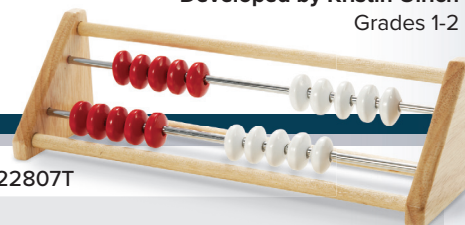


$$a^2 + b^2 = c^2$$

MATH Works!

Addition & Subtraction Word Problems Using the Rekenrek

Developed by Kristin Ulrich
Grades 1-2



TB22807T



Common Core State Standards

CCSS.Math.Content.1.OA.A.1 —

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions (e.g. by using objects, drawings, and equations with a symbol for the unknown number to represent the problem).

CCSS.Math.Content.2.OA.B.2 —

Fluently add and subtract within 20 using mental strategies. By the end of Grade 2, know from memory all sums of two 1-digit numbers.



Objectives

Students will...

- Count on to find the answer to word problems with answers between 0 and 20.
- Design their own real-world word problems with answers between 0 and 20.
- Utilize an algebraic equation when solving each word problem.



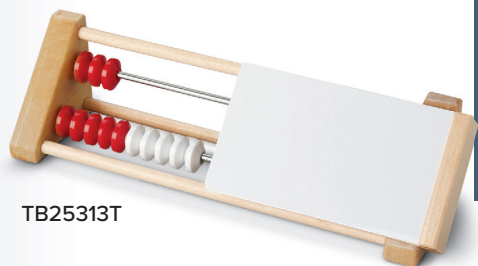
Materials

- Individual Student Rekenrek Up to 20, 1 per student (Cat. No. TB26259T, TB22807T, or TB25313T)
- Single-Sided Unlined Dry-Erase Board, 1 per student (Cat. No. TB18431T)

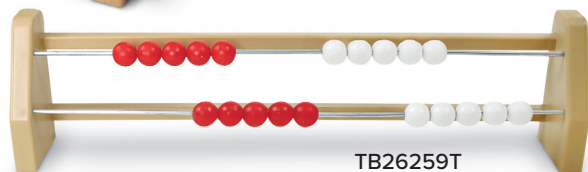


Activity

1. Students should be somewhat familiar with the use of the Rekenrek to complete this lesson.
2. Start by just using the top row of the Rekenrek and ask a student to remind you how many red beads there are and how many white beads there are. The student should answer 5 of each.
3. Ask students how they would make the number 6. They should answer that you would move 5 red beads and 1 white bead. Next, ask them how they would make the number 8. They should answer that you would move 5 red beads and 3 white beads. Continue this questioning strategy with numbers less than 10 until you feel students have mastery of the concept.
4. When students are ready for a little more challenge, ask how they would make numbers greater than 10. Remind students to start by sliding over all 10 on the top row. For example, you can ask students how they would make the number 13. If they use all 10 beads on the top row, how many more do students need on the second row? They should answer 3 more red beads. Show what that would look like.
5. Continue with this questioning strategy with numbers 11-20 until you feel students have mastery of the concept. Using this questioning style is pivotal because it continues to encourage students to count on, instead of starting from the beginning and recounting each time.



TB25313T



TB26259T

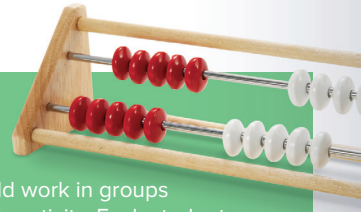


Discussion

1. Start with the following word problem: *Julia has 3 stuffed animals on her bed. When she cleaned her room, she found 2 more stuffed animals under her bed. How many stuffed animals does Julia have in all?*
2. Ask students, "How many stuffed animals did Julia have at the beginning of the problem?" They should say that Julia had 3 stuffed animals. Have students write 3 on their dry-erase boards and move 3 red beads over on their Rekenreks to represent those 3 animals.
3. Ask students, "How many stuffed animals did Julia find under her bed?" They should say that she found 2 stuffed animals under her bed. Have students write $+ 2 =$ on their dry-erase boards. The dry-erase boards should now read $3 + 2 =$. Have students add a ? after the equals sign. Explain to the students that the question mark is being added because that is the answer they are trying to find. Students should also move 2 red beads on their Rekenreks to represent those 2 animals.
4. Now ask students if they can answer the question posed by the word problem, "How many stuffed animals does Julia have in all?" based on how many beads they have moved. They should be able to answer 5 stuffed animals. On their dry-erase boards, students can either erase the ? and replace it with 5, or they can write $? = 5$ under the problem.
5. Introduce the next word problem: *Samuel had 4 books checked out of the library. He went back and checked out 5 more. How many library books does Samuel have in all?*
6. Ask students, "How many books did Samuel check out the first time he went to the library?" They should say that he checked out 4 books. Have students write a 4 on their dry-erase boards and move 4 red beads on their Rekenreks.
7. Ask students, "How many books did Samuel check out the second time he went to the library?" They should say that he checked out 5 more books. Have students write $+ 5 = ?$ on their dry-erase boards. Remind them to count on from the 4 they have already moved and to move 5 more beads.
8. Students should now be able to answer the question posed by the word problem, "How many library books does Samuel have in all?" based on the number of beads they have moved. On their dry-erase boards, students can either erase the ? and replace it with 9, or they can write $? = 9$ under the problem.
9. Introduce the next word problem: *Hector ate 9 crackers. He was still hungry, so he ate 5 more. How many crackers did Hector eat in all?*
10. Ask students, "How many crackers did Hector eat at first?" They should say that he ate 9 crackers. Have students write a 9 on their dry-erase boards and move 5 red beads and 4 white beads on the top row of their Rekenreks.
11. Ask students, "Because he was still hungry, how many more crackers did Hector eat?" They should say that he ate 5 more crackers. Have students write $+ 5 = ?$ on their dry-erase boards. Remind them to count on from the 9 they have already moved, then ask them, "How many more beads are on the top row?" They should answer 1 bead. Have them move that bead over, then ask how many more beads need to be moved on the bottom row. They should say 4 beads. Have them move those 4 beads.
12. Students should now be able to answer the question posed by the word problem, "How many crackers did Hector eat in all?" Point out to students that they have moved 10 beads on the top row and 4 red beads on the bottom row. Using that information, they should be able to say how many beads have been moved in all to answer the question. On their dry-erase boards, students can either erase the ? and replace it with 14, or they can write $? = 14$ under the problem.

Practice

1. Students should work in groups of 2 or 3 for this activity. Each student in the group should have a worksheet. Problem 1 of the worksheet should be completed together as a class, with groups working together to come up with the answers. Using this method provides one more practice problem for struggling students and an opportunity for students who understand the concept to "teach" others how to work the problem.
2. Ask students, "How many pencils did Marcus have at first?" The groups should come up with 6 pencils. Ask students what they need to write on their dry-erase boards and what beads need to be moved on their Rekenreks. They should be writing 6 on their dry-erase boards and moving 5 red beads and 1 white bead.
3. Ask students, "How many more pencils did Kelly give to Marcus?" The groups should come up with 7 pencils. Ask students what needs to be written on their dry-erase boards and what beads need to be moved. The groups should write $+ 7 = ?$ on their dry-erase boards and move the 4 remaining beads on the top row and 3 red beads on the bottom row.
4. Remind students that they have 10 beads on the top row and that they have moved 3 red beads on the bottom row. Ask them how many beads have been moved in all so they can answer the question in the word problem. Students should either erase the ? and replace it with 13 or write $? = 13$ under the problem.
5. Students will now complete problems 2-5 in their groups. Depending on your students' ability levels, you may either fill in the blanks with numbers you want students to use, or one person in the group can come up with the numbers to be used in the problems. If the latter approach is chosen, remind the student that the numbers need to be between 1 and 9.
6. Problems 6-8 should be done individually.



Intervention

- Create word problems for the students, rather than asking them to create their own problems.
- Create addition word problems that utilize the top row of the Rekenrek only.



Extension

- Use subtraction problems as well as addition problems.
- Have students draw what the Rekenrek looks like at both stages (with just the first addend in the problem and then after the addends have been put together).



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Addition and Subtraction Word Problems Using the Rekenrek Worksheet

1. Marcus had 6 **pencils**. His friend, Kelly, gave him 7 more **pencils**. How many **pencils** did Marcus have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

2. Bridget had _____ **markers**. She borrowed _____ more **markers** from her friend Grace. How many **markers** did Bridget have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

3. Henry had _____ blue **fish**. Henry had _____ red **fish**. How many **fish** did Henry have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

4. Victor had _____ green **notebooks**. He had _____ orange **notebooks**. How many **notebooks** did Victor have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

5. Lucy found _____ **butterflies** in her garden. Her friend, Meg, found _____ **butterflies** in her garden. How many **butterflies** did the girls find in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

6. Greg had 6 **toy cars**. For his birthday, he got 4 more **toy cars**. How many **toy cars** did Greg have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

7. Mario had 7 **hats**. Julie had 5 **hats**. How many **hats** did they have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

8. Brooke had 3 green **apples** and 8 red **apples**. How many **apples** did she have in all?

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$