

## How to Assess Progress

The materials contain many opportunities and tools for both formative and summative assessment. Some things are purely formative, but the tools that can be used for summative assessment can also be used formatively.

- Each unit begins with a diagnostic assessment (“Check Your Readiness”) of concepts and skills that are prerequisite to the unit as well as a few items that assess what students already know of the key contexts and concepts that will be addressed by the unit.
- Each instructional task is accompanied by commentary about expected student responses and potential misconceptions so that teachers can adjust their instruction depending on what students are doing in response to the task. Often there are suggested questions to help teachers better understand students’ thinking.
- Each lesson includes a cool-down (analogous to an exit slip or exit ticket) to assess whether students understood the work of that day’s lesson. Teachers may use this as a formative assessment to provide feedback or to plan further instruction.
- A set of cumulative practice problems is provided for each lesson that can be used for homework or in-class practice. The teacher can choose to collect and grade these or simply provide feedback to students.
- Each unit includes an end-of-unit written assessment that is intended for students to complete individually to assess what they have learned at the conclusion of the unit. Longer units also include a mid-unit assessment. The mid-unit assessment states which lesson in the middle of the unit it is designed to follow.

## Pre Unit Diagnostic Assessments

At the start of each unit is a pre-unit diagnostic assessment that is titled *Check Your Readiness*. These assessments vary in length. Most of the problems address prerequisite concepts and skills for the unit. Teachers can use these problems to identify students with particular below-grade needs, or topics to carefully address during the unit. *Check Your Readiness* also may include problems that assess what students already know of the upcoming unit's key ideas, which teachers can use to pace or tune instruction; in rare cases, this may signal the opportunity to move more quickly through a topic to optimize instructional time.

*What if a large number of students can't do the same pre-unit assessment problem?* Teachers are encouraged to address below-grade skills while continuing to work through the on-grade tasks and concepts of each unit, instead of abandoning the current work in favor of material that only addresses below-grade skills. Look for opportunities within the upcoming unit where the target skill could be addressed in context. For example, an upcoming activity might require solving an equation in one variable. Some strategies might include:

- ask a student who can do the skill to present their method
- add additional questions to the warm-up with the purpose of revisiting the skill
- add to the activity launch a few related equations to solve, before students need to solve an equation while working on the activity
- pause the class while working on the activity to focus on the portion that requires solving an equation

Then, attend carefully to students as they work through the activity. If difficulty persists, add more opportunities to practice the skill, by adapting tasks or practice problems.

*What if all students do really well on Check Your Readiness?* That means they are ready for the work ahead, and special attention doesn't likely need to be paid to below-grade skills.

## Cool-Downs

Each lesson includes a cool-down (also known as an exit slip or exit ticket) to be given to students at the end of the lesson. This activity serves as a brief checkpoint to determine whether students understood the main concepts of that lesson. Teachers can use this as a formative assessment to plan further instruction.

*What if the feedback from a cool-down suggests students haven't understood a key concept? Choose one or more of these strategies:*

- Look at the next few lessons to see if students have more opportunities to engage with the same topic. If so, plan to focus on the topic in the context of the new activities.
- During the next lesson, display the work of a few students on that cool-down. Anonymize their names, but show some correct and incorrect work. Ask the class to observe some things each student did well and could have done better.
- Give each student brief, written feedback on their cool-down that asks a question that nudges them to re-examine their work. Ask students to revise and resubmit.
- Look for practice problems that are similar to, or involve the same topic as the cool-down, then assign those problems over the next few lessons.

Here is an example. For a lesson in grade 6, unit 2, the learning goals are

- Understand that doubling, tripling, or halving a recipe yields something that tastes the same.
- Understand that “doubling, tripling, or halving the recipe” means “doubling, tripling, or halving each ingredient.”

The cool-down reads:

Usually when Elena makes bird food, she mixes 9 cups of seeds with 6 tablespoons of maple syrup. However, today she is short on ingredients. Think of a recipe that would yield a smaller batch of bird food but still taste the same. Explain or show your reasoning.

A number of students responded with 8 cups of seeds and 5 tablespoons of maple syrup, and did not provide an explanation or show their reasoning. Here are some possible strategies:

- Notice that this lesson is the first of several that familiarize students with contexts where equivalent ratios carry physical meaning, for example, the taste of a recipe or the result of mixing paint colors. Over the next several lessons, there are more opportunities to reason about multiple batches of a recipe. When launching these activities, pause to assist students to interpret this correctly. Highlight the strategies of any students who use a discrete diagram or other representation to correctly represent multiple batches.
- Select the work of one student who answered correctly and one student whose work had the common error. In the next class, display these together for all to see (hide the students' names). Ask each student to decide which interpretation is correct, and defend

their choice to their partner. Select students to share their reasoning with the class who have different ways of representing that 9:6 is equivalent to 3:2 , 6:4, or 4.5 :3 .

- Write feedback for each student along the lines of "If this recipe is 3 batches, how could you make 1 batch?" Allow students to revise and resubmit their work.
- Look for practice problems in upcoming lessons that require students to generate examples of different numbers of batches equivalent to a given ratio, and be sure to assign those problems.

## End-of-Unit Assessments

At the end of each unit is the *end-of-unit assessment*. These assessments have a specific length and breadth, with problem types that are intended to gauge students' understanding of the key concepts of the unit while also preparing students for new-generation standardized exams. Problem types include multiple-choice, multiple response, short answer, restricted constructed response, and extended response. Problems vary in difficulty and depth of knowledge.

Teachers may choose to grade these assessments in a standardized fashion, but may also choose to grade more formatively by asking students to show and explain their work on all problems. Teachers may also decide to make changes to the provided assessments to better suit their needs. If making changes, teachers are encouraged to keep the format of problem types provided, which helps students know what to expect and ensures each assessment will take approximately the same amount of time.

In longer units, a *mid-unit assessment* is also available. This assessment has the same form and structure as an end-of-unit assessment. In longer units, the end-of-unit assessment will include the breadth of all content for the full unit, with emphasis on the content from the second half of the unit.

All summative assessment problems include a complete solution and standard alignment. Multiple-choice and multiple response problems often include a reason for each potential error a student might make. Restricted constructed response and extended response items include a rubric.

Unlike formative assessments, problems on summative assessments generally do not prescribe a method of solution.

## Design Principles for Summative Assessments

Students should get the correct answer on assessment problems for the right reasons, and get incorrect answers for the right reasons. To help with this, our assessment problems are targeted and short, use consistent, positive wording, and have clear, undebatable correct responses.

In multiple choice problems, distractors are common errors and misconceptions directly relating to what is being assessed, since problems are intended to test whether the student has proficiency on a specific skill. The distractors serve as a diagnostic, giving teachers the chance to quickly see which of the most common errors are being made. There are no “trick” questions, and the phrases “all of the above” and “none of the above” are never used, since they do not give useful information about the methods a student used.

Multiple response prompts always include the phrase “select all” to clearly indicate their type. Each part of a multiple response problem addresses a different piece of the same overall skill, again serving as a diagnostic for teachers to understand which common errors students are making.

Short answer, restricted constructed response, and extended response problems are careful to avoid the “double whammy” effect, where a part of the problem asks for students to use correct work from a previous part. This choice is made to ensure that students have all possible opportunities to show proficiency on assessments.

When possible, extended response problems provide multiple ways for students to demonstrate understanding of the content being assessed, through some combination of arithmetic or algebra, use of representations (tables, graphs, diagrams, expressions, and equations) and explanation.

## Rubrics for Evaluating Student Answers

Restricted constructed response and extended response items have rubrics that can be used to evaluate the level of student responses.

### Restricted Constructed Response

- *Tier 1 response*: Work is complete and correct.
- *Tier 2 response*: Work shows general conceptual understanding and mastery, with some errors.
- *Tier 3 response*: Significant errors in work demonstrate lack of conceptual understanding or mastery. Two or more error types from Tier 2 response can be given as the reason for a Tier 3 response instead of listing combinations.

### Extended Response

- *Tier 1 response*: Work is complete and correct, with complete explanation or justification.
- *Tier 2 response*: Work shows good conceptual understanding and mastery, with either minor errors or correct work with insufficient explanation or justification.
- *Tier 3 response*: Work shows a developing but incomplete conceptual understanding, with significant errors.
- *Tier 4 response*: Work includes major errors or omissions that demonstrate a lack of conceptual understanding and mastery.

Typically, sample errors are included. Acceptable errors can be listed at any Tier (as an additional bullet point), notably Tier 1, to specify exclusions.