

6

Open Response and Reengagement

- 6.1 Overview
- 6.2 Open Response and Reengagement Lessons
 - 6.2.1 Preparing for Day 1
 - 6.2.2 Day 1: Open Response

- 6.2.3 Getting Ready for Day 2
- 6.2.4 Day 2: Reengagement
- 6.2.5 Evaluating Student Performance
- 6.3 Open Response Assessments
- References

Contents

6.1 Overview

Open response problems are tasks that have multiple solution paths and often more than one solution. They offer students rich opportunities to solve engaging problems using their own strategies and reasoning.

Research conducted by the Mathematics Assessment Collaborative has demonstrated that the use of complex open response problems “significantly enhances student achievement both on state standardized multiple choice achievement tests and on more complex performance based assessments” (Paek & Foster, 2012, p. 11). Learning through problem solving has been at the center of *Everyday Mathematics* beginning with the first edition. This edition of *Everyday Mathematics* builds on this tradition by featuring challenging problems in Open Response and Reengagement lessons and the inclusion of open response problems in assessments.

Open Response and Reengagement lessons are two-day lessons that include a day for students to solve a challenging problem, followed by a day for students to analyze and learn from the solutions of others and then revise their own work from the first day. Except for the first section of Kindergarten, there is one Open Response and Reengagement lesson in each unit or section of Grades K–6 *Everyday Mathematics*. In Kindergarten, students are introduced to the process of analyzing and learning from others’ work, but they are not expected to revise their initial responses.

Open Response Assessments appear in Progress Check lessons in odd-numbered units in Grades 1–6. The tasks in the Open Response Assessments are similar to those in Open Response and Reengagement lessons, but they do not include a second day of student reengagement with the problem.

For information on SMPs and GMPs in *Everyday Mathematics*, see Section 1.2 *Standards for Mathematical Practice*.

Note Outline of Open Response and Reengagement lessons in Grades 1–6

Day 1 Open Response

Day 1 Lesson Opener

- 1 Warm-Up
 - Mental Math and Fluency
 - Daily Routines (Grades 1–2)

2a Focus

- Math Message
- Math Message Follow-Up
- Solving the Open Response Problem

Getting Ready for Day 2

Day 2 Reengagement

Day 2 Lesson Opener and Rubric

2b Focus

- Setting Expectations
- Reengaging in the Problem
- Revising Work
- Assessment Check-In

3 Practice

- Math Boxes
- Home Link

6.2 Open Response and Reengagement Lessons

Open Response and Reengagement lessons provide students with the following opportunities:

- **To solve complex problems.** Through the open response problems, all students have multiple opportunities to persevere with challenging tasks, communicate their thinking, and learn from the mathematical thinking of others. These problems differ from exercises, which often provide practice for previously learned skills and are typically found in practice activities and games. Open response problems offer opportunities for students to learn new concepts through the problem solving process.
- **To promote explicit attention to the mathematical practices.** The Open Response and Reengagement lessons systematically address the Common Core's Standards for Mathematical Practices (SMP) by highlighting a different mathematical practice in each Open Response and Reengagement lesson within each grade level. For each lesson, three to four *Everyday Mathematics* Goals for Mathematical Practice (GMP) are emphasized. One of these targeted GMPs is the focus for class discussion during reengagement and for assessment. To highlight the GMPs that support development of problem-solving skills, the targeted GMPs in each lesson in Grades K–5 include one of the six GMPs within SMP1.
- **To differentiate instruction through challenging mathematical tasks.** Because the open response problems can be solved with multiple strategies and tools, they are accessible to diverse learners. Using an analysis of class performance on the task as an instructional guide, teachers can address students' needs during reengagement. In the reengagement discussion, students make sense of others' thinking by interpreting strengths, weaknesses, or misconceptions in their peers' solutions. Following the discussion, students apply these new understandings to revise their work. This approach provides struggling students with new opportunities to access the mathematics, while creating an expanded, high cognitive demand task for students who performed well on the original problem as they interpret the mathematical thinking of others.

Teachers can approach Open Response and Reengagement lessons in three parts. First, on Day 1 teachers introduce the problem, encourage students to persevere in solving it, and observe students' use of the mathematical practices. Second, teachers examine students' responses from Day 1 and identify sample work that can be used to focus student attention on the content and practices addressed in the lesson. Teachers then use the chosen work samples to develop discussion questions that highlight use of the focus mathematical practice as well as misconceptions in need of attention. Third, on Day 2 teachers use the work samples and associated questions to facilitate a reengagement discussion. This discussion provides an extended opportunity for students to think through the mathematics of the problem, see how other students engage in the practices, and develop ideas for revising their work.

6.2.1 Preparing for Day 1

The Before You Begin section of the Lesson Opener often recommends that teachers solve the open response problem themselves prior to the lesson. While working through the problem, teachers should consider the following:

- strategies students are likely to use (both correct and incorrect);
- mathematical misconceptions that may affect students' work;
- questions to support students' perseverance as they work through the problem; and
- ways to highlight the focus GMP that the problem addresses.

Note Outline of Open Response and Reengagement lessons in Kindergarten

Day 1 Open Response

Day 1 Lesson Opener
Daily Routines
Core Activities
Focus: Solving the Open Response Problem
Getting Ready for Day 2

Day 2 Reengagement

Day 2 Lesson Opener
Core Activities
Focus: Reengaging in the Problem Practice
Home Link

Lesson
2-6
Open Response and Reengagement

Little and Big

Overview **Day 1:** Students use multiplicative reasoning to make predictions based on information in an open response problem and then make mathematical arguments to support their predictions (conjectures). **Day 2:** Students analyze others' conjectures and arguments and then revise their own work.

2-Day Lesson

Day 1: Open Response

Before You Begin
Solve the open response problem. Consider the reasoning your students may use to make predictions, or conjectures, and how they might construct arguments to support their conjectures. If possible, schedule time to review students' work and plan for Day 2 of this lesson with your grade-level team.

Vocabulary
conjecture • argument

CCSS Common Core State Standards

Focus Clusters

- Use the four operations with whole numbers to solve problems.
- Generate and analyze patterns.

	Activity	Materials
1	Warm Up 5 min. Mental Math and Fluency Students identify the place value of digits in a given number.	4.NBT.2
2a	Focus 55-65 min. Math Message Students decide whether suggested rules for a "What's My Rule?" table are correct and make arguments supporting their decisions. Making Conjectures and Arguments Students use the terms <i>conjecture</i> and <i>argument</i> in a discussion of the "What's My Rule?" table. Solving the Open Response Problem Based on information in the problem, students make predictions, or conjectures, about the comparative heights of two dogs, and then make arguments to justify their answers.	<p><i>Math Journal 1, p. 47</i></p> <p><i>Math Journal 1, p. 47; Student Reference Book, pp. 10-11; Standards for Mathematical Practice Poster</i></p> <p><i>Math Masters, pp. 65-66, p. 67 (optional); 10 small (1½ in.) paper clips; scissors and glue (optional)</i></p>

Getting Ready for Day 2 →
Review students' work and plan discussion for reengagement. *Math Masters, p. TA8; students' work from Day 1*

CCSS 4.OA.2 **Spiral Snapshot**
EMC Solve number stories involving multiplicative comparison.

2-6 Focus Practice

2-8 Focus Practice

2-9 Focus Practice

2-12 Practice

3-12 Focus

4-1 Focus

4-8 Practice

5-3 Warm Up

Spiral Tracker [Go Online](#) to see how mastery develops for all standards within the grade.

connectED.mcgraw-hill.com

Plan your lessons online with these tools.

150
Unit 2 | Multiplication and Geometry

Open Response and Reengagement Lesson Opener, Grade 4 Lesson 2-6

See the Getting Started Videos, accessible from the Main Menu in the Teacher Center.

Unit 2 Lesson 2-6 (Day 1) ▶ Open Response Little and Big

Materials

PRINT
Math Masters: pp. 65–66; 67 (optional); 68; TAB

Additional Materials
Standards for Mathematical Practice Poster
10 small (1 $\frac{1}{4}$ in.) paper clips
Guidelines for Discussions Poster
scissors; glue; colored pencils (optional)
selected samples of students' work
students' work from Day 1

Overview
Students use multiplicative reasoning to make predictions based on information in an open response problem and then make mathematical arguments to support their predictions (conjectures).

Before You Begin
Solve the open response problem. Consider the reasoning your students may use to make predictions, or conjectures, and how they might construct arguments to support their conjectures. If possible, schedule time to review students' work and plan for Day 2 of this lesson with your grade-level team.

Vocabulary
conjecture • argument

Add a Note Upload Files (Go to resources to view uploaded files.)
Enter a Note here...

Overview
Activities
Differentiation
Presentation
Standards
Notes
Resources

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Lesson Overview screen, Grade 4, Lesson 2-6

Other features of Open Response and Reengagement lessons that are helpful in preparing for Day 1 include the following:

- **Lesson Openers for Day 1 and Day 2** give information for preparation that should be done before the lesson and identify the content and mathematical practices addressed in the lesson.
- A **professional development note** provides mathematical background on the focus GMP.
- An **evaluation rubric** helps teachers evaluate student work and make appropriate connections between the problem and the focus GMP.
- **Samples of student work** in the *Teacher's Lesson Guide* and online help teachers anticipate student performance on the problem and provide examples of work that might be used in the reengagement discussion.

For more information and the location of the rubrics, see Section 6.2.3 *Getting Ready for Day 2*.

6.2.2 Day 1: Open Response

The Focus section of Day 1 of the Open Response and Reengagement lessons consists of three parts: Math Message, Math Message Follow-Up, and Solving the Open Response Problem.

2a Focus 45-55 min

Math Message
Math Journal 1, p. 76
Complete journal page 76. You may use base-10 blocks to help you. **GMP2.2**

Drawing Base-10 Blocks for Numbers
Math Journal 1, p. 76

Math Message Follow-Up Ask partners to compare their drawings. Before discussing children's ideas as a class, review the name of each of the **base-10 blocks (cube, long, and flat)**, the number each represents, and the appropriate shorthand drawing for each. Remind children that to **represent** a number with base-10 blocks is to show the number with the blocks. Ask children to describe or display their representations using both blocks and base-10 shorthand. Discuss the similarities and differences in the numbers and their base-10 representations. **GMP2.2**

Solve the problems.
Use to show a flat, to show a long, and to show a cube.
1 Use base-10 blocks to show the number 23. Draw your blocks below.
2 Use base-10 blocks to show the number 230. Draw your blocks below.
3 Use base-10 blocks to show the number 203. Draw your blocks below.

Lesson 4-6 **367**

Math Message and Math Message Follow-Up, Grade 2 Lesson 4-6

Math Message GRADE LEVEL K 1 2 3 4 5 6

The Math Message is an entry point for teaching the lesson that provides an opportunity for students to work with the content and practices addressed in the open response problem. Student performance on the Math Message provides useful information that teachers can use to determine the amount and type of scaffolding that will be needed to prepare students for the open response problem.

Math Message Follow-Up GRADE LEVEL K 1 2 3 4 5 6

The Math Message Follow-Up actively engages students in a discussion of the Math Message. This discussion provides an opportunity for students to recall their understanding of the content or practices that they will use to solve the open response problem and allows teachers to address any misconceptions or weaknesses they observed. This discussion also helps students practice talking about problem-solving strategies and solutions, which they will do again during Day 2 of the lesson.

Solving the Open Response Problem

Each Open Response and Reengagement lesson provides suggestions for introducing the problem, information on the mathematical concepts and context of the problem, prompts to focus students on the target content and practices, and suggestions for tools to make available to students for solving the problem. Because Open Response and Reengagement lessons do not include Differentiation Options pages, these lessons include English Language Learner notes that offer suggestions for introducing the vocabulary in the problem and Adjusting the Activity notes that provide information on how to

Note In Kindergarten, a Warm Up serves a similar purpose as the Math Message and Math Message Follow-Up.

help struggling students begin solving the problem and, when appropriate, how to challenge students by extending the problem. Teachers should take care not to “over-teach” this part of the lesson, since students need the chance to struggle a bit, make mistakes, and solve the problem in a way that makes sense to them. See example from the Grade 2 *Teacher’s Lesson Guide* on the following page.

The Open Response Problems are available in print as *Math Masters* or digitally in the Student Learning Center. Since the digital problems are often displayed on multiple screens, it may be preferable for students to work on print copies of the *Math Masters* pages. This will allow for easy viewing of all the problems simultaneously, and allow students room to both show their work and explain their thinking fully.

Before students begin the open response problem, teachers should read through the problem with students and make sure they understand what is expected and what tools and manipulatives are available. Once students have started working, teachers can use discussion prompts to monitor student progress and to clarify the problem when necessary. If students are having difficulty, the teacher should ask them to explain what they are doing and why in order to understand their thinking about the problem. Teachers, however, should try to minimize how much they intervene. Allowing students to use their own strategies and tools will produce better learning in the long run and a more robust and informative range of responses on the problem.

1

Solve the Problem and Revise

Solve the Problem and Revise

Base-10 Block Representations

Camilo believes the number represented by the blocks is 2,154. Susan believes it is 354.

1 Who is correct? Circle one: Camilo Susan

2 Explain how you decided on your answer. You may include drawings.

Activity Kit Writing Tools eTools

Students click on the Activity Tile “Solve the Problem and Revise” to access the screen for the Open Response problem on Day 1. Students will open the same tile on Day 2 to revise their work.

Students should be encouraged to work in partnerships and small groups, but students should record their own solutions. The resulting diversity in student work provides an essential element in planning the reengagement discussion. Student performance on challenging open response problems is “a gold mine of information that can drive significant learning for teachers as well as students” (Foster & Poppers, 2009, p. 8).

ELL Support

Prior to the lesson and as needed with English language learners, review the vocabulary using base-10 blocks and shorthand. Use Total Physical Response commands, such as these: *Show me a long (or flat, or cube).* Use blocks to represent (or show) 15. Now, draw 15 using base-10 shorthand. Show 13 cubes. Ask: *What is another way to represent 13?*

Use yes or no questions with different representations. For example, ask: *Do these blocks represent 17?* Include less-typical representations (such as 17 cubes) as well as more efficient ones (such as 1 long and 7 cubes).

Ask one-word response questions, such as: *How many cubes (or longs, or flats) are in this collection?*

Math Masters, p. 102

Base-10 Block Representations

Camilo believes the number represented by the blocks is 234.
Susan believes it is 354.

① Who is correct? Susan

② Explain how you decided on your answer. You may include drawings.

Answers vary. See sample children's work on page 372 of the *Teacher's Lesson Guide*.

102 one hundred two 2.NBT.1, 2.NBT.4a, 2.NBT.3, SMP1, SMP2

NOTE When discussing the 0 in the numbers 203 and 230, a child may ask why the number 23 is not written as 023. Tell children that 023 is correct and has the same meaning or value as 23, but that we generally do not include 0s that do not affect the size of a number. When discussing Problems 2 and 3, consider asking children if it would affect the size of the number if the zeros were removed.

Refer children to **GMP2.2** on the Standards for Mathematical Practice Poster, and tell them that they are going to do more thinking and talking about how to use base-10 blocks to represent numbers. **GMP2.2**

▶ Solving the Open Response Problem
Math Masters, p. 102

WHOLE CLASS | SMALL GROUP | **PARTNER** | INDEPENDENT

Distribute *Math Masters*, page 102 and make base-10 blocks available to children. Read the problem as a class. Tell children that, in addition to telling who is correct, an important part of the task is explaining how they decided.

Some children will believe Camilo's number is correct because they mechanically transfer the number of flats (2), longs (15), and cubes (4) to digits in the number (2,154). Do not tell children that this reasoning is incorrect, but ask them if there is a way to check their thinking. Let children devise their own strategies for counting 10 longs as 100. **GMP1.1**

Encourage them to use the base-10 blocks to clarify their thinking. You may also see children counting up (100, 200, 210, 220, . . .) in an appropriate way to reach 354. **GMP2.2**

Differentiate Adjusting the Activity

For children who have difficulty, discuss the drawing referencing actual base-10 blocks. If they still have trouble, show 1 long and 12 cubes and ask them to tell you what number is shown. This will guide them to count the blocks. Then bring their attention back to the base-10 blocks for the open response problem and ask them how they can figure out what number the blocks represent. **GMP2.2**

For children who have trouble beginning their written explanations, ask them to describe orally who is correct and why. Then have them write down what they said or dictate their response to an adult. Some children may benefit from using a sentence frame, such as: "I believe that _____ is correct because _____." If students need more support, provide additional frames, such as: "There are _____ flats, _____ longs, and _____ cubes. I counted them like this _____."

Partners may work together to share ideas about the task, but children should complete their own explanations and drawings.

Summarize Ask: *How did you show your thinking about which number was correct? Did you use words, pictures, numbers, or something else?*

GMP2.2 Answers vary.

Collect children's work so that you can evaluate it and prepare for Day 2.

Solving the Open Response Problem section, Grade 2 Lesson 4-6 with open response problem from *Math Masters*, Grade 2 Lesson 4-6

Note Teachers have found that it can be helpful to take time to plan reengagement discussions with other grade-level teachers. Discussing student work with colleagues broadens the discussion, so that teachers can see how students solved the problem in several different classrooms and share ideas about which pieces of student work to use in the reengagement discussions. Together, colleagues can identify trends in students' work, share ideas about how to address misconceptions, capitalize on unique strategies and solutions, and find ways to help students learn about the mathematical practices.

6.2.3 Getting Ready for Day 2

Using the “gold mine” of student work to guide instruction is the central idea of reengagement. This section suggests strategies for using student work in planning and implementing a reengagement discussion.

Getting Ready for Day 2

Math Masters, p. TA5

Planning a Follow-Up Discussion

Review children's work. Use the Reengagement Planning Form (*Math Masters*, page TA5) and the rubric on page 370 to plan ways to help children meet expectations for both the content and practice standards. Look for common misconceptions in children's understanding of the number represented by the base-10 blocks as well as clear and complete explanations and drawings.

Organize the discussion in one of the ways below or in another way you choose. If children's work is unclear or if you prefer to show work anonymously, rewrite the work for display.

[Go Online](#) for sample children's work that you can use in your discussion.

- Show a paper that claims Camilo is correct and a paper that claims Susan is correct. Begin with a response that chooses Camilo (as in Child A's work). Use a place-value approach to connect the number of flats, longs, and cubes to the number 2,154. Focus children on how Camilo might have decided the number was 2,154, and not necessarily on whether the reasoning is correct. Ask:
 - What do you think this child's work says about how Camilo figured out his number? **GMP2.2** *Sample answer: It shows the 2 comes from the number of flats, the 15 from the number of longs, and the 4 from the number of cubes.*

Then display a child's response that says Susan's number is correct (as in Child B's work) and shows a direct counting method. Consider asking the child (or a volunteer) to demonstrate this counting method, and watch for children who have difficulty when the counting shifts from 100s to 10s (100, 200, 210, ...), when it reaches and passes 300, and when there is a shift from 10s to 1s (340, 350, 351, ... 354). Ask:

 - What does this drawing tell us about this child's thinking? **GMP2.2** *Sample answer: It shows how the child counted the blocks.*
 - Now that we have counted the blocks, do you agree with Camilo or Susan? **GMP2.2** *Sample answer: I agree with Susan because when we counted the flats and the longs, we counted to 300 then 350 and added on 4.*
- Display a child's response that says Susan is correct and shows an exchange of 10 longs for 1 flat. See sample work for Child C. Ask:
 - What does this drawing tell us about this child's thinking? **GMP2.2** *Sample answer: This child crossed out 10 longs and made a flat.*
 - Does the new representation show the same number? How do you know? **GMP2.2** *Sample answer: The blocks represent the same number because you get the same number when you count the blocks.*
 - What questions do you have about this drawing? **GMP2.2** *Answers vary.*

Planning for Revisions

Have copies of *Math Masters*, page 102 or extra paper available for children to use in revisions. You might want to ask children to use colored pencils so you can see what they revised.

Sample child's work, Child A

② Explain how you decided your answer. You may include drawings.

Because Susan thinks that are 0 flats and 5 longs and the last one she is 154 because there is 4 flats why I chose Camilo.

Sample child's work, Child B

Sample child's work, Child C

Lesson 4-6 369

Getting Ready for Day 2, Grade 2 Lesson 4-6

Using the Task-Specific Rubric

An essential first step in planning an effective and engaging reengagement discussion is to evaluate class performance on the problem. Teachers can use the rubric provided in the Lesson Opener for Day 2 in the *Teacher's Lesson Guide* to guide them in evaluating student work. In the Teacher Center, the rubric appears in the Assessment Check-In box. Look for the yellow tile, accessible through the Activities view. All rubrics were developed from an analysis of student work collected during field testing. The rubrics are task-specific so teachers can anticipate the range of student performance and analyze the responses based on the lesson's focus GMP.

Goal for Mathematical Practice	Not Meeting Expectations	Partially Meeting Expectations	Meeting Expectations	Exceeding Expectations
GMP7.2 Use structures to solve problems and answer questions.	Produces some combinations of 10, but many may be missing. Provides no evidence of using a pattern to find all the combinations. The table is not organized, and the child cannot describe a strategy.	Produces many combinations of 10 and makes some attempt to find combinations that are missing. However, any pattern in the table is inconsistent or unclear, and the child cannot fully describe or apply a strategy to find all the combinations.	Writes a complete or nearly complete set of combinations of 10. Provides oral or written evidence of using a pattern. For example, writes the combinations in numerical order or describes checking to see if all combinations using the turn-around rule are present.	Writes a complete set of combinations of 10. Produces a table with a clear method of organization and describes a strategy for finding all the combinations. May also describe an additional method for checking that all combinations are present.

Task-specific rubric used to evaluate student work in preparation for Day 2, Grade 1 Lesson 2-5

Lesson 2-6 (Day 2): Focus: Revising Work

Students revise their predictions and arguments based on what they learned in the reengagement discussion.

Materials
PRINT
 Math Masters: pp. 65–66 (optional)
 colored pencils (optional)
 students' work from Day 1

Activity Resources

Differentiate Adjusting the Activity

Have students who made satisfactory arguments complete an additional problem. Tell them about Middle, another dog in the picture, who was 4 dog treats tall. Ask: *What would Middle's height be in paper clips?* **GMP7.2 6 paper clips**

Ask students to make a table of the three dogs' heights in dog treats (input) and paper clips (output). A sample table is provided below.

Dog's Name	Height in Treats	Height in Paper Clips
Little	2	3
Middle	4	6
Big	6	9

Ask: *What is the rule for this table? How do you know?* **GMP3.1, GMP7.2** Sample answer: *The rule is the number of treats plus half the number of treats gives the height in paper clips. It works in all three boxes: $2 + 1 = 3$; $4 + 2 = 6$; $6 + 3 = 9$.*

Assessment Check-In

Collect and review students' revised work. Expect them to improve their arguments based on the class discussion. For the content standard, expect most students to use multiplicative reasoning to make a correct prediction of 9 paper clips for Big's height. You can use the rubric on page 156 to evaluate students' revised work for **GMP3.1**.

Goal for Mathematical Practice	Not Meeting Expectations	Partially Meeting Expectations	Meeting Expectations	Exceeding Expectations
GMP3.1 Make mathematical conjectures and arguments.	Provides an argument in Problem 3 that is inconsistent with the conjecture in either.	Provides an argument in Problem 3 that is consistent with the conjecture in Problem 2 and either.	Provides an argument in Problem 3 that is consistent with the conjecture in Problem 2 and both.	Meets expectations using both words and drawings to explain and show: <ul style="list-style-type: none"> the relationship

Focus

Revising Work

Students revise their predictions and arguments based on what they learned in the reengagement discussion.

From the Activities tile view, click on the yellow tile to access the rubric on the Revising Work screen, as shown for Grade 4, Lesson 2-6.

Teachers can use the rubric to sort student work into three groups: work that clearly meets expectations based on the description in the rubric, work that does not meet expectations, and work that teachers are undecided about. For guidance in using the rubric to sort student work, teachers can refer to the evaluated sample student work in the *Teacher's Lesson Guide* and the online work samples. The following questions should be kept in mind while sorting student work and preparing for the reengagement discussion:

- Do most papers show evidence that students can correctly solve the problem and meet expectations for the GMP? Are there common strengths and areas of understanding?
- Are there common misconceptions about the content or GMP that can be addressed in the reengagement discussion? Are there common deficiencies in students' strategies, explanations, and justifications?

For more information on using rubrics, see Section 9.4.1 *Rubrics for Evaluating Mathematical Practices*.

Note See Grade 3 Lesson 3-2, Grade 4 Lesson 4-5, and Grade 5 Lesson 2-9 for information on using a student-friendly rubric in each grade level.

Note In Grade 6 on Day 2, the class generates “features of a successful paper,” a list to focus the reengagement discussion and to support students as they revise their work.

Using Student-Friendly Rubrics

Student-friendly rubrics offer another approach for organizing a reengagement discussion. In Grades 3–5, one Open Response and Reengagement lesson includes an example of a student-friendly rubric and a description of how it can be used in a reengagement. These rubrics use language that is easily understood by students to describe criteria for meeting expectations on key practices or content in the problem. By clearly defining specific performance goals, student-friendly rubrics provide a structure that students can use to analyze their peers’ work.

Rubric for Estimating Costs				
Lesson 3-2				
	NAME	DATE	TIME	
Goal: Explain your mathematical thinking clearly and precisely.				
Meets Expectations	Child 1	Child 2	Child 3	
Shows the close-but-easier numbers used to make estimates.				
Shows how to make an estimate of how much money the art club has left over.				
Exceeds Expectations				
Explains that Ann’s answer of \$67 is NOT reasonable because it is not close to an estimated leftover amount of \$40.				

82

Student-friendly rubric from Grade 3 Lesson 3-2

Typically, teachers select three samples of student work that represent a range of performance on the problem. After distributing the selected work, teachers use one of the samples to demonstrate that in order for work to *meet expectations*, it must clearly meet the criteria in the rubric. Students then work with partners to analyze the other two samples.

Once partnerships have completed their analysis, the class shares their findings. In the discussion, students explain how they decided whether a work sample meets or does not meet specific criteria in the rubric. In field tests, student-friendly rubrics were found to be effective in providing structure and vocabulary for students to use in analyzing and discussing their peers' work.

Using the Reengagement Planning Form

The Reengagement Planning Form is a Teaching Aid Master that can assist teachers in using information from their analysis of student work and organizing the reengagement discussion. The focus content and practice standards are at the top of the form, so teachers can keep these in mind as they look for strengths and weaknesses in student performance. Teachers can then use the second section of the form to determine specific issues they want to address in the reengagement discussion. Then they can select at least one sample of student work that addresses each issue and develop questions for discussion. Work samples might include:

- clear examples of well-executed solutions or misconceptions that can generate discussion of the key mathematical ideas or the focus GMP addressed in the problem;
- examples of a common error that can be used to discuss ways to correct the error and learn from it; and
- interesting or unique solutions that show different strategies or tools for solving the problem.

Reengagement Planning Form

Common Core State Standard (CCSS): 1.OA.6 Add combinations of 10 automatically.
Use structures to solve problems and answer questions.

Goal for Mathematical Practice (GMP): GMP7.2 Use structures to solve problems and answer questions.

Strengths and understandings: Most kids understood that they must make a sum of 10.

Weaknesses and misconceptions:

- That turn-around facts are not the same
- Listing the same combination

Planning the Reengagement Discussion

Issue to address	Work samples that illustrate this issue	Questions to ask about the sample student work
① — same combinations listed more than once	1a. all comb. = 10 w/ repeats	What is right about this table? Why did he run out of room for listing combinations?
② — combinations $\neq 10$	2a. not all comb. equal 10 - no repeats 2b. does not = 10	Do these #'s equal 10? — use 10 frame
③ — lack of organization of #'s	3a. addresses turn-around pattern 3b. addresses # order pattern	What patterns do you see?

Example of a Reengagement Planning Form completed by a teacher for Grade 1 Lesson 2-5

Planning a Follow-Up Discussion

Preparing discussion questions that will actively engage students in making sense of the selected student work is at the heart of reengagement. Successful reengagement discussions offer powerful opportunities for students to refine and deepen their understanding of the lesson's mathematical content and practices.

Guidelines for Discussions*During our class discussions, we can:*

- ✓ Make mistakes and learn from them
- ✓ Change our minds
- ✓ Ask questions
- ✓ Listen closely to others' ideas

For other ideas on how to facilitate discussions in a whole-class setting, see Section 5.1 *Facilitating Discussions*.

- **Presenting a solution that clearly shows effective use of the focus GMP and one that does not.** Students compare and contrast the two different solutions based on the GMP and make suggestions for revisions.

Students benefit most when reengagement discussions focus on sample work from their own class. When they are discussing their work and the work of their peers, students are more engaged because they see themselves as active participants in the learning process. An ePresentations note gives instructions for uploading and viewing student work from the classroom. The sample student work in the *Teacher's Lesson Guide* is also available online for use in discussions.

6.2.4 Day 2: Reengagement

The Focus section of Day 2 of the Open Response and Reengagement lessons consists of three parts: Setting Expectations, Reengaging in the Problem, and Revising Work.

Setting Expectations

This part of the lesson provides suggestions for teachers to briefly review the mathematics of the open response problem from Day 1, discuss the focus GMP, and establish expectations for a correct and complete solution.

Establishing Guidelines for Reengagement. To promote an environment that supports constructive class discussions, the first Open Response and Reengagement lesson in each grade describes how teachers can develop general discussion guidelines for the class to use throughout the year. Teachers can solicit suggestions from the class and include items that they feel are important. Early in the year, this list may only include a few items so as not to overwhelm students. Teachers and students can add to the list throughout the year and refer to it during any group discussion. See sample poster in the margin.

Modeling or having students role-play situations based on one or more of the guidelines on the poster can help reinforce appropriate behavior during discussions. For example, teachers may want to model how to disagree politely with a student's solution or how to learn from a mistake.

Teachers can use sentence frames when modeling and encourage students to use appropriate language as they discuss other students' work. Examples of sentence frames include:

- I noticed _____.
- I like how you _____.
- Could you explain _____?
- I disagree because _____.
- I don't understand _____.
- I wonder why _____.
- I agree because _____.
- I also think _____.

Reengaging in the Problem

Teachers organize and facilitate the reengagement discussion based on the decisions they made while analyzing and selecting student work. Students analyze the presented student work and offer suggestions for revision. Because open response problems offer opportunities for multiple solution strategies, students may come up with inventive and creative paths to a solution, so teachers should be prepared to deviate from a planned discussion

to follow these ideas as these are often the best opportunities for lively and generative discussions. However, discussion should always come back to the focus GMP.

Revising Work GRADE LEVEL K 1 2 3 4 5 6

After discussing sample work, students revise their own work from Day 1. (Note: Open Response and Reengagement lessons in Kindergarten do not always include revision of students' work.) Teachers should encourage students to use what they learned from the reengagement discussion to make corrections or improvements to their work. At the same time, students should be reminded that the solutions presented in the reengagement discussion are not the only possible strategies for solving the problem. Students should be encouraged to write clear and complete solutions that demonstrate their understanding of the focus GMP. Students should be encouraged to add to their work or write on a new copy rather than erase their original work. Teachers may wish to have students use colored pencils to make their revisions in order to help distinguish the original work from the revisions made after reengagement. In the Student Learning Center, the program automatically saves students' work from Day 1. When students open the Solve the Problem and Revise tile on Day 2, they will see their work. Similar to the print, students can choose a different color for the writing tool when they begin revising.

6.2.5 Evaluating Student Performance

Each Open Response and Reengagement lesson has two sets of guidelines to evaluate students' revised work for the content and mathematical practices addressed in the problem. The **Assessment Check-In** provides expectations for meeting the content standards and points to a qualitative, task-specific rubric to evaluate students' performance on the focus GMP. While teachers may find the rubric useful for selecting student work and building a framework for the reengagement discussion, they should wait until after students have revised their work on Day 2 to assess their performance.

Assessment Check-In 2.NBT.1, 2.NBT.1a

Collect and review children's revised work. Expect children to improve their work based on the class discussion. For the content standards, expect most children to show that they understand that a bundle of ten 10s makes 100. You can use the rubric on page 370 to evaluate children's revised work for **GMP2.2**.

Assessment Handbooks [Go Online](#) to record student progress and to see trajectories toward mastery for these standards.

[Go Online](#) for optional generic rubrics in the *Assessment Handbook* that can be used to assess any additional GMPs addressed in the lesson.

Sample Children's Work—Evaluated

See the sample in the margin. This work meets expectations for the content standards by explaining in writing and showing in the drawing that ten 10s make 100. The work meets expectations for the mathematical practice because the child stated that Susan was correct and the words, drawing, and number model show evidence that he or she interpreted ten 10s as a 100. **GMP2.2**

[Go Online](#) for other samples of evaluated children's work.

Sample child's work, "Meeting Expectations"

① Who is correct? Susan

② Explain how you decided your answer. You may include drawings.

Susan is right. There are 2 flat and ten longs which makes a number flats. There are 5 tens and 4 ones and that adds up to 354.

300
50 4
||| |
300 + 50 + 4 = 354
354!

372 Unit 4 | Place Value and Measurement

Assessment Check-In and evaluated student work that meets expectations, based on the task-specific rubric on Grade 2 Lesson 4-6

For information on tracking progress on the GMPs in the Open Response lessons, see Section 9.4.2 *Individual Profiles of Progress and Class Checklists*.

For information on the Open Response Assessments, see Section 9.3.2.



Click on the Activity Tile to open up the Open Response Assessment in the Student Learning Center.

An evaluated work sample that meets expectations for both the content and practice standards is included in the *Teacher's Lesson Guide* and Teacher Center for each Open Response and Reengagement lesson in Grades 1–6. Three additional evaluated work samples are available online. These samples represent a range of performance for the content and the practice standards. Each sample includes an explanation of the evaluation, making specific connections between the student's work and expectations for the content and GMP based on the rubric.

Teachers can use data collected during the Open Response and Reengagement lessons in a variety of ways. When teachers return revised work to students, comments and evaluation of performance based on the task-specific rubric will provide useful feedback.

6.3 Open Response Assessments

GRADE LEVEL K 1 2 3 4 5 6

In Grades 1–6, Progress Check lessons in odd-numbered units include an Open Response Assessment on Day 2. Unlike the Open Response and Reengagement lessons, these problems do not include a second-day discussion and revision. The Open Response Assessments include expectations for meeting the content standards addressed in the assessment and task-specific rubrics for evaluating performance on the focus GMP. The *Teacher's Lesson Guide* includes one sample of evaluated student work that meets expectations on the content and mathematical practice. Three additional evaluated work samples are available in the Teacher Center and the online *Assessment Handbook*. Although the Open Response Assessments do not include suggestions for a reengagement discussion, teachers should still take time to discuss the problem after students have had a chance to solve it.

References

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