 > Think Before You Click	Take a minute to read the top paragraph and take a look at the pop-up that explains the perception-action cycle. *<u>How is the perception-action cycle supported by the immediate feedback given in ST Math games?</u>* *The three activities on this page provide opportunities to discuss the big picture of ST Math including Think Before You Click:* • *Experience – Play the game* • *Process - How to help students with that game (includes making choices and short videos)* • *Analyze – Examine the math progression in that game (video)* • *After everyone has completed the Experience and Process sections, consider sharing one or both of the following video clips with the group to foster a discussion of participants' experiences.*  *The K-2 Analyze video presents the importance of students developing a conceptual understanding instead of memorizing steps and some interesting statistics (begins at 0:29).*  *The 3-6 Analyze video presents the difference between solving a fraction problem visually vs. with an algorithm (begins at 1:23).*

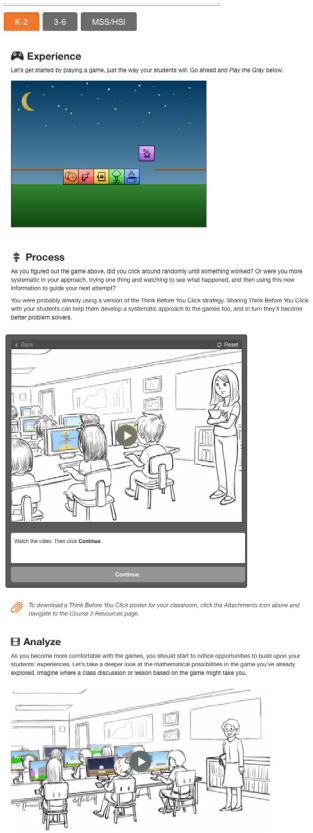
Image	Section	Talking Points
	SGOC 2 > Think Before You Click	First, go ahead and choose a grade band. In Experience, you're going to play a game and then, once you have the idea of the game, go to the Process section. You can watch the video on the first slide by clicking on the play icon in the bottom left of the first slide. Go ahead and watch the Analyze video if you have time. • *K-2 Grade 2 Pie Monster (addition), 4 levels* • *3-6 Grade 4 Pie Monster (fractions), 3 levels* • *MSS 6th-MSS Wall Factory (parentheses), 5 levels* *When everyone has finished the Process section, share one or both of the Analyze video clips (see above) with the group.* *How does this approach support students in developing a deep understanding of a math concept?* *How does the ST Math approach compare to memorizing a series of steps?*

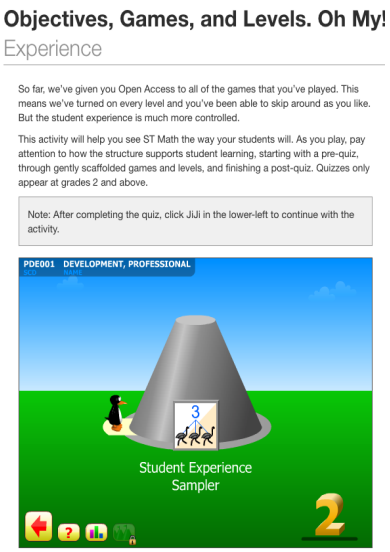
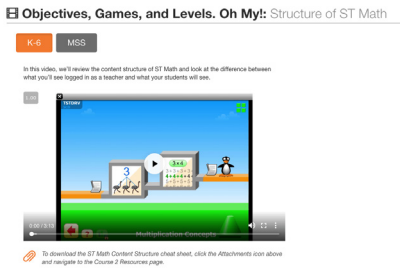
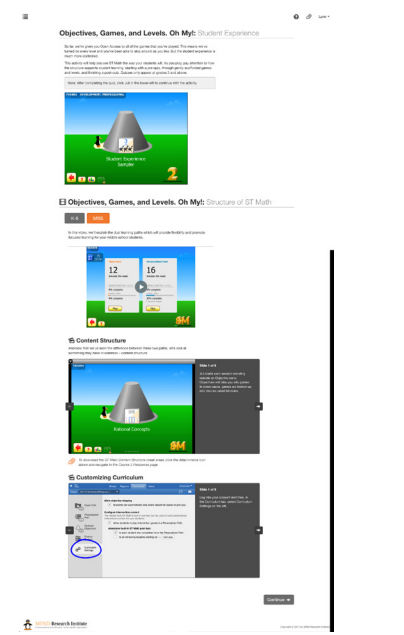
Image	Section	Talking Points
	SGOC 2 > Objectives, Games, and Levels. Oh My!	Up to now, you've been playing games as a teacher. For example, you were given the choice of which level to play first. That isn't true for the student experience. In the student view, there's only one place to click. Rather than being presented with many different choices which could be overwhelming, there is just one new or not completed game or level. When you play as a student, you'll need to "Play the Gray." On the screen with "Student Experience Sampler," what is gray? (The truncated cone.) That tells you where to click. What's gray in the next screen? (the paper and pencil) The paper and pencil icon means a pre-quiz which are only found in grades 2 and up. Now you're going to take the quiz and then play a few games. If you finish the last level you'll get a chance to take the post-quiz as well. As you play, notice that you're not given many choices. And remember the note that's above the screen for when you finish the quiz. *Additional elements that you can share:* • *These are shortened games so you can move more quickly through the levels and see the progression from concrete to abstract.* • *On the quizzes you'll chose your answer and confidence level (which encourages metacognition or thinking about thinking).* • *Some games have tutorials which are indicated by a large hand icon that tells you where to click. To skip a tutorial, click the curved circle icon.* *After everyone has had time to play several games, continue:* *WHY DO YOU THINK WE ASK STUDENTS TO REFLECT ON THEIR QUIZ ANSWERS?* *WHAT IS THE VALUE OF MAKING STUDENTS GET ALL THE PUZZLES RIGHT BEFORE MOVING ON?* I hope you noticed that eliminating choices allows students to systematically move through the content which has been intentionally built to support conceptual understanding. If you got far enough, you saw that in the first objective, the first level was entirely visual. The third level presented just numerals and then provided a visual proof of the answer.

Image	Section	Talking Points
	SGOC 2 > Objectives, Games, and Levels. Oh My!	Let's take a look at the video so you can get an idea of the structure of ST Math. **K-6 ONLY** **View the video (3:13) about structure then have teachers turn to each other and describe the content structure to each other.**
		**MSS ONLY** *The first video (2:33) explains the two paths that are found in the MSS program.* *The first slideshow explains the structure of ST Math (objectives>modules>games>levels>puzzles).* *The second slideshow explains the settings that are available in the MSS program.* Go ahead and view the video and the two slideshows and then take the quiz. *WHAT ARE THE DIFFERENCES BETWEEN THE TWO PATHS?* *WHAT ARE THE BENEFITS OF HAVING TWO PATHS FOR MIDDLE SCHOOL STUDENTS?* *WHY IS THE PRE-TEST VERY IMPORTANT IN THE MSS PROGRAM?*
Quiz	SGOC 2 > Quiz	**Have teachers take quiz independently, asking for help from you or a friend if needed.**

Course 3: Day 1 on the Games (Text to Picture Password)

Image	Section	Talking Points
	SGOC 3 > Preparing Students for ST Math	Now that you have an idea of the structure of ST Math and a little background, we're ready to dive in to actually getting your students on the games. Putting in a little thought about how you're going to use the program will make life much easier. **Play video and answer questions about scheduling – ideally, share the school's plan for using ST Math.**

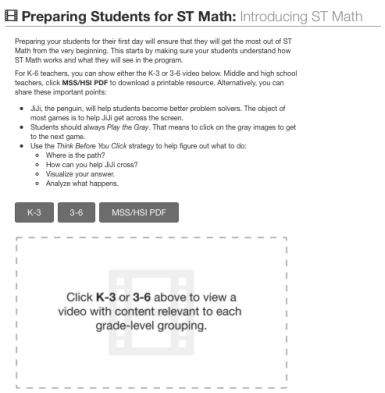
	SGOC 3 > Preparing Students for ST Math	As you've discovered, ST Math is a little different from most math programs. Preparing your students before they start playing will help them get the most out of ST Math.
		We have several resources that you can use with your students. All of them present the points you see in the course.
		• JiJi, the penguin, will help students become better problem solvers. The object of most games is to help JiJi get across the screen.
		• Students should always *Play the Gray*. That means to click on the gray images to get to the next game.
		• Use the *Think Before You Click* strategy to help figure out what to do:
		  ◦ Where is the path?
		  ◦ How can you help JiJi cross?
		  ◦ Visualize your answer.
		  ◦ Analyze what happens.
		K-3 OR 3-6
		Play the video (4:15 or 3:52), asking teachers to take notes on the most important aspects of ST Math to share with students before they get on the games (see box).
		Explain that third grade teachers can choose from either video depending on the maturity of their students.
		Explain that these videos are available in the Getting Started section of ST Math Central.
		MSS
		Have teachers open the MSS/HSI PDF and review the important points. Older students may appreciate that the focus is on helping them understand math concepts that they might struggle with while skipping over those they already know.

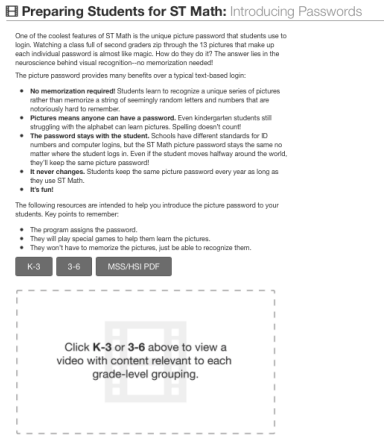
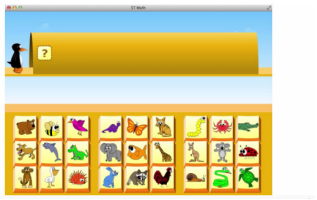
Image	Section	Talking Points
 	SGOC 3 > Preparing Students for ST Math	You'll also want to familiarize students with the idea of a 13-character picture password. These students will enter their text password the first time they log in but every time after that, they'll use their picture password. **Go over the information about the picture password.** • **No memorization required!** Students learn to recognize a unique series of pictures rather than memorize a string of seemingly random letters and numbers that are notoriously hard to remember. • **Pictures means anyone can have a password.** Even kindergarten students still struggling with the alphabet can learn pictures. Spelling doesn't count! • **The password stays with the student.** Schools have different standards for ID numbers and computer logins, but the ST Math picture password stays the same no matter where the student logs in. Even if the student moves halfway around the world, they'll keep the same picture password! • **It never changes.** Students keep the same picture password every year as long as they use ST Math. • **It's fun!** **K-6 ONLY - CLICK EITHER THE K-3 OR 3-6 PATH AND PLAY VIDEO (2:10 OR 2:09)** Ask teachers to take notes on the most important aspects of the picture password to share with students before they get on the games. *Explain that third grade teachers can choose from either video depending on the maturity of their students.* *Explain that these videos are available in the Getting Started section of ST Math Central.* **MSS** *Have teachers open the MSS/HSI PDF and review the important points. Since older students are often skeptical of attempts to help them understand math, explaining that learning the password (which seems like a very difficult task but actually isn't) is the first clue that using neuroscience can help them do amazing things.*

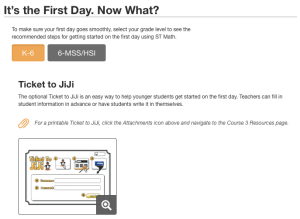
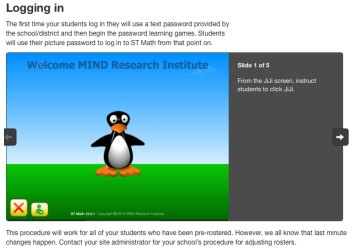
Image	Section	Talking Points
	SGOC 3 > Preparing Students for ST Math	**Have teachers play the password simulator.** *WERE YOU ALL ABLE TO LEARN THE PASSWORD?* *WHAT ASPECTS OF THE TRAINING GAMES HELPED YOU RECOGNIZE THE PICTURES THAT JIJI PICKED JUST FOR YOU?*
	SGOC 3 > It's the First Day. Now What?	You'll need to get every student the one-time password that was provided to you by your school. After that, they'll go right into the password training games. Be sure that everyone has at least 15 minutes to work through the password training games. **K-6 ONLY** Now click on K-6. The Ticket to JiJi can help your students get started. It shows them where to click, and then gives them the information they'll need to log in. You can find a PDF with four on a page on the STMC Printables page. If you print and fill them out before the first time your students use ST Math, the procedure will go more smoothly. It's a particularly good idea to do this for younger students.
	SGOC 3 > It's the First Day. Now What?	Students new to ST Math will enter their user name and password from the class roster. Students returning to ST Math will just enter their password. **Review the steps in the slideshow.** **MSS ONLY - The Ticket to JiJi link is not in the MSS version but can be found on the 3 Easy steps page in Getting Started and in Printables.**

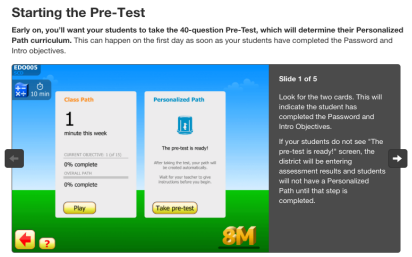
Image	Section	Talking Points
	SGOC 3 > It's the First Day. Now What?	**MSS ONLY** Use the Starting the Pre-Test slideshow to introduce the Pre-Test which will determine the objectives assigned to a student in their Personalized Path.
	SGOC 3 > It's the First Day. Now What?	**MSS ONLY** The rest of the page shows some of the features of the MSS/HSI program. The first image with the clipboard shows what a student sees after they take the Pre-Test. It shows which Topic Clusters were passed and that the student can skip in their Personalized Path and which were not passed. Even though an entire Topic Cluster wasn't completely skipped by doing well on the Pre-Test, they are still able to skip individual objectives when they take the pre-quiz. Students sometimes don't try very hard on the pre-quizzes, but as soon as one student does well and JiJi flies over the objective cone in a helicopter, the word spreads and suddenly everyone does better on pre-quizzes. There is a special report for the Personalized Path that provides the results of the Pre-Test. It lets you know which objectives were skipped and how students did on the ones they didn't test out of. The final screen shows a student's progress on the Topic Cluster. You'll find it on the Student Detail report. To see all the reports and what they contain, you can go to the Screens page in ST Math Central.

Image	Section	Talking Points
	SGOC 3 > It's the First Day. Now What?	It's very important that students exit the program correctly. If students don't see the Today's Accomplishments screen AND click the big red X, their progress won't be recorded. *Review the slideshow which shows what to do at the end of the first day.*
	SGOC 3 > It's the First Day. Now What?	*Have teachers quickly go through the Exiting Simulation so they experience clicking on the red arrows and then the red X.* **MSS ONLY** *Review the Check for Understanding questions and clarify any misconceptions.*
		*If there's time, review the Teacher Tips. There are some great ideas.* *Share that there is a checklist and additional information in the 3 Easy Steps page in the Getting Started section of ST Math Central.*
Quiz	SGOC 3 > Quiz	*Have teachers take quiz independently, asking for help from you or a friend if needed.*

Course 4: Day 2 on the Games: Trouble Free in Three Steps (Text to Picture Password)

Image	Section	Talking Points
	SGOC 4 > Three Steps	Before students log in using their picture passwords, it's important that you make sure your roster is correct. This slideshow explains how to do it. **Go through slideshow.** *Debrief questions:* *When is a good time for you to review your roster after the first day? (E.g., during recess, during planning period, etc.)* *What things are you going to be looking for? (E.g., duplicate or missing students, misspelled names.)* *Who do you need to contact at your school to get the problem fixed?* *NOTE: If teachers ask about co-teachers and students appearing in more than one class, you might want to review the tutorial found ST Math Help > Using the Program > Using Co-teachers and Multiple Groups.*
	SGOC 4 > Three Steps	Students should be encouraged to try their hardest to recognize the pictures in their password. The program will work through their password if they remember some of them. If there's absolutely no hope, this slideshow shows what to do to retrain a student on their password. **Optional: review slideshow**

Image	Section	Talking Points
	SGOC 4 > Three Steps	A few minutes before the end of the session, review the exiting procedures (red arrows and then the red x) and have students exit the program. You may want to have them log back in using their picture password and exit again just to make sure everyone knows what to do. This video shows what it might look like. And be sure to notice the Today's Accomplishment screen. ST Math Central has several different resources you can use to help students record that information as both assessment and reflection. *Share the video (1:36).*
	SGOC 4 > Teacher Tips & Optional Resources	*Allow a few minutes for teachers to read and discuss the Teacher Tips. Be sure teachers understand that they can look at the Screens and Reports page to find out more about anything they see in the program.*
Quiz	SGOC 4 > Quiz	*Have teachers take quiz independently, asking for help from you or a friend if needed.*

Course 5: It's All About the Toolbar: What Teachers & Students Need to Know

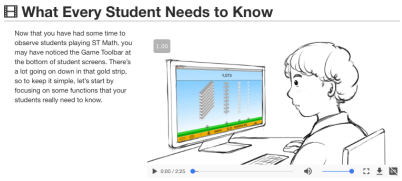
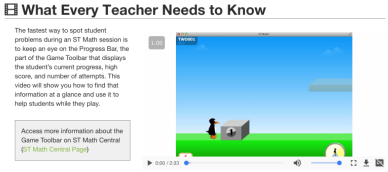
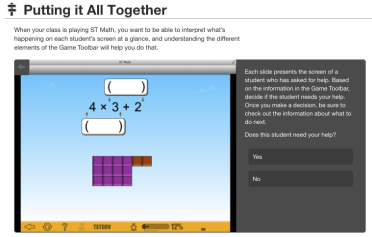
Image	Section	Talking Points
	SGOC 5 > Content: What Every Student Needs to Know	Now we're going to get into the actual games and how you'll be able to get sorts of information just by glancing at their screen. The first video covers the things that students need to know. While you're watching, listen for "level canceling," "refresh button," and how students can raise their hand and keep playing. **Play the video (2:25).** *How can you tell your students about the back arrow without encouraging them to "level cancel" (which means avoiding losing both JiJi tries by exiting the level)?*
	SGOC 5 > Content: What Every Teacher Needs to Know	The second video shows a few things that teachers need to know. Watch for the Progress Bar and how much information is packed into that little gauge. **Play the video (2:33).** *How does the Progress Bar give you information about what the student has done on this game?* *What does an orange frame mean? What should you do?*
	SGOC 5 > Content: Putting it All Together	*This activity allows teachers to practice interpreting the toolbar with immediate, informative feedback. You can have teachers work in pairs to answer the questions or you can go through the activity as a group.* *Tip: Teachers sometimes walk out with the misconception they can only help students with lots of dots – reinforce they should be talking to all their students, but the onscreen indicators help them know what kind of conversation to have.*

Image	Section	Talking Points
	SGOC 5 > Content: Teacher Tips & Best Practices	*Assign each of the Tips to a group of teachers and have them share the information with the group.*
		*Have teachers complete the check for understanding on their own.*
		*Have teachers take quiz independently, asking for help from you or a friend if needed.*

Course 6 – Power of the Card: Managing Students, Reports, and Content (K-6)

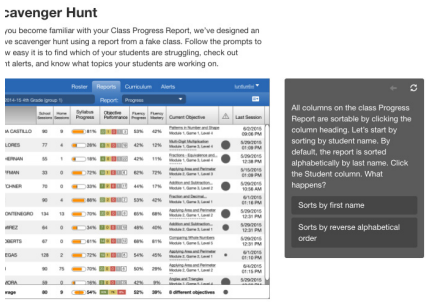
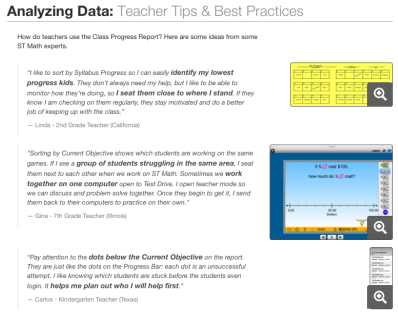
Image	Section	Talking Points
	SGOC 6 > Analyzing Data	There is a lot of information contained on the JiJi Console. You'll access that through your Class Card. This first video gives a great overview of some of the information that's available. I want to remind you that you can check out what everything means on the Screens and Reports page on ST Math Central. **Share video (2:04).**
	SGOC 6 > Analyzing Data	I hope you were paying attention! Below the video is a scavenger hunt. Work in pairs or triples to finish the hunt. **Complete Scavenger Hunt.**
	SGOC 6 > Analyzing Data	*As teachers finish the scavenger hunt, have them read over the teacher tips and be ready to share any that they find particularly interesting or helpful. Be sure to point out the magnifying glasses which provide a closer view.*

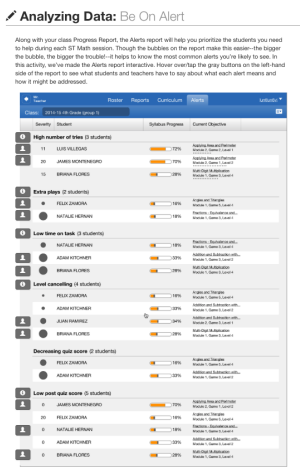
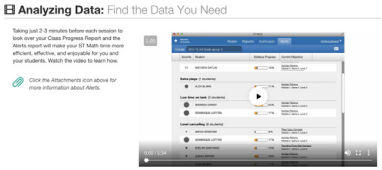
Image	Section	Talking Points
	SGOC 6 > Analyzing Data	One really interesting report is the Alerts Report. Do you remember the rhyme that the video had about those alert circles? (The bigger the bubble, the bigger the trouble.) Spend a few minutes exploring the report and clicking on the little rectangles. When you're done, be ready to share what student or students you would go to first at the next ST Math lab session. **Provide time for examining the Alerts Report.** *Have teachers share what they see as the best to address first. Some might choose to do the "easy" ones first (e.g., Ask the Low post quiz score students to tell you when they're ready to do a post quiz so you can see what's going on.). Others might want to work with a small group (e.g., on Applying Area and Perimeter). There is no right answer.*
	SGOC 6 > Analyzing Data	Now that you've seen what's available in the Alerts Report (2:38), this video shows how to use that information in planning for your next ST Math session.
	SGOC 6 > Analyzing Data	*Explain that the Action Plan mentioned in the video is available on the Printables page in ST Math Central.* *Have pairs of teachers look at the example and discuss if they would have the same priorities.*

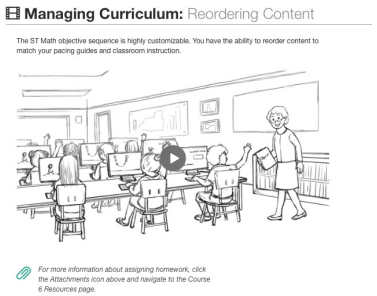
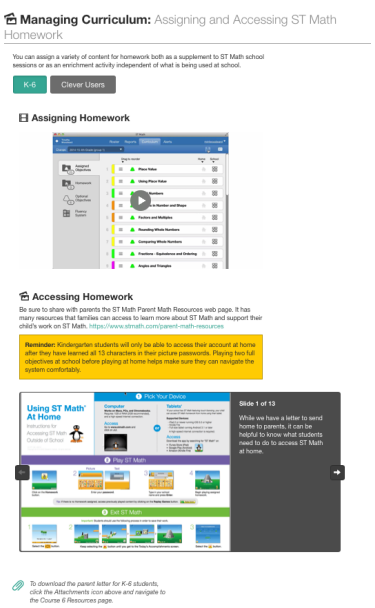
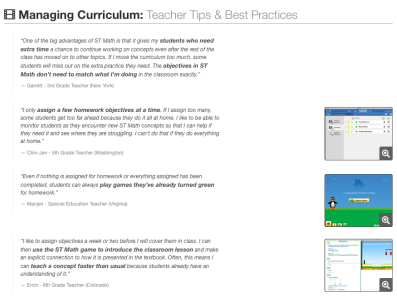
Image	Section	Talking Points
	SGOC 6 > Managing Curriculum	The curriculum is carefully designed to build conceptual understanding but sometimes it is appropriate to reorder the curriculum (for example, to preteach concepts before they're covered by the textbook). *Either show the video (2:13) or demonstrate how to reorder the curriculum.* *WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF REORDERING THE CURRICULUM?*
	SGOC 6 > Managing Curriculum	Students can access ST Math at home either by using the app or logging on a computer's browser. *Depending on the school's set-up, teachers may or may not be able to assign objectives to be done as homework. For clarification, call Support at 888-491-6603. Generally speaking, schools that use a single sign-on (e.g., Clever) are not able to assign objectives as homework. Teachers in schools using picture passwords, text to picture passwords, and text passwords are able to choose which objectives students will have access to at home and the order in which they appear. All students can replay objectives they have completed.* *If teachers are interested in learning more about homework, review the STMC Homework in ST Math (K-6) page.* https://web.stmath.com/central/content/st_math_help/using_program/homework.htm *WHAT MIGHT BE SOME BENEFITS OR DRAWBACKS OF HAVING STUDENTS USE ST MATH AT HOME?* ST Math Central has several resources that you can use to help parents access ST Math at home. For computers, students log in at web.stmath.com or through their school's portal. For tablets, the app needs to be downloaded from the device's app store or, once again, accessed through the school's portal. We have an additional resource on ST Math's regular web page. You can find it here: **Navigate to** https://www.stmath.com/parent-math-resources

Image	Section	Talking Points
	SGOC 6 > Managing Curriculum	*Have teachers spend a few minutes reviewing the Teacher Tips. Allow time for teachers to share their own tips and ask questions.*
Quiz		*Have teachers take quiz independently, asking for help from you or a friend if needed* *Thank teachers for their time and tell them when you'll be back to complete more training (about two months) and who they should reach out to if they have trouble (you, Support, or their Education Consultant)*