Grade 2 rich tasks mathematics

Instructional mathematics tasks are accessible to all learners because they invite students to wrestle with a problem. Students share their ideas, ask questions of one another, use and apply multiple representations, and collaborate to develop various solution pathways. Then, teachers use students' solutions to make the math visible, connect prior learning, and forecast new mathematical learning.

Directions: You can launch the tasks in a whole group to provide opportunities for students to discuss their understanding of the task and suggest strategies to solve. Then, organize the students in pairs or groups of four to encourage participation. Provide manipulatives, chart paper, and markers.

1

Topic

Operations and Algebraic Thinking: Represent and solve problems involving addition and subtraction.

Task

Leanne and Thomas are planting flowers and vegetables. Leanne wants to plant more vegetables and Thomas wants to plant more flowers.

Flowers	Vegetables
26 petunias	18 tomatoes
35 daisies	21 cucumbers
	15 corn

Are there more vegetables or flowers? If they want to plant an equal number of vegetables and flowers, what kind of plant will they need to get? How many more will they need? Prove how you know!

Facilitate

Display the first two sentences of the problem first and ask the students to discuss the problem with a partner. Ask the students what information they need to know. Next, reveal the chart with a sticky note covering up the numbers. Ask the students, "What do you notice now?" and "What are you wondering?" Finally, remove the sticky notes and the final portion of the problem. Distribute base 10 blocks and chart paper to the students. As the students are working, ask, "How do you know if they have more flowers or vegetables? How many more do they need to have an equal amount?" and "How can you represent your thinking with the base 10 blocks?"

Make the Math Visible

Ask the students to share strategies and solutions. Encourage the students to show how they grouped the values, perhaps using place value strategies or with manipulatives. Some students might total each column and then find the difference. Other students might find the difference between petunias and tomatoes and daisies and cucumbers first. Emphasize how place value strategies make adding easier.

2

Topic

Number and Operations in Base 10: Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones.

Task

Nita and Nelson disagree about which of the following values is greatest. Nita thinks it is A, and Nelson thinks it is B. Malcolm says that neither is correct! Who is correct? Prove how you know!

A. 2 ones, 3 hundreds, 5 tens	B. 5 ones, 2 hundreds, 3 tens
C. 5 tens, 3 ones, 2 hundreds	D. 3 tens, 2 ones, 5 hundreds

Facilitate

Display the prompt to the students and ask them to discuss what they notice with a partner. Elicit from the students that the values include 1s, 10s, and 100s. The students also might notice that the values are not written in the same order. Distribute base 10 blocks to the students and encourage them to use the blocks to find the values to prove their ideas. Ask, "How can you prove the value?"

Make the Math Visible

Ask the students to share solutions and highlight student work that reveals understanding about place value. Emphasize students' representations that use the place value blocks to compare the values. Elicit from the students that when the values are not written in order, they must pay attention to both the number and value, and that when the value is written in standard form, the position of the digit indicates the value. For example, 2 ones, 3 hundreds, 5 tens will be written as 352.

3

Topic

Number and Operations in Base 10: Explain why addition and subtraction strategies work, using place value and the properties of operations.

Task

Timmy and Aliyah solved 39 + 45 = ____ in different ways. Can they both be right? Draw a visual model to show how they solved.

Timmy said he added 39 + 40 = 79. Then he added 79 + 5 = 84.

Aliyah said that she added 39 + 1 = 40. Then she added 40 + 44 = 84.

Facilitate

Ask the students to solve the problem first without seeing Timmy's strategy and Aliyah's strategy. Then, reveal their strategies and ask students to draw a visual model to match the strategies. Ask, "What visual model matches the strategy?" and "How did Timmy and Aliyah use what they know about place value to add?"

Make the Math Visible

Encourage the students to share their visual models. Highlight how each of the students used place value to add. Then, ask the students to share their solutions. Emphasize how using place value as a strategy makes adding simpler and even more efficient.

4

Topic

Measurement and Data: Measure and estimate lengths in standard units.

Task

How long is your desk? Use two different objects (units) to measure your desk and record the measurements. First, make a prediction for each object, then carefully measure and record what you found. What do you notice about the objects you used to measure?

Facilitate

This task works best if all students have the same two objects (units) to measure the desks. Arrange the students in partners and review measuring techniques to improve accuracy. Ask students to measure and record the measurements using the different objects. As students work, ask, "What are you noticing about the measurement units you are using?" If time, add a third object (unit).

Make the Math Visible

Record the students' measurements and ask the students to discuss what they notice about the total measurement. For example, if the desk measured 24 cubes and 6 pencils, ask, "What does the total measurement for the desk tell us about the size of the unit?" Students should notice that the greater the number, the smaller the size of the unit (object). Also, ask students to compare the units of measure. For example, if students used cubes and pencils, ask, "What is the relationship between the cubes and the pencil? About how many cubes equal a pencil?"

Notes

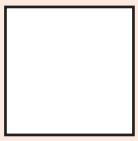
Topic 5

Geometry: Partition circles and rectangles into two, three, or four equal shares.

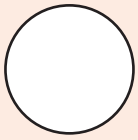
Task

Best friends, Kyra and Keisha share everything! They want to make sure that each of them receive an equal share of the following items. Show how you will help Kyra and Keisha get an equal share. Find all the ways each item can be shared equally.

A sandwich:

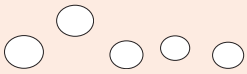


A pizza:



A slice of pizza:

Candy pieces:



A candy bar:

Facilitate

Display only the items and ask the students to discuss what they notice. Then, reveal the task to the students and ask them to talk with a partner about sharing equally. Elicit from the students that equal shares mean that each person will get exactly the same size and shape and that what is shared will be equal. Distribute multiple shapes to each pair of students and prompt them to find as many ways to share each item equally by drawing and/or folding.

Make the Math Visible

Ask the students to share solutions in a progression from the simplest representation to the most advanced. For example, some students might divide the sandwich into two pieces (halves), while other students might divide the sandwich into four pieces with each person receiving two $\frac{1}{4}$ pieces. Use mathematics vocabulary explicitly with the students to highlight equal parts and equal sharing. Demonstrate how parts are equal by comparing using folding or manipulatives to cover the shape.

Adapt-a-Mathematical TASK Tool

Do you have a task that is not quite right? Use this guide to adapt the task to meet your needs!

How does the task meet your STUDENTS' needs?

ACCESS and EQUITY: Ensure that the task is "responsive to students' backgrounds, experiences, cultural perspectives, traditions, and knowledge" (NCTM, 2014, para. 1, https://www.nctm.org/uploadedFiles/Standards_and_Positions/Position_Statements/Access_and_Equity.pdf). Consider students' language readiness, including access to mathematical vocabulary.

- How can you differentiate the context of the task to support the students' backgrounds, experiences, and cultural needs?
- How can you group students to engage the students' socio-emotional and developmental needs?
- How can you "open up" the task to encourage access to the task for all learners?
- How can you connect the task to the mathematics the students have learned and students' interests?

Notes

How do you PLAN for students to learn from the task?

MATHEMATICAL GOAL: The task should provide students opportunities to access new mathematical knowledge and to solidify, consolidate, or extend knowledge. Tasks can be changed to highlight multiple learning needs and content standards. Ensure that you strategically connect the learning goal to the task.

- What do your students know how to do right now?
- What do you expect your students to understand as a result of this task?
- What do you anticipate students will do? What changes might you make as a result of your anticipation?

FACILITATE: Task facilitation is critical to student success. Consider how you will organize students and **design** purposeful questions to help them discover and connect mathematics concepts and procedures.

- What **questions** are you going to ask? What tools will you provide? How will students be grouped?
- How and when will you provide opportunities for student **discourse**?

Notes

How do you move learning FORWARD?

FORMATIVE ASSESSMENT: Collecting information about student understanding will help you adjust instruction as you conduct the task.

- How will you listen, observe, and identify students' strategies?
- How will you respond to students' understanding?
- How will you provide feedback to students?
- How will you provide opportunities for students to provide feedback to one another?
- How will you provide opportunities for students to persevere and productively struggle through problems?
- How will you make the mathematics visible for your students?

Notes