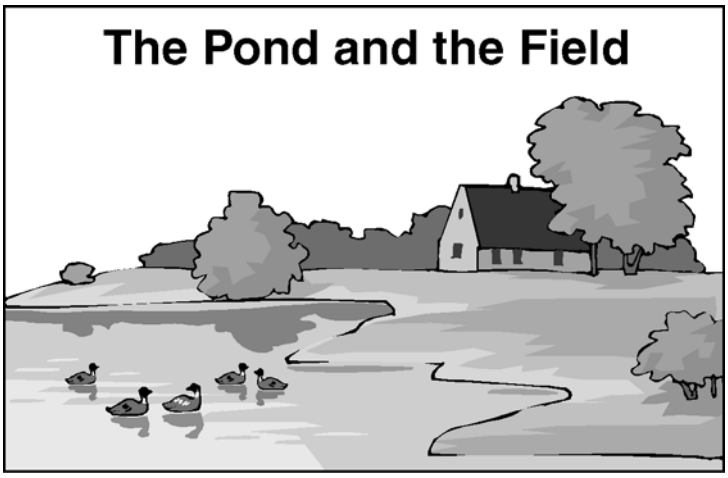
SITES-M Mathematics Challenge



Level: Grade Two

Standard: Number and Operations

Learning Target: Focus on Addition and Subtraction

Checks for Understanding

0206.2.11	Solve addition and subtraction problems in context using various representations.
0206.2.8	Use efficient procedures, and understand why they work, to solve problems involving the addition and subtraction of two- and three-digit whole numbers (including those that require regrouping).
0206.1.12	Write numbers and translate word clues to number sentences and vice versa.

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction
The Pond and the Field

The purpose of the Mathematics Challenges is to provide opportunities for students to develop and demonstrate understanding of important mathematical concepts and standards. Each Challenge includes a set of tasks that require higher-order thinking skills. Because these types of tasks may be new for students and they will have varying levels of understanding, the student responses will vary. The Challenges and guiding questions were designed to help teachers plan their implementation and elicit, analyze, and act on evidence of student understanding.

You will be able to choose which Mathematics Challenge Packet to implement each month, according to the learning needs of your students and your teaching context. Each packet contains all the materials necessary to implement the Mathematics Challenge including a grade-appropriate Challenge, the Mathematics Challenge Meeting Protocol, and the Guiding Questions for Analyzing Student Responses to Mathematics Challenges.

For each Challenge, you will complete a six step process of planning, implementation, and analysis and reflection.

The Mathematics Challenge Process

Stage	Step	Task
Planning	Step 1.	Review the Mathematics Challenge Meeting Protocol
	Step 2.	Review and solve the Mathematics Challenge prior to your Professional Learning Community (PLC) meeting. Think about your responses to the guiding questions on the Meeting Protocol
	Step 3.	Hold your PLC meeting and discuss your responses to the Guiding Questions on the Meeting Protocol
Implementation	Step 4.	Implement the Mathematics Challenge with your class
Analysis and Reflection	Step 5.	For your own planning and documentation, respond to the Guiding Questions on the Analyzing Student Responses Protocol
	Step 6.	To help us improve the Challenges and to provide recommendations for teachers implementing them in future years, complete the Mathematics Challenge Feedback Log and provide copies of all student work to the Assessment Coordinator

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction
The Pond and the Field

Mathematics Challenge Meeting Protocol

Each month, your Professional Learning Community will meet to discuss the implementation of one Mathematics Challenge. In preparation for your monthly meeting, please print and review this month's Mathematics Challenge, solve all tasks within the Challenge, and think about the guiding questions below. These questions will be used to facilitate a group discussion regarding the implementation of the upcoming Mathematics Challenge.

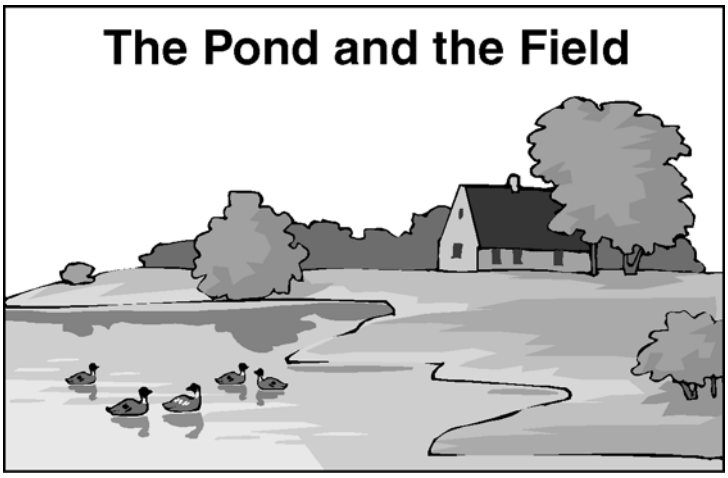
Guiding Questions for Implementing the Mathematics Challenges

1. What is the title of the Challenge that you will use this month?
2. What skills or standards is this Challenge measuring?
3. Where does this Challenge fit within your curriculum? Within which unit?
4. At what point during the unit will you administer this Challenge (e.g., At the beginning of a unit to determine what students do or do not know, at the end of a unit to assess what students have or have not learned, in the middle of a unit to determine where to go next instructionally)?
5. How will your students complete this Challenge (e.g., individually, one-on-one, in small groups, as a class)? Why?
6. Are there any prerequisite skills, common misunderstandings, or vocabulary needs that you will have to address? What are they?
7. What difficulties do you anticipate your students will have with the Challenge? How will you address them?
8. Are these skills and difficulties different for special needs students, ELL students, etc.? How? Will you do anything different for these students? What?
9. How will you evaluate student responses (e.g., grade responses with the provided rubric, scan responses to identify common mistakes/misconceptions, have students evaluate one another's responses, have students evaluate their own response)?
10. What will student responses to this Challenge tell you about student understanding?
11. How might you use this evidence of student understanding to adapt your teaching and learning?
12. What other materials, resources, or support might you need? Where can you get them?
13. How can your colleagues assist you in the analysis of student understanding?
14. What other questions or concerns do you have about this Mathematics Challenge?

After you have implemented the challenge with your class, be sure to respond to the Guiding Questions on the Analyzing Student Responses Protocol

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction



Standard: Number and Operations

Learning Target: Focus on Addition and Subtraction

Claims:
Students should understand and be able to explain or demonstrate how to:

- ✓ Solve addition and subtraction problems in context using various representations;
- ✓ Use efficient procedures, and understand why they work, to solve problems involving the addition and subtraction of two- and three-digit whole numbers (including those that require regrouping);
- ✓ Write numbers and translate word clues to number sentences and vice versa.

Task Preparation:

Each student will need a copy of the Student Response Sheet and a pencil.

Stimulus Cards (Drawing or Word Description):

None

Manipulatives/Supplies:

A copy of the student response sheet for each student
Pencils

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction

Cues/Directions:

Distribute student response sheets. Students should be directed to look carefully at each figure. Allow students time to answer.

Instruct students to follow along as you read aloud and say: **Ms. Garcia's class went to a nearby pond. They made a table to show the numbers of animals they saw.** Students should look at the table.

1. Say: **How many bugs and frogs did the class see in all? Show how you get your answer. (TEACHER NOTE:** Students should show their work in the box and write their answers on the blank below the box.**)**

2. **Did the class see more bugs or frogs? Show how you get your answer. (TEACHER NOTE:** Students should show their work in the box and check the appropriate box below.**) How many more? Show how you get your answer. (TEACHER NOTE:** Students should show their work in the box and write their answers on the two blanks provided below the box.**)**

Mr. Eng's class went to a nearby field. They made a table to show the numbers of animals they saw. (TEACHER NOTE: Students should look at the table.**)**

3. **How many butterflies and birds did the class see in all? Show how you get your answer. (TEACHER NOTE:** Students should show their work in the box and write their answers on the blank below the box.**) Write a number sentence to tell how you got your answer. (TEACHER NOTE:** Students should write their number sentences on the blank provided.**)**

4. **How many more butterflies than birds did they see? Show how you get your answer. (TEACHER NOTE:** Students should show their work in the box and write their answers on the blank below the box.**) Write a number sentence to tell how you got your answer. (TEACHER NOTE:** Students should write their number sentences on the blank provided.**)**

The students in Ms. Garcia's and Mr. Eng's classes combined all the animals they saw at the pond and at the field. They put all the numbers into one table. (TEACHER NOTE: Students should look at the table.**)**

5. **Did they see more than 400 animals or less than 400 animals in all? (TEACHER NOTE:** Students should show their work in the box, check the correct box, and write their answers on the blank below the box.**) Write a number sentence to tell how you got your answer. (TEACHER NOTE:** Students should write their number sentences on the blank provided.**)**

6. **How many <u>more</u> animals would the students need to see so that they saw 500 animals in all? (TEACHER NOTE:** Students should write their answers in the blank.**) How do you know? (TEACHER NOTE:** Students should show their work in the box.**)**

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction

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Grade 2–Focus on Addition and Subtraction

Student Response Sheet

The Pond and the Field

Name: _____ **Date:** _____

Ms. Garcia's class went to a nearby pond. They made a table to show the numbers of animals they saw.

ANIMALS MS. GARCIA'S CLASS SAW

Animal	Number
Bugs	52
Frogs	28

1. **How many bugs and frogs did the class see in all? Show how you get your answer.**

They saw _____ bugs and frogs in all.

**2. Did the class see more bugs or frogs?
Show how you get your answer.**

Check one: ☐ **More bugs** ☐ **More frogs**

**How many more?
Show how you get your answer.**

They saw _____ more _____.
(bugs or frogs)

Mr. Eng's class went to a nearby field. They made a table to show the numbers of animals they saw.

ANIMALS MR. ENG'S CLASS SAW

Animal	Number
Butterflies	253
Birds	127

3. How many butterflies and birds did the class see in all? Show how you get your answer.

They saw _____ butterflies and birds in all.

Write a number sentence to tell how you got your answer.

Number sentence: _____

4. How many more butterflies than birds did they see? Show how you get your answer.

They saw _____ more butterflies than birds.

Write a number sentence to tell how you got your answer.

Number sentence: _____

The students in Ms. Garcia's and Mr. Eng's classes combined all the animals they saw at the pond and at the field. They put all the numbers into one table.

ALL THE ANIMALS THEY SAW

Animal	Number
Bugs	52
Frogs	28
Butterflies	253
Birds	127

5. Did they see more than 400 animals or less than 400 animals in all?

Show how you get your answer.

Check one: ☐ **More than 400** ☐ **Less than 400**

They saw _____ animals in all.

Write a number sentence to tell how you got your answer.

Number sentence: _____

6. How many <u>more</u> animals would the students need to see so that they saw 500 animals in all?

They would need to see _____ more animals.

How do you know?

Learning and Teaching Considerations

Task 1:

A) Be sure that students understand that the words "in all" generally signify the addition operation.

B) Students may answer in words, symbols (digits, dots, dashes, base-10 block representations), by using manipulatives (blocks, cubes), or with a number line. They may also add traditionally, add the tens and ones separately and then add the subtotals, add in chunks, or add the tens first and then the ones. Be sure that they understand that they can get the correct answer using any of the strategies, though some are more efficient.

C) Be sure that students understand that not only does $52 + 28 = 80$ and $28 + 52 = 80$ but also $80 = 52 + 28$ and $80 = 28 + 52$. Many textbooks and teachers have a tendency to write equations only one way, and so students are confused when they see them written differently. Using a balance scale may help.

D) Be sure that students understand that as you move right (→) on a number line, the numbers increase in value. As you move left (←), the numbers decrease in value.

E) Some students may have the misconception that when adding two numbers that requires carrying a ten, a hundred, etc., you write the entire number and continue adding; for example, $52 + 28 = 710$ (because $8 + 2 = 10$). Working with base-10 blocks may help.

F) Be sure that students understand that it helps to first determine what a reasonable answer would be for a problem. Estimation is often a helpful strategy. For task 1, $52 + 28$ can be estimated as $50 + 30 = 80$ (the exact answer). Such an estimate should raise a red flag for students who obtain 710 as the answer.

G) If a student says or writes, "I just know," prompt him or her by saying something like "I'm glad you know, but it's important in math to be able to explain your answers so other people can understand what you're thinking." (This applies to the other tasks, as well.)

H) If a student says or writes, "I don't know," say something positive like "Let's start with what you do know about this problem." Students often know more than they think or say, and getting them to vocalize or write about that knowledge is all they need. (That applies to the other tasks, as well.)

Task 2:

A) Be sure that students understand that the word "more" generally signifies comparing numbers or amounts to find out which is greater–the focus of the first question. Determining exactly how many or how many more generally signifies subtracting one number or amount from the other–the focus of the second question.

B) Students may answer in words, symbols, or by using manipulatives. They may also use number lines, recall number sense, subtract traditionally, add two to each number and then subtract, add on, or subtract in chunks. Be sure that they understand that they can get the correct answer using any of the strategies, though some are more efficient.

C) Be sure that students understand that addition is assumed in the definition of subtraction, so that they can obtain or check their answers by adding, e.g., $52 - 28 = 24$ means $52 = 28 + 24$.

D) Be sure that students understand that $52 - 28 = 24$ is the same as $24 = 52 - 28$. Using a balance scale may help.

E) Some students may have the misconception that $52 - 28$ is the same as $28 - 52$, like addition. Working with manipulatives and number lines may help.

G) Some students may have the misconception that in a multi-digit subtraction problem you always subtract the smaller digits from the larger digits; for example, $52 - 28 = 36$ (because $8 - 2 = 6$ and $5 - 2 = 3$). Working with base-10 blocks may help.

Task 3:

A) Students may answer in words, symbols, or by using manipulatives. They may also add traditionally, add the hundreds, the tens, and the ones separately and then add the subtotals, add in chunks, or add the hundreds first, followed by the tens and the ones. Be sure that they understand that they can get the correct answer using any of the strategies, though some are more efficient.

B) Be sure that students understand that not only does $253 + 127 = 380$ and $127 + 253 = 380$ but also $380 = 253 + 127$ and $380 = 127 + 253$. Using a balance scale may help.

C) Some students may have the misconception that when adding two numbers that requires carrying a ten, a hundred, etc., you write the entire number and continue adding; for example, $253 + 127 = 3{,}710$ (because $3 + 7 = 10$). Working with base-10 blocks may help.

D) Be sure that students understand that it helps to first determine what a reasonable answer would be for a problem. Estimation is often a helpful strategy. For this task, $253 + 127$ can be estimated as $250 + 130 = 380$ (the exact answer). This should raise a red flag for students who obtain 3,710 as the answer.

Task 4:

A) Students may answer in words, symbols. They may also subtract traditionally, add a constant difference and then subtract, add on, or subtract in chunks. Be sure that they understand that they can get the correct answer using any of the strategies, though some are more efficient.

B) Be sure that students understand that addition is assumed in the definition of subtraction, so that they can obtain or check their answers by adding; for example, $253 - 127 = 126$ means $253 = 127 + 126$.

C) Be sure that students understand that $253 - 127 = 126$ is the same as $126 = 253 - 127$. Using a balance scale may help.

D) Some students may have the misconception that $253 - 127$ is the same as $127 - 253$, like addition. Working with manipulatives and number lines may help.

E) Some students may have the misconception that in a multi-digit subtraction problem you always subtract the smaller digits from the larger digits; for example, $253 - 127 = 134$ (because $7 - 3 = 4$). Working with base-10 blocks may help.

Task 5:

A) Be sure that students understand that task 5 is a two-step problem. They first have to determine how many animals both classes saw in all. Then they need to compare the answer to 400; that is, is the answer more or less than 400?

B) Students may answer in words, symbols, or by using manipulatives. They may also add traditionally, add the hundreds, the tens, and the ones separately and then add the subtotals, add in chunks, or add the hundreds first, followed by the tens and the ones. They may also add the first two numbers to get 80 and then add the last two numbers to get 380. Be sure that they understand that they can get the correct answer using any of the strategies, though some are more efficient.

C) Be sure students understand that not only does $253 + 127 + 28 + 52 = 460$ but also $460 = 253 + 127 + 28 + 52$. Using a balance scale may help. They should also know that adding the four numbers in any combination will still result in 460.

D) Some students may have the misconception that when adding two numbers that requires carrying a ten, a hundred, etc., you write the entire number and continue adding; for example, $52 + 28 = 710$ or $253 + 127 = 3{,}710$. Working with base-10 blocks may help.

E) Be sure that students understand that it helps to first determine what a reasonable answer would be for a problem. Estimation is often a helpful strategy. For task 5, $52 + 28 + 253 + 127$ can be estimated as $50 + 30 = 80$, $250 + 130 = 380$, and $80 + 380 = 460$ (the exact answer). Such an estimate should raise a red flag for students who obtain either 710 or 3,710 as a partial answer.

Task 6:

A) Be sure that students understand that determining exactly how many more generally signifies subtracting one number or amount from the other–the focus of the question.

B) Students may answer in words, symbols, or by using manipulatives. They may also use number lines, recall number sense, subtract traditionally, add on from 460, or subtract in chunks. Be sure that they understand that they can get the correct answer using any of the strategies, though some are more efficient.

C) Be sure that students understand that addition is assumed in the definition of subtraction, so that they can obtain or check their answers by adding; for example, $500 - 460 = 40$ means $500 = 460 - 40$.

Name: ANSWER KEY Date: _____

Ms. Garcia's class went to a nearby pond. They made a table to show the numbers of animals they saw.

ANIMALS MS. GARCIA'S CLASS SAW

Animal	Number
Bugs	52
Frogs	28

1. How many bugs and frogs did the class see in all? Show how you get your answer.

$$\begin{array}{r} {}^{1}52 \\ +28 \\ \hline 80 \end{array}$$

50 + 20 = 70

2 + 8 = 10

so 70 + 10 = 80

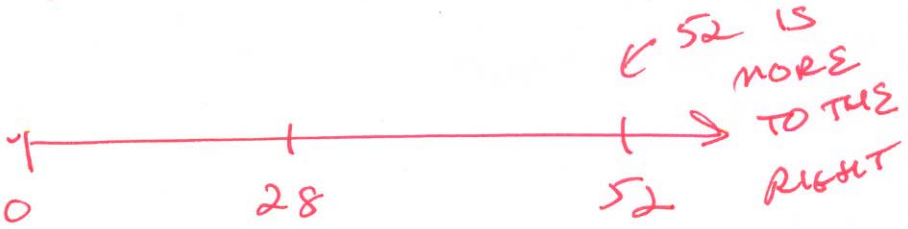
METHODS CAN VARY

They saw 80 **bugs and frogs in all.**

2. Did the class see more bugs or frogs?
Show how you get your answer.

52 > 28

OR 52 IS A BIGGER NUMBER THAN 28

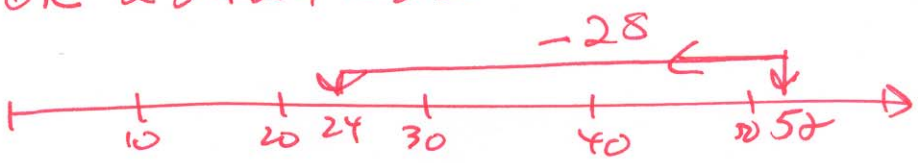


Check one: ☒ **More bugs** ☐ **More frogs**

How many more?
Show how you get your answer.

$\begin{array}{r} 52 \\ -\,28 \\ \hline \end{array}$ → regroup $\begin{array}{r} 4\ 12 \\ 2\ 8 \\ \hline 2\ 4 \end{array}$

OR 28 + 24 = 52



METHODS CAN VARY.

They saw 24 **more** BUGS.
(bugs or frogs)

Mr. Eng's class went to a nearby field. They made a table to show the numbers of animals they saw.

ANIMALS MR. ENG'S CLASS SAW

Animal	Number
Butterflies	253
Birds	127

3. How many butterflies and birds did the class see in all? Show how you get your answer.

$$\begin{array}{r} {\scriptstyle 1} \\ 253 \\ +\,127 \\ \hline 380 \end{array}$$

$250 + 120 = 370$

$3 + 7 = 10$

$370 + 10 = 380$

METHODS CAN VARY

They saw 380 **butterflies and birds in all.**

Write a number sentence to tell how you got your answer.

Number sentence: $253 + 127 = 380$

OR $127 + 253 = 380$

OR ANY EQUIVALENT EQUATION.

4. How many more butterflies than birds did they see? Show how you get your answer.

$$\begin{array}{r} 253 \\ -\ 127 \\ \hline \end{array}$$ regroup $$\begin{array}{r} 243 \\ 127 \\ \hline 126 \end{array}$$

$250 - 10 = 240$ $\quad 3 + 10 = 13$

$$\begin{array}{r} 240 \\ -\ 120 \\ \hline 120 \end{array} \qquad \begin{array}{r} 13 \\ -\ 7 \\ \hline 6 \end{array}$$

$120 + 6 = 126$

They saw 126 **more butterflies than birds.**

Write a number sentence to tell how you got your answer.

Number sentence: $253 - 127 = 126$

OR ANY EQUIVALENT EQUATION.

The students in Ms. Garcia's and Mr. Eng's classes combined all the animals they saw at the pond and at the field. They put all the numbers into one table.

ALL THE ANIMALS THEY SAW

Animal	Number
Bugs	52
Frogs	28
Butterflies	253
Birds	127

5. Did they see more than 400 animals or less than 400 animals in all?

Show how you get your answer.

AN ESTIMATE MIGHT BE SEE THERE ARE ABOUT 250 BUTTERFLIES, PLUS AT LEAST 100 BIRDS (250+100=350), PLUS AT LEAST 50 BUGS (350+50=400). WE HAVEN'T COUNTED IN THE FROGS, SO THERE MUST BE MORE THAN 400 IN ALL.

52+28+253+127=460

METHODS CAN VARY

Check one: [X] **More than 400** [ ] **Less than 400**

They saw 460 **animals in all.**

Write a number sentence to tell how you got your answer.

Number sentence: 52+28+253+127=460
OR 380+80=460

6. **How many <u>more</u> animals would the students need to see so that they saw 500 animals in all?**

They would need to see 40 **more animals.**

How do you know?

500 − 460 → 400 − 460 = 40

OR 460+40=500

THEY MAY COUNT FROM 460:

460 +10 =470
470 +10 =480
480 +10 =490
490 +10 =500

4 10s ARE 40.

METHODS CAN VARY.

Grade 2–Focus on Addition and Subtraction
Rubric

CATEGORY	4	3	2	1
Mathematical concepts	**Response shows complete understanding of the mathematical concepts used to solve the problem(s).**	**Response shows substantial understanding of the mathematical concepts used to solve the problem(s).**	**Response shows some understanding of the mathematical concepts needed to solve the problem(s).**	**Response shows very limited understanding of the underlying concepts needed to solve the problem(s), OR the response is not written.**
	Response shows evidence in ALL of the following tasks. **Task 1**. Student shows evidence of understanding addition of two-digit numbers. **Task 2**. Student shows evidence of understanding subtraction of two-digit numbers. **Task 3**. Student shows evidence of understanding addition of three-digit numbers. Student translates the addition into an equation (number sentence). **Task 4**. Student shows evidence of understanding subtraction of three-digit numbers. Student translates the subtraction into an equation (number sentence). **Task 5**. Student shows evidence of addition of four numbers with a mixture of two and three digits. Student translates addition into an equation (number sentence). **Task 6.** Student shows evidence of understanding subtraction of three-digit numbers.	Response shows evidence in only 4 or 5 of the tasks described in category 4.	Response shows evidence in only 2 or 3 of the tasks described in category 4.	Response shows evidence in only 1 or none of the tasks described in category 4.

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction
Rubric

CATEGORY	4	3	2	1
Strategy and procedures	**Student typically uses an efficient and effective strategy to solve the problem(s).**	**Student typically uses an effective strategy to solve the problem(s).**	**Student sometimes uses an effective strategy to solve problem(s), but not consistently.**	**Student rarely uses an effective strategy to solve problem(s).**
	Response shows evidence in ALL of the following tasks. **Task 1**. Student shows evidence of adding 52 + 28, including correct regrouping. **Task 2**. Student shows evidence of subtracting 52 – 28, including correct regrouping. **Task 3**. Student shows evidence of adding 253 + 137, including correct regrouping. Student produces a correct equation. **Task 4**. Student shows evidence of subtracting 253 – 137, including correct regrouping. Student produces a correct equation. **Task 5**. Student shows evidence of adding 52 + 28 + 253 + 127, including correct regrouping. Student produces a correct equation. **Task 6.** Student shows evidence of subtracting $500 - 460$, including correct regrouping.	Response shows evidence in only 4 or 5 of the tasks described in category 4.	Response shows evidence in only 2 or 3 of the tasks described in category 4.	Response shows evidence in only 1 or none of the tasks described in category 4.

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction
Rubric

CATEGORY	4	3	2	1
Explanation and communication	**Explanation is detailed and clear; uses appropriate terminology and/or notation.**	**Explanation is clear; uses some appropriate terminology and/or notation.**	**Explanation is a little difficult to understand, but includes critical components; shows little use of appropriate terminology and/or notation.**	**Explanation is difficult to understand, is missing several components, and does not use or include appropriate terminology and/or notation.**
	Response shows evidence in ALL of the following explanations. **Tasks 1 and 2**. Student shows correct addition with regrouping and correct subtraction with regrouping of the numbers 52 and 28. **Tasks 3 and 4**. Student shows correct addition with regrouping and correct subtraction with regrouping of the numbers 253 and 127. Student writes a number sentence that includes an equal sign along with the correct numbers. **Task 5**. Student shows correct addition with regrouping of all four numbers or of the two class sums. Student writes a number sentence that includes an equal sign along with the correct numbers. **Task 6**. Student explains how to determine the number of animals needed to get from 460 to 500.	Response shows evidence in only 4 or 5 explanations described in category 4.	Response shows evidence in only 2 or 3 explanations described in category 4.	Response shows evidence in only 1 or none explanations described in category 4.

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction
Rubric

CATEGORY	4	3	2	1
Mathematical accuracy	**All or almost all of the steps and solutions have no mathematical errors.**	**Most of the steps and solutions have no mathematical errors.**	**Some of the steps and solutions have no mathematical errors.**	**Few of the steps and solutions have no mathematical errors.**
	Student provides correct answers for ALL of the following tasks. **Task 1**. Student answers 80. **Task 2**. Student checks box for more bugs and answers 24. Student answers they saw 24 more bugs. **Task 3**. Student answers 380 and writes equation equivalent to 253 + 127 = 380. Number sentence must contain an = sign. **Task 4**. Student answers 108 and writes equation equivalent to 253 – 127 = 108. Number sentence must contain an = sign. **Task 5**. Student answers 460 and checks more than 400. Student writes an equation equivalent to 52 + 28 + 253 + 127 = 460 or 80 + 380 = 460. Number sentence must contain an = sign. **Task 6**. Student answers 40.	Student provides correct answers for only 4 or 5 of the tasks described in category 4.	Student provides correct answers for only 2 or 3 of the tasks described in category 4.	Student provides a correct answer for only 1 task or none of the tasks described in category 4.

Scoring Notes Checklist

Task	Check Yes	Category
Task 1		
Student shows evidence of understanding addition of two-digit numbers.		Concepts
Student shows evidence of adding 52 + 28, including correct regrouping.		Strategy
Student shows correct addition with regrouping and correct subtraction with regrouping of the numbers 52 and 28.		Explanation
Student answers 80.		Accuracy
Task 2		
Student shows evidence of understanding subtraction of two-digit numbers.		Concepts
Student shows evidence of subtracting 52 – 28, including correct regrouping.		Strategy
Student shows correct addition with regrouping and correct subtraction with regrouping of the numbers 52 and 28.		Explanation
Student checks box for more bugs and answers 24. Student answers they saw 24 more bugs.		Accuracy
Task 3		
Student shows evidence of understanding addition of three-digit numbers. Student translates the addition into an equation (number sentence).		Concepts
Student shows evidence of adding 253 + 137, including correct regrouping. Student produces a correct equation.		Strategy
Student shows correct addition with regrouping and correct subtraction with regrouping of the numbers 253 and 127. Student writes a number sentence that includes an equal sign along with the correct numbers.		Explanation
Student answers 380 and writes equation equivalent to 253 + 127 = 380. Number sentence must contain an = sign.		Accuracy
Task 4		
Student shows evidence of understanding subtraction of three-digit numbers. Student translates the subtraction into an equation (number sentence).		Concepts
Student shows evidence of subtracting 253 – 137, including correct regrouping. Student produces a correct equation.		Strategy
Student shows correct addition with regrouping and correct subtraction with regrouping of the numbers 253 and 127. Student writes a number sentence that includes an equal sign along with the correct numbers.		Explanation
Student answers 108 and writes equation equivalent to 253 – 127 = 108. Number sentence must contain an = sign.		

Task	Check Yes	Category
Task 5		
Student shows evidence of addition of four numbers with a mixture of two and three digits. Student translates addition into an equation (number sentence).		Concepts
Student shows evidence of adding 52 + 28 + 253 + 127, including correct regrouping. Student produces a correct equation.		Strategy
Student shows correct addition with regrouping of all four numbers or of the two class sums. Student writes a number sentence that includes an equal sign along with the correct numbers.		Explanation
Student answers 460 and checks more than 400. Student writes an equation equivalent to 52 + 28 + 253 + 127 = 460 or 80 + 380 = 460. Number sentence must contain an = sign.		Accuracy
Task 6		
Student shows evidence of understanding subtraction of three-digit numbers.		Concepts
Student shows evidence of subtracting $500 - 460,$ including correct regrouping.		Strategy
Student explains how to determine the number of animals needed to get from 460 to 500		Explanation
Student answers 40.		Accuracy

SITES-M Mathematics Challenge

Grade 2–Focus on Addition and Subtraction

Analyzing Student Responses Protocol

The purpose of the Mathematics Challenges is to provide opportunities for students to develop and demonstrate understanding of important mathematical concepts and standards. They include extended responses, open-ended tasks, and tasks that require higher-order thinking skills. Because these types of tasks may be novel for students and they will have varying levels of understanding, the student responses will vary.

The guiding questions below were designed to assist you in analyzing your class' response to the Challenge and determining appropriate next steps for your teaching and learning. Responses to these questions are for your reflection and documentation and will not be collected.

Guiding Questions for Analyzing Student Responses to the Mathematics Challenges

1. When completing the Challenge, what did your students do well? How do you know?

2. When completing the Challenge, what did your students struggle with? How do you know?

3. When your students completed the Challenge, did they implement multiple correct solutions strategies? What insightful approaches to problem solving did you observe?

4. What, if any, patterns (e.g., common errors/misconceptions) did you observe across your student responses?

5. What questions or concerns did your students have when working through this Challenge or a particular task? Are these things you should address for the class as a whole?

6. What, if any, feedback did you provide to your class? How did you provide it?

7. What did you learn about your students' mathematical understanding based on their responses to this Challenge?

Reminders:

1) After you have completed the Challenge with your class and responded to these Guiding Questions for Analyzing Student Responses, please complete the Challenge Feedback Log. A link to this Log is e-mailed to you each month. Responses will be used to improve the Challenges and to provide recommendations for teachers implementing the Challenges in future years.

2) Please provide copies of all student work to the Assessment Coordinator.