

Formative Assessment Collaborative Team (FACT) Meetings:

Implementation Guide

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The writing of this facilitator’s guide was led by Charity Bauduin and Robert Schoen. Although the meeting protocols were developed through a joint and ongoing effort of all of the coauthors, Ms. Bauduin was the lead developer and writer for the current report. As principal investigator of the *Foundations for Success in STEM* project, Robert Schoen was integrally involved with conceiving and designing the FACT weekly meeting process and protocol and refining it on the basis of a continual stream of evaluation data. Ms. Bauduin and Dr. Schoen worked closely together to design the FACT weekly meeting process and protocol and to coordinate the creation of the weekly meeting forms and other data-collection devices.

Throughout the 2015–2016 and 2016–2017 school years, Charity Bauduin, Wendy Bray, Zachary Champagne, and Naomi Iuhasz-Velez facilitated weekly meetings with more than 30 teams of teachers. These experiences provided important insight into the development and refinement of the weekly meeting process and protocol. These weekly meeting facilitators provided critical feedback on the implementation of the protocol and weekly meeting process, as well as the forms used each week during the meetings. Charity used her knowledge and previous experience of facilitating weekly meetings with teachers to provide support and feedback to the other facilitators throughout the two years of weekly meetings. Amanda Tazaz provided feedback on the process and protocol as well as this guide. The coauthors of this report met weekly over a two-year period to discuss the progress of weekly meetings and provided support and recommendations to the facilitators to improve the structure and substance of the weekly FACT meetings.

Mark LaVenía and Kristy Farina served as reviewers of the early drafts of the meeting process, protocol, and forms. The authors of this report express their gratitude for these contributions of expertise.

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Introduction and Background

Formative Assessment Collaborative Team (FACT) meetings provide educators with a structured time each week to engage in peer collaboration focused on students' mathematical thinking. In these meetings, educators work together to analyze their students' mathematical thinking and make purposeful adaptations to instructional plans based on the insight gained through the process. The FACT meetings use a structured protocol and weekly record-keeping documents to focus the topics of discussions, provide a mechanism for accountability, and promote consistency of the process across teams of teachers.

The structured FACT meeting protocol involves weekly meetings of teachers who teach similar content. The meetings are led by an external facilitator. They are designed to focus teachers' attention on the cognitive processes of students as they draw inferences about student understanding of mathematical topics and to support teachers in making instructional decisions based on what they learn about their own students. The development of the FACT meeting process and protocol was guided by previous research involving similar types of collaborative inquiry in regularly scheduled meetings of school-based instructional personnel (Gallimore et al., 2009; Gersten et al., 2010; Lang et al., 2011; Lang et al., 2014; Lang et al., 2013; Saunders et al., 2009; Supovitz, 2002). Studies conducted by Lang et al. (2014) and Gallimore et al. (2009) found that student achievement may increase when teams of teachers who teach similar content use an inquiry-based, structured protocol in regularly scheduled instructional team meetings. Gallimore et al. argued that teacher attributions shifted once teachers started focusing on learning goals and tracking progress. Saunders et al. (2009) noted that time for teachers to collaborate by itself is unlikely to improve achievement unless structured conditions are in place.

The FACT meeting process and all documents in this guide have been used with more than 30 teams of teachers through the *FCR-STEM Learn: Foundation for Success in STEM* project. Including the first meeting, which occurred late in the summer, each team participated in approximately 28 meetings over the course of the school year. The process occurred in school years 2015–2016 and 2016–2017. Teachers participating in the FACT meetings through the *Foundations for Success in STEM* project during the 2015–2016 school year were participating in a randomized controlled trial. The purpose of the randomized controlled trial was to evaluate the impact and implementation of a series of workshops based around the Cognitively Guided Instruction (Carpenter et al., 2015) and the combined effect of the workshops plus the weekly meetings (as compared with a randomly assigned, wait-list comparison group). The results of the study are not yet known at publication time of the present implementation guide.

Three of the coauthors of this implementation guide were also involved in a previous project involving similar meetings, Florida's Mathematics Formative Assessment System (MFAS). For 18 months, more than 20 teams of MFAS teachers met weekly and followed a process similar to that described here. MFAS was found to have a positive effect on student achievement in two separate randomized controlled trials.

The primary goal of the FACT meetings is to provide support for extended professional collaboration and inquiry into mathematics teaching and learning as a means of improving instruction and student learning. The main strategy for improving teaching and learning is to focus teachers' attention on student thinking in mathematics and support teachers in deciding how to use what they learn about

student thinking to guide their instructional decisions. Student thinking is defined as the cognitive processes occurring in a student’s mind. Student thinking is surely related to a student’s answers to mathematics problems—but it can not be deduced solely from their answer. A secondary goal of the FACT meetings is to provide opportunities for teachers to increase their knowledge of mathematics and support further learning and implementation of ideas they encountered during mathematics professional-development workshops.

The purpose of the *Formative Assessment Collaborative Team (FACT) Meeting Facilitator’s Guide* is to provide information on how to structure and facilitate weekly FACT meetings. Included here are explanations of our structured protocol and weekly meeting forms, as well as suggestions for how to help support teachers in the process of analyzing student thinking. In addition, information is provided that will assist in establishing teams, initiating FACT meetings, guiding teachers to understand the weekly meeting process and helping the facilitator to reflect upon and improve the functioning of the meetings.

Establishing FACT Meeting Teams

Composition of Teams

Whenever possible, teams should be composed of between three and six teachers who have similar teaching assignments. Typically, the best situation involves teachers who teach the same grade level in the same school. Teams can be composed of teachers teaching different grade levels and/or at different schools, but that situation is not ideal. A team should include at least three teachers to create an environment more conducive to collaboration (and to allow conversation when individuals are absent). The maximum number of teachers may depend on the situation, but a maximum of six serves as a general guideline.

Meeting Place and Times

Before teams begin meeting, the facilitator should coordinate with the team to determine a meeting place (classroom, conference room, etc.) and a set time to meet each week. School leaders should be invited to assist in determining the location and time. The facilitator should take care to accommodate the teachers' requests for meeting days/times whenever possible. The ideal situation is to have meetings that last at least 40 minutes each week.

FACT Meeting Process

Formative Assessment

The two-week cycle of the FACT meeting process encompasses and parallels the formative assessment process, in which teachers observe students completing tasks and elicit student thinking to gain insight into what students understand and are able to do. Teachers then adapt instruction to meet the needs of their students on the basis of information gained. The approach to formative assessment involves focusing on identifying students' existing knowledge and making decisions about how to try to build on their existing ideas. The focus is not on whether students answer questions correctly. The protocol also does not frame student thinking in terms of misconceptions or lack of understanding. In other words, emphasis is placed on students' thinking processes and on what they *do* understand, rather than what they do not. Figure 1 shows the iterative formative assessment process that serves as the basic for the FACT meeting process. A formative assessment handout that can be distributed and used with teachers within the first three meetings to explain the formative assessment process encouraged in the weekly FACT meetings appears in Appendix A.

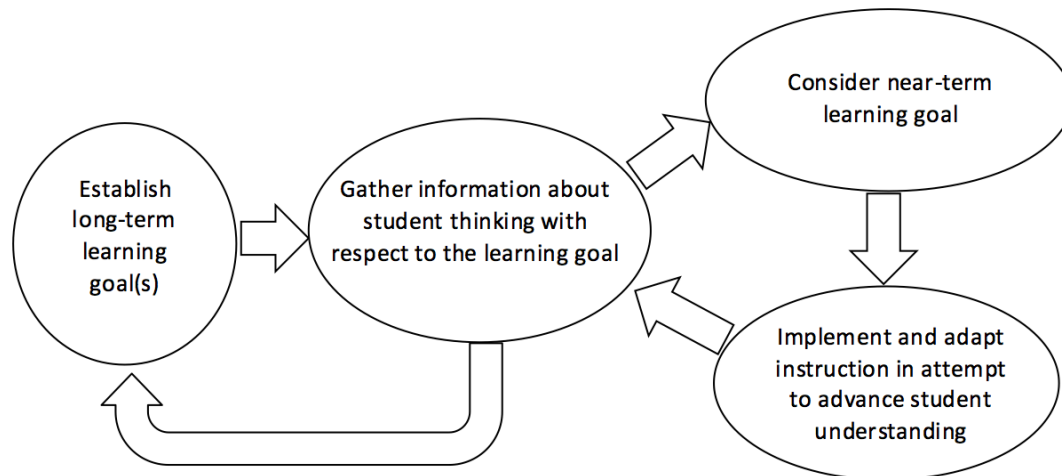


Figure 1. Formative assessment process.

FACT Meeting Cycle

The FACT meeting process consists of a two-week cycle. Figure 2 provides a snapshot of the recursive two-week FACT meeting cycle. This figure also appears in Appendix B and can be distributed to teachers. A detailed outline of the weekly meeting process appears on the second page of Appendix C.

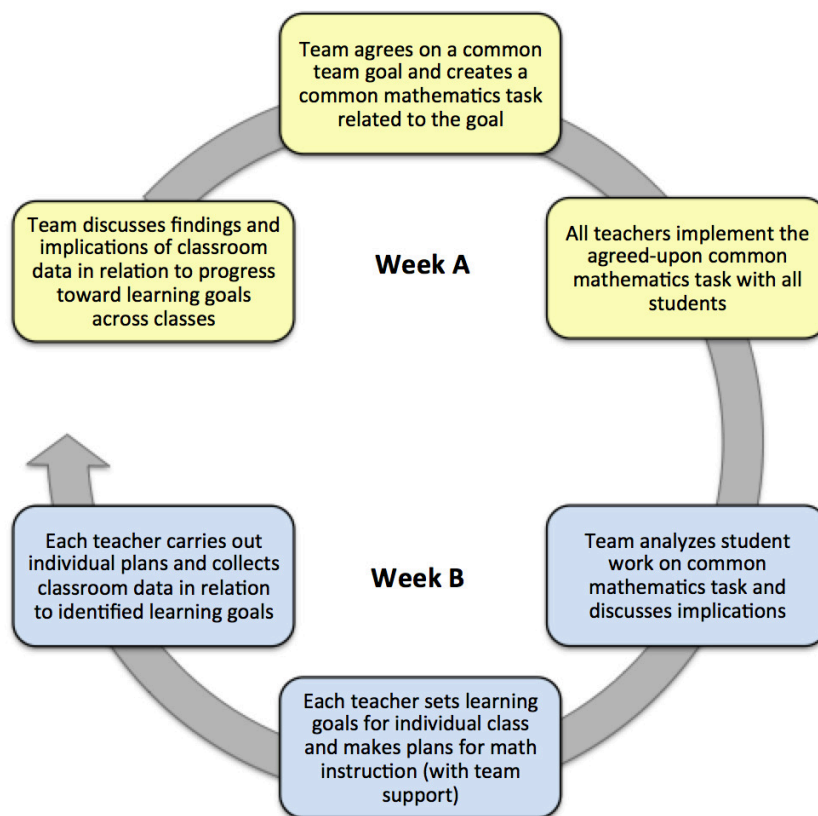


Figure 2. Weekly FACT meeting process.

Week A

In the first week of the cycle, Week A, teachers share with one another the strategies each used to work toward the previous week's established student learning goals. In addition, teachers share what they have noticed about students' thinking as a result of using these strategies. Teachers think about and discuss what they want to learn about students' mathematical thinking. Teachers then work together to determine a common math focus and select or create a common problem that will provide insight into student thinking about an upcoming topic in the instructional plan or some other topic of interest determined by the teachers. After a common problem has been selected or written by the group, teachers collaborate to assemble a detailed list of anticipated student strategies for solving the problem.

After the meeting, teachers pose the problem to their students over the next week. While posing the problem, teachers are expected to ask clarifying questions of their students with the goal of gathering information about students' thinking processes. Before the next week's meeting, teachers analyze the responses of their students and sort them into categories of similar ways of thinking. These categories

go beyond correct and incorrect responses or misconceptions that students hold about the given topic. Instead, emphasis is placed on the various strategies that students use to solve the problem and what those strategies suggest about their mathematical understanding.

Week B

In the second week of the cycle, Week B, teachers share and compare their analyses of students' responses to the common problem and collaborate to understand puzzling student work. Teachers then establish student learning goals designed to advance the current understanding of the specific students in their classrooms. Teachers collaborate and share instructional ideas that would help move students toward achieving the student learning goals. After the meeting, teachers use the knowledge they have gained about their students and spend the next week using strategies to move students toward the established student learning goals.

The First Few Meetings

The first four to five meetings involve a gradual immersion of teams in the full FACT meeting process. An outline of the first few meetings appears in Appendix D. During the initial meeting, late in summer, teams determine a common math problem that will be used to elicit student thinking. The student work from this problem will be used during the first few meetings to assist teachers in understanding the FACT meeting process. During the first few weeks of meetings, the formative assessment handout found in Appendix A can be used to help teachers make a connection between the FACT meeting process and the formative assessment process.

Over the course of the first four or five weeks, teachers learn and review the FACT meeting process each week and discuss how the process is directly related to the formative assessment process. Teachers practice collaborating to determine common math problems, sort student work, and establish student-learning goals directly related to students' thinking on the common problem. The first meeting of the school year is recorded on the Meeting 1 form, and appears in Appendix E. All of the group members present at the meeting sign their names on the lines provided. This form is different from the subsequent forms and coordinates with the outline of the first meeting. All subsequent forms will be discussed in the next section.

Documenting FACT Meetings

Each week, the facilitator is responsible for having the appropriate meeting forms printed and ready for each team in accordance with where the team is in the cycle. Each week, team members will sign in on the meeting log before the beginning of the meeting. The Week A and Week B meeting forms are explained below.

The following forms are needed for Week A meetings:

1. Weekly FACT Meeting Log (Week A)—one copy for the meeting facilitator to record notes
2. Weekly FACT Meeting Teacher Summary Sheet—one copy per team member
3. Optional: The facilitator may choose also to have the Weekly FACT Meeting Log Summary of Student Strategies readily available and may choose to write in the categories into which the team decides to sort student thinking so as to create a snapshot of all classes. These categories can be recorded in the column headings. If used, this form should be brought back again to the next meeting.

The following forms are needed for Week B Meetings:

1. Weekly FACT Meeting Log (Week B)—one copy for the meeting facilitator to record notes
2. Weekly FACT Meeting Log Summary of Student Strategies
3. Weekly FACT Meeting Teacher and Student Learning Goals Table (extra copies on hand)

Weekly FACT Meeting Log (Week A)

The Weekly FACT Meeting Log (Week A) found in Appendix H is circulated among teachers at the beginning of the meeting as a record of attendance. Figure 4 shows the Week A meeting log prompts. Initially, the facilitator records notes of the meeting, but this responsibility can shift to another person if a team member is willing to assume this role. The facilitator asks the team members to restate their goal(s) from the previous week, what strategies and activities were used to work toward those goals, and what student behaviors were noticed as a result of these efforts. A description of each teacher's update on established goals is recorded in Part 1 of the meeting log. In many cases, anonymity is appreciated by teachers, so, for example, "Teacher A," "Teacher B," etc. can be used instead of names.

Weekly FACT Meeting Log (Week A)	
<p>School/Team: _____ Date: _____ Note Taker: _____</p> <p>Start Time: _____ End Time: _____</p> <p>In Attendance (Please sign first and last names.):</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Part 1: Strategies and Progress Towards Previously Set Goals</p> <p>What strategies have you used since we last met to support student progress on established learning goals and what were the outcomes? What progress have you made on established teacher goals?</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>Part 2: Determine New Common Problem and Anticipate Student Thinking</p> <p>Think about what you have learned so far about your students' thinking and where you will be instructionally within the next 2-3 weeks. What are some topics about which you would like to learn more about how your students think? Record all suggestions.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>As a team, decide on one math focus for a new common math problem. What will be the focus? What will be the common problem?</p> <p>Focus:</p> <p>Common problem:</p> <p>_____</p> <p>_____</p> <p>What is the rationale for this particular problem? What are you hoping to learn about your students? Why did you choose the selected numbers?</p> <p>_____</p> <p>_____</p> <p>What are some various ways students may think about the problem(s)? What are some strategies they may use to solve the problem(s)?</p> <p>_____</p> <p>_____</p> <p>What other topics were discussed during the meeting?</p> <p>_____</p> <p>_____</p>

Figure 4. Weekly FACT meeting log (Week A).

Topics suggested, the common math problem, and the rationale for the common problem are all recorded on the second part of the log. Teachers work collaboratively to identify mathematics topics that are relevant to current or upcoming math instruction. Teachers may use district pacing guides, textbooks, or anything else to help them determine topics that are relevant. After all topics have been named and listed on the meeting log, the facilitator prompts the team to select one topic that will be the focus for the common math problem. If teachers struggle to determine a common math focus, the facilitator can ask probing questions to help stimulate ideas.

After the team determines the common math focus, the team determines the problem(s) that will be posed to students. Although some teachers do decide to pose more than one problem, the ideal is to pose one problem and no more than three. If the team decides to pose more than one, the facilitator may need to ask how the team plans to sort student work (e.g., will they sort each problem separately?).

Teachers may choose to select a problem from any resource, or they may decide to instead write an original problem. Sometimes teachers will talk aloud explaining the reasoning behind the problem(s) selected. The facilitator makes note of any conversations that teachers have regarding problem selection. If teachers have not already stated the reasoning behind the problem selection/creation, the facilitator asks the teachers to explain their reasoning for posing that problem. Sometimes teachers determine a common math focus and then select a problem that does not match the goal of that focus. In this case, the facilitator redirects the team back to their reasoning in selecting the common math focus.

If the team selects a problem from a resource, the facilitator may have to ask the team whether the numbers within the problem will lend themselves to a variety of student responses. Sometimes teachers prefer to create their own problem. When they do, readability and vocabulary should be considered so that all students have an opportunity to make sense of the problem. The team should decide together how the problem will be posed to students. For example, if the team decides to pose a two-digit addition problem, they should decide as a team whether everyone plans to present the problem to students horizontally or vertically.

As the teachers select or write a problem, they should discuss particular aspects of problem design (e.g., problem type, context, wording) and how it aligns with the learning goals for students and their current knowledge. Some groups may do so spontaneously, without prompting from the facilitator. Other groups may be reticent to discuss these elements, and the facilitator may need to ask probing questions to stimulate discussion and consideration of these features. For example, when a problem involves numbers, the numbers in the problem should be considered carefully with respect to the learning goal and student understanding.

The last task on the second part of the log is to anticipate the varied ways students might approach the problem and to record these anticipated strategies on the meeting log. As teams become more skilled at anticipating students' strategies, they use this part of the meeting to establish tentative categories for sorting the anticipated student responses. Some facilitators choose to record at this point the sorting categories established by teachers on the Summary of Student Strategies table found in Appendix I, which will be used to summarize students' responses in the next meeting. This form appears in Figure 5 and will be described in more detail with the description of Week B forms. As teachers consider the anticipated strategies, the facilitator may ask probing questions to help teachers think of ways that go beyond what has already been mentioned. If teachers only name misconceptions, the facilitator can ask probing questions that will engage teachers in thinking about all of the strategies students could use that would result in a correct answer.

Weekly FACT Meeting Log Summary of Student Strategies

School/Team:

Meeting Date:

Common Problem Given to Students:

Number of Students Using Each Strategy										
Teacher Name										
1.										
2.										
3.										
4.										
5.										
6.										
7.										
Totals										

Figure 5. Weekly FACT meeting log summary of student strategies.

Weekly FACT Meeting Teacher Summary Sheet

As the facilitator completes the top of the Summary of Student Strategies Table, teachers may also complete the top of the Weekly FACT Meeting Teacher Summary Sheet as shown in Figure 6. The teacher summary sheet also appears in Appendix J. Doing so ensures that both the facilitator and the teachers are aware of the sorting categories for the next week’s meeting. This summary sheet is strictly for teachers and will not be submitted to the facilitator. If teachers request it, the facilitator can e-mail the form to them so that student names can be entered and retained for the duration of the school year. This form is just one option for sorting student work, and teachers and/or teams may determine another way to classify student thinking.

Weekly FACT Meeting Teacher Summary Sheet

Problem(s) Given to Students: _____ Class _____
 Week of _____

Bring this summary of student strategy use with you to the next FACT meeting.

		Number of Students Using Each Strategy							
Student Name									
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
15.									
16.									
17.									
18.									
19.									
20.									
21.									
22.									
Totals									

As you sort your student work, consider the following:

1. What examples of student thinking or strategy use are surprising to you?
2. Are there any examples of student work you are unsure of and would like to discuss during our weekly FACT meeting?
3. Did you notice within a category of strategy use (e.g., direct modeling, counting, etc.) that there were different ways students approached the problem? Be ready to discuss these instances.
4. What are some patterns in student thinking that you noticed?

Figure 6. Weekly FACT meeting teacher summary sheet.

establish a teacher goal in addition to student learning goals. As time allows, the team generates instructional ideas for working on established goals.

Weekly FACT Meeting Log (Week B) Summary of Student Strategies

At the beginning of the meeting in Week B of the cycle, the facilitator asks each teacher to report the number of students who responded by each category. The facilitator records this information, tallies the numbers, and records the result at the bottom of the table as shown in Figure 7. The form also appears in Appendix I. If the teachers have encountered another category and want to include it, the facilitator can write the additional category at the top of the table and record numbers relevant to this category.

Weekly FACT Meeting Teacher and Student Learning Goals Table

Teachers record their student learning goals on the Weekly FACT Meeting Teacher and Student Learning Goals Table, as shown in Figure 8. The form also appears in Appendix L. Goals should be recorded on separate rows, and emphasis should be placed on relating student-learning goals directly to what was noticed about student thinking.

Date	Items noticed from student thinking on common problem	Student learning goal(s) or teacher goal(s) (Indicate whether goal is for students or teacher)

Figure 8. Weekly FACT Meeting Teacher and Student Learning Goals table.

Guidance for the FACT Meeting Facilitator

The primary role of the external facilitator is to guide teachers to adhere to the weekly FACT meeting protocol. The facilitator is therefore responsible for ensuring that all components of the protocol are met within the two-week cycle.

The facilitator must remember that some of the teachers meeting on a weekly basis are developing a basic understanding of analyzing student thinking to make instructional decisions and are just beginning to incorporate what they are learning into their instructional practice. The facilitator should keep a positive, nonjudgmental attitude about the teachers in their learning process.

The external facilitator's role does not include model teaching or assuming a math coaching role. When the teachers are also participating in professional development workshops or some other program in conjunction with the FACT meetings, the facilitator should feel free to engage in inquiry into how information learned during the professional development workshops can be useful in making sense of curriculum and student thinking and how it might be used to inform instruction along with the teachers, but the facilitator should not take the position as the expert in the group. Accordingly, the facilitator should refrain from setting an agenda to use the weekly meetings to teach concepts to teams of teachers.

The meeting environment should provide a safe environment designed to encourage teacher inquiry into the relations among mathematics, teaching, and student thinking. At times, the teachers may express frustrations, and they must feel comfortable expressing themselves freely. Nevertheless, the facilitator must also help the team remain positive toward each other and the work they are doing. If a situation arises in which the group is behaving nonproductively, the facilitator may use the norms established during the initial summer meeting to redirect the focus and culture of the group. Any concerns or issues that a team expresses during the meeting should be kept confidential and should not be shared with anyone outside the group.

Communication with Team

The facilitator scans the meeting logs each week and e-mails them to the corresponding team members, including any absent members, within 24 hours of the meeting. Principals are copied on e-mails containing the scanned copies of the meeting log. In part because of concerns about security of student data, the summary tables used during the weekly meeting are not e-mailed to teachers or to the principal. Whether they would like to share their own personal Teacher Summary Sheets with their administrators is left to the discretion of the individual teachers.

Facilitator's Guiding Questions

At times, guiding questions from the facilitator may help to encourage conversation and collaboration within the weekly meeting. Below are some sample questions for each week of the cycle that can be used to help guide teachers in their discussions.

Examples of questions to consider using during Week A of the cycle

Part 1 of the Week A Meeting Log

- Were you able to make progress toward your goal within the last week?
 - What are some examples of instruction that helped you make progress towards your goal? What didn't work?
 - What did not notice about your students' thinking as a result of differentiating your instruction?

Part 2 of the Week B Meeting Log

- What topic do you think would be a good focus in the coming week (e.g., word problems, computation, equality)?
- Would more work on the same mathematical focus be worthwhile, or would moving on to a new topic be more beneficial?
- What is your reasoning for selecting this focus topic?
- What mathematics problem (or task) will provide the best opportunities to advance student understanding of mathematics and provide you with insight into student thinking?
 - What problem and numbers should we use to provide opportunities for all of the students in the class to advance their understanding of mathematics and make their thinking visible?
 - What do you want to learn about your students by posing this problem?
 - What data do you want to gather about student thinking through this problem?
- What is the reason for selecting these particular numbers?
- How will these numbers provide an opportunity for use of a variety of strategies by students?
- What are some strategies students may use to solve this problem?
 - How will you respond if the students struggle to get started on this problem?
 - What questions will you ask your students as they are solving this problem?
 - What are some ways you can help students record their thinking and strategies when they work out the problems mentally or by counting?

Examples of questions to consider using during Week B of the cycle

Part 1 of the Week B Meeting Log

- What patterns do you notice in how students solved the problem?
 - Why do you think most of the students "direct modeled"?
 - Why do you think most of the students used the same strategy?
 - Do you think the numbers selected gave students an opportunity to solve the problem in different ways?
 - How could the problem have been rewritten to provide an opportunity for a variety of strategies?
- What examples of student thinking or strategy use are surprising to you?
- Why did it surprise you that [student name] used facts in that way to solve the problem?
- Would you like to discuss any particularly puzzling or interesting examples of student work?
- Which strategies were difficult to fit into the framework?

- What is it about this student's work that makes it difficult to name the strategy used?
- Did you notice within a category of strategy use (e.g., direct modeling, counting) that students approached the problem in different ways?

Part 2 of the Week B Meeting Log

- What did you notice about your students' thinking?
- Are some strategies used by all students?
- What would you like to see this group of students do next? What are some ideas on how to move these students forward?

Scheduling Meetings

At the beginning of the weekly meetings, teachers are given the opportunity to provide input on the meeting dates for the school year. After the meeting dates are scheduled, the facilitator provides each team member with a printed list of the scheduled meetings for the year.

If a meeting must be rescheduled, the facilitator sends an e-mail to each teacher on the team and copies the principal.

Inevitably the facilitator will sometimes be unavailable to meet with a team during the team's regularly scheduled meeting time. If the facilitator's absence can be predicted, the facilitator should attempt to reschedule the meeting to another day within the same week. If the team cannot agree upon an alternate meeting time for the week, then the facilitator should ask someone from the team to assume the role of note-taker and facilitator for that week's meeting.

If a regularly scheduled meeting falls on a school holiday or a school event that interferes with the team's meeting, the facilitator should make every effort to reschedule the meeting for another day within the same week. Teachers will not be expected to maintain the scheduled FACT meetings during the week of Thanksgiving or the week students are dismissed for winter or spring break.

Reflecting and Monitoring Progress

Facilitator's Reflections

Each week, the facilitator writes a short reflection from his or her perspective about the weekly meeting. A template of suggested questions appears in Appendix M. This practice can help guide facilitators to make adjustments each week in their efforts to help guide teachers forward.

Midyear Survey

In late December or early January, the facilitator uses the reflection found in Appendix N for each team. This midyear reflection can help guide facilitators to make adjustments that could provide more opportunities for functionality and growth within each team.

Exit Interview

At the end of the school year, after the last weekly team meeting, the facilitator meets with the team one last time and interviews the teachers using the questions found in the Exit Interview. Found in

Appendix O, this interview asks questions of the team members that provide insight into what they found particularly helpful or unhelpful each week. This interview can help provide guidance on how to approach certain teams the following year or how to make adjustments to the weekly meetings.

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What is Formative Assessment?

By Robert C. Schoen and Charity Bauduin

Formative assessment is a *process*. In the formative assessment process, teachers elicit information from students in an effort to gain insight into their understanding with respect to a learning goal. Students may be expected to complete tasks and explain their thinking to the teacher or to their peers as part of this process. In formative assessment, teachers assess student understanding and provide feedback, and students engage in self-assessment or peer assessment. The insight teachers gain through the process guides their day-to-day and minute-to-minute instructional decisions. This reaction to the information gathered in the process is what makes the assessment formative. Figure 1 shows the basic formative assessment process.

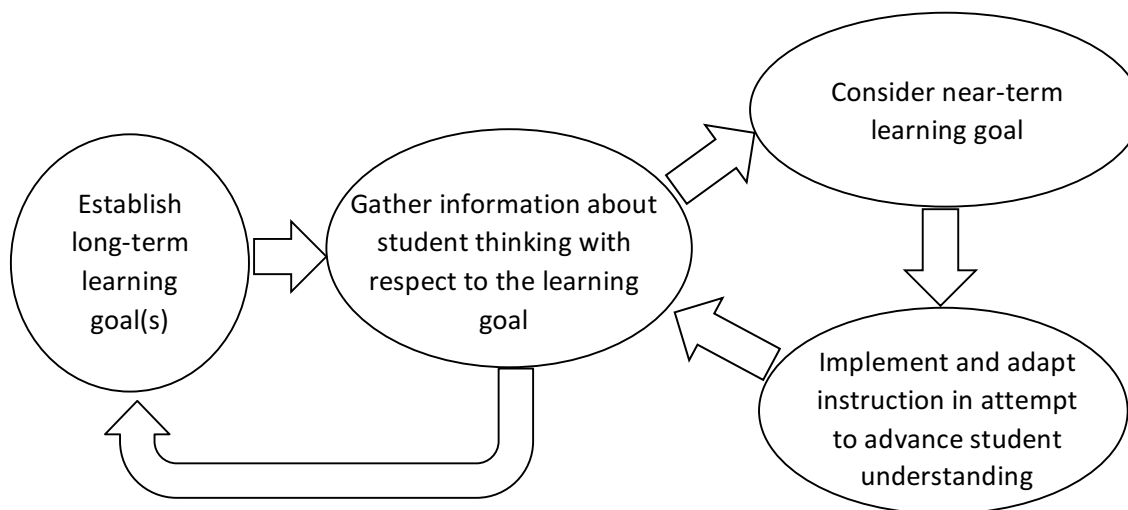


Figure 1. Formative assessment process.

Formative assessment has been said to be an assessment *for* learning as opposed to being an assessment *of* learning (Stobart & Gipps, 1997). Assessments *of* learning focus on finding out how much a student knows or has learned—usually after instruction has occurred. Assessments *for* learning focus on finding out what a student knows or can do in order to provide information to the teacher and/or learner to guide their decisions about what to do next to advance the student’s understanding further. In this sense, formative assessment is a process, not a test. It is something you do, not something you give.

Formative assessment should

- provide timely information to the teacher so that adjustments can be made to the instructional plan to meet the learning needs of individual students in a class
- focus on thinking and communications processes rather than on whether answers are correct or incorrect
- help teachers determine next steps in instruction
- be naturally embedded within learning activities

Formative assessment can

- occur before, during, or after the planned instruction
- involve informal observations and/or formal data collection
- focus on a single mathematical idea, skill, or process
- involve a short task or be situated within a larger problem or set of problems

Weekly FACT Meeting Process

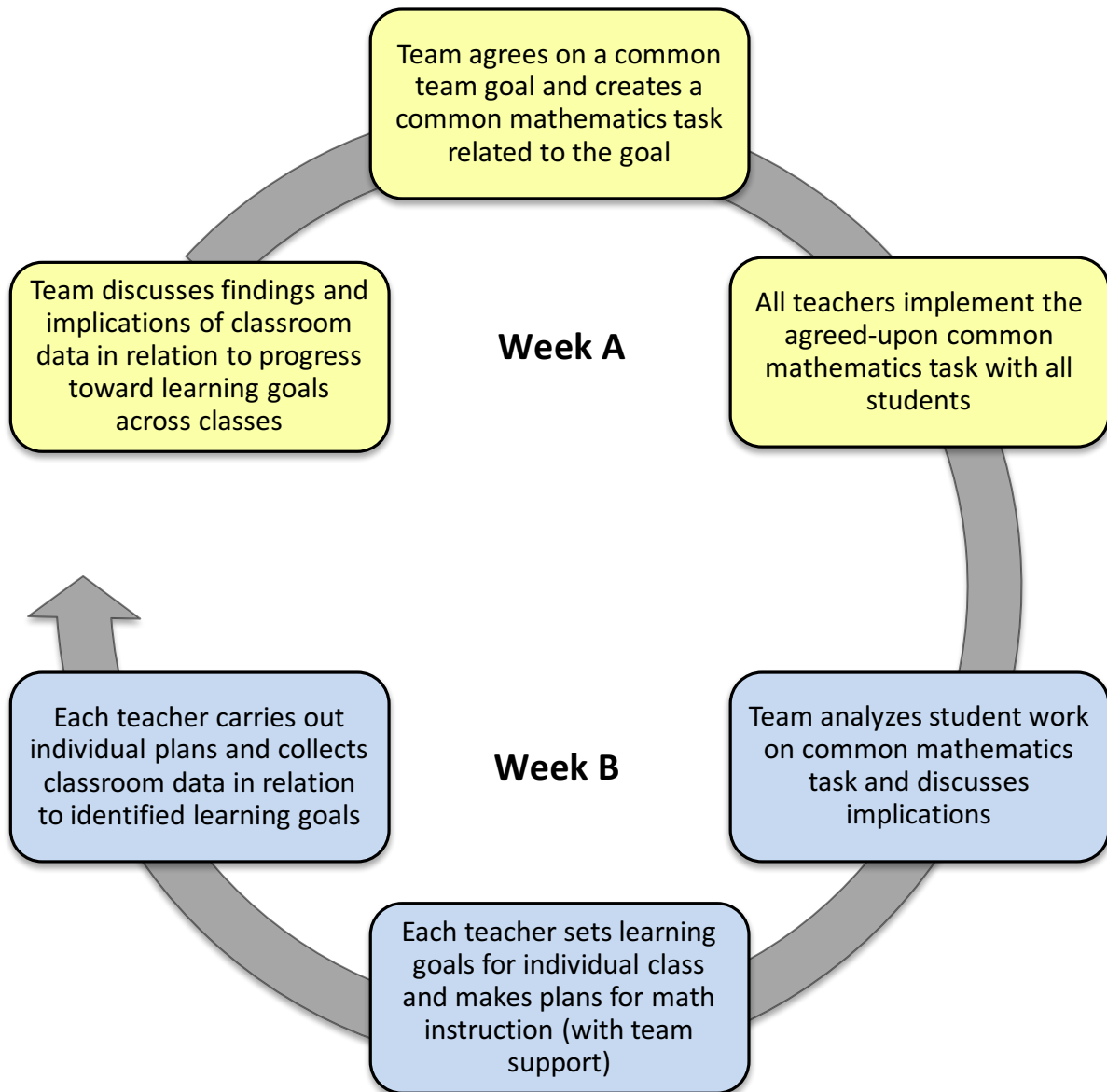


Figure 2. Weekly FACT meeting process.

Weekly FACT Meeting Protocol

Overarching Goal: All team members will engage in extended inquiry by attending to the details in student thinking and continually searching for and experimenting with ways to improve instruction to meet the needs of all learners in mathematics.

Expectations

- Teams will meet each week at the designated day, time, and place.
- All team members will bring agreed-upon materials (e.g., pacing guides, student work, Cognitively Guided Instruction (CGI) binder, and CGI books) to weekly meetings.
- Attendees will be prompt.
- The group will agree to dedicate the allocated weekly meeting time solely to the activities of attending to the details of students' mathematical thinking, formulating mathematics learning goals, and planning to address the instructional needs of students.

Social Norms

Meeting Log

A record of the discussion will be captured each week on the meeting log form. These log sheets will be kept in a binder. The facilitator will begin the school year taking notes and completing the meeting log. After a few weeks, however, the duty of completing the log could transfer to a member of the team, and the group may decide whether to rotate this role or keep it with the same person every week. The facilitator will scan the meeting log and send copies to all members of the team within 24 hours of the meeting.

Goal Setting

Every two weeks, each team member will establish one or more student learning goals based on evidence of student thinking. Each member will also have opportunities to establish a teacher professional goal. Goals will be kept in each team member's binder, and each teacher will be responsible for deciding how to collect classroom data related to the established goals.

Weekly FACT Meeting Process

Week A

During Weekly FACT Meeting

With your team

1. Share one positive moment or success story about mathematics instruction for the week.
2. Reflect on the effectiveness of the previous week's instructional plan and its impact on students.
3. Determine the math concept that will provide the focus for the next week's common problem.
4. Select or create a math problem that will provide you an opportunity to learn about your students' thinking with respect to the identified math focus. Select numbers that support the learning goal or will provide the desired insight into student thinking.
5. Anticipate the various ways that students may think about the common problem and strategies that they may use to solve it. Spend extra time trying to predict unexpected or insightful strategies and discuss how particular strategies might be used to advance student thinking.

After Weekly FACT Meeting

While implementing the common math problem with your students

1. Express to students the expectation that they grapple with the problem as problem solvers, using strategies that they select or invent on their own.
2. Ask clarifying questions that will simultaneously help you to understand the details of a given student's thinking processes and provide the student with practice communicating his or her thinking.
3. Encourage the students to write or verbalize their thinking, even when the strategy is mental or counting (e.g., write the numbers counted on the paper).
4. Encourage students to engage with one another's ideas as a means to increase their understanding of the mathematics. This process may include trying to understand more advanced or sophisticated strategies or trying to draw connections between different strategies.

After students solve the math problem and before meeting with your team during Week B

1. Sort student work on the basis of common thinking expressed by students or common strategies used to solve the problem. Analyze the distribution of students.
2. Earmark particular pieces of student work that you found especially interesting or puzzling so you can discuss them with your team.

Week B

During the Weekly FACT Meeting

With your team

1. Share one positive moment or success story about mathematics instruction for the week.
2. Discuss the details of student thinking and strategies used by your class.
 - a. Share summary data on student thinking or strategies used by students in your class, and compile team data on the Weekly FACT Meeting Log.
 - b. Discuss patterns of student thinking and strategy use within and across classes, and examine student work that team members found especially interesting or puzzling.
3. Plan instruction to assist students in advancing their mathematical understanding.
 - a. Write individual goals (for you and your class) for the coming week. Include a learning goal for students and an instructional goal specifying a classroom strategy on which you would like to focus.
 - b. Generate strategies that might be used to support student learning.

After Weekly FACT Meeting

1. Implement the instructional plan outlined in the previous weekly FACT meeting.
2. Collect and analyze classroom data in relation to the identified goals, and prepare to share your data and observations with the team.

Beginning-of-the-year Meeting Outline

Meeting 1 (after initial summer meeting): Please proceed in the order listed. You will also need a copy of the Meeting 1 Attendance and Agenda, which will replace the Meeting Log for this week only.

- **Weekly Meeting Process:** Distribute the *Weekly FACT Meeting Process Diagram* handout to each team member. Go through the entire process with the team members and answer any questions that may arise.
- **Weekly Meeting Protocol:** Distribute the *Weekly FACT Meeting Protocol* handout to each team member. Have teachers read the overarching goal and expectations silently. After everyone has read, emphasize that each week team members should be bringing their binders or books from the professional development workshops (when applicable), pacing guides, student work (when applicable), and anything else that they feel would be needed to plan common problems. Afterward, answer any questions that arise. Then, move onto *Establish Social Norms*. You will come back to the protocol.
- **Establish Social Norms:** Distribute the *Establishing Social Norms* handout. Have available the *Sample Social Norms* handout but recollect them after norms have been established so that the same copies can be used at each meeting. Teachers will select/create their own social norms. Teachers will record the norms on their own copies of the *Weekly FACT Meeting Protocol*.
- **Weekly Meeting Protocol:** Continue with reading about meeting logs and goal setting on the protocol. Then move on to the second page and read with teachers the steps in the protocol. Refer to the diagram as necessary to reinforce where the step in the protocol is in relation to the process.
- **Proposed Weekly Meeting Dates:** Distribute the *Proposed Weekly Meeting Dates* handout. Have teachers read through the dates. Have any conversations necessary about locations, times, any meetings that may need to be rescheduled, etc. Also discuss the expectation that, if any problem arises in the future, teachers will contact the facilitator before the meeting day if at all possible and make clear that any cancelled meetings must be made up. If you are willing, you may decide to give teachers your phone number so that they can reach you in the event of emergencies, but that is at your discretion. This would also be a good time to discuss what should happen if an individual must miss a meeting and the expectation that that teacher still provide his or her results on the common problem, or a short report on the progress toward goals, either by giving them to another team member or by e-mailing the facilitator before the meeting.
- **Homework Assignment:** Ask teachers to bring their student work from the common problem to the next meeting.

Handouts That Should Be Available for Distribution to Every Teacher (Teachers should put all handouts in their binders except the Sample Social Norms):

- *Establishing Social Norms*
- *Sample Social Norms*
- *Weekly FACT Meeting Protocol*
- *Weekly FACT Meeting Process Diagram*
- Proposed Weekly FACT Meeting Dates

Meeting 2: (Complete the first part of the Week B meeting log)

- **Short Overview of Formative Assessment:** Distribute the *Overview of Formative Assessment* handout to teachers. They should put this handout in their binders. Have teachers read the handout silently. Afterward, have teachers share one or two points they want to remember.
- **Relating Our Process to Formative Assessment:** Have teachers refer to the diagrams that were distributed at Meeting 1. Review our meeting process and how it is related to formative assessment. Answer any questions that may arise.
- **Sort Student Work from First Common Problem:** Teachers were asked at the end of the previous meeting to bring their students' work. Ask teachers to take about 10 minutes to sort the student work into groups of common strategies or ways of thinking about the problem. Ask them to hold any questions until everyone has had a chance to sort their work. Once teachers have sorted their student work, open the floor to discussion of any pieces of student work that were particularly difficult to categorize. Encourage teachers to help one another make sense of the troublesome items. Once the activity is complete, inform teachers that, generally speaking, all student work will be sorted on their own before the weekly meeting and that they should collaborate as needed outside of the meeting if they are unsure of how to categorize an item. You may want to provide paper clips in case teachers want to keep their sorted student work in the groups they made during the sorting portion of the activity.
- **Homework Assignment:** Ask teachers to think of how they sorted their student work. Before the next meeting, brainstorm several student goals related to the groups created from sorting the student work. Also, brainstorm any teacher professional goals they may want to identify at this time.

Handout That Should Be Available for Distribution to Every Teacher:

- *Overview of Formative Assessment* handout

Meeting 3: (Complete the Second part of the Week B meeting log...a new copy of the log)

- **Overview of Setting Goals:** Distribute the *Setting Goals* handout. Read and discuss the material on the handout. Answer any questions that may arise.
- **Relate Setting Student Goals (Instructional) to using Formative Assessment:** Have teachers refer to the *Overview of Formative Assessment* handout that was distributed at

Meeting 2. Review the process of formative assessment and why setting goals is important. Answer any questions that may arise.

- **Review Our Meeting Process:** Have teachers refer to the diagrams that were distributed at Meeting 1. Review our meeting process and where setting goals is in relation to our process. Answer any questions that may arise.
- **Determine Goals for Common Problem:** Distribute the *Teacher and Student Learning Goals* handout. Ask teachers to refer to the brainstormed list of goals that they generated as homework. Have teachers set 1–2 student (instructional) goals for the upcoming week(s) on the basis of how students responded on the previous problem. If teachers also want to set personal teaching/classroom goals, that is great. Have teachers record their goals on the *Teacher and Student Learning Goals* handout.
- **Goal Sharing:** Have teachers share their goals. Encourage them to brainstorm ideas on how to make progress toward these goals within their classrooms.
- **Housekeeping:**
 - Explain the two-week cycle of meetings that will begin with Meeting 4.
 - If time permits, encourage teachers to share ideas about logistics within their classrooms to work on goals.
 - Homework Assignment: Work on set goals. Be ready to report strategies used to make progress towards goals. Also, bring ideas to the next meeting on where you will be instructionally within the next 2–3 weeks so that a new problem can be chosen/created at the next meeting.

Handout That Should Be Available for Distribution to Every Teacher:

- *Weekly FACT Meeting Teacher and Student Learning Goals Table*

Meeting 4: (Complete Week A Meeting Log)

- Complete entire protocol for Week A

Meeting 5: (Complete Week B Meeting Log)

- Complete entire protocol for Week B

Weekly FACT Meeting 1

School/Team: _____ Date: _____

Start Time: _____ End Time: _____

In attendance (please sign first and last names.):

_____	_____	_____	_____
_____	_____	_____	_____

Agenda:

- **Weekly FACT Meeting Process**
- **Weekly FACT Meeting Protocol**
- **Establish Social Norms**
- **Proposed Weekly Meeting Dates**
- **Homework Assignment**

Group Norms Examples

We will encourage the contributions of every member.

We will strive to create a collegial and friendly atmosphere.

We will keep our discussions, comments, and deliberations confidential.

We will place cell phones on silent.

We will respect others and their contributions.

We will be present both physically and mentally and be active participants in discussions.

We will listen and not interrupt.

We will speak respectfully toward each other.

We will bring before the whole all group concerns regarding our group.

We will listen respectfully and consider matters from another's perspective.

We will use our time wisely.

We will strive to maintain a positive tone at our meetings.

We will share the responsibility of bringing absent members up to date.

We will each notify the team in advance of any foreseen absences.

Norms Related to Student Thinking

We will not assume that we know what students understand until we watch them solve problems in their own way and ask questions about their thinking.

We will attend to the details in student thinking and use these to help us determine the best ways to help children learn.

We will strive to build student understanding through encouraging them to make connections between mathematical ideas.

We will pose problems with multiple entry points so that all of the children can participate in learning through problem solving and communicating their ideas with their classmates.

We will let student thinking be our guide in determining the next steps in instruction.

Weekly FACT Meeting Log (Week A)

School/Team: _____ Date: _____ Note Taker: _____

Start Time: _____ End Time: _____

In attendance (please sign first and last names.):

_____	_____	_____	_____
_____	_____	_____	_____

Part 1: Strategies and Progress Toward Previously Set Goals

What strategies have you used since we last met to support student progress on established learning goals, and what were the outcomes? What progress have you made on established teacher goals?

Part 2: Determine a New Common Problem and Anticipate Student Thinking

Think about what you have learned so far about your students' thinking and where you will be instructionally within the next 2–3 weeks. What are some topics about which you would like to learn more about how your students think? Record all suggestions.

As a team, decide on one math focus for a new common math problem. What will be the focus? What will be the common problem?

Focus:

Common problem:

What is the rationale for this particular problem? What are you hoping to learn about your students? Why did you choose the selected numbers?

What are some various ways students may think about the problem(s)? What are some strategies they may use to solve the problem(s)?

What other topics were discussed during the meeting?

Weekly FACT Meeting Log Summary of Student Strategies

School/Team:

Meeting Date:

Common Problem Given to Students:

Number of students using each strategy									
Teacher name									
1.									
2.									
3.									
4.									
5.									
6.									
7.									
Totals									

Weekly FACT Meeting Teacher Summary Sheet

Problem(s) Given to Students:

Class _____

Week of _____

Bring this summary of student strategy use with you to the next FACT meeting.

Number of students using each strategy									
Student name									
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
15.									
16.									
17.									
18.									
19.									
20.									
21.									
22.									
Totals									

Weekly FACT Meeting Log (Week B)

School/Team: _____ Date: _____ Note Taker: _____

Start Time: _____ End Time: _____

In attendance (please sign first and last names.):

Part 1: Analyzing Student Thinking

What was the common problem or problems given to students?

What did you learn about your students' mathematical thinking through implementation and analysis of the common problem? (Include patterns of student thinking, strategies used, and interesting or puzzling work.)

What questions do you have?

Part 2: Setting Goals

On the basis of your analysis of student thinking on the common problem(s), what are some learning goals for your students? What strategies might be used to work on identified student learning goals?

Do you have any teacher goals at this time that are related to what you are learning through analyzing your students' mathematical thinking? What strategies might be used to work on identified teacher learning goals?

What other topics were discussed during the meeting?

Weekly FACT Meeting Teacher and Student Learning Goals

Date	Items noticed from student thinking on common problem	Student learning goal(s) or teacher goal(s) (Indicate whether goal is for students or teacher)

Date	Items noticed from student thinking on common problem	Student learning goal(s) or teacher goal(s) (Indicate whether goal is for students or teacher)

Facilitator's Reflections—Team Name
Date

1. Week of the Process:
2. How long did the team spend on Part 1 of the log?
3. How long did the team spend on Part 2 of the log?
4. What went particularly well during the meeting?
5. How did the group function together as a team?
6. How were decisions made during the meeting?
7. What concerns, if any, do you have about the team this week?

Group:

Facilitator:

Date:

Please respond to each of these prompts for each group you are working with this year. Be as concise as you can without sacrificing important information. Two single-spaced pages per group would be fine, but do not treat that as a limit if you have more to write. Don't feel you need to spend days on this task. Just record the most salient thoughts, reflections, and memories at this time.

- (A) **Tell a story about this group that stands out in your mind.** Explain how this story taught you an important lesson about your role as a facilitator of weekly meetings or about the learning process for teachers. If the story that stands out in your mind, but you don't yet know what lesson to take from it, it is fine to write that too.
- (B) The goal of the meetings is to support teachers by creating time and space for them to engage in long-term inquiry that supports their ongoing learning and improvement of instruction. **How is this group using things they learned in the CGI workshops in their teaching practice, and how has this use evolved over the past four months?** (Note. Teaching practice is used in the inclusive sense. It includes planning and reflecting as well as the time when teachers are interacting with students.)
- (C) We are trying to support the process and have teachers decide the direction and focus. What guidance do these teachers ask you to give them, and how has that changed (or not changed) over time?
- (D) Apart from the omnipresent pressure of not having sufficient time, **what barriers do you see as a hindrance to these teachers' learning?** Please explain the barriers you identify.
- (E) **What support do you feel is needed from school leadership** to increase learning opportunities for teachers and effectiveness of the meetings?

Questions to Discuss in the Team Exit Interviews

- (1) How is math class different this year than previous years? What do you want to do differently next year?

- (2) How have the weekly meetings changed your instructional practice this year?

- (3) What do we need to know or do to make weekly meetings more effective?

- (4) If a teacher is thinking about whether to participate in weekly team meetings, what does he or she need to know in order to make an informed decision?

- (5) What do principals need to know about this program? What do they need to know in order to support teachers in the program?