



ONGOING ASSESSMENT PROJECT

Additive Reasoning Professional Development Overview

About the Ongoing Assessment Project (OGAP)

The Ongoing Assessment Project (OGAP) is a systematic and intentional formative assessment system in mathematics based on mathematics education research on how students learn specific concepts, common errors students make, and preconceptions or misconceptions that may interfere with learning new concepts or solving related problems.

The system involves using OGAP knowledge and the OGAP Frameworks/learning progressions to:

- 1) Gather evidence about pre-existing knowledge through the use of a pre-assessment;
- 2) Analyze the pre-assessment to guide unit planning; and
- 3) Implement a continuous and intentional system of instruction, probing with instructionally embedded questions, and analysis of evidence in student work to make timely instructional modifications.

Implementing the OGAP formative assessment system requires a commitment by teachers, teacher leaders, and administrators:

- a) To deepen professional development on related content, related math education research, and OGAP tools and strategies for gathering evidence from student work and making instructional decisions.
- b) To support and implement the ongoing nature of OGAP. For OGAP to have sustaining power districts/schools should provide teachers and teacher leaders time (e.g., regular PLC) to meet regularly to discuss evidence in student work, instructional implications, and implementation issues as they arise.
- c) To implement OGAP school wide. For example, it is strongly recommended that *all* teachers who teach mathematics (classroom teachers, special educators and interventionists), within grades 3-6 receive the professional development and ongoing support for fractions.

Evidence from OGAP work with hundreds of OGAP teachers has shown that utilizing the knowledge from the professional development is *only* solidified as teachers use this knowledge with students and that seems to happen best when teachers are supported on an ongoing basis through a system like PLCs.

IMPORTANT: *If asked to do OGAP professional development in a school or district, please secure a commitment to a system of ongoing support.*

OGAP Additive Reasoning Professional Development Overview

OGAP Additive Reasoning professional development consists of 12 sessions. These sessions are organized around content, mathematics education research, and evidence in student work and instructional decision-making using formative assessment and learning progressions.

Foundational Concepts – Content and Research

Number Sense

Counting

Subitizing

Number
Composition

Number Lines

Equality and
Properties

Operations and Fluency – Content and Research

Addition

Subtraction

Basic Fact
Fluency

Supporting Sessions and Strategies

CCSSM

Problem Posing

Item Bank

**Formative Assessment and Learning
Progressions Embedded Throughout**

OGAP Additive Reasoning Sessions
Session 1: What is number sense?
Session 2: Counting
Session 3: Subitizing
Session 4: Number Composition
Session 5: Number Lines
Session 6: Addition
Session 7: Subtraction
Session 8: CCSSM and Addition and Subtraction
Session 9: Problem Posing
Session 10: Equality and Properties
Session 11: Basic Fact Fluency
Session 12: Item Bank

Summary of the OGAP Additive Sessions

There are 12 sessions. A short description of the sessions is in the chart below.

An exploration of the item bank is embedded into most sessions. The sessions that include exploration of the item bank are indicated in the chart by an *. This means that teachers will need to have Internet access throughout the training.

You will notice that student work and video are bolded so it is easy to see any session that has student work or video as a part of the session.

Session	Title	Description	Length of Time
1	What is Number Sense?	In this session participants will determine characteristics of additive reasoning and begin to interact with the OGAP Additive Framework. They will also participate in a poster activity to deepen understanding of some of the fundamental number concepts related to number sense and additive reasoning. The session also includes a student work sort.	2 hrs 30 min
2	Counting*	In this session participants will begin by engaging in a short warm-up to help them understand how we use counting in our everyday adult lives. They will learn about an instructional strategy called counting collections by watching, discussing video , reading an article, and sorting student work for the purpose of grouping for instruction. They will plan for integrating Counting Collections in their classrooms. Participants will also examine the OGAP Additive Framework to determine the role counting plays in additive reasoning. They will also examine the Counting sections in the OGAP Additive Item Bank.	3 hours
3	Subitizing	In this session participants will build on their understanding of subitizing in Session 1. They will see the role perceptual and conceptual subitizing using quick images plays in the development of a variety of math concepts. They will learn how to use subitizing with students and at the end of the session they will make a subitizing card to use in their	40 min

		classrooms. This is the main session on subitizing but session 4 begins with more quick images extended to base ten understanding and linked to the OGAP Additive Framework.	
4	Number Composition*	This session begins with a short conceptual subitizing activity with a focus on unitizing and base ten understanding. Participants will watch a video where a Kindergarten teacher is conducting a number talk using subitizing. The session continues with a focus on unitizing and base ten understanding. Participants will watch a second video and sort student work related to base ten understanding. They will look at the Number Progression and the addition and subtraction progression for application of number concepts. Finally participants will examine the Base Ten/Place Value section of the item bank.	2hrs 15 min
5	Number Lines*	In this session participants will make a concrete number line with string and beads and use it to develop understanding of attributes of number lines and develop base ten understanding. They will link the varying number line models together and examine the Number Line Progression for the number line expectations at each grade level with regards to number lines. Two sets of student work will be analyzed in this session. Finally, participants will examine the item bank for number line tasks and select a task to use with their students.	2 hrs 10 min
6	Addition*	In this session participants begin this session by analyzing a set of student work . They write story problems to match equations and then match their story problems to the Common Addition and Subtraction Table on the front of the OGAP Framework. They will examine the item bank for addition and subtraction situations and learn about problem structures to consider when selecting tasks. Finally they will examine addition strategies and analyze another set of student work.	2 hrs 15 min
7	Subtraction	In this session participants will use a variety of strategies for solving mental subtraction problems. They will examine the subtraction progression and use it to sort and analyze student work . They will participate in an activity designed to make them more aware of what the research says about teaching and learning subtraction. Finally, they will examine a number of strategies	2 hrs 30 min

		used by students to solve a subtraction problem, linking the strategies to each other and considering the efficacy of each strategy.	
8	CCSSM and Operations	Participants will examine the CCSSM for expectations related to operations of addition and subtraction with a focus on fluency and strategies.	45 min
9	Problem Posing	In this session participants will participate learn about the limitations of using a keywords approach to solving word problems. In this session participants will engage in a strategy to help students solve word problems. The strategy is adapted from researched- based literacy strategies.	30 min
10	Equality and Properties*	In this session participants will solve some balance tasks focusing on equality and consider the challenges and importance of deep understanding of the equal sign. They will examine student work. Participants will watch and discuss a video related to equality and examine the section of the item bank related to concepts and properties. They will also sort a set of student work .	2 hrs 15 min
11	Basic Fact Fluency	<p>In this session participants will make number fans to use as one tool for fact fluency. Participants will learn about the difference between fact fluency and automaticity and look at expectations in the CCSSM related to recall of basic math facts. Finally they will learn about different kinds of fact practice and ideas for both kinds.</p> <p>This session can be done in parts if desired. The games can be played throughout the training and referred to when doing part C of this session.</p> <p>The Number Fan Activity can be shortened by having participants make the number fan as they arrive in the morning of the last day, and then learn how to use it during this session.</p>	1 hr 30 min
12	Item Bank	<p>In this session participants will learn about using items from the OGAP Additive Item Bank and what it means to use the items through a short presentation.</p> <p>This session is intended to be done before the first time participants go in to explore a section of the item bank. In the training, the first time they explore</p>	15 min

		<p>the item bank is planned to happen at the end of session 2. After that, many sessions end with an exploration of a related section of the item bank.</p> <p>This session has been left as a stand-alone session in case participants do not have access to the Internet throughout the training or as a facilitator you choose to have participants examine the item bank in one session as opposed to within a number of sessions.</p>	
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There are some supplies you need to bring with you and some materials you should make ahead for demonstration purposes. See the list below.

Supplies to bring with you: small clothespins (2 per teacher), 3' lacing string (1 per teacher), single hole punches (if you have some the more there are the better).

Materials to make ahead: Tens frame to cut into tens strip (session 3), Subitizing card (session 3), 1 set of arrow cards (session 4), a bead number line (session 5), empty number line from 1-10 (session 5), a number path made from the hundred grid (session 5), Number Fan (session 11).

OGAP Professional Development Instructional Strategies: These professional development materials utilize a range of instructional strategies designed to engage all participants *in thinking about* the important aspects of the workshops. Strategies such as:

- a. **Think, Pair, Share:** “The Think-Pair-Share strategy is designed to differentiate instruction by providing students time and structure for thinking on a given topic, enabling them to formulate individual ideas and share these ideas with a peer. This learning strategy promotes classroom participation by encouraging a high degree of pupil response, rather than using a basic recitation method in which a teacher poses a question and one student offers a response. Additionally, this strategy provides an opportunity for all students to share their thinking with at least one other student which, in turn, increases their sense of involvement in classroom learning. Think-Pair-Share can also be used as an information assessment tool; as students discuss their ideas, the teacher can circulate and listen to the conversations taking place and respond accordingly.” <http://www.readwritethink.org/professional-development/strategy-guides/using-think-pair-share-30626.html> The think, pair, share strategy is used throughout OGAP training.
- b. **Group work:** We suggest that participants be in groups of not more than 3 or 4 people for the most effective use of group work.
- c. **Questioning:** Questioning is used throughout all OGAP sessions as a strategy to deepen understanding of targeted concepts and ideas. In some cases probing questions are provided. However, facilitators should not limit themselves to those questions provided if opportunities arise.

- d. **Sharing Solutions:** The point of sharing solutions is to help deepen understanding of a concept. The point is NOT to give participants an opportunity to participate. For this strategy to be effective the facilitator must carefully select solutions to share with the mathematical goal in mind. See Session 1 Facilitator Notes, page 4 of the for an example.
- e. **Poster Sessions:** The point of poster sessions is to get *all* participants to think deeply about an idea or concept. We have found that the depth of discussion and thought increases when participants have to commit their ideas to a public poster. In addition, poster sessions are designed to synthesize ideas and concepts. See Session 3 Facilitator Notes, page 9 for one example of how to debrief a poster session.
- f. **Problem Solving:** Many of the sessions start with a set of problems or a single problem for the sole purpose of engaging participants in the mathematical ideas related to the session. Examples include: Sessions 1, 4, 6, 9, 10, 11, 12, 13, and 14. Providing participants ample time to engage in the problems, activity, or sets of problems in these sessions is critical.
- g. **Formative assessment:** Every session is designed to help the facilitator gather evidence about participant learning to guide their facilitation: a) listening and observing during individual work; b) listening and observing group discussions; c) analysis of posters as they are developed and discussed; d) Full group discussion; and, e) embedding problems into instruction as needed as entry or exit cards.