

Supplies

Interlocking cubes or counting tiles in two different colors, number cards from 3 to 9, graph paper and markers in the colors of the cubes.

The Activity

The student will pick a number and make as many different combinations as possible for that number with the two colors.

Variations

- The student draws the pattern formed by the combinations for each number on the graph paper with colored markers.
- The student chooses a number and draws the combination on a small piece of paper, together with the math sentence. They use a separate sheet for each combination and, when finished, staple them together for each number to make number booklets.

Focus:

Encourage the student to focus their attention on the task. Begin by allowing the student to explore the supplies by touching and holding them. Talk to them as they do so. Following this, explain what you will do during the task. Finally, formulate a plan for the task with the student.

Questions: What is the plan? What number do you want to use? What do you need to do first? Next?

Act:

The student makes the different combinations for the numbers chosen.

Questions: What is the pattern for this number? How many different ways can you make this number? If you look at the combinations for the number 3 and the number 9, what can you see? Which number has the most combinations? Why do you think that is?

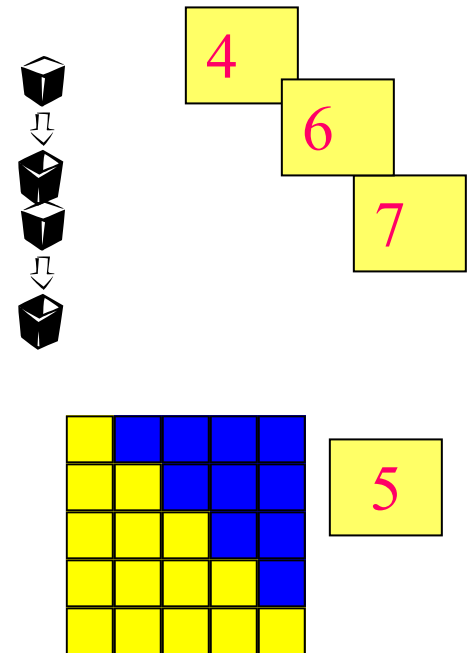
Reflect:

Reflect on what the student has done during and after the activity

Questions: What did you do? What did you like best about this? What was the same between the combinations you made from the numbers? What was always different?

Math Observation Checklist:

This activity will give insight into the student's understanding of addition, subtraction, position, order of numbers, and orientation in space. It will also reveal their ability to attend to more than one piece of information, and relevant information.



Supplies

A “slice of toast” (drawn on a sheet of paper and cut in half) and 10 small pom-poms or beads that look like raisins.

The Activity

The student will add sums up to 10 by making “raisin toast”. Put raisins (pom- poms) on each part of the slice of toast and move the parts together to form the whole slice. The student does the math sum by counting the raisins. Make sure to clarify to the student the students that the reverse order of the sum will still yield the same result. For example, $2+3$ is the same as $3+2$, as both result in 5. You can visually teach them by showing that 2 raisins on one half of the toast and 3 on the other equals 5 raisins, and you get the same result when you switch the places of the 3 and 2.

Variations

- Start with the number on the whole slice and slide away a part. Ask the student what is left and explain that this is subtraction. Discuss the fact that subtraction is the reverse of adding. Show this by sliding the pieces back together.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next? How many raisins shall we put on this side? On that?

Act:

The student makes the different combinations for the numbers chosen.

Questions: What happens when we slide the two pieces of toast together? Where do you have more, on the parts or on the whole slice? How come? What do you think will happen if I slide this part away from the whole slice? How about if I slide away this part? And when I put them back together?

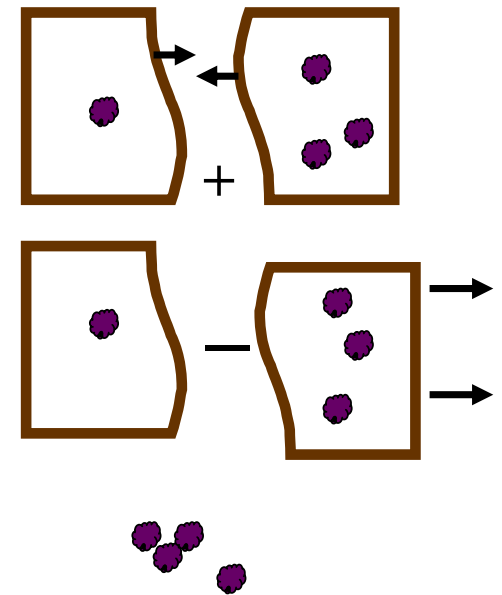
Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? When did you always have the biggest number? What is it called when we put two numbers together? What happens to the numbers? What is it called when we take something away? What happens to the numbers?

Math Observation Checklist:

This activity will give insight into the student’s understanding of conservation, addition and subtraction, attending to more than one piece of information, and attending to relevant information.



Supplies

All addition sentences up to 5 written on index cards (one addition sentence per card); interlocking cubes or inch-tiles in two colors; graph paper and markers.

The Activity

The student will pick a number sentence card and “build” the addition sum with the interlocking cubes or inch-tiles, using a different color for each number and find the answer. Then they write the number sentence. Next, ask them to write the number sentence vertically on the graph paper. Ensure that the numbers are lined up properly.

Variations

- Ask the student to draw the number sentences as bar graphs on the graph paper, using the two colors that were used for building the number sentence. Have the student compare the different bars as to which one is longer, shorter, or the same.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next? How would you make this number sentence out of these two colors?

Act:

The student “builds” the different number sentences and finds the answers

Questions: What happens when you add these two numbers together? You told me that the answer to this number sentence is 5, but this other number sentence also equals five. Why do we get the same answer, even though they look different?

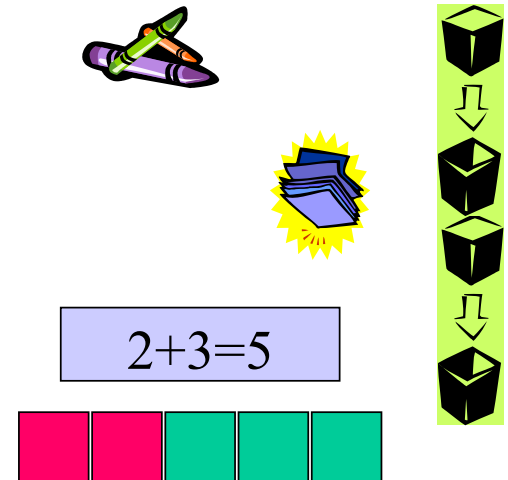
Reflect:

During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? What is it called when we put two numbers together? What happened to the numbers? Did it make a difference in the answer when you write the sum up and down, or to the side? How come?

Math Observation Checklist:

This activity will give insight into the student’s understanding of conservation, addition, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



Supplies

A set of 10 small counter objects that can fit in the student's hand (such as, beans, pennies or beads) and a number cube or spinner.

The Activity

Select a number by spinning the spinner or tossing the cube. Take that number of counters, divide them between two hands, and open up one hand. The student will guess/calculate what is in the other hand. (You can give the student a set of counters to work out the problem, so they don't need to do it in their head). The student records the math sentence with the missing number.

Variations

- Switch roles with the student and have the student check if you were right with your guess.
- Open up the other hand, keeping the same total and discuss what happens.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student determines the missing numbers.

Questions: When you take a big number of counters and divide them over two hands, does the number in each hand get bigger or smaller? What do you need to do to figure out what is in the other hand. Could you use addition? How? Could you use subtraction? How?

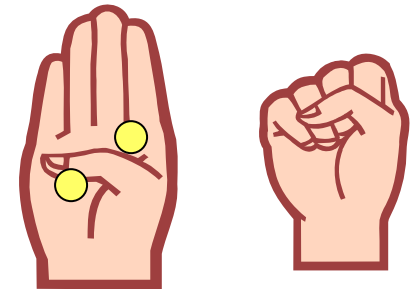
Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? What was easier counting to the number or subtract from the number?

Math Observation Checklist:

This activity will give insight into the student's understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



$$2 + \underline{\quad} = 5$$



Supplies

Graph paper, pencils or markers, interlocking cubes or colored inch-tiles.

The Activity

Using the interlocking cubes or inch tiles, the student will make sums of doubles. For example $6+6$. Then they will add or subtract one number, for example $6+7$ or $6+5$. Following this they will record the number sentence, for instance if $6+6=12$ then $6+7=13$ and $6+5=11$. The objective here is to have the student understand that if they know $6+6$, he/she also knows $6+7$ and $6+5$. Work on helping the student understand this.

Variations

- Instead of using the cubes, the student can draw the number sentences on graph paper with colored markers.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student does the number sums for doubles and doubles plus or minus 1.

Questions: You made 2 towers of 4, how much is that altogether? What if I add 1 to this one tower of 4, can you tell me without counting how many I have now? Did you need to recount them all? What did you do to get the answer. What if I take away 1, what do I have now?

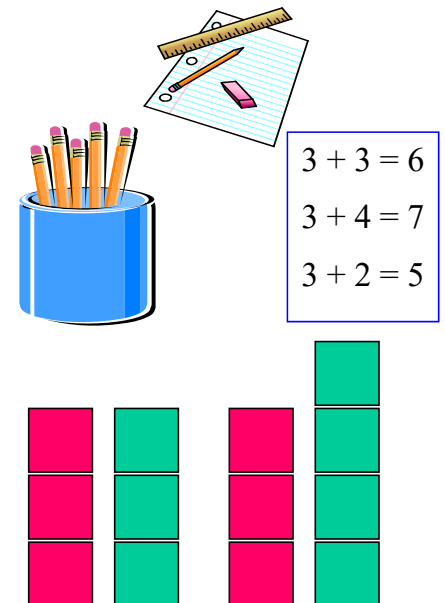
Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was?

Math Observation Checklist:

This activity will give insight into the student's understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



Supplies

Paper strips divided into 10 squares, counters in 2 colors that fit in the squares, a number cube or spinner, graph paper and markers.

The Activity

The student will make number sentences of 10 and more. The student will put 9 counters on one of the strips and spin or roll the number cube. This number will be added to the 9 by adding counters of a different color and by adding a new strip of paper next to the first one. The student will then record the number sentence.

Variations

- Use interlocking cubes, starting with 9 cubes and adding to 10 and more with another color.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student does the number sums for $9 + a$ number and observes the pattern.

Questions: What happens when you add 6 to 9? How many of the 6 are you using to make the 9 into 10, and what is left? What do you think will happen if you add 7 to 9? Can you see the pattern?

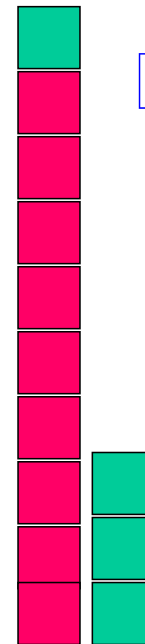
Reflect:

During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? Can you see the “trick” when you add a number to 9?

Math Observation Checklist:

This activity will give insight into the student’s understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



$$9 + 4 = 13$$



Supplies

Counters (2 different colors); number cube or spinner; graph paper; markers.

The Activity

The student will add multiples of 10 without renaming (carrying). Use one color for the tens, for instance red, the other color for the ones, for instance blue. Ask the student to role the number cube two times to come up with the first number, for instance 42. Discuss with the student which role of the dice will represent the “tens” and the “ones”. Next, ask the student to role the dice one time, to come up with the multiple of ten that needs to be added, for instance 30. The student will then add 42 and 30. First they will add the ones (2 blue counters) then the tens (4 red counters + 3 red counters). Then the student will record the math sentence (see example).

Variations

- Instead of counters, use rods and unit cubes for tens and ones, or interlocking cubes.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will role the number cube to determine the numbers to be added.

Questions: What are the numbers you are adding. How can you write down, for instance, 56 in two different ways? How can you write down, for instance, 40 in a different way? $10+10+10+10=40$.

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you added 4 yellow counters and 3 yellow counters? It adds up to 7, how come you called it 70?

Math Observation Checklist:

This activity will give insight into the student’s understanding of tens and ones, attending to more than one piece of information, and attending to relevant information.

What is $42 + 30$?

- Ones
- Tens

$ \begin{array}{r} 42 = 40 + 2 \\ + 30 = 30 + 0 \\ \hline 70 + 2 = 72 \end{array} $
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●● + 0 = 2

●●●● + ●●● = 70

$70 + 2 = 72$	$\begin{array}{r} 42 \\ + 30 \\ \hline 72 \end{array}$
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Supplies

Counters (2 different colors); number cube, spinner, or number cards; graph paper; markers.

The Activity

The student will add 10's and 1's with renaming (carrying). Use one color for the tens, for instance red, the other color for the ones, for instance blue. Determine a double digit number, by rolling the number cube twice, for instance 46 (discuss with the student which role of the dice will represent the "tens" and the "ones".) Next determine a number that needs to be added, for instance 18. The student will then add 46 and 18. First he/she will add the ones (6 blue counters + 8 blue counters) and then the tens (4 red counters + 1 red counter.) Help the student understand that out of the 14 blue counters 10 need to be traded for 1 red counter. This red counter then needs to be "carried" to the 10's column and added to the 4. Then the student will record the math sentence (see example).

Variations

- Instead of counters, use rods and unit cubes for tens and ones, or interlocking cubes.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will determine the numbers to be added and do the addition problems using the counters.

Questions: What are the numbers you are adding. How can you write down, for instance, 56 in two different ways? How can you write down, for instance, 40 in a different way? $10+10+10+10=40$). What happens if you get more than 9 ones-counters?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you added 4 blue counters and 8 blue counters?

Math Observation Checklist:

This activity will give insight into the student's understanding of tens and ones, attending to more than one piece of information, and attending to relevant information.

46
+ 18
?

● Ones
● Tens

Add the ones
6 blue circles + 8 blue circles = 14 blue circles

Carry the tens
14 blue circles = 1 red circle + 4 blue circles

6 red circles + 4 blue circles = 64

46 = 4 + 6
+ 18 = 1 + 8
64

Supplies

Counters (2 different colors); number cube, spinner, or number cards; graph paper; markers.

The Activity

The student will add sums into the hundreds with renaming (carrying). Use one color for the hundreds, one color for the tens, and one for the ones. Determine a triple digit number, by rolling the number cube, for instance 146. Next determine a number that needs to be added, for instance 285. Make sure the sum of the numbers stays below 999. The student will then add 146 and 285. First they will add the ones —column (blue counters) and do the —trade and carry”. Then the tens column (red counters + the —carried” red counters), and next the hundreds-column (yellow counters + —carried” yellow counters). Help the student understand that, for instance, 13 red counters represent 13 tens, and out of those 13, 10 tens need to be traded for 1 hundred, or 1 yellow counter. Then the student will record the math sentence (see example).

Variations

- Instead of counters, use rods and unit cubes for tens and ones, or interlocking cubes.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Then explain what you will do. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will determine the numbers to be added and do the addition problems using the counters.

Questions: What are the numbers you are adding. How can you write down, for instance 146?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you added 4 blue counters and 8 blue counters (ones)? What happened when you added 8 red counters and 5 red counters (tens)?

Math Observation Checklist:

This activity will give insight into the student’s understanding of tens and ones, attending to more than one piece of information, and attending to relevant information.

$$\begin{array}{r} 146 \\ + 285 \\ \hline ? \end{array}$$

● Ones
● Tens
● Hundreds

Add the ones column

$= 11$
 $=$
 $+$

Add the tens column

$= 12$
 $=$
 $+$

$$\begin{array}{r} 146 = 100 + 40 + 6 \\ + 285 = 200 + 80 + 8 \\ \hline 400 \quad 130 \quad 11 = 431 \end{array}$$

Supplies

Counters (3 different colors); number cube or spinner; graph paper; markers.

The Activity

The student will add 3 numbers with double digits into the hundreds with renaming (carrying). Use one color for the hundreds, one color for the tens, and one for the ones. Determine 3 double digit numbers that need to be added. Make sure the sum of the numbers stays below 999. Using the differently colored counters for “trade and carry” the student will then add the 3 numbers starting with the ones, then the tens. Help the student understand that the 14 red counters represent 14 tens and that 10 tens need to be traded for 1 hundred, or yellow counter. Then the student will record the math sentence (see example).

Variations

- Instead of counters, use flats, rods and unit cubes for tens and ones.
- Repeat with triple-digit numbers.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding and talking about them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will determine the numbers to be added and do the addition problems using the counters.

Questions: What are the numbers you are adding. How can you write down, for instance 146? What happens if your ones add up to 24? Where does the 2 of 24 go? Why? What do you need to do when you get more than 9 tens-counters? Where does the traded counter go? Why? How many is 15 tens?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you added 4 blue counters and 8 blue counters (ones)? What happened when you added 8 red counters and 5 red counters (tens)? How come you did not carry the tens counter to the hundreds column?

Math Observation Checklist:

This activity will give insight into the student’s understanding of hundreds, tens ones, attending to more than one piece of information, and attending to relevant information.

45
37
59 +
?

● Ones
● Tens
● Hundreds

Add the ones
=21

Carry the tens
=12+2

14 tens = 140

12
45
37
59 +
141

Supplies

Counters (4 different colors); number cube, spinner, or number cards; graph paper; markers.

The Activity

The student will add triple-digit numbers into the thousands with renaming (carrying). Use one color for the thousands, one color for the hundreds, one color for the tens, and one for the ones. Determine 2 triple-digit numbers that need to be added.

Using the differently colored counters for “trade and carry” the student will then add the numbers starting with the ones. Help the student understand that ten tens, or 10 red counters, need to be traded for 1 yellow (equals 100) counter, and that 10 yellows/hundreds is the same as one thousand. Then the student will record the math sentence (see example).

Variations

- Instead of counters, use blocks, flats, rods and unit cubes.
- Repeat with four-digit numbers.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and talking about them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will determine the numbers to be added and do the addition problems using the counters.

Questions: What are the numbers you are adding. How can you write down, for instance 1046? What happens if your hundreds add up to 14? Where does the 1 of 14 go? Why? Where does the 4 go? What do you need to do when you get more than 9 hundreds-counters? Where does the traded counter go? Why? How many is 15 hundreds?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you added 8 red counters and 5 red counters tens)? How come you did not carry the tens counter to the hundreds column?

Math Observation Checklist:

This activity will give insight into the student’s understanding of thousands, hundreds, tens ones, attending to more than one piece of information, and attending to relevant information.

$$\begin{array}{r} 345 \\ + 786 \\ \hline ? \end{array}$$

● Ones
 ● Tens
 ● Hundreds
 ● Thousands

$5 \text{ (ones)} + 6 \text{ (ones)} = 11$
 Trade and carry

$4 \text{ (tens)} + 8 \text{ (tens)} + 1 \text{ (tens)} = 13$
 Trade and carry

$3 \text{ (hundreds)} + 7 \text{ (hundreds)} + 1 \text{ (hundred)} = 11$
 Trade and carry

$11 \text{ hundreds} = 1 \text{ thousand} + 1 \text{ hundred}$

$$\begin{array}{r} 111 \\ 345 \\ + 786 \\ \hline 1131 \end{array}$$

Supplies

Paper strips with up to 5 pictures or stickers on each, folded at different places so that when folded, some pictures/stickers are covered up, allowing for a subtraction sentence to be made.

The Activity

The student will create subtraction sentences and calculate the answer by counting the pictures on the paper strip.

Variations

- The student can use counters to represent the number of pictures on the paper strip and remove the counters according to the number of pictures covered when the strip is folded.
- Reverse the process by having the student record the addition sentence by uncovering the pictures and adding them.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and talking about them. Then explain the activity. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student creates subtraction sentences by folding the paper strips.

Questions: What happens when you have 5 pictures and you cover up 2? What is that called? What sign do you use to show you are subtracting? What happens when you uncover the pictures?

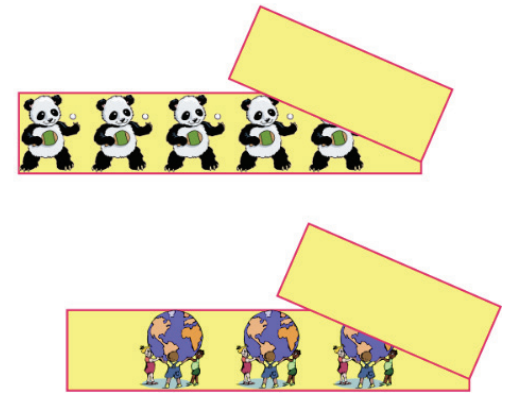
Reflect:

During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? What did you find out about the numbers when you uncovered and covered the pictures?

Math Observation Checklist:

This activity will give insight into the student's understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



Supplies

10 small objects such as buttons, pom-poms, plastic bugs, or beans. A small box with the bottom cut out or a paper towel tube cut in half lengthwise.

The Activity

The student will create subtraction sentences and calculate the answer by placing a number of “bugs” on the “log” (the box or paper towel tube). They will then take a few “bugs” and put them under the “log,” writing the corresponding subtraction sentence.

Variations

- To reinforce the concept that subtraction and addition are opposites, ask the student to put the hidden bugs back on the log and create the corresponding addition sentence.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Then explain the activity. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student creates subtraction sentences by hiding the bugs under the log.

Questions: What happens when you have 5 bugs and you hide 2? What is that called? What sign do you use to show you are subtracting? What happens when you put the bugs back on the log?

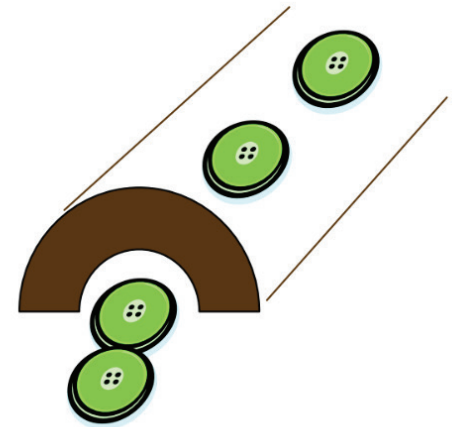
Reflect:

During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? What did you find out about the numbers when you hid the bugs and then put them back?

Math Observation Checklist:

This activity will give insight into the student’s understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



Subtraction

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Supplies

Small counters, number cubes or dice, egg cartons cut so they have 6 to 10 slots.

The Activity

The student selects an egg carton and fills each slot with a counter. They then roll the number cube and remove that number of counters. Afterward, they write the corresponding subtraction sentence. The same starting number can be used to subtract several different numbers. The student then chooses another egg carton and repeats the process with a different starting number.

Variations

- To reinforce the concept that subtraction and addition are opposites, ask the student to write a corresponding addition sentence for each subtraction sentence.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Then explain the activity. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student fills the egg cartons with counters and removes the number indicated by the roll of the number cube. They then write the subtraction sentences.

Questions: What happens when you have 8 slots in the egg carton and you take away 3? 5? What are you doing when you put back the 3? What happens to the number?

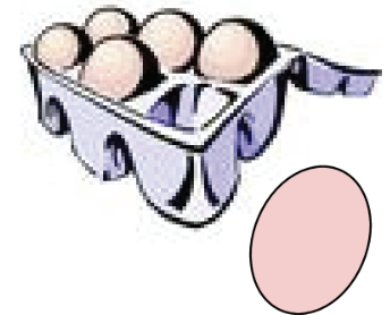
Reflect:

During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? What did you find out about the numbers when you took the counters out of the slots? When you put them back?

Math Observation Checklist:

This activity will give insight into the student's understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



$$6 - 1 = 5 \quad 5 + 1 = 6$$

Supplies

Sheets of construction paper folded like window shutters, ten flat counting chips, graph paper, and markers.

The Activity

The instructor will place a number of flat counting chips (up to 10) on the construction paper, and the student will count how many there are. The student will then fold one of the shutters over to cover some of the chips and write the corresponding subtraction sentence. Next, the student covers the chips with the other shutter and writes another subtraction sentence.

Variations

- To reinforce the concept that subtraction and addition are opposites, ask the student to write a corresponding addition sentence for each subtraction sentence by opening the shutter. Explain that with three numbers, you can create four math sentences (two addition and two subtraction).

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Then explain the activity. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will choose numbers, open and close the shutters, and write the number sentences.

Questions: What happens when you have 8 counters and you cover up 3? 5? What are you doing when you open the shutter? What happens to the number?

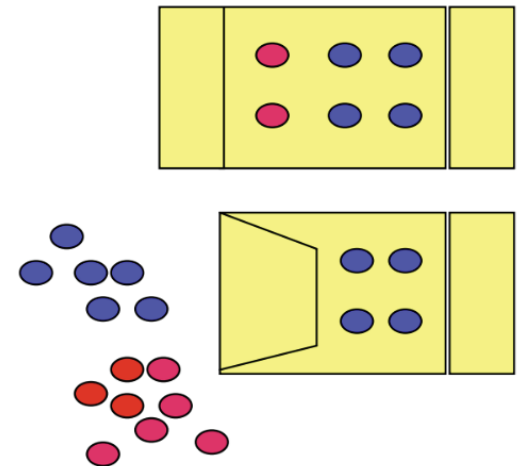
Reflect:

During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? What did you find out about the numbers when you closed the shutters? When you opened them?

Math Observation Checklist:

This activity will give insight into the student's understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



$$6 - 2 = 4 \quad 6 - 4 = 2$$

$$4 + 2 = 6 \quad 2 + 4 = 6$$

Supplies

Sheet of poster board or craft paper divided into two columns labeled “tens” and “ones,” small counters such as beans or buttons, plastic lids, graph paper, and markers.

The Activity

Place a number of lids filled with 10 counters each in the “tens” column, and up to 8 counters in the “ones” column. The student will subtract a number that requires “borrowing.” For example, with 4 lids in the tens column and 3 counters in the ones column (representing 43), subtract 4. To do this, the student will need to break up one lid of 10 counters and add those counters to the ones column. The student will record each step and write a vertical subtraction sentence.

Variations

- Start by subtracting numbers under 10. Once the student masters this, move on to subtracting double-digit numbers.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Then explain the activity. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will fill lids with 10 counters each and determine how many “tens” there are. They can roll a number cube to determine the “ones.” Then a number is subtracted, and the student counts the counters to determine the answer.

Questions: What do you need to do when you have 8 counters in the ones column and you need to subtract 9? How can you do that?

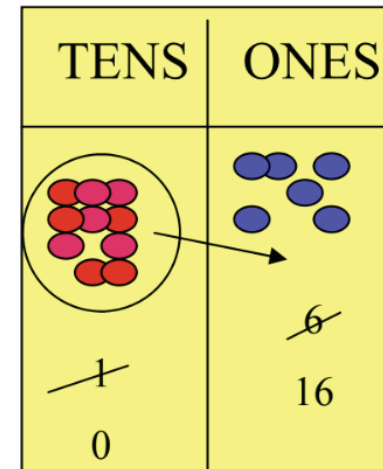
Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? How did you figure out what the number was? What happened to the tens column when you borrowed? What happened to the ones column?

Math Observation Checklist:

This activity will give insight into the student’s understanding of conservation, addition, subtraction, symbolic understanding, attending to more than one piece of information, and attending to relevant information.



$$16 - 9 = \dots\dots$$

Supplies

Counters (2 different colors), number cube or spinner, graph paper, and markers.

The Activity

The student will subtract multiples of 10 without renaming (borrowing). Use one color for the tens, such as red, and another color for the ones, such as blue. The student will roll the number cube twice to create the first number, for example, 42 (4 red counters and 2 blue ones). Discuss with the student which roll of the cube will represent the “tens” and the “ones.” Next, the student will roll the cube once to determine the multiple of ten to be subtracted, for example, 3 (3 red counters). The student will then subtract 30 from 42 by first subtracting the ones column (2 blue counters minus 0 counters) and then the tens column (4 red counters minus 3 red counters). Finally, the student will record the math sentence.

Variations

- Instead of counters, use rods and unit cubes for tens and ones, or interlocking cubes.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student rolls the number cube to determine the numbers to be subtracted.

Questions: What are the numbers you are subtracting? Which column do you need to subtract first? How can you do that with the counters? What happens to the number when you subtract from it? Where do you start when you subtract, the top or the bottom?

Reflect:

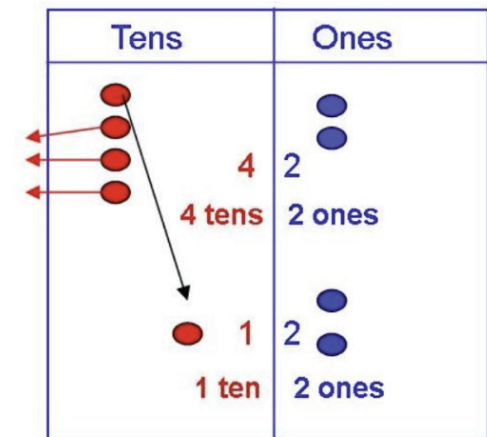
During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you subtracted 3 red counters from 4 red counters? How many tens are in 42? How many ones?

Math Observation Checklist:

This activity will give insight into the student’s understanding of tens and ones, attending to more than one piece of information, and attending to relevant information.

$\begin{array}{r} 42 \\ - 30 \\ \hline ? \end{array}$	$\begin{array}{r} 2 \text{ ones} - 0 \text{ ones} \\ 4 \text{ tens} - 3 \text{ tens} \end{array}$
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Supplies

Counters (2 different colors), number cube or spinner, graph paper, and markers.

The Activity

The student will subtract double-digit numbers without renaming (borrowing). Use one color for the tens, such as red, and another color for the ones, such as blue. The student will roll the number cube twice to create the first number, for example, 46 (4 red counters and 6 blue ones). Discuss with the student which roll of the cube will represent the “tens” and the “ones.” Then, ask the student to roll the cube two more times to create the number that needs to be subtracted, for example, 24. The student will then subtract 24 from 46 by first subtracting the ones column (6 blue counters minus 4 blue counters) and then the tens column (4 red counters minus 2 red counters). The student will record the math sentence.

Variations

- Instead of counters, use rods and unit cubes for tens and ones, or interlocking cubes.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will roll the number cube to determine the numbers to be subtracted.

Questions: What are the numbers you are subtracting? Which column do you need to subtract first? How can you do that with the counters? What happens to the number when you subtract from it? Where do you start when you subtract, the top or the bottom?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

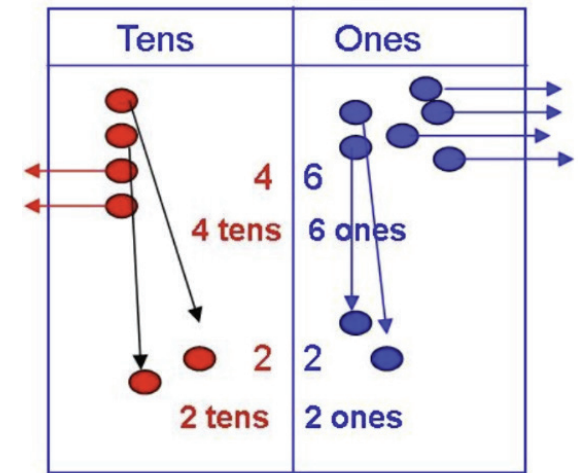
Questions: What did you do? What happened when you subtracted 3 red counters from 4 red counters? How many tens are in 46? How many ones?

Math Observation Checklist:

This activity will give insight into the student’s understanding of tens and ones, attending to more than one piece of information, and attending to relevant information.

$$\begin{array}{r} 46 \\ - 24 \\ \hline ? \end{array}$$

$$\begin{array}{l} 6 \text{ ones} - 4 \text{ ones} \\ 4 \text{ tens} - 2 \text{ tens} \end{array}$$



Supplies

Counters (2 different colors), number cube or spinner, graph paper, and markers.

The Activity

The student will subtract double-digit numbers with renaming (borrowing). Use one color for the tens and another color for the ones. Choose two double-digit numbers to be subtracted, for example, 32 - 14. Explain that 4 cannot be subtracted from 2, so the student needs to "borrow from the neighbor" (the tens column). One tens counter is exchanged for 10 ones counters, and the 2 is renamed as 12. Then the 4 can be subtracted. The 3 tens will become 2 tens. Emphasize that subtraction goes "down like the rain," so the student starts at the top and subtracts the bottom number. Also, stress that the ones column is always subtracted first, followed by the tens column.

Variations

- Instead of counters, use rods and blocks for tens and ones, or interlocking cubes.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will exchange and rename the counters to be subtracted and record the math sentences.

Questions: What are the numbers you are subtracting? What do you need to do when there are only 2 in the ones column and you have to subtract 4? What happens to the tens column when you "borrow"?

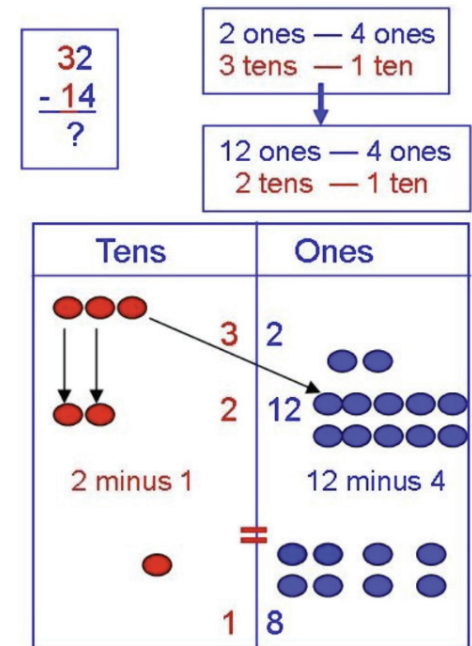
Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you had to subtract 5 blue counters from 4 blue counters? How many tens are in 42? How many ones? When you borrowed 1 ten from 42, how did you rename the numbers?

Math Observation Checklist:

This activity will give insight into the student's understanding of tens and ones, attending to more than one piece of information, and attending to relevant information.



Supplies

Counters (3 different colors), number cube or spinner, graph paper, and markers.

The Activity

The student will subtract three-digit numbers with renaming (borrowing). Use different colors for the hundreds, tens, and ones. Choose two three-digit numbers to be subtracted, for example, $432 - 151$. Explain that 5 cannot be subtracted from 3, so the 3 needs to "borrow from the neighbor" (the hundreds column). One hundreds counter is exchanged for 10 tens counters, and the 3 will be renamed as 13 (13 tens). Then the 5 can be subtracted. The 4 hundreds will become 3 hundreds. Emphasize that subtraction goes "down like the rain," so the student starts at the top and subtracts the bottom number. Also, stress that the ones column is always subtracted first, then the tens column, and finally the hundreds column.

Variations

- Use numbers where the student has to borrow from both the tens column and the hundreds column.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will exchange and rename the counters to be subtracted and record the math sentences.

Questions: What are the numbers you are subtracting? What do you need to do when there are only 2 in the tens column and you have to subtract 4? Why do you need to borrow from the hundreds column when you don't have enough in the tens column? What happens to the tens column when you "borrow"?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you had to subtract 5 blue counters from 4 blue counters? What happened when you borrowed from a column? Why did we call it "renaming"?

Math Observation Checklist:

This activity will give insight into the student's understanding of place value (hundreds, tens, and ones), attending to more than one piece of information, and attending to relevant information.

Hundreds	Tens	Ones
● ● ● ●	● ● ● ●	● ●
↓ ↓ ↓ ↓		
● ● ●	● ● ● ● ● ● ● ● ● ●	● ●
	● ● ● ● ● ● ● ● ● ●	● ●
	● ● ● ● ● ● ● ● ● ●	
3 - 1	13 - 5	2 - 1
2	8	1

Supplies

Counters (4 different colors), number cube or spinner, graph paper, and markers.

The Activity

The student will subtract four-digit numbers with renaming (borrowing). Use different colors for the thousands, hundreds, tens, and ones. Choose two four-digit numbers to be subtracted, e.g., $2432 - 1151$. Explain that 5 cannot be subtracted from 3, so the 3 needs to "borrow from the neighbor" (the hundreds column). One hundreds counter is exchanged for 10 tens counters, and the 3 will be renamed as 13 (13 tens). Then the 5 can be subtracted. The 4 hundreds will become 3 hundreds. Stress that subtraction goes "down like the rain," meaning the student starts at the top and subtracts the bottom number. Also, stress that the ones column is always subtracted first, followed by the tens column, then the hundreds, and finally the thousands.

Variations

- Use place value cards to display the numbers.
- Choose numbers where the student has to borrow from all columns.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will exchange and rename the counters to be subtracted and record the math sentences.

Questions: What are the numbers you are subtracting? Where do you need to start? What do you need to do when there are only 2 in the tens column and you have to subtract 4? Why do you need to borrow from the hundreds column when you don't have enough in the tens column? What happens to the tens column when you borrow?

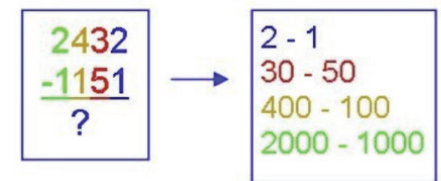
Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you had to subtract 5 blue counters from 4 blue counters? What happened when you borrowed from a column? Why did we call it "renaming"?

Math Observation Checklist:

This activity will give insight into the student's understanding of place value up to thousands, attending to more than one piece of information, and attending to relevant information.



Thousands	Hundreds	Tens	Ones
● ●	● ● ● ●	● ● ●	● ●
● ●	● ● ● ●	● ● ● ● ● ● ● ●	● ●
2 - 1	3 - 1	13 - 5	2 - 1
1	2	8	1

END ← START

Supplies

Counters (4 different colors), number cube or spinner, graph paper, and markers.

The Activity

The student will subtract three-digit numbers involving borrowing from a column with a 0 (zero). Use different colors for the hundreds, tens, and ones. Choose two 3-digit numbers to be subtracted, e.g., $304 - 158$. Explain that 8 cannot be subtracted from 4 and that you cannot borrow from the "neighbor" 0. Therefore, the 0 needs to borrow from its "neighbor" first (the hundreds column). One hundreds counter is exchanged for 10 tens counters, and then the 4 can borrow from the tens column. After that, the 8 can be subtracted. The 3 hundreds will become 2 hundreds. Emphasize the correct sequence, and have the student physically go through the motions of exchanging the counters to understand why the 0 becomes 9 when the subtraction takes place.

Variations

- Use 4-digit numbers with 2 zeros, ensuring the correct sequence of borrowing and exchanging takes place.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the supplies by touching, holding, and discussing them. Formulate a plan with the student.

Questions: What is the plan? What do you need to do first? Next?

Act:

The student will exchange and rename the counters to be subtracted and record the math sentences.

Questions: What are the numbers you are subtracting? Where do you need to start? What do you need to do when there are only 2 in the tens column and you have to subtract 4? Why do you need to borrow from the hundreds column when you don't have enough in the tens column? What happens to the tens column when you borrow? What happens if you cannot borrow from a 0?

Reflect:

During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened when you borrowed from a column with 0 in it? Why was that?

Math Observation Checklist:

This activity will give insight into the student's understanding of place value, attending to more than one piece of information, and attending to relevant information.

$$\begin{array}{r} 304 \\ -158 \\ \hline ? \end{array} \rightarrow \begin{array}{r} 4 - 8 \\ 0 - 50 \\ 300 - 100 \end{array}$$

Hundreds	Tens	Ones
● ● ●		● ● ● ●
↓	● ● ● ● ● ● ● ●	● ● ● ●
↓	↓	● ● ● ● ● ● ● ●
● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●
2 - 1	9 - 5	14 - 8
1	4	6

END ← START