

Grade 1

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 to encourage participation. Provide manipulatives, chart paper, and markers.

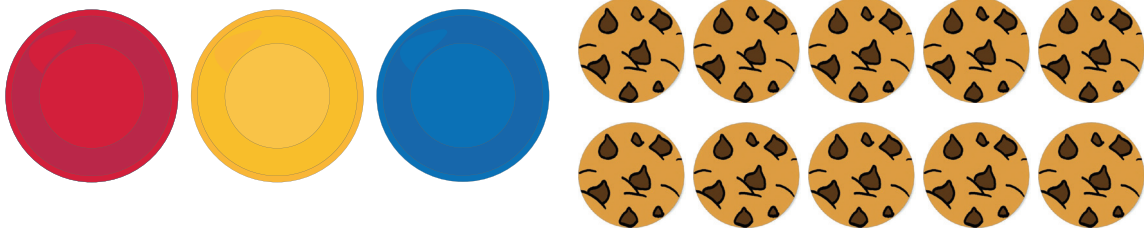
1

Topic Operations and Algebraic Thinking: Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.

Task Teddy's mother asked him to arrange 10 cookies on three plates. She said that each plate has to have at least one cookie. Help Teddy find all the ways to arrange the cookies.

Facilitate

Show three plates (red, yellow, and blue) and 10 cookies.



Ask the students to turn and talk with a partner about what they notice. Encourage the students to notice the number of plates and the number of cookies. Then, ask the students to ask questions about what they see. Record their questions. Reveal the task to the students and ask, "How many ways do you think Teddy can arrange the 10 cookies?" Encourage the students to make predictions and record their ideas.

Distribute 10 cubes and three small circles, one each that is red, yellow, and blue. Then, ask the students to find ways to place the cookies on the plates. Ask the students to record what they find as a number sentence. For example, $8 + 1 + 1 = 10$. As the students are working, ask, "How did you decide on that combination?" "Can you find another combination?" As the students are working, record the combinations that you see.

Make the Math Visible

Post the students' number sentences on sentence strips, one combination per sentence strip. Ask the students to talk with a partner about what they notice. Then, begin arranging the number sentences in a pattern and ask the students to turn and talk about the pattern they see. $8 + 1 + 1 = 10$. $7 + 2 + 1 = 10$. $6 + 3 + 1 = 10$. $5 + 4 + 1 = 10$. $4 + 5 + 1 = 10$, etc. Ask, "What is the next number sentence in the pattern?"

2

Topic

Operations and Algebraic Thinking: Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false.

Task

Sally says only one of these equations is true! Benji says that more are true! Which ones are true? Which ones are false? Prove how you know!

$$4 + 5 = 10, \quad 3 + 4 = 5 + 2, \quad 8 + 1 = 5 + 5, \quad 1 + 1 = 11$$
$$3 + 5 = 5 + 3, \quad 43 = 4 + 3, \quad 12 = 6 + 5 + 1, \quad 6 + 7 = 13$$

Facilitate

Arrange the students in pairs and distribute the equations on slips of paper or index cards. Ask the students to sort them into true and false piles. As the students

are working, ask, "How can you prove that the equation is true? False?" Encourage the students to use manipulatives and drawings to represent the equation.

Make the Math Visible

Ask the students to share a variety of methods they used to determine which equations were true and which were false. Encourage the students to show multiple representations for the same equation. As the students share each equation, record the equation under the correct true or false heading. Ask the students to notice the placement of the equal sign. Conduct a discussion about the role of the equal sign.

3

Topic

Number and Operations in Base 10: Understand place value.

Task

Alice and Mona are having a disagreement about the number of groups of 10 crayons they have in their crayon box. Alice thinks her crayon box has the greatest number of groups of 10 crayons. Mona thinks her crayon box has the greatest number of groups of 10 crayons. Alice's box has 30 new crayons and 16 old crayons. Mona has 20 new crayons and 23 old crayons. Can you help them find out how many groups of 10 crayons each student has? Prove how you know!

Facilitate

Present the task with the values 30, 16, 20, and 23 covered with a sticky note. Ask the students to turn and talk about what they notice in the problem. Encourage the students to make predictions about Alice and Mona's values. Then, reveal the values to the students and pose the question. Have student

pairs work together to solve the problem using blank 10 frames, cubes, base 10 blocks, hundred charts, or other materials. As students are working, ask, "How can you prove who has more groups of 10 crayons?" As the students are working, observe students who are using a variety of methods to show the groups of tens.

Make the Math Visible

Ask the students to share a variety of methods. Revisit the values presented in the problem and ask the students to notice that 30 and 16 had a total of 46 crayons, which equaled 4 groups of 10 crayons. Write $30 + 16 = 46$. 46 has 4 tens and 6 ones. Then record $20 + 23 = 43$. 43 has 4 tens and 3 ones. Ask, "What do you notice?" Encourage the students to notice that the number of groups of 10 matches the number in the tens place.

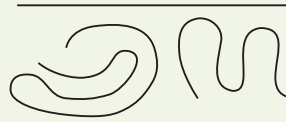
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Topic

Measurement and Data: Measure lengths indirectly and by iterating length units.

Task

Sarita is going to go for a walk. She wants to take the longest walking path. Can you help her figure out which path is the longest? Shortest?



Facilitate

Present the above three walking paths to the students and ask them to turn and talk about what they notice. Record their ideas. Then, ask the students what they wonder. Encourage the students to wonder about the lengths of the paths. Distribute a copy of the three walking paths to the students. Ensure that the straight path is shorter than at least one of

the other paths. Give students access to string, centimeter cubes, paper clips, or some other manipulative that can be used to measure. As students are working, ask students to show you their measuring technique. Ask questions such as, "How do you know which path is longer?" and "How can you compare the length of the walking paths?"

Make the Math Visible

When students are finished, ask some groups to share how they determined the longest walking path. Have students demonstrate their measuring technique to model effective and efficient measuring. Ask the students if they were surprised by the results. Encourage the students to share their surprises about the length of the path. Some students may have thought that the straight path was longest. Highlight how measurement proves the lengths of the paths.

Notes

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Topic

Geometry: Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*.

Task

Petra made sandwiches for her picnic. There will be a total of 4 friends at the picnic. She needs to make sure that everyone gets a fair share. She is thinking about the two situations:

1. The 4 people share 1 sandwich.
2. The 4 people share 2 sandwiches.

How much sandwich will each person get in each situation? Prove how you know!

Facilitate

Pose the task to the students with the number values covered with sticky notes. Ask the students to turn and talk about what they notice and wonder about the problem. Then, uncover the sticky notes to reveal the number of people and sandwiches to the

students. Distribute multiple paper squares to the students to find out how much of the sandwich each person gets. Encourage students to show their solutions by drawing, cutting, and/or folding the squares.

Make the Math Visible

Revisit the sandwich situations and ask, "What is the fair share for each person when 4 people share 1 sandwich?" and "What is the fair share for each person when 4 people share 2 sandwiches?" Encourage the students to share their methods to determine the fair share for each person. Ask students to describe the fair shares.

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