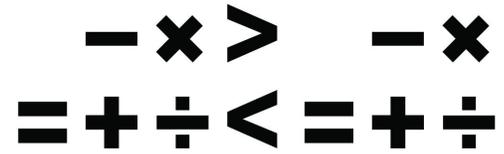


K-2 MATH

PERFORMANCE TASK

TEACHER INSTRUCTIONS



TASK OVERVIEW¹

TITLE	GRADE LEVEL	SUBJECT AREA	INSTRUCTIONAL UNIT	TIME FRAME: HOW LONG TO ADMINISTER THE TASK?
Let's Plan a Zoo	1	Mathematics	Developing addition and subtraction strategies	One to two 60 minute windows*

¹ The student work samples posted for this task are a result of the task being administered over the course of two days. Upon reflection, teachers wondered if it would have been better to administer the entire task in one day.

CONTENT AREA²

PROFICIENCIES AND PERFORMANCE INDICATORS

GRADUATION PROFICIENCY	GRADUATION PROFICIENCY DESCRIPTION	PERFORMANCE INDICATOR	PERFORMANCE INDICATOR DESCRIPTION
#4 Functions & Algebraic Reasoning	Students will create, interpret, use and analyze expressions, equations and inequalities including recognizing when a relationship is a function and evaluating that function.	A	Represent and solve problems involving addition and subtraction (of all problem types). (K.OA.1, 2, 3, 4; 1.OA.1, 2; 2.OA.1)
#4 Functions & Algebraic Reasoning	Students will create, interpret, use and analyze expressions, equations and inequalities including recognizing when a relationship is a function and evaluating that function.	C	Explain the relationship between addition and subtraction. (1.OA.4, 8)

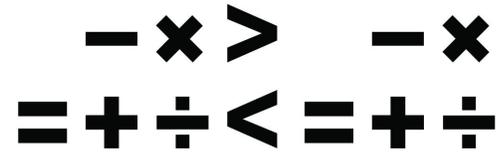
² Modifications were made to the Content Performance Indicators (PIs) after the task was administered. These modifications were based on a more thoughtful interpretation of the relevant CCSS standards. Functions &



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Algebraic Reasoning C was eliminated and folded into A. The modified version of Functions & Algebraic Reasoning A is shown below.

The order in which the Content Scoring Criteria is printed in the document is hierarchical based on the alphabetical coding of the Performance Indicators. The team wondered if it would be more user friendly to reverse the printed order of the A and C indicators to reflect how they are aligned with parts of the task. That is to say, 4C should have appeared first since the team determined it was aligned with Part 1 and 4A should have appeared last since it was determined to be aligned with Part 2 of the task. With the ultimate elimination of the 4C Performance Indicator, this ceases to be an issue.

#4 Functions & Algebraic Reasoning	Students will create, interpret, use and analyze expressions, equations and inequalities including recognizing when a relationship is a function and evaluating that function.	A	Represent and solve problems (of all problem types) using the relationship between addition and subtraction. (K.OA.1, 2, 3, 4; 1.OA.1, 2, 4, 8; 2.OA.1
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CROSS-CURRICULAR PROFICIENCIES AND PERFORMANCE INDICATORS

GRADUATION PROFICIENCY	GRADUATION PROFICIENCY DESCRIPTION	PERFORMANCE INDICATOR	PERFORMANCE INDICATOR DESCRIPTION
Reflection and Evaluation	Students will demonstrate reflection and evaluation through goal setting, self-assessment, and feedback, monitoring their progress toward goals and adjusting their strategies to account for individual strengths and challenges.	1	Represent and solve problems Describe individual strengths and challenges.

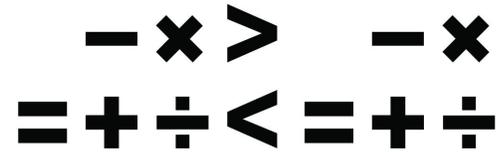
SCORING CRITERIA^{3 and 4}

³ The blue text inserted into the original scoring criteria represents the questions and “look fors” the team used to guide their calibration and scoring session.

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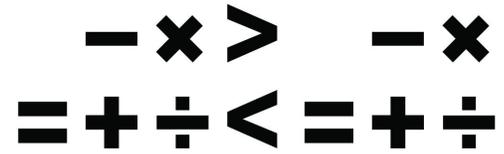


PERFORMANCE INDICATOR	BEGINNING	DEVELOPING	PROFICIENT	EXPANDING
<p>#4 Functions & Algebraic Reasoning: A</p> <p>Represent and solve problems involving addition and subtraction (of all problem types). (K.OA.1, 2, 3, 4; 1.OA.1, 2; 2.OA.1)</p> <p>The team decided this criteria aligned to Part 2 and they interpreted it in terms of what it would look like for first grade work.</p>	<p>Identify the appropriate operation in addition and subtraction situations.</p> <p>Addition equation</p>	<p>Create a model to represent addition and subtraction situations.</p> <p>Correct numbers used in addition or subtraction problem/equation, incorrect problem type, and/or wrong answer</p>	<p>Create and use an appropriate model to represent and solve addition and subtraction problem(s).</p> <p>Must be subtraction problem, answer correct, correct problem type</p>	<p>Create multiple representations of addition and subtraction problems and explain connections between the representations and the situation(s).</p> <p>Model, answer, and equation correct</p>
<p>#4 Functions & Algebraic Reasoning: C</p> <p>Explain the relationship between addition and subtraction. (1.OA.4, 8)</p> <p>The team decided this criteria aligned to Part 1 and they interpreted it in terms of what it would look like for first grade work.</p>	<p>Describe/demonstrate the meaning of addition or subtraction by using concrete models or examples.</p>	<p>Describe/demonstrate the meaning of addition and subtraction using concrete models or examples.</p> <p>2 addition/ 2 subtraction equations, addition word problem?</p> <p>Are just the 4 equations enough and no word problem at all?</p>	<p>Describe/demonstrate the relationship between addition and subtraction using concrete models or examples.</p> <p>2 addition/ 2 subtraction equations, attempt at subtraction word problem?</p> <p>3 equations and correct word problem?</p> <p>Is attempt sufficient to be proficient?</p>	<p>Describe/demonstrate the relationship between addition and subtraction using concrete models or examples and connecting those examples to the parts of addition and subtraction equations.</p> <p>2 addition/ 2 subtraction equations, word problem reflects subtraction, equation circled</p> <p>Is the expectation in expanding really "expanding"?</p>

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Reflection and Evaluation: 1 Describe individual strengths and challenges.	Identify an individual strength or challenge.	Identify individual strength(s) and challenge(s).	Describe how individual strength(s) and challenge(s) impact progress toward goals.	Analyze individual strengths and challenges to identify strategies to overcome challenge(s) and build on strengths.
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4 Modifications were made to the Scoring Criteria after the task was administered. These modifications were based on those made to the Performance Indicators. Functions & Algebraic Reasoning C was eliminated and folded into A. The modified version of Functions & Algebraic Reasoning A is shown below.

If the decision is made to use this task, we advise using the modified Scoring Criteria. This may require the user to make adaptations to the task before administering it to students.

PERFORMANCE INDICATOR	BEGINNING	DEVELOPING	PROFICIENT	EXPANDING
4A. Represent and solve problems (of all problem types) using the relationship between addition and subtraction. (K.OA.1, 2, 3, 4; 1.OA.1, 2, 4, 8; 2.OA.1)	Identify the appropriate operation in addition and subtraction situations.	Represent addition and subtraction problems.	Represent and solve problems (of all problem types) using the relationship between addition and subtraction.	Create multiple representations of addition and subtraction problems (of all problem types) and explain connections between the representations, the solutions, and the situation(s).

CONNECTIONS TO INSTRUCTIONAL UNIT

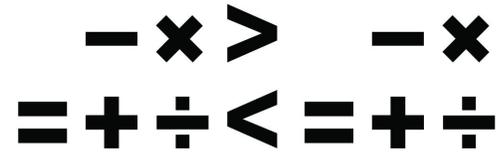
UNIT SUMMARY ⁵

May include big ideas, authentic context, enduring understandings, essential questions.

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The unit focuses on addition and subtraction strategies and emphasizes solving for an unknown. Students use manipulatives and models to discover the relationship between addition and subtraction, to further explore the commutative property, and to learn to solve for an unknown in any position. They generate equation fact families and story problems. The idea that the equal sign describes a relationship between two quantities that have the same value, rather than indicating “the answer,” is reinforced.

This unit/assessment can be integrated through the concept of planning a zoo. Content connections could include ELA, Science, Social Studies, Art, Music, and possibly PE. Alternative connections where students need to group quantities can be substituted.

5 Upon reflection and given time, the writing team would have liked to include instructional tips regarding modeling problem types and student goal setting and reflection.

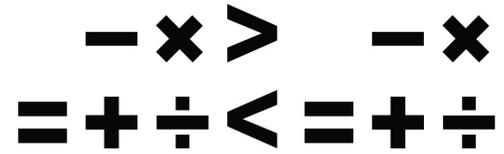
What will students know as a result of instruction in this unit in order to complete the task?	What will students be able to do as a result of instruction in this unit in order to complete the task?
<ul style="list-style-type: none"> Relationship between addition and subtraction Commutative Property 	<ul style="list-style-type: none"> Solve for an unknown Select manipulatives and/or models to problem solve Recognize patterns Demonstrate their understanding of a relational view of equality by writing and solving equations

How will teachers know what students know and can do prior to the task? Which relevant concepts and skills have students struggled with, had misconceptions about or missed entirely?	What background knowledge do students need (cultural, language, etc)? Have both content goals and language demands for ELL students been considered? Have the needs of diverse learners been considered?
<p>Misconceptions:</p> <ul style="list-style-type: none"> Equal sign means “the answer” “The unknown” always after equal sign The location of the unknown when writing/solving a word problem Meaning of the +/- symbol <p>Prior knowledge:</p> <ul style="list-style-type: none"> Fluent to 5 	<ul style="list-style-type: none"> Using manipulatives Number fluency Counting & cardinality Decompose numbers less than or equal to 10 into pairs in more than one way An understanding of a zoo and animals they might find in a zoo The meaning of exhibits and shelters in a zoo

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<ul style="list-style-type: none"> • Adding and subtracting to 5 • Solving word problems within 10 using objects, drawings with less complex problem types 	<p>setting</p>
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CULMINATING TASK

TASK SUMMARY
<ul style="list-style-type: none"> • Students will demonstrate their understanding of addition, subtraction, and solving for an unknown in any position. • Students will generate equations and a word problem.

STUDENT ACTIVITY
<ul style="list-style-type: none"> • Students engage in a whole class discussion about zoos as a means to activate prior knowledge about zoos, promote engagement, and introduce the context for the task. Students share prior zoo experiences and develop their understanding of a zoo exhibit and animal shelters. • Students listen to a read-aloud of 1, 2, 3 to the Zoo by Eric Carle. • Students select an animal they will use to complete the assessment. • Students individually complete the Student Task Template for Let’s Plan a Zoo including the Student Reflection.⁶ • Follow up to assessment could be that students could share/gallery walk their:⁷ <ul style="list-style-type: none"> ○ representations for part 1a ○ word problems

⁶ The team suggested the addition of this reflection prompt: *I was successful with this math task because . . .*

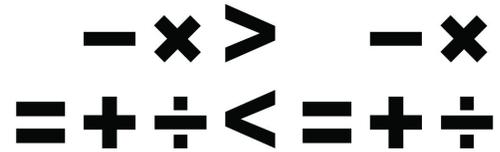
⁷ Teacher Quote - “As students finished their responses, I gave them blank paper and had them find a partner and switch papers for task #1 and asked them to solve each others word problem.”

CONSIDERATIONS FOR DIFFERENTIATION AND ACCESSIBILITY

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- Multiple images may be needed to establish a sound understanding of the vocabulary words exhibit and shelter.
- Students may also need/want to pass around photographs of animals at the zoo.
- Teacher can read task aloud to all students.
- Manipulatives can be used to help students draw their representation.
- Students create their own story to allow for real life connections
- Have images available with clear ideas of shelter and outside space.
- Continue to reinforce the idea of exhibit in a zoo.
- The quantity of 8 was selected because while students worked on word problems with numbers within 10, they did not work with the more complex problem types and were not expected to write equations. Also, the focus of this assessment is more about the inverse relationship of +/- , reasoning abstractly and quantitatively, solving a change unknown, and a relational view of equality.
- These concepts can be revisited later in the year with numbers to 20.

ADMINISTRATION NOTES AND DIRECTIONS

Show [image](#) from National Zoo to build student curiosity and introduce the idea of planning a zoo. Ask questions about places where animals live, the purpose of zoos, etc. Additional images and a [map](#) can also be used to promote discussion.

Students will be asked to help plan a zoo. “Today we will talk about the parts of an animal exhibit and how animals live in a zoo.”

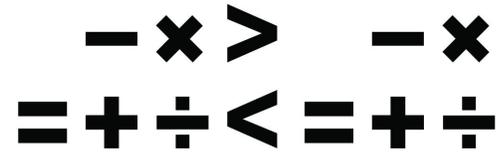
For this assessment the anticipatory set will include a discussion about the zoo.

- Teacher asks students about any prior zoo experiences.
- Teacher shows images from the [National Zoo](#) to explain the meaning of “exhibit” and to illustrate the difference between animals being [inside their shelter](#) v. [outside their shelter](#). Ask questions to prompt students to articulate the parts of an exhibit--inside shelters v. outside.
 - National Zoo still images
 - [Elephants webcam](#)
 - “What do you notice?”
 - “What are the different parts of the exhibit?”
 - “What do you think the purpose is of these different parts?”
 - “Can you think of other animals at the zoo that have a shelter in their exhibit?”
 - [Show Panda cam 2](#) from the National Zoo.
 - Make sure students notice the window and shelter at the Panda exhibit.

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Teacher reads [1, 2, 3 to the Zoo](#) by Eric Carle. While children may already be familiar with this book, it connects the idea of numeracy and zoo animals.

Tell students they will be able to select an animal to work with to help plan a zoo exhibit.

Students should select their animal before introducing the task.

Teacher will display a picture of each [animal](#).

Students will write their name and the type of animal they select on a sticky note and post it on the picture displayed.

Teacher provides each student with the appropriate animal sheet, the Student Task Template, and a large piece of paper for part 1a of the task. ⁸

If so desired, time could be set aside for students to share their work with other students. This could take the form of partners discussing one another's solutions or a gallery walk of some type followed by a class discussion.

Partner share time provides a good opportunity to facilitate student analysis of work allowing students to evaluate the process and analyze errors.

Alternatives:

- This unit/assessment can be integrated through the concept of planning a zoo. Content connections could include ELA, Science, Social Studies, Art, Music, and possibly PE. Alternative connections where students need to group quantities can be substituted.

⁸ Teacher Suggestion: When printing the task for students, it would be helpful to include 1a - c on a single page. This will prevent students from having to go back and forth between papers/pages. Document edits should include enlarging the answer space for Parts 1a and 2a and inserting a rectangular box labeled "Exhibit" so students have a defined space for their representations.

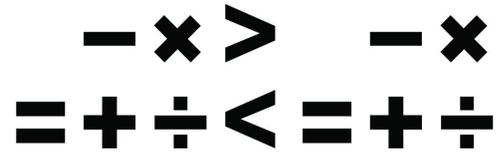
During the calibration and scoring session, educators had these additional wonders:

- In Part 2, should there be directions that prompt students to draw a model that reflects the correct subtraction equation? We are seeing pictures that do not reflect subtraction, which is okay to help a student solve a problem, but adding another prompt could provide an opportunity for a score of Expanding (4) and

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also inform instruction with modeling.

- For Part 2, would “boxing” be sufficient to show removal? Would a correct equation identify the idea that a student was not adding?
- For Part 2, the language of “inside their shelter” and “outside their shelter” was wordy for kids. Should the prompt be reworded to include two different types of animals and/or two different locations? It would probably be easier to rephrase the prompt with two different locations. Teachers found this interesting because they had recently finished a science unit with shelters and habitats. They suggested the use of blacktop and grass because it is something many students are familiar with from their recess/lunchtime. That being said, there is the acknowledgment of possible bias here with respect to students’ personal experiences, but in terms of authentic habitats at zoos it is reasonable.

MATERIALS AND RESOURCES

- [Animal Images](#) - an enlargement of each image should be made for class discussion
- Photographs of animals at the zoo - several links provided below
 - <https://nationalzoo.si.edu/webcams/panda-cam>
 - <https://nationalzoo.si.edu/webcams/elephants>
 - <https://nationalzoo.si.edu/animals/exhibits/elephant-trails>
- [1, 2, 3 to the Zoo](#) by Eric Carle
- Large pieces of paper for each student
- Classroom manipulatives
 - Pencils
 - Glue
 - Scissors

Supporting Resources:

[Addition/Subtraction Problem Types](#)

[Definition of Rigor](#) (Achieve the Core)

[Achieve the Core Coherence Map](#)

[Standards for Mathematical Practice](#)

[Progressions for the Common Core Math Standards](#)

Student Assessment Task:

<https://docs.google.com/document/d/12Si30PD5kCmuw21mENpJLidfMEGzzk57Nf9O3xYFVR8/edit>