

# Rolling Out

## *Building Fact Fluency*

*A Toolkit for Multiplication and Division*  
by Graham Fletcher and Tracy Johnston Zager



### Welcome to *Building Fact Fluency!*

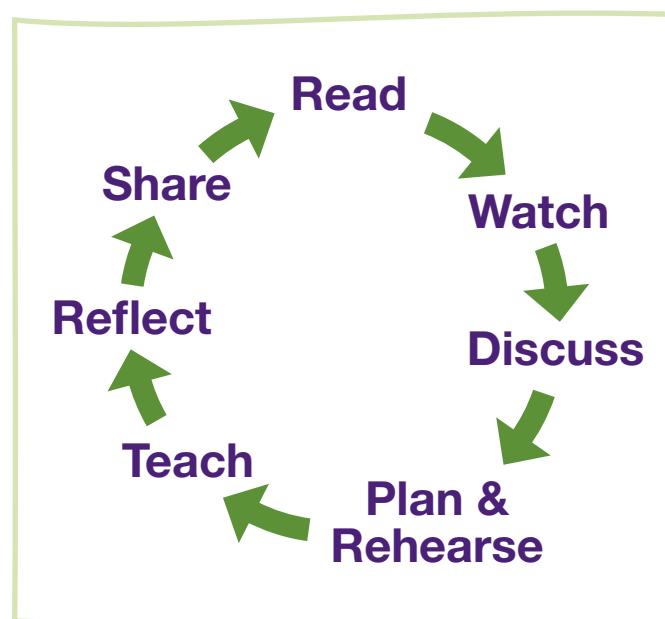
We've written this rollout guide for coaches, math lead teachers, administrators, PLC coordinators, and teaching specialists who are planning to launch and support implementation of the *Building Fact Fluency* toolkits in a team, school, or district. We've packed a lot of professional learning into the toolkits—way too much to take in all at once or frontload at the beginning! Instead, we hope educators will engage with the professional learning videos and *Facilitator's Guide* over time, while trying out the routines with students.

If you'd like to plan out a sequence of videos, readings, discussions, and action items, feel free to use or adapt the example guide below. Just please remember that it is only *one* of the many possible ways to sequence and pace the professional learning incorporated in your toolkit, and you should always feel free to make different choices that fit your needs.

Each of the modules below is scheduled for 90 minutes, assuming you might use them in a series of early-release or after-school sessions. Feel free to combine modules if you have longer chunks of time, such as half- or whole-day in-services or back-to-school professional learning days. Similarly, if you need to break modules into shorter chunks to fit them into weekly planning times, by all means go ahead. And rearrange as you see fit!

Overall, we recommend teachers read a bit, watch some professional learning videos, talk with colleagues, and plan upcoming lessons in each session. Rehearsing those plans in small groups can be invaluable—teachers can role-play being students and alternate taking the lead. Rehearsal is an ideal way to get a feel for routines and experiment with language and pacing in the safety of your professional learning community, so you'll be more prepared with students.

Between sessions, teachers can try *Building Fact Fluency* out in the classroom. Whenever possible, participants should come to the next session with an artifact from their teaching. Sharing and reflecting together on these artifacts (student work, a photo of the whiteboard, a short video or audio clip, etc.) is a wonderful way to start professional learning sessions and build the team's capacity and practice of collaboration. We are very excited about what *Building Fact Fluency* can do for students, but we are just as excited to provide a resource that can bring teachers together in the best sort of collective learning. All of us are smarter than one of us!



# Module 1

## Welcome and Orientation

### Activities

### Suggested Times

(Webcam suggestions for remote PD sessions only)

#### Unpack Your Box!

- **Read** through the Getting Started Guide and find all the materials described in the “What’s Inside” section.
- **Flip** through your *Facilitator’s Guide* to get a sense of it.
- **Flip** through the *Image Talks* and *Tool Talks* books.
- **Open** your group and array cards.
- **Skim** through your “Games at a Glance” reference.
- **Unpack** your dice and playing chips and put them in whatever classroom storage containers you’ll use.

25 minutes



#### Log In to the Companion Website

Find your unique access code on the inside of your box lid and use it to register your toolkit at [www.buildingfactfluency.stenhouse.com](http://www.buildingfactfluency.stenhouse.com).

- **Watch** the welcome page video (2:27).
- **Surf** the website for 15 minutes or so to see what’s there. If your school is new to *Building Fact Fluency*, select “Set A” when looking at the Lesson String materials. You can always change this setting later.

25 minutes



#### Why Fluency?

- **Read** Chapter 1 of your *Facilitator’s Guide*: “Why Fluency?” (pages 1–10). As you read, choose a quote or an idea that you want to think about more.
- **Discuss** Chapter 1 in grade-level/school teams:
  - What quotes/ideas did you choose? Take turns sharing in pairs, small groups, or a large group.
  - What did the chapter make you think about for your teaching practice? What is resonating with you?
  - How is *fact fluency* defined in the *Building Fact Fluency* toolkit?
  - How is this framing of fact fluency similar to or different from the ways we’ve thought about fluency and sensemaking in the past?

40 minutes



Cameras off during reading, cameras on for discussion

## Module 2

# Multiplicative Reasoning, Embedded Professional Learning, and an Introduction to Lesson Strings

## Activities

### Suggested Times

(Webcam suggestions for remote PD sessions only)

### The Math of Multiplication and Division

(We'll be reading Chapter 2 in brief pieces across these sessions.)

- **Read** pages 13–17 in Chapter 2 of your *Facilitator's Guide*, stopping at "Problem Types and Structures." As you read, take note of any phrasing or images that help clarify your thinking about multiplicative reasoning, make you feel confused, or spark questions.
- **Discuss** what phrases/images are helping you make sense of multiplication or causing you to think about it in a new way. Remember, historically we've not spent enough time making sense of this math as students or teachers, so if you're feeling a little unsure, that is expected! It may help to use some rough-draft talk to try to summarize key ideas together. For example, in your own words, describe many-to-one correspondence. What's the *many* and what's the *one*?

15 minutes



Cameras off during reading, cameras on for discussion

### Plan Your Professional Learning

- **Watch** the "Introduction" and "Built-In Support and Professional Learning" chapters of Tracy's Getting Started video (Implementation → Getting Started Videos → "Tracy on Jumping Right In; Embedded Professional Learning; and Planning, Pacing, and Sequencing"). **PAUSE** at 13:25, before "Pacing, Sequencing, and Planning."
- **Discuss** how you would prefer to engage over time in the professional learning that's built into the toolkit. How can you plan to read, watch, try, and reflect together? How can you make sure you take the deeper dives into the teaching practice and assessment work later on, once your feet are wet? What sorts of structures do you want to put in place so you'll collaborate with one another and help students have a coherent experience in your school?

20 minutes



Cameras off during the video, cameras on for discussion

### Talk About Multiyear Decisions and Choose Set A or Set B

- **Watch** Tracy's Getting Started video on multiyear pacing (Implementation → Getting Started Videos → "Tracy on Jumping Right In; Embedded Professional Learning; and Planning, Pacing, and Sequencing"). **START** at 13:25 and **STOP** at 20:13.
- **Read** Chapter 4 on multi-year pacing, pages 103–109.
- **Discuss** how you will use the toolkit year over year. Table 4.1 on page 109 may help you decide who could teach which set this year and in future years. (All grades can start with Set A the first year, and then older grades can shift to Set B the following year.) After discussing possibilities, commit to who is teaching which set this year and next, and then set your accounts accordingly.

25 minutes



Cameras off for reading and watching the video, cameras on for discussion

### Introduction to Lesson Strings—Context and Coherence

- **Watch** the first 13 minutes of Graham's Getting Started video (Implementation → Getting Started Videos → "Graham on Fluency; the Lesson String Routines; the Properties of the Operations; and Assessment"). **STOP** at 13:30, "Got Context?"
- **Read** pages 49–53 in Chapter 3 of your *Facilitator's Guide*, which introduces contexts and the structure of Lesson Strings.
- **Discuss** the idea of context:
  - Reread the paragraph at the bottom of page 49 and top of page 50, starting with "Contexts are . . ."
  - Open the Lesson Strings page on the Companion Website, which shows a thumbnail image of each of the thirty contexts listed in Table 3.1, on page 50 of the *Facilitator's Guide*.
  - As a team, discuss the choices of contexts that Graham and Tracy made. How do these contexts help students make mathematical sense of multiplication and division with different factors? What do you notice about the variety, mathematical structures, and arrangement of objects within the contexts?

30 minutes



Cameras off for reading and watching the video, cameras on for discussion

# Module 3

## Jumping In with Lesson Strings and the Core Routines (3-Act Math Tasks)

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<h3>Lesson Strings</h3> <p>Watch the Lesson Strings sections of Graham's Getting Started video (Implementation → Getting Started Videos → “Graham on Fluency; the Lesson String Routines; the Properties of the Operations; and Assessment”), which will give you an overview of all the tasks in a Lesson String. Pause at the suggested points to talk with your grade-level/school teams.</p> <ul style="list-style-type: none"><li>• <b>START</b> at 13:14 and <b>STOP</b> at 40:55, when the slide says, “Virtual Tour,” before the “Assessment” chapter.</li><li>• <b>Discuss</b> your questions and observations at suggested stopping points throughout the video. At the end, discuss what you notice about the coherence of a Lesson String.</li></ul>	55 minutes (28 for the video, plus discussion)   Cameras off during the video, cameras on for discussion
<h3>Time to Jump In! Let's Read, Watch, Try, Starting with 3-Act Math Tasks</h3> <ul style="list-style-type: none"><li>• <b>Read</b> pages 54–59 of your <i>Facilitator's Guide</i> to learn about 3-Act Math Tasks.</li><li>• <b>Watch</b> “Facilitating a 3-Act Math Task” (18:45) on the Companion Website to see Graham teach a 3-Act Math Task, which activates a Lesson String (Implementation → Lesson String Component Videos).</li><li>• <b>Plan</b> in grade-level/school teams. Commit to teaching a 3-Act Math Task before your next meeting. How might students think about this problem? What solutions do you anticipate?</li><li>• <b>Rehearse</b> together. If possible, one colleague can volunteer to lead the 3-Act Task so teachers can experience the routine from students' point of view.</li></ul>	30 minutes 
<h3>Prep for Your Next Meeting</h3> <ul style="list-style-type: none"><li>• <b>Teach</b> a 3-Act Math Task before you meet again for the next session.</li><li>• <b>Bring</b> some student work from this task to your next meeting.</li></ul>	5 minutes 

# Module 4

## More Core Routines (Image Talks, Tool Talks, and Number Talks)

### Activities

#### Suggested Times

(Webcam suggestions for remote PD sessions only)

#### Reflect Together

Share student work and reflections from your 3-Act Math Task in grade-level/school teams. How did it go? What was challenging about it? What went well? What might you do differently next time?

10 minutes



#### Plan Image Talks, Tool Talks, and Number Talks

Take this time to read and watch the materials around Image Talks, Tool Talks, and Number Talks. Plan those components of your upcoming Lesson String and look for connections among them. Guiding question: *What connections and relationships do you see across the Image, Tool, and Number Talk routines?*

- **Read** “Image Talks,” pages 60–64.
- **Watch** “Facilitating an Image Talk” (13:35) on the Companion Website to see Graham teach an Image Talk (Implementation → Lesson String Component Videos).
- **Plan** your first (or next!) Image Talk in grade-level/school teams.
  - How might students see the objects?
  - How might you record their thinking?
- **Read** “Tool Talks,” pages 65–67.
- **Watch** “Facilitating a Tool Talk” (12:11) (Implementation → Lesson String Component Videos)
- **Discuss** what you notice about the relationship between the Image and Tool Talks.
- **Read** “Number Talks,” pages 68–70.
- **Watch** “Facilitating a Number Talk” (14:20) (Implementation → Lesson String Component Videos)
- **Discuss** how starting with an Image Talk, following with a Tool Talk later in the week, and finally ending with a Number Talk might affect who talks and how during these routines.
- **Plan** the Image Talk, Tool Talk, and Number Talk of your next Lesson String. What connections and relationships do you notice within and among these strings of problems? What mathematical properties do you see? What questions might you ask to encourage students to look for patterns, explore properties, and construct general arguments?
- **Rehearse** together. If possible, colleagues can volunteer to lead Image, Tool, or Number Talks so teachers can experience the routines from students’ point of view.

75 minutes



Cameras off for reading and watching videos, cameras on for discussion

#### Prep for Your Next Meeting

- **Teach** an Image Talk, Tool Talk, and Number Talk before you meet again for the next session. Capture an artifact from one of these warm-ups (video, audio, the questions you asked, a photo of the board, chart paper, etc.).
- **Bring** your artifact from this task to your next meeting.

5 minutes



# Module 5

## Planning and Pacing

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<h3>Reflect Together</h3> <p>Share your artifacts. How did it go and what are you thinking for next time? What connections did you notice students making across the Image Talk, Tool Talk, and Number Talk?</p>	10 minutes 
<h3>The Math of Multiplication and Division</h3> <ul style="list-style-type: none"><li>• <b>Read</b> pages 17–25 in Chapter 2 of your <i>Facilitator's Guide</i>, from “Problem Types and Structures,” through “Arrays—A Special Kind of Equal Groups.”</li><li>• <b>Discuss:</b><ul style="list-style-type: none"><li>– Which of the Image and Tool Talks that you just discussed involved equal grouping? Thinking about multiplication as the number of groups x the number of items per group = the total number of items, which quantities do we know? Which quantities can we figure out?</li><li>– Have you taught or planned any <i>Building Fact Fluency</i> tasks that involved arrays yet? What language did students use? Using rough-draft talk, how would you describe what we’re counting when we describe something as a “4-by-6 array,” as discussed on page 23?</li><li>– Look at your standards to see how equal grouping and arrays come up. How does <i>Building Fact Fluency</i> align? (Depending on where you are, you might find support on the Standards Alignments tab under Implementation.)</li></ul></li></ul>	25 minutes   <p>Cameras off during reading, cameras on for discussion</p>
<h3>Planning and Pacing</h3> <p>Now that you are developing a feel for Lesson Strings, it’s a good time to think about planning and pacing within your year, Lesson String, and day.</p> <ul style="list-style-type: none"><li>• <b>Watch</b> the rest of Tracy’s Getting Started video (Implementation → Getting Started Videos → “Tracy on Jumping Right In; Embedded Professional Learning; and Planning, Pacing, and Sequencing”). <b>START</b> at 20:42 and <b>STOP</b> at 41:55.</li><li>• <b>Read</b> pages 109–117 in Chapter 4: “Who, When, Where, and How Often? Flexible Implementation Ideas.”</li><li>• <b>Discuss</b> how you might schedule your weeks. Table 4.4 on page 116 may help.</li></ul>	50 minutes   <p>Cameras off for reading and watching videos, cameras on for discussion</p>
<h3>Prep for Your Next Meeting</h3> <ul style="list-style-type: none"><li>• <b>Plan</b> to discuss your schedules in the next session: think about how you’ll capture and share out what you’re noticing about lesson cadence, timing, and scheduling.</li><li>• <b>Bring</b> your notes and come to the next meeting ready to talk about planning, pacing, and scheduling.</li></ul>	5 minutes 

# Module 6

## More Core Routines (Contextualized Practice Problems) and Assessment Part 1

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<h3>Reflect Together</h3> <p>Share your scheduling/pacing choices with your team. When are you teaching <i>Building Fact Fluency</i>? Which routines, when, in what order? What pacing adjustments are you considering? As the routines become established, what might shift?</p>	10 minutes 
<h3>The Math of Multiplication and Division</h3> <ul style="list-style-type: none"><li>• <b>Read</b> pages 26–30 in Chapter 2 of your Facilitator's Guide, starting from "Area and Volume." Stop at "Properties of the Operations."</li><li>• <b>Discuss</b> why measurement and comparison problems are more cognitively challenging than equal grouping or array problems. What have you observed in your teaching experience? What standards are you expected to teach for area, volume, measurements that involve multiplication, rates, comparisons, and/or scale? How can the contexts and tools in <i>Building Fact Fluency</i> support your teaching of those standards?</li></ul>	15 minutes   <p>Cameras off during reading, cameras on for discussion</p>
<h3>Explore Contextualized Practice Problems</h3> <p>Take this time to read and watch the materials around problem-based story problems, and then talk with your colleagues. (Facilitator's note: Contextualized Practice Problems will be more familiar to teachers who have been trained in Cognitively Guided Instruction.)</p> <ul style="list-style-type: none"><li>• <b>Read</b> pages 71–78, "Contextualized Practice Problems."</li><li>• <b>Discuss</b> how the number choice built into these problems might increase students' access to mathematics. How do you see this student choice playing out when you teach?</li><li>• <b>Watch</b> "Facilitating Contextualized Practice Problems" (8:28) (Implementation → Lesson String Component Videos).</li><li>• <b>Discuss</b> how this sort of patient problem-solving relates to fact fluency.</li><li>• <b>Plan</b> a Contextualized Practice Problem for your upcoming Lesson Strings. Take some time to generate as many solutions as you can. Once you've anticipated solutions, talk with your colleagues to see if you can generate some more ideas.</li><li>• <b>Rehearse</b> together. If possible, try facilitating these problems with each other so you can practice teaching and also experience the routine from students' point of view.</li></ul>	30 minutes   <p>Cameras off for reading and watching videos, cameras on for discussion</p>
<h3>Assessment and Problem-Based Lessons</h3> <ul style="list-style-type: none"><li>• <b>Discuss</b> what we can learn from observing and conferring with students while they work, and from looking at student work.</li><li>• <b>Watch</b> "Formative Assessment: Questioning During Problem Solving" (9:29) (Implementation → Assessment Videos &amp; Downloads).</li><li>• <b>Watch</b> "Formative Assessment: Probing Student Thinking About Problem Solving" (12:32) (Implementation → Assessment Videos &amp; Downloads).</li><li>• <b>Discuss</b> what you noticed about Graham's questioning during problem solving in the two videos.</li></ul>	30 minutes   <p>Cameras off for videos, cameras on for discussion</p>
<h3>Prep for Your Next Meeting</h3> <ul style="list-style-type: none"><li>• <b>Teach</b> Contextualized Practice Problems before you meet again for the next session. Plan to capture an artifact (video, audio, the questions you asked, a photo of the board, chart paper, student work, etc.).</li><li>• <b>Bring</b> your artifacts from this task to your next meeting.</li></ul>	5 minutes 

# Module 7

## The Last Core Routine (Games) and Assessment Part 2

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<b>Reflect Together</b> <p>Share your Contextualized Practice Problem artifacts. How did it go, and what are you thinking for next time? What strategies did students use?</p>	10 minutes 
<b>The Math of Multiplication and Division</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 30–33 in Chapter 2 of your <i>Facilitator's Guide</i>, from “Properties of the Operations” through “Commutative Property of Multiplication.”</li><li>• <b>Discuss</b> the challenge of thinking about the commutative property in equal grouping situations. What did the discussion of the five-legged dogs and the process of decontextualizing and recontextualizing make you think about?</li><li>• <b>Read</b> pages 34–37, “Distributive Property of Multiplication over Addition.”</li><li>• <b>Discuss</b> Figures 2.16–2.18, using rough-draft talk to describe how the pictures and expressions relate to each other.</li><li>• <b>Discuss</b> the true/false statements at the bottom of page 36. Choose a couple to talk about together. How can you describe <i>why</i> a statement is either true or false? Might representations help your arguments?</li></ul>	25 minutes   <p>Cameras off during reading, cameras on for discussions</p>
<b>Let's Play Games!</b> <p>Games are a crucial component of the <i>Building Fact Fluency</i> toolkits.</p> <ul style="list-style-type: none"><li>• <b>Discuss</b> how game play can help students develop fluency.</li><li>• <b>Read</b> pages 79–85, “Games for Purposeful Practice.”</li><li>• <b>Watch</b> “Launching a New Game” (6:12) (Implementation → Lesson String Component Videos).</li><li>• <b>Play</b> a game! Navigate to the Games menu and choose a core game from your upcoming Lesson String. Watch the how-to-play video, and then play the game. (You can share a screen and mark it up on Zoom, or you can set up a document camera. Games will be much more fun in person, but you'll get a sense of the strategy this way.)</li><li>• <b>Discuss</b> what mathematics came up during this game play.</li></ul>	40 minutes   <p>Cameras off for reading and watching videos, cameras on for discussion</p>
<b>Assessment and Games</b> <ul style="list-style-type: none"><li>• <b>Watch</b> “Formative Assessment: Learning About Student Thinking During Game Play” (2:56) (Implementation → Assessment Videos &amp; Downloads).</li><li>• <b>Discuss</b> what you noticed about Graham's role during game play. What can we learn by listening in while students play games?</li></ul>	10 minutes   <p>Cameras off during the video, cameras on for discussion</p>
<b>Prep for Your Next Meeting</b> <ul style="list-style-type: none"><li>• <b>Teach</b> some games! Capture an artifact of assessment during game play before you meet again for the next session (video, audio, notes of what you learned, list of questions, student recording).</li><li>• <b>Bring</b> your assessment artifact to your next meeting.</li></ul>	5 minutes 

# Module 8

## Optional Routines Part 1 (Optional Games and Same/Different)

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<b>Reflect Together</b> <p>Share your artifacts. What did you learn by listening in and questioning students during game play since the last session?</p>	10 minutes 
<b>The Math of Multiplication and Division</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 37–40, “Associative Property of Multiplication,” in Chapter 2 of your <i>Facilitator’s Guide</i>.</li><li>• <b>Explore</b> the <i>Image Talks</i> and <i>Tool Talks</i> books. Find a few tasks that might invite students to explore the associative property.</li><li>• <b>Discuss</b> the images you chose and ask one another how you might solve them so you can develop your mental math with the associative property—remember, we likely weren’t taught this way!</li><li>• <b>Read</b> pages 40–42, “Zero Property of Multiplication” and “Identity Property of Multiplication.”</li><li>• <b>Explore</b> the <i>Image Talks</i> and <i>Tool Talks</i> books. Find examples of <math>a \times 0</math>, <math>0 \times a</math>, <math>a \times 1</math>, and <math>1 \times a</math>.</li><li>• <b>Discuss</b> the language you might use to describe the images you tagged.</li></ul>	20 minutes   Cameras off during reading, cameras on for discussions
<b>Optional Games</b> <ul style="list-style-type: none"><li>• <b>Explore</b> the charts describing the optional games, which you can find on the Companion Website (Games → The Building Fact Fluency Games → Games at a Glance), in the “Games at a Glance” insert that came in your toolkit, or in your <i>Facilitator’s Guide</i> on page 83. Choose a few games to investigate on the website. Make sure to notice the gray “Mixed Practice” button at the bottom of the list to explore games that incorporate lots of factors.</li><li>• <b>Discuss</b> optional games. Each colleague can share a game they found and talk about how and when they might use it. (If you have time, you might play some of the games to get a sense of them!)</li></ul>	15 minutes   Cameras off during exploration, cameras on for discussion
<b>Same/Different Talks</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 86–88 in your <i>Facilitator’s Guide</i>, about the Same/Different routine.</li><li>• <b>Watch</b> “Facilitating a Same/Different Talk” (11:11) (Implementation → Lesson String Component Videos).</li><li>• <b>Discuss</b> how the structure of a Same/Different Talk invites students into the mathematics.</li><li>• <b>Plan</b> the Same/Different Talk in your next Lesson String(s). Discuss with colleagues, anticipating what students might say.</li><li>• <b>Rehearse</b> together. If possible, one colleague can volunteer to lead a Same/Different Talk so teachers can experience the routine from students’ point of view.</li></ul>	40 minutes   Cameras off for reading and watching videos, cameras on for discussions
<b>Prep for Your Next Meeting</b> <ul style="list-style-type: none"><li>• <b>Teach</b> a Same/Different Talk before next session and capture an artifact of students’ thinking (a picture of your recording, audio or video, etc.).</li><li>• <b>Bring</b> your Same/Different artifact to your next meeting.</li></ul>	5 minutes 

# Module 9

## Optional Routines Part 2 (Card Talks) and Assessment Part 3

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<b>Reflect Together</b> <p>Share your artifacts. How did your Same/Different Talk go? What did you notice about students' participation?</p>	10 minutes 
<b>The Math of Multiplication and Division</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 43–44 in Chapter 2 of your <i>Facilitator's Guide</i>, “Inverse Operations—The Relationship Between Multiplication and Division.”</li><li>• <b>Discuss</b> Graham and Tracy’s choice to teach these operations together. How is this similar to or different from other ways you’ve taught the content? What are you noticing about how students approach word problems in and out of <i>Building Fact Fluency</i>?</li><li>• <b>Read</b> pages 44–47, “Strategic and Relational Thinking—Leveraging the Properties.” Note a couple of key takeaways from the synthesis of this chapter. What’s on your mind?</li><li>• <b>Discuss</b> your takeaways with your colleagues. What are you thinking about the way <i>Building Fact Fluency</i> pays explicit attention to the properties of the operations while teaching the number combinations? How are you feeling about teaching and exploring these properties with students?</li></ul>	25 minutes   Cameras off during reading, cameras on for discussions
<b>Card Talks</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 89–91 in your <i>Facilitator's Guide</i>, about the Card Talk routine.</li><li>• <b>Watch</b> “Facilitating a Card Talk” (12:26) (Implementation → Lesson String Component Videos).</li><li>• <b>Discuss</b> the teaching possibilities you see with these card decks. What excites you?</li><li>• <b>Plan</b> the Card Talk in your next Lesson String(s). Discuss it with colleagues, anticipating what students might say. Is a productive argument possible?</li><li>• <b>Rehearse</b> together. If possible, one colleague can volunteer to lead a Card Talk so teachers can experience the routine from students’ point of view.</li></ul>	40 minutes   Cameras off for reading and watching videos, cameras on for discussions
<b>Formative Assessment: The Quick Card Conference</b> <ul style="list-style-type: none"><li>• <b>Watch</b> “Formative Assessment: The Quick Card Conferences” (6:38) (Implementation → Assessment Videos &amp; Downloads).</li><li>• <b>Discuss</b> what Graham learned in his conference. Do you see opportunities to confer with students in this way? What student strengths might you notice this way?</li></ul>	10 minutes   Cameras off for the video, cameras on for discussions
<b>Prep for Your Next Meeting</b> <ul style="list-style-type: none"><li>• <b>Teach</b> a Card Talk before next session or engage in a Quick Card Conference and capture an artifact of students’ thinking (a picture of your recording, audio or video, your notes, etc.).</li><li>• <b>Bring</b> that artifact to your next meeting.</li></ul>	5 minutes 

# Module 10

## Optional Routines Part 3 (True/False and Open Middle)

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<b>Reflect Together</b> <p>Share your artifacts. How did you use the cards? What did you learn? What are you thinking now?</p>	10 minutes 
<b>True/False</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 92–95 in your <i>Facilitator's Guide</i>, "True/False."</li><li>• <b>Discuss</b> the math in this section with your colleagues. How might your students react to the equal sign being used in this way? What are you thinking about teaching students to construct general arguments using this routine?</li><li>• <b>Watch</b> "Facilitating a True/False Talk" (6:53) (Implementation → Lesson String Component Videos).</li><li>• <b>Discuss</b> the video. These students are fairly new to this routine, so Graham kept the conversation more teacher-led. Over time, how might you support students to take more ownership of the conversation and learn to craft arguments?</li><li>• <b>Plan</b> the True/False Talk in your next Lesson String(s). Discuss it with colleagues, anticipating what students might say. Practice recording different arguments, including any representations students might draw on.</li><li>• <b>Rehearse</b> together. If possible, one colleague can volunteer to lead a True/False Talk so teachers can experience the routine from students' point of view.</li></ul>	35 minutes   Cameras off for reading and watching the video, cameras on for discussions
<b>Open Middle® Problems</b> <ul style="list-style-type: none"><li>• <b>Read</b> pages 96–101, "Open Middle Problems."</li><li>• <b>Watch</b> "Facilitating an Open Middle Problem" (6:11) (Implementation → Lesson String Component Videos).</li><li>• <b>Plan</b> the Open Middle Problem in your next Lesson String(s). (Remember, you need to be in Set B to view it; make sure you switch back to Set A afterward if you're teaching Set A.) Take some time to work on the problem yourself. It should take you several attempts—that's the idea! Record your thinking using the Open Middle Recording Sheet, which you can find on the problem page or under Implementation → Student Recording Sheets.</li><li>• <b>Discuss</b> your solutions with colleagues.</li><li>• <b>Plan</b> together. How might your students solve this Open Middle Problem?</li><li>• <b>Rehearse</b> together. If possible, one colleague can volunteer to lead an Open Middle Problem so teachers can experience the routine from students' point of view.</li></ul>	40 minutes   Cameras off for reading and watching the video, cameras on for discussions
<b>Prep for Your Next Meeting</b> <ul style="list-style-type: none"><li>• <b>Teach</b> a True/False or an Open Middle Problem before next session and capture an artifact of students' thinking (a picture of your recording, audio or video, your notes, etc.).</li><li>• <b>Bring</b> that artifact to your next meeting.</li></ul>	5 minutes 

# Module 11

## Assessment Part 4

Activities	Suggested Times (Webcam suggestions for remote PD sessions only)
<b>Reflect Together</b> <p>Share your artifacts from True/False or Open Middle. How did they go? What did you learn? What are you thinking now?</p>	10 minutes 
<b>Assessment in Building Fact Fluency</b> <ul style="list-style-type: none"><li>• <b>Read</b> Chapter 5: “How Should We Assess Fluency?” (pages 119–131). Look through the questions on pages 121–122. Star or select some that you want to focus on in your teaching and be ready to talk about them with your colleagues.</li><li>• <b>Discuss</b> your starred questions from the list. How might you remember to ask them? More generally, what do you think about the role of assessment in this toolkit? Which strategies described here feel comfortable, and which feel like a departure?</li><li>• <b>Watch</b> “Formative Assessment: The Quick-Fact Conference” (6:48) (Implementation → Assessment Videos &amp; Downloads). Find the “Fact Self-Check Recording Sheets” under Implementation → Student Recording Sheets.</li><li>• <b>Discuss</b> how you might use these self-assessments in your teaching, either in conferences, in small groups, or with your whole class.</li><li>• <b>Watch</b> “Formative Assessment: Student Reflection” (5:06) (Implementation → Assessment Videos &amp; Downloads).</li><li>• <b>Discuss</b> what Graham learned about this student’s thinking through this open assignment and follow-up conversation. What sorts of questions helped him gather that information?</li><li>• <b>Plan</b> together. What assessment strategies might you use in your upcoming Lesson String—observations and interviews, looking at student work, journaling and reflection, or student self-assessment? Choose some strategies to try, and plan to bring artifacts from that assessment to your next session.</li></ul>	65 minutes   Cameras off for reading and watching the video, cameras on for discussion
<b>Family Communication</b> <ul style="list-style-type: none"><li>• <b>Read</b> the “Family/Caregiver Letter” (Implementation → “Family/Caregiver Letter” in both English and Spanish).</li><li>• <b>Discuss</b> how you might communicate with families about these shifts.</li></ul>	10 minutes   Cameras off for reading, cameras on for discussion
<b>Prep for Your Next Meeting</b> <ul style="list-style-type: none"><li>• <b>Experiment</b> with assessment strategies before next session and bring some artifacts to share (notes from interviews or observations, student work, student journals, student self-assessments, etc.).</li><li>• <b>Bring</b> those artifacts to your next meeting.</li></ul>	5 minutes 

# Module 12

## Taking a Deeper Dive into Problem-Based Facilitation with the 5 Practices

### Activities

#### Reflect Together

Share your assessment artifacts. What did you learn? What are you wondering now?

#### Problem-Based Learning

Choose an upcoming problem-based lesson (3-Act Math Task, Contextualized Practice Problem, or Open Middle Problem) to ground today's work. Please come to consensus so you can work on one problem together.

#### Begin Planning: Do the Math and Anticipate Student Strategies

- **Solve** the math problem yourself, individually. What mathematics came up?
- **Generate** as many solution paths as you can.
- **Think** about what representations, tools, and reasons students might use as part of their work.
- **Discuss** your solutions as a team—record any ideas you learn from your colleagues.
- **Reread** the corresponding pages in the *Facilitator's Guide* ("3-Act Math Tasks," "Contextualized Practice Problems," or "Open Middle Problems") to review the facilitation of a problem-based lesson.
- **Watch** "Managing the Flow of a Problem-Based Lesson: Using the 5 Practices to Facilitate (Planning and Anticipating)" (6:40) (Implementation → Teaching Technique Videos).
- **Revisit** your list of strategies and see if you need to add anything.
- **Plan** using this [planning guide](#) (the same one Graham uses in the video) to record the strategies you've generated in the first column. Begin thinking about how you might draw connections among these strategies.

#### Plan the Launch

- **Watch** "Managing the Flow of a Problem-Based Lesson: Launching a Task" (3:08) (Implementation → Teaching Technique Videos).
- **Discuss** your launch. What is just enough activation so students can get started on the problem? Where will you stop so you don't remove the cognitive lift from the problem or over-scaffold the reasoning? Rehearse with one another if you have an opportunity.

#### Plan Your Monitoring, Selecting, Sequencing, and Connecting

- **Watch** "Managing the Flow of a Problem-Based Lesson: Using the 5 Practices to Facilitate (Monitor, Select, Sequence, Connect)" (7:46) (Implementation → Teaching Technique Videos).
- **Discuss** this video. What did you notice about how Graham selected and looked for connections among students' solutions? How do you imagine the share-out might have gone (in contrast with calling on raised hands, for example)?
- **Revisit** your planning guide. What strategies will you monitor for, and what are some possible ways you might sequence and connect them? What are the storylines you might pull out of the whole-class discussion? Discuss as a team.
- **Plan** your back-pocket questions. What assessing questions will you ask as students are working? What advancing questions will you ask to encourage students to go deeper in their thinking? What just-in-time questions might you have for students who need support? What extensions might you consider for students who are ready?
- **Watch** "Managing the Flow of a Whole-Class Discussion: Turn and Talks" (2:37) (Implementation → Teaching Technique Videos).
- **Discuss** how you might use this discourse move in your whole-class discussion about the selected strategies. What talk or discourse moves can you make so the discussion remains open and accessible to all students rather than devolving into a forum for just a handful of students to discuss their own work?
- **Plan** your timing. Think about your launch, student work time, and closing conversation. How much time do you anticipate you and your students will need for each part?

#### Prep for Your Next Session

- **Plan** when you'll teach a problem-based lesson, and think about what artifacts you might collect (video, audio, student work, picture of the board, etc.).
- **Bring** an artifact of your problem-based lesson to your next session.

### Suggested Times

(Webcam suggestions for remote PD sessions only)

10 minutes



10 minutes



25 minutes



Cameras off for reading and watching videos, cameras on for discussion

10 minutes



Cameras off for the video, cameras on for discussion

30 minutes



Cameras off for the videos, cameras on for discussion

5 minutes



# Module 13

## 5 Practices Debrief, Standards Alignment, and Next Steps

### Activities

#### Suggested Times

(Webcam suggestions for remote PD sessions only)

#### Reflect Together

Share your problem-based lesson artifacts. What did you learn? How did you planfully improvise on the spot? Did you see the solutions you anticipated? Did any solutions surprise you? How did you choose to select, sequence, and connect the work? What other possible storylines might you have chosen? What are the pros and cons of those storylines? What 5 Practices facilitation moves do you want to work on for future problem-based lessons?

20 minutes



#### Standards Alignments

Now that you're familiar with the routines of *Building Fact Fluency*, spend some time analyzing your grade-level math standards to see where *Building Fact Fluency* aligns. Note that the Companion Website lists standards alignments for several states (e.g., Texas TEKS, Florida B.E.S.T., and Indiana), along with the Common Core State Standards (Implementation → Standards Alignments). These documents may be helpful. Make sure to have your state standards handy, as well as your core curriculum scope and sequence.

- **Discuss** the practice and process standards—for example, the Standards for Mathematical Practice in the Common Core State Standards. How does *Building Fact Fluency* align?
- **Discuss** your content standards. Which standards will you address thoroughly using *Building Fact Fluency*? Which standards does your core curriculum address? Do you see any excessive redundancy or any missing standards?
- **Discuss** any adjustments you want to make to the planning and pacing of *Building Fact Fluency*, your core curriculum, and any other supplemental resources based on your conversation.

50 minutes



#### Reflect and Plan for the Future

How can you keep going, as a PLC, to work on your practice together? What has it been like to work together? Where might you go next? For example, can you plan to visit one another's classrooms during *Building Fact Fluency* to keep learning together?

20 minutes

