

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?

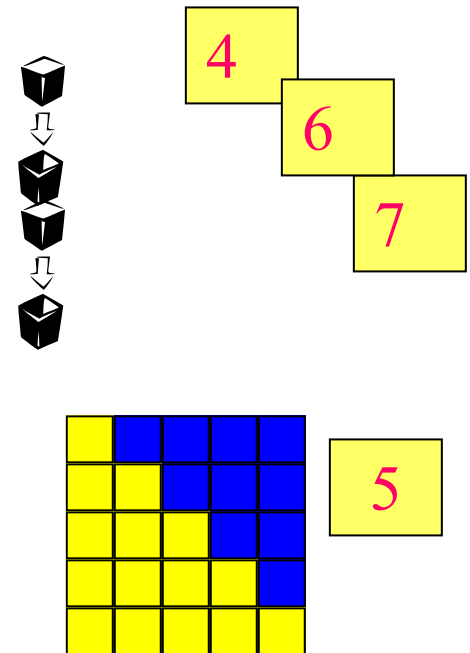
Reflect:

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?

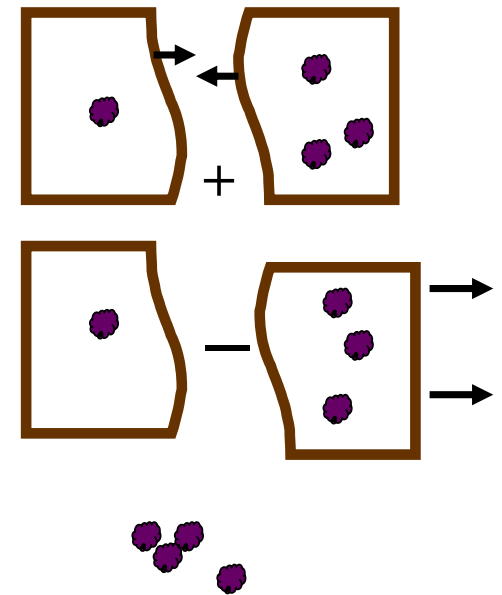
Reflect:

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?

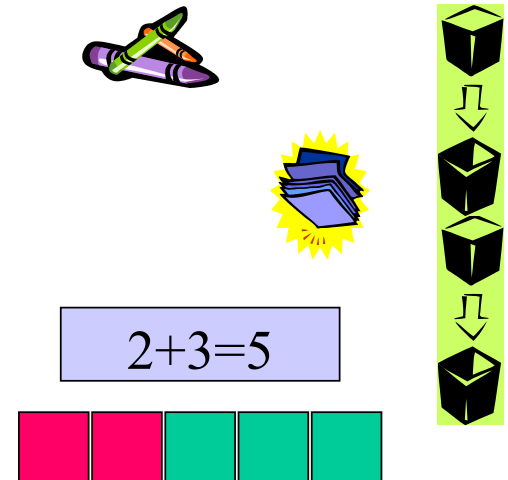
Reflect:

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?

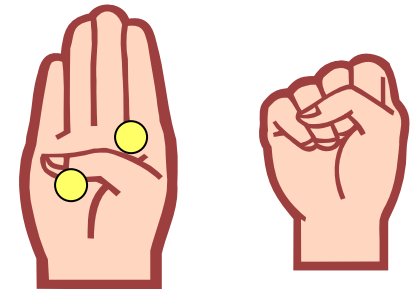
Reflect:

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?

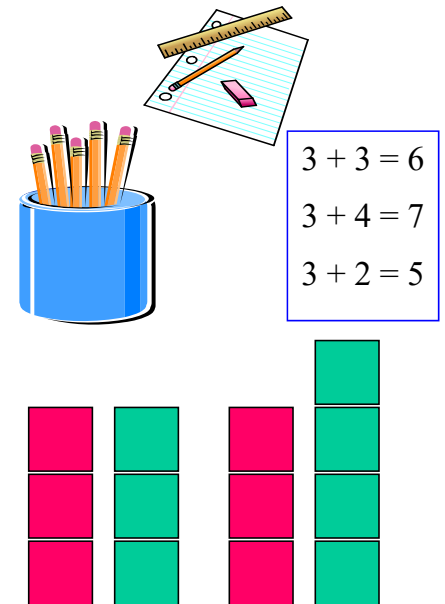
Reflect:

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?

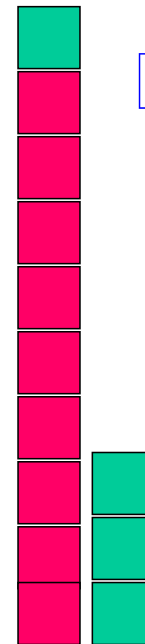
Reflect:

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

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

●● + 0 = 2

●●●● + ●●● = 70

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

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?

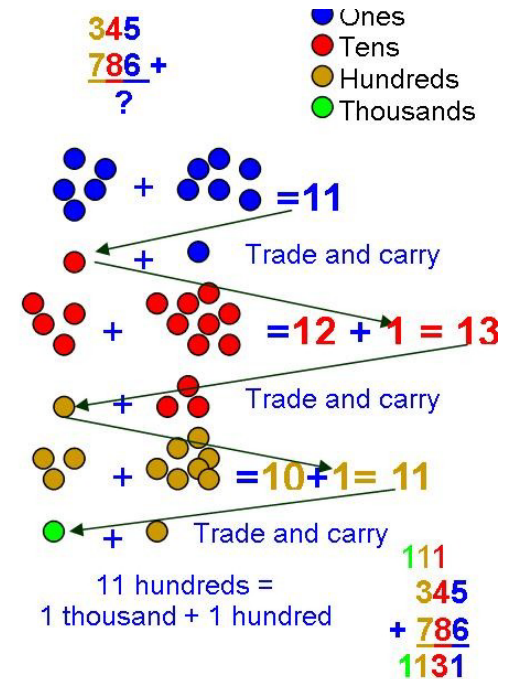
Reflect:

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.



Supplies

Toy monkeys, puppies, or flannel board pieces of children, a bed, a mother, and a doctor.

The Activity

Put all the monkeys or objects together and tell the student : “this is a set”. Count the pieces from 1-3, or more if the student is able. Sing or say the words to the Ten Little Monkeys and have the student sing along “Three little monkeys jumping on a bed, one fell off and bumped his head. Momma called the doctor and the doctor said “no more monkeys jumping on the bed”. Two little monkeys jumping on the bed....” Continue until no more monkeys are jumping on the bed.

Variations

- Change the song to counting up, instead of counting down.

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 they will do. Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What do you need to do first? Next? And then? Which monkey would you like to hold?

Act:

Sing the song and invite the student to sing along and make the monkeys jump on the bed.

Questions: What are the monkeys doing? How many are in the bed? What do you need to do to find out? What happens to the monkeys on the bed when one falls off?

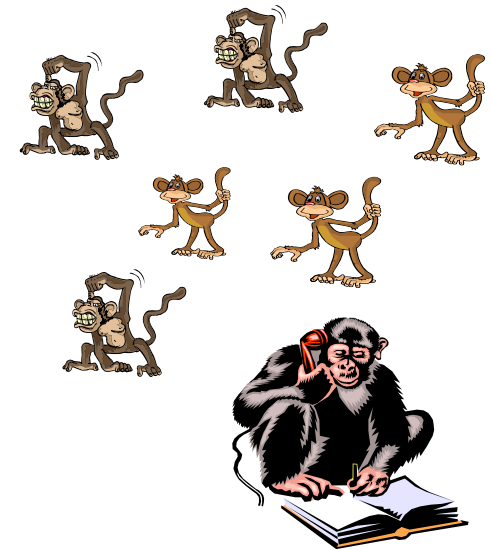
Reflect:

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

Questions: What did we do? How many monkeys did we start with? When they fell off the bed, were there more or less monkeys on the bed? Each time a monkey fell on the floor, were there more or less monkeys on the floor?

Math Observation Checklist:

This activity will give insight into the student’s understanding of more and less, counting, one-to-one correspondence, cardinality, and taking 2 pieces of information into account.



Supplies

Flannel board pieces or pictures of Goldilocks and the Three Bears. Teddy bear counters of different sizes.

The Activity

Tell the story of Goldilocks and the 3 bears while the student helps to put the flannel pieces on the board. As the story progresses, have the student count the number of bears, beds, bowls and the one girl. Repeat the sequence, incorporating the number concepts of 1,2,3 items and 0 when all are gone.

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 do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

Tell the story and invite the student to tell parts of it. Ask the student to count the items.

Questions: What do you think will happen next? How many chairs did Goldilocks try? How many bowls of porridge? Which one did she like best, the biggest or the smallest? Why do you think that is?

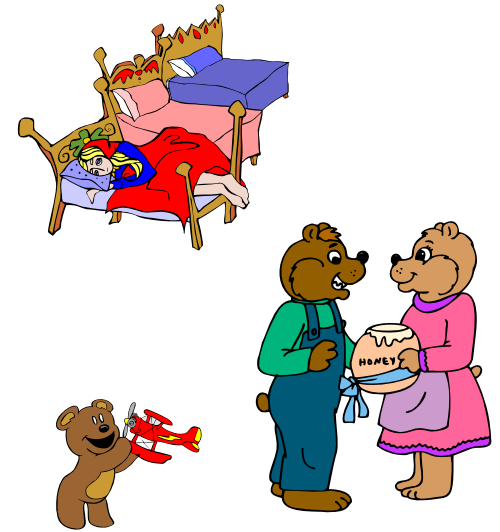
Reflect:

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

Questions: What did we do? What did Goldilocks do? How many bears were there? How many big bears? How many baby bears? If we take away all the bowls of porridge, how many do we have left?

Math Observation Checklist:

This activity will give insight into the student's understanding of more and less, counting, one-to-one correspondence, cardinality, and taking 2 pieces of information into account.



Supplies

Toy cars, blocks, balls, items of clothing. For this activity you will also refer to the student's hands, fingers or feet.

The Activity

Play the game Simon Says. The student is asked by Simon, for instance, to hold up, show, or count one foot, two fingers, three blocks. 'Simon' can also ask the student to do a number of actions. For instance, Simon Says, take 1 baby step, or 3 big steps, or do two hops."

Variations

- Switch roles and have the student "be Simon". Make some errors when the student requests you to do something and see if the student can recognize and correct the errors.

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 rules of Simon Says (i.e. only move when the words Simon Says are being used in the command). Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

Play Simon Says.

Questions: What do you need to do? How do you know that? I forgot to say Simon Says, what do you need to do now? How many steps does it take to get to the other side of the room?

Reflect:

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

Questions: What did we do? What happened when I did not say "Simon Says?". What was your favorite thing to do?

Math Observation Checklist:

This activity will give insight into the student's understanding of counting, one-to-one correspondence, cardinality, and taking 2 pieces of information into account.



Supplies

Toys of interest to the student, stacking toy of rings or a nesting toy.

The Activity

The student counts the rings of the stack toy and/or the pieces in the nesting toy. After counting in various ways, let the student play the Hide and Seek game. Before starting the game, the student may choose a toy with parts [either the nesting toy or the stack-ring toy] to use. Re-count the toy parts, giving emphasis to remembering how each looks. Have the student cover their eyes while you hide the toy parts very openly around the room. They find each one by themselves and count the parts from 1-3 or more if able.

Variations

- Switch roles and allow the student to hide the toy parts. Then, you seek them and count the toy parts as you find 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 what they will do. Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

Count the different parts of the toys and play hide and seek.

Questions: What do you need to do? How do you know that? How do you remember what you need to look for? Can you put the parts together and count them all?

Reflect:

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

Questions: What did we do? How many parts does this toy have? What did you do to find out? How did you make a picture in your head? Where did you hide the parts?

Math Observation Checklist:

This activity will give insight into the student's understanding of counting, one-to-one correspondence, cardinality, and taking 2 pieces of information into account, and attend to relevant information.



Supplies

One half-dozen egg carton, marbles, seashells, or rocks.

The Activity

Have the student show sets of one marble, two rocks, three rocks, and four seashells. Place one red dot inside the first egg compartment, two red dots inside the 2nd, and so on through number 4. The student may count the dots with you and then fill the compartments with the correct number of marbles.

Variations

- Use dot cards and ask the student to pull a card and create a set with the number of dots on the card.
- Ask the student to lay out the objects in the same pattern as the dots on the card.

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 do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

The student will make sets according to the number of dots.

Questions: What do you need to do? How do you know that? How many are in this set? And that one? Which one comes next?

Reflect:

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

Questions: What did you do? Which was the largest set? Which one the smallest? How did you know that? What did you need to focus on to do this game?

Math Observation Checklist:

This activity will give insight into the student's understanding of counting, one-to-one correspondence, cardinality, taking 2 pieces of information into account, and attending to relevant information.



Supplies

Index cards; small items such as beans, pop-corn, popsicle sticks, or buttons; play-doh; paper plates; glue; number and/or dot cards with numbers 1 to 10.

The Activity

The student will pick a number or dot card and will make a set of objects with that number. The sets can be put in a paper plate or bowl, or can be glued on an index card. Repeat the process with different numbers.

Variations

- The student can make pieces of “fruit” with the play-doh according to the number on the number/dot card.
- The student can line up the sets in the same pattern as the dot cards.
- The student creates dot and/or numeral cards.

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 do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

The student will make sets according to the number of dots.

Questions: What do you need to do? How do you know that? How many are in this set? And that one? Which one comes next?

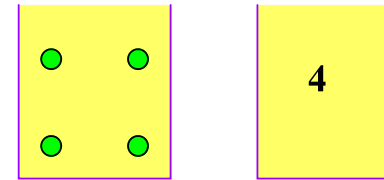
Reflect:

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

Questions: What did you do? Which was the largest set? Which one the smallest? How did you know that? What did you need to focus on to do this game?

Math Observation Checklist:

This activity will give insight into the student’s understanding of counting, one-to-one correspondence, cardinality, taking 2 pieces of information into account, and attending to relevant information.



Supplies

Large sheet of construction paper with the numbers 1—10 written on top; 55 counters, for instance beans, or buttons.

The Activity

The student fills in each column of the counting board with a set of counters to correspond to the number of pennies written in the column's title. Emphasize the fact that the number of counters in the columns increase by 1.

Variations

- The student can color in squares on graph paper marked with the numbers 1 to 10 on top.
- Mark the numbers 10 to 1 on top and have the student count down by coloring the columns.
- Use 10 cups and have child fill the cups with from 1 to 10 items.

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. Discuss rows and columns with the child. Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

Fills in each column with the counters.

Questions: What do you need to do? Can you see a pattern? What is the pattern? What comes first? Next? How does the pattern change from one column to the next? How many more do you need to add in each following column?

Reflect:

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

Questions: What did you do? Which was the largest column? Which one the smallest? Why do you think that is?

Math Observation Checklist:

This activity will give insight into the student's understanding of counting, one-to-one correspondence, cardinality, taking 2 pieces of information into account, and attending to relevant information.

1	2	3	4	5	6	7	8	9	10
●	●●	●●●							



Supplies

Index cards with different arrangements of dots for the numbers 2 to 5. Number cards 2-5 or magnetic numbers 2-5.

The Activity

The student will match the numeral cards with the dot cards. The goal is to have the student match the numerals with the dot patterns without counting the dots so that numbers are recognized by patterns. This is called subitizing.

Variations

- Present a number from 2 to 5 to the student and have them draw the dot pattern for that number.

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 do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

The student will match numerals with dot patterns.

Questions: What do you need to do? How do you know that? You say this pattern of dots is a 3 and this one as well, but they look different. How come they are both 3?

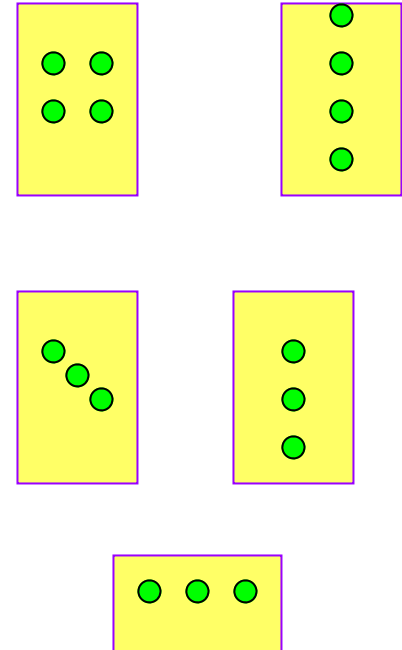
Reflect:

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

Questions: What did you do? How did you know how many dots there were without counting?

Math Observation Checklist:

This activity will give insight into the student's understanding of counting, subitizing, one-to-one correspondence, cardinality, taking 2 pieces of information into account, and attending to relevant information.



Supplies

Paper plates or bowls. Counters (for instance, beans, square inch tiles, beads, or buttons).

The Activity

The instructor and student work as a team. Build sets from 3 items to 10 items by adding one to each set. The instructor starts the pattern by putting 3 counters in a bowl and thereby making a set of 3. The student then makes the next sets, up to 10 items in a set. The next set would be 4, then 5, and so on.

Variations

- Use interlocking cubes and have the student sort them according to color. Then start a set by putting together 4 cubes of one color. Have the student choose another color for the next set of 5.
- Compare the lengths of the different sets.

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 do you need to do to focus on what you are going to do? What is the plan? What will we do first? Next? And then?

Act:

The student will count out the counters to make the sets.

Questions: How many are in the set that I started? What number do you need to start with? What do you need to do? How do you know that. How do you make the next higher number for your set? Can you line them up starting with the biggest number?

Reflect:

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

Questions: What did you do? What kind of pattern do your sets form? Where are the most? The least? What did you do after I started my set?

Math Observation Checklist:

This activity will give insight into the student's understanding of counting, one-to-one correspondence, cardinality, taking 2 pieces of information into account, and attending to relevant information.



Supplies

Sheet of 1" grid paper. Small counters such as beans, buttons, beads, or counting cubes, cards for the numbers 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, and 20. Graph paper and markers.

The Activity

The student will choose a number card and lay out that number of counters in equal rows and columns. For instance, 18 could be laid out in 3 columns of 6 (6 groups of 3) or 2 columns of 9 (9 groups of 2). The student will discuss with instructor how many equal groups can be formed from 18. The student records this as division sentences. Then the instructor rotates the mat so that the reverse shows, namely 6 columns of 3 (3 groups of 6) or 9 columns of 2 (2 groups of 9). The student will record the new division sentences, while identifying if the division sentences are different or the same.

Variations

- The student can make equal groups by dividing the objects into sorting bowls or paper plates.

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 pick a product number and lay out the arrays for that number and record the math sentences.

Questions: How many rows/groups are in your array? How many are in each group? How can you use the same numbers for a different division sentence? How many groups of 5 are in twenty?

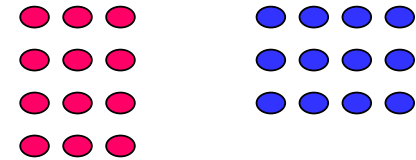
Reflect:

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

Questions: What did you do? Which was the largest column? Which one the smallest? Why do you think that is?

Math Observation Checklist:

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



12 is 4 groups of 3

12 is 3 groups of 4

$$12 \div 4 = 3$$

$$12 \div 3 = 4$$

Supplies

Wide wooden popsicle sticks, small stickers. Cards with division instructions such as “share 12 among 6 groups (popsicle sticks)”. Small counters such as beans or buttons. Paper plates. Graph paper and markers.

The Activity

The student will choose a division instruction card and follow the instruction by choosing the appropriate number of popsicle sticks (groups) and count out the required number of stickers. The student puts the required number of stickers on each popsicle stick. The student records the division sentences and chooses another instruction card.

Variations

- The student can make equal groups by dividing the counters into sorting bowls or paper plates and recording the division 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 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 pick an instruction card and decides how many popsicle sticks/paper plates are needed and how many stickers/counters.

Questions: How many popsicle sticks do you need? How many stickers? How do you know that? How will you divide up your stickers among the popsicle sticks?

Reflect:

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

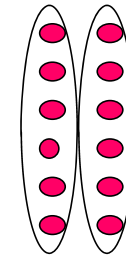
Questions: What did you do? You divided 12 stickers among 2 sticks and then among 3 sticks. Where were the popsicle sticks with the most stickers? How come?

Math Observation Checklist:

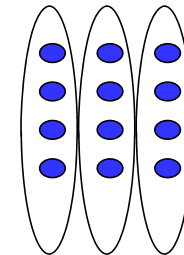
This activity will give insight into the student’s understanding of division, attending to more than one piece of information, and attending to relevant information.

Share 12 among 2 groups

Share 12 among 3 groups



$$12 \div 2 = 6$$



$$12 \div 3 = 4$$

Supplies

Cards with remainder-division instructions such as “share 14 among 6 groups.” Small counters such as beans or buttons. Paper plates or cups. Graph paper and markers.

The Activity

The student will choose a remainder division instruction card and follow the instruction by choosing the appropriate number of cups (groups) and counting out the required number of counters. Then the student puts a counter in each cup until there are not enough counters to put in each cup. These remaining counters are “leftovers.” The student records the division sentences. For instance, 14 counters shared among 6 groups is 2 in each group and 2 leftover.

Variations

- The student can make a table out of the math facts for the division sentences.

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 pick an instruction card and decides how many paper plates/cups are needed and how many counters. Then they will divide the counters.

Questions: How many cups do you need? How many counters? How do you know that? How will you divide up your counters among the cups?

Reflect:

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

Questions: What did you do? You divided 15 counters among 2 cups. What happened?

Math Observation Checklist:

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

Share 15 among 2 groups

Share 14 among 3 groups

$15 \div 2 = 7$
1 leftover

$14 \div 3 = 4$
2 leftover

Supplies

Sheet of 1" grid paper; cubes that interlock on all sides, or tile counters.

The Activity

The student will work on odd and even numbers. Ask the student to build patterns with the cubes or tiles starting with 2, then 4, 6, and so on. Start the pattern with 2 cubes or tiles in a horizontal position, then build 2 on top for each subsequent number (see model on the right.). Show the student that each tower can be **evenly** split in 2, and discuss that this means it is an **“even”** number. Next, ask student to build patterns for the numbers 1, 3, 5, and so on, keeping the earlier built patterns in tact. Use a different color for the **“odd one out”** (see model on the right.) Discuss that these are **“odd”** numbers. When you split odd numbers in 2 there always is a remainder of 1. Note: help the student understand that all numbers that end with 2, 4, 6, 8 or 0 are always even, no matter how large the number is. Therefore, all numbers that **do not** end in 2, 4, 6, 8 or 0 are odd. **(No need to remember those numbers!)**

Variations

- Ask student to take a handful of cubes or counters, lay them out in an array of 2 columns and determine if the number is even or odd.

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 lay out the patterns for the even and odd numbers.

Questions: If you start with 2 cubes next to each other, how can you make it into a tower of 4? How many blocks did you add? If you make another tower that has 2 more cubes than this one, how many cubes do you have? What happens when you put an extra cube on top of this tower? How can you skip-count the even numbers?

Reflect:

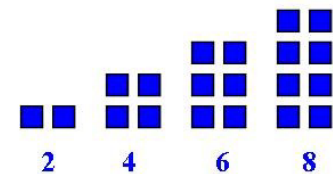
During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? How can you tell a number is “Even”? “Odd”? How can you tell if a really high number is even or odd?

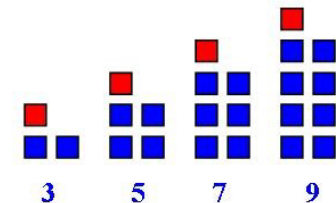
Math Observation Checklist:

This activity will give insight into the student’s ability to understand odd and even numbers; division; attend to more than one piece of information, and attend to relevant information.

Even numbers can be split evenly into 2 groups



Odd numbers have an Odd one out



Supplies

Sheet of 1" grid paper; Base ten rods and cubes (for tens and ones)

The Activity

The student will work on long division without remainder or regrouping. You will need to help the student understand how to write the division symbols and where to put the answers. With the manipulatives the student can "see" the division.

Division is different from other math operations, in that it starts on the left side. When the student uses the base 10 rods and cubes, make sure that the sequence is correct and that they starts by dividing the tens-column. The example on the right shows how you can discuss the sequence with the student.

Variations

- Ask student to divide a 3-digit number. Make sure the hundreds-column has a number that can be divided by the number you chose, so that no regrouping into the tens column needs to take 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 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 use the manipulatives to perform the division and record the answer in a long-division format.

Questions: Where do you need to start when you divide 46 by 2? Can you show me how you do that? In what column are you putting the answer?

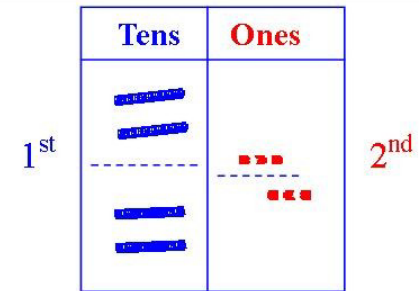
Reflect:

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

Questions: What did you do? Did division remind you of something? (multiplication).

Math Observation Checklist:

This activity will give insight into the student's ability to understand whole numbers; divide numbers into even groups; attend to more than one piece of information, and attend to relevant information.



- $46 \div 2 = ?$
- 2 $\overline{)46}$
 $\underline{4}$ 6
 $\underline{0}$ 6
 $\underline{6}$
 0
- Divide the tens by 2**
Write the 2 above the 4 (the tens-column)
Multiply 2×2 and write 4.
Subtract
 - Bring down 6 and divide by 2.**
Write the 3 above the 6
Multiply 3×2 and write 6.
Subtract. Done!

Supplies

Sheet of 1" grid paper; Base ten flats, rods and cubes (for tens and ones)

The Activity

The student will work on long division with regrouping. You will need to help the student understand how to write the division symbols and where to put the answers. With the manipulatives the student can “see” the division. Division is different from other math operations, in that it starts on the left side. When the student uses the base 10 rods and cubes, make sure that the sequence is correct and that they start by dividing the tens-column. Once the tens-column has been divided, there will be leftover tens. These need to be put into the ones-column and then the ones-column can be divided. The example on the right shows how you can discuss the sequence with the student .

Variations

- The student can make pieces of “fruit” with the play-doh according to the number on the number/dot card.
- The student can line up the sets in the same pattern as the dot cards.
- The student creates dot and/or numeral cards.

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 use the manipulatives to perform the division and record the answer in a long-division format.

Questions: Where do you need to start when you divide 56 by 2? Can you show me how you do that? In what column are you putting the answer?

Reflect:

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

Questions: What did you do? Did division remind you of something? (multiplication).

Math Observation Checklist:

This activity will give insight into the student’s ability to understand whole numbers; understand that division is the opposite of multiplication; long division with regrouping; attend to more than one piece of information, and attend to relevant information.

	Tens	Ones	
1 st			2 nd

$56 \div 2 = ?$

$$\begin{array}{r} 28 \\ 2 \overline{)56} \\ \underline{4} \\ 16 \\ \underline{16} \\ 0 \end{array}$$

1. Divide the tens by 2
Write the 2 above the 5 (the tens-column)
Multiply 2 x 2 and write 4.
Subtract: remainder 1 ten

2. Bring down 6 and divide 16 by 2.
Write the 8 above the 6
Multiply 8x2 and write 16.
Subtract. **Done!**

Supplies

Sheet of 1" grid paper; Counting tiles; Markers or pencils.

The Activity

The student will evenly divide a number by as many different numbers as possible ("factors".) Explain that some numbers can only be evenly divided by 1 or by itself.

These are called "prime numbers", for instance 2, 3, 7 and 11.

The rules for dividing are as follows:

a number can be divided by:

2 if the last digit is 0, or even

3 if the **sum** of all digits can be divided by 3

4 if the last 2 digits can be divided by 4

5 if the last digit is a 5 or a 0

10 if the last digit is 0

With your student, decide on a number to be factored. Ask the student to use the counters to lay out the different groups that the number can be divided into. Then, the number of groups and the number of counters in that group will be the factors.

Variations

- Ask student to find the factors for two numbers and determine the **Greatest Common Factor (GCF)**. The GCF is the largest factor that the 2 numbers have in common.

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 use the manipulatives to find the factors and record the answers.

Questions: What number do you always start with when you want to find the factors (1)? So, what is the first factor for 56? Can you show me how you write that down?

Reflect:

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

Questions: What did you do? How many factors did you find for 24? When you had a number, how did you find the factors? (Answer: by division) How can you find the number when you know the 2 factors? (Answer: by multiplying). What did you find out about multiplying and dividing?

Math Observation Checklist:

This activity will give insight into the student's ability to understand division is the opposite of multiplication; factoring; division; attend to more than one piece of information, and attend to relevant information.

What are the factors for 18? (How many different ways can we divide 18?)

Can we divide 18 by 1? **Yes!** We get 18.
 $18 \div 1 = 1$ group of 18. **Factors: 1 and 18**

Can we divide 18 by 2? **Yes!** We get 9
 $18 \div 2 = 2$ groups of 9. **Factors: 2 and 9**

Can we divide 18 by 3? **Yes!** We get 6
 $18 \div 3 = 3$ groups of 6. **Factors: 3 and 6**

Can we divide 18 by 4? **No!** (Try it out!)

Can we divide 18 by 5? **No!** (Try it out!)

**So, the factors for 18 are:
1, 2, 3, 6, 9, 18**

Trick! When we have 3 groups of 6, we can "flip" and have 6 groups of 3!
So, we don't need to go further than trying out 5!

Supplies

Sheet of 1" grid paper; Counting tiles; Markers or pencils

The Activity

The student will find the **prime factors** for a number. Prime factors are the numbers that cannot be divided by any number, except itself. For instance 3, 5 or 13. When factoring, when you reach a “prime number” such as 3 or 5, you cannot continue to divide. To find the prime factors, start by dividing the number you chose (for instance 18) by the smallest prime number (that is 2). The student will write 18 on the paper with 2 arrows pointing down. 18 can be divided into 2 groups of 9 and the student will lay out the two groups. They will then write 2 and 9 under the arrows pointing down from 18, and circle the 2.

Next, one group of 9 will be removed and the student will determine if the remaining group of 9 can be further divided.

Nine cannot be divided by 2, so we try the next prime number, which is 3. Nine can be divided into 3 groups of 3, and the student lays out the groups. They draw 2 arrows down from the 9 and write 3 and 3, circling the first 3.

Two groups of 3 are removed and the student determines if the remaining group of 3 can be further divided. No. So the last 3 is circled. The circled numbers (2, 3, and 3) are the prime factors for 18.

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 will we do first? Next? And then?

Act:

The student will use the manipulatives to find the prime factors and record the answers.

Questions: What number do you need to start with, when you want to find the prime factors? Why is that? So, what is the first factor for 18? Can you show me how you write that down?

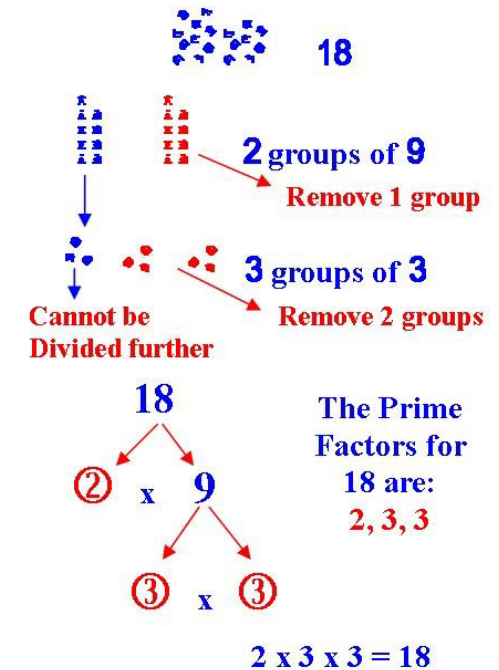
Reflect:

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

Questions: What did you do? What were the prime factors for the number you chose? When you had a number, how did you find the factors? How can you check if your prime factors are correct?

Math Observation Checklist:

This activity will give insight into the student’s ability to understand division is the opposite of multiplication; divide a number among equal groups; factoring; division; attend to more than one piece of information, and attend to relevant information.



Supplies

Circular and rectangular fraction tiles; spinner or number cards; paper; markers.

The Activity

The student will work on fractions. Because many students may have a negative mental block for fractions, explain that a fraction just means small parts, or little pieces of something that are all exactly the same size, and that you are just going to figure out how many equal small parts there are in a whole. Also explain that something, for instance a square, can be broken down into different small parts, for instance 2 ($\frac{1}{2}$) or 3 ($\frac{1}{3}$) and that when the small pieces are all put together, they form the whole. Use the correct fraction terminology, for instance, one out of three is called one third, or one out of four can be called one fourth or one quarter.

Introduce the terms “**numerator**” (the number that is **up**), and “**denominator**” (the number that is **down**).

Variations

- The student can make pieces of “fruit” with the play-doh according to the number on the number/dot card.
- The student can line up the sets in the same pattern as the dot cards.
- The student creates dot and/or numeral cards.

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 will we do first? Next? And then?

Act:

The student will divide the square or the bar into different sized pieces and record the fraction.

Questions: If you divide this square into 2 (4, or 9) parts, what could we call one of those parts? What would happen if we put these parts together? What could we call it now? What happens when I have a whole square and split it into 2 (4 or 9) parts, and then I take away one part? If a circle is split into 5 parts, how many parts do I need to take away so that I have only 1 part left? How come?

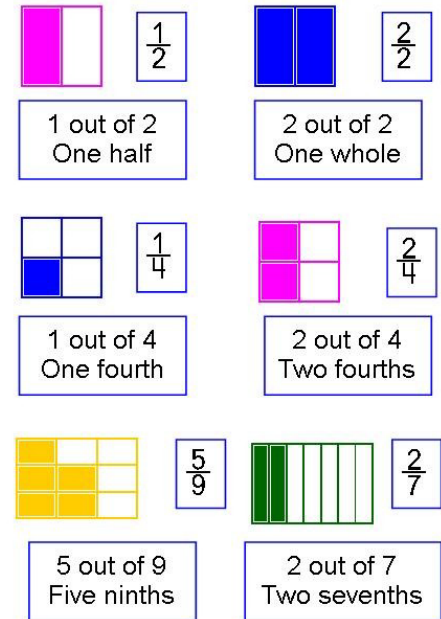
Reflect:

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

Questions: What did you do? How can you tell which number is the numerator? The denominator? What happened when you divide a circle (pizza)?

Math Observation Checklist:

This activity will give insight into the student’s ability to understand whole numbers; fractions; systematic exploration; attend to more than one piece of information, and attend to relevant information.



Supplies

Circular and rectangular fraction tiles; paper strips; spinner or number cards; paper; markers.

The Activity

The student will work on equivalent fractions, fractions that look different but have the same value. Explain that something, for instance a rectangle, can be broken down into different small parts, for instance 2 ($\frac{1}{2}$), 4 ($\frac{1}{4}$), or 8 ($\frac{1}{8}$) and that when the small pieces are all put together, they form the whole. Ask the student to fold a strip of paper in half (2 segments); the next strip of paper in half, then again in half (4 segments); the next strip gets folded 3 times (8 segments). The student will color each strip in a different color and line up the strips under one another. Discuss how many segments of the strip that was divided into 4 (8) are needed to match on segment of the strip that was folded in half. $\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$. These are called “equivalent fractions” because they are equal (the same). The student will record the results. Repeat this with different fractions and point out how the numerator and denominator changes are related (i.e. multiplied, or divided by the same number).

Variations

- Ask the student to divide different shapes into fractions. for instance a circle or a square, and make equivalent fractions.

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. Discuss rows and columns with the child. Formulate a plan with the student.

Questions: What is the plan? What will we do first? Next? And then?

Act:

The student will divide the strips of paper into different sized equal pieces and record the fractions, and the equivalent fractions.

Questions: If you divide this strip into 2 (4, or 8) parts, what could we call one of those parts? How many parts from the strip divided into 8 parts do you need to match one part of the strip divided into 2 parts? What could you call it now? If a circle is split into 6 parts, how many parts do I need to take away so that I have $\frac{1}{3}$ left? How come?

Reflect:

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

Questions: What did you do? What happened to the numerator when the denominator got bigger?

Math Observation Checklist:

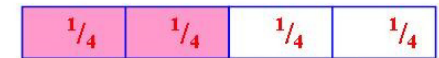
This activity will give insight into the student’s ability to understand whole numbers; fractions; attend to more than one piece of information, systematic exploration, and attend to relevant information.



1 whole



2 out of 2 equal parts = 1 whole
1 out of 2 equal parts = $\frac{1}{2}$



4 out of 4 equal parts = 1 whole
2 out of 4 equal parts = $\frac{2}{4}$
 $\frac{2}{4} = \frac{1}{2}$



8 out of 8 equal parts = 1 whole
4 out of 8 equal parts = $\frac{4}{8}$
 $\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$

$$\frac{1}{2} \times 2 = \frac{2}{4} \times 2 = \frac{4}{8} \times 2 = \frac{8}{16}$$

Supplies

Circular and rectangular fraction tiles; paper strips; spinner or number cards; paper; markers.

The Activity

The student will work on adding and subtracting like fractions (with the same denominator.) The student can make up the fractions by rolling a number die, or using a spinner.

Show the student that when adding fractions with the same denominator, they just need to “add the little pieces”. For instance, if a pizza is cut into 8 equal slices and one person eats 1 slice ($\frac{1}{8}$) and another person eats 3 ($\frac{3}{8}$), 4 pieces out of 8 were eaten. So, $\frac{1}{8} + \frac{3}{8} = \frac{4}{8}$, or one eighth plus three eighths equals 4 eighths.

The student will then further reduce the fraction: $\frac{4}{8} = \frac{2}{4} = \frac{1}{2}$. The same holds true for subtracting. If a pizza was cut into 8 equal slices and one person ate $\frac{2}{8}$ (two slices out of 8), how much was left? $\frac{8}{8} - \frac{2}{8} = \frac{6}{8}$. Reduce $\frac{6}{8}$ to its simplest form by dividing the numerator and denominator by the same number (2). The answer is: $\frac{3}{4}$.

Variations

- Instead of using manipulatives, have the student draw a model of the fractions, showing the parts to be added in different colors, or crossing out the parts to be subtracted.

Focus:

Encourage the student to focus the student’s 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 will we do first? Next? And then?

Act:

The student will make up fractions and add and subtract them. The student will also record the fractions, and reduce them to the simplest form.

Questions: If you divide this circle (pizza) into 2 (4, or 8) parts, what could we call one of those parts? What do you need to do to add fractions? How can you subtract fractions?

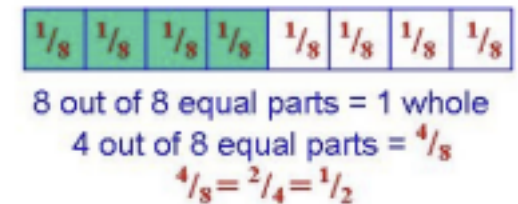
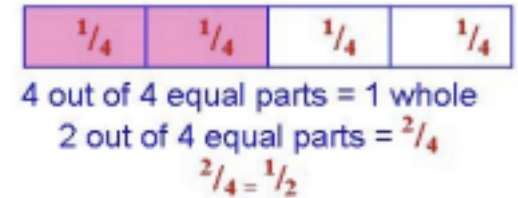
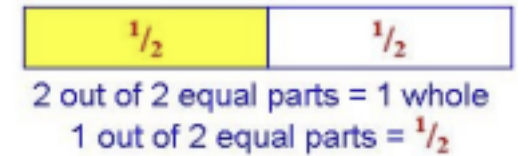
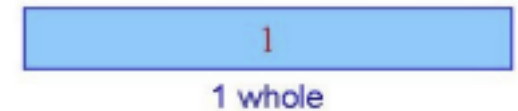
Reflect:

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

Questions: What did you do? What happened to the numerator when you added two fractions? What happened when you subtracted? Did anything happen to the denominator?

Math Observation Checklist:

This activity will give insight into the student’s ability to understand whole numbers; fractions; attend to more than one piece of information, and attend to relevant information.



$$\frac{1}{2} \times 2 = \frac{2}{4} \times 2 = \frac{4}{8} \times 2 = \frac{8}{16}$$

Supplies

Circular and rectangular fraction tiles; paper strips; spinner or number cards; paper; markers.

The Activity

The students will work on adding and subtracting fractions with different denominators. They can make up the fractions by rolling a number die, or using a spinner. Show the student that when adding fractions with different denominators, the first needs to make the denominators equal (multiply by the same number.) If the student has difficulty with this, go back to the lesson on equivalent fractions.

For instance, if a pizza is cut into fourths and eighths and one person eats $\frac{1}{8}$ and another person eats $\frac{1}{4}$, how much of the pizza was eaten?

Wherever possible, the student will further reduce the answer to its simplest form by dividing the numerator and denominator by the same number.

Variations

- Instead of using manipulatives, have the student draw a model of the fractions, showing the parts to be added in different colors, or crossing out the parts to be subtracted.

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 will we do first? Next?

Act:

The student will make up fractions and add and subtract them. They will also record the fractions, and reduce them to the simplest form.

Questions: If you divide this circle (pizza) into 2 (4, or 8) parts, what could we call one of those parts? What do you need to do to add fractions? How can you subtract fractions? What is a larger part $\frac{5}{10}$ or $\frac{1}{2}$? How did you do that?

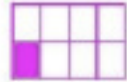
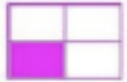
Reflect:

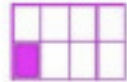
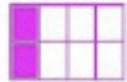
During and after the activity, reflect on what the student is doing/has done.

Questions: What did you do? What happened to the numerator when the you added two fractions? What happened when you subtracted? Did anything happen to the denominator?

Math Observation Checklist:


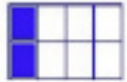
This activity will give insight into the student's ability to understand whole numbers; fractions; systematic exploration; attend to more than one piece of information, and attend to relevant information.

 +  = $\frac{1}{8} + \frac{1}{4} =$

 +  = $\frac{1}{8} + \frac{2}{8} = \frac{3}{8}$

What is $\frac{1}{2} - \frac{2}{8}$?

 -  = $\frac{1}{2} - \frac{2}{8} =$

 -  = $\frac{4}{8} - \frac{2}{8} =$

 = $\frac{2}{8} =$  = $\frac{1}{4}$

Supplies

Circular and rectangular fraction tiles; paper strips; spinner or number cards; paper; markers.

The Activity

The student will work on adding mixed numbers (whole numbers and fractions), and on converting mixed numbers to an improper fraction. You and your student can make up the numbers and the fractions by rolling a number die, or using a spinner.

Show the student that when adding fractions to a whole number you get that number “plus a little bit”. For instance, two apples and a $\frac{1}{4}$ of an apple is $2\frac{1}{4}$ apples.

Then show the student that $2\frac{1}{4}$ can be converted into a fraction and because it is not a “real” fraction, it will be called an “improper fraction”. This can be done by breaking up the whole number into parts and then adding everything, or by multiplying the whole number by the denominator of the fraction and adding the numerator. Before you show the multiplication, make sure the student understands what is happening by using the addition method with manipulatives.

Variations

- Have the student draw a number line with whole numbers and then put the fractions (for instance halves and quarters) in between the numbers at the correct places.

Focus:

Encourage the student to focus the student 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 will we do first? Next?

Act:

The student will make up fractions and add and subtract them. They will also record the fractions, and reduce them to the simplest form.

Questions: What do you need to do to add a fractions to a whole number? How can you change a mixed number to a fraction? Show me how to do that. Why is it called an improper fraction?

Reflect:

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

Questions: What did you do? What happened to the numerator when you changed a mixed number to an improper fraction? What happened to the denominator?

Math Observation Checklist:

This activity will give insight into the student’s ability to understand whole numbers; fractions; attend to more than one piece of information, systematic exploration, and attend to relevant information.

What is $2 + \frac{1}{2}$?

$$\square + \square + \square \square = 2\frac{1}{2}$$

$$2\frac{1}{2} = \square\square + \square\square + \square\square = \frac{5}{2}$$

What is $3 + \frac{1}{3}$?

$$\square + \square + \square + \square\square\square = 3\frac{1}{3}$$

$$3\frac{1}{3} = \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{1}{3} = \frac{10}{3}$$

Supplies

A sheet of poster board divided into two columns;
Pictures of people that are cut out of magazines.

The Activity

The student will determine a sorting category, for instance, pants-skirts, tall-short, adult-child, blue eyes-brown eyes. The poster board columns will then be marked with the sorting criterion. The student will then sort through the pictures and paste them on the poster board under the appropriate heading. Instructor and student then discuss the interpretation of the graph in terms of more, less, and the same.

Variations

- The student can look for pictures in magazines that would give other categories, such as animals, fish, or cars.
- The student can add a category, for instance men, women with skirts, women with pants, and then draw a bar graph of the results.

Focus:

Encourage the student to focus the student's 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 will we do first? Next? And then?

Act:

The student sorts the pictures and makes a graph.

Questions: What do you want to use as sorting category? What do you need to look for? Which column has more pictures? What does that tell you?








Reflect:

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

Questions: What did you do? Why do you think we use graphs? Where did you have the most? Does that mean that in general there are more?

Math Observation Checklist:

This activity will give insight into the student's understanding of sorting, categorizing, focused perception, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.

Men	Women
	
	
	
	

Supplies

Several sheets of graph paper with 1" squares:
Markers or coloring pencils; small objects such as buttons or beans or counters that will fit into the squares of the graph paper.

The Activity

The student will build a number pattern by laying out the counters in columns on the graph paper. They will then copy the pattern as a bar graph¹ on another sheet of graph paper. Instructor and student then discuss the bar graphs in terms of more, less, and the same.

Variations

- Instead of laying out the counters on the graph paper, the student can grab a handful and count them. Then they will record this number on the graph paper as a bar graph. Repeat with the next handful.

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 to achieve the goal.

Questions: What is the plan? What will we do first? Next?

Act:

The student lays out the counters and makes bar graphs.

Questions: What pattern are you making with the counters? What other patterns can you make? With this graph paper, what is the highest number of counters you can have in your column? How did you know that?

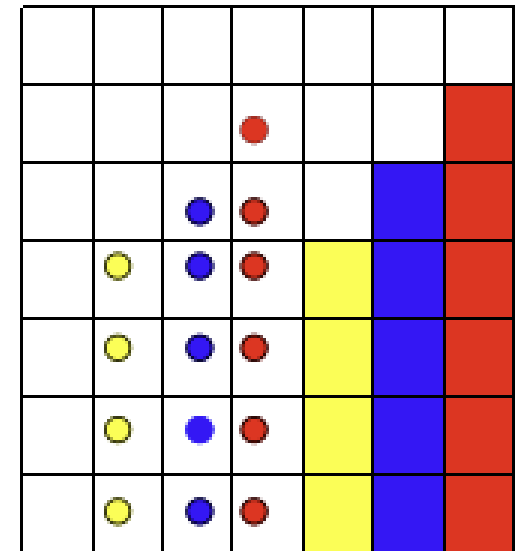
Reflect:

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

Questions: What did you do? Why do you think we use graphs? Where did you have the most?

Math Observation Checklist:

This activity will give insight into the student's understanding of sorting, categorizing, focused perception, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.



Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

Supplies

Several sheets of graph paper with 1" squares; A large graph mat drawn on a sheet of poster board; Markers or coloring pencils; A collection of objects such as plastic toy animals, leaves, or small plastic figurines.

The Activity

The student will sort out the objects according to some chosen category. Then he/she will count the objects in each category and create a bar graph¹ on a sheet of graph paper. Instructor and student then discuss the bar graphs in terms of more, less, and the same.

Variations

- Change the sorting category and have the student sort the same objects according to the new category. Compare the two graphs.

Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

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 to achieve the goal.

Questions: What is the plan? What will we do first? Next?

Act:

The student sorts and lays out the objects, and makes bar graphs.

Questions: How are you sorting these objects? Where do you have the most? The least? How do you know that without counting?

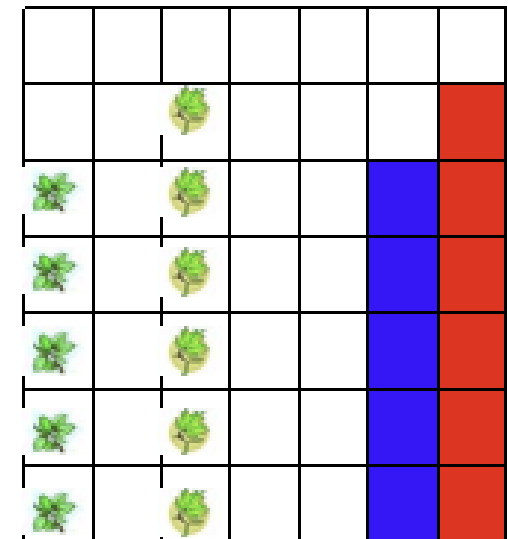
Reflect:

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

Questions: What did you do? Why do you think we use graphs? Where did you have the most? How could you tell?

Math Observation Checklist:

This activity will give insight into the student's understanding of sorting, categorizing, focused perception, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.



Supplies

Plastic or cardboard 1"-tiles. Several sizes of rectangular and square sheets of construction paper or regular paper, cut so that an exact number of inch-tiles fits. Tape measure, markers and paper.

The Activity

The student will work on calculating the **perimeter** of squares and rectangles. Explain that the word perimeter means the outside of the shape, like "putting a fence around it."

Ask the student to describe the properties of a square: 4 equal sides, and 4 right angles; and the properties of a rectangle: 1 pair of long parallel lines, one pair of short parallel lines, and 4 right angles. The "secret" of the rectangle is that the opposite sides are equal.

Then show the student that when calculating the perimeter of a square it can be done by adding each side (side A + side B + side C + side D), but that a faster way is to **multiply one side by 4**, because all the sides are equal. Show that the perimeter of the rectangle can be calculated by **multiplying the long side by 2, the short side by 2** and then **adding** the two numbers.

Variations

- Ask the student to calculate the perimeter of other equal-sided shapes, for instance an octagon, a hexagon, or an equilateral triangle.

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 will we do first? Next? And then?

Act:

The student will calculate the perimeters of differently sized squares and rectangles.

Questions: What is the slow way and what is the fast way to calculate the perimeter of a square? Where are the parallel sides of the rectangle? What does parallel mean?

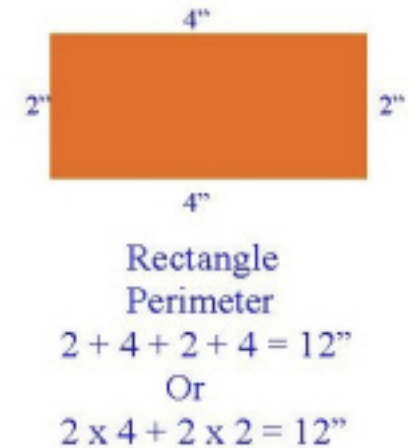
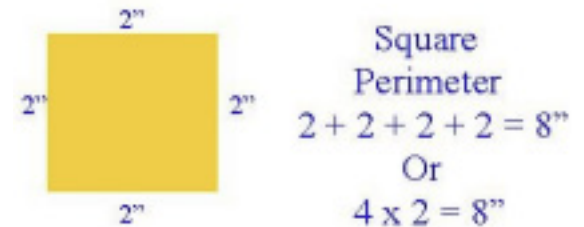
Reflect:

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

Questions: What did you do? How could you tell which shape was larger than another one? When you were using the inch-tiles, how did you know how long a side was without measuring?

Math Observation Checklist:

This activity will give insight into the student's ability to understand size, sequencing, position, addition, multiplication, perimeter, attend to more than one piece of information, and attend to relevant information.



Supplies

Plastic or cardboard 1"-tiles. Several sizes of rectangular and square sheets of construction paper or regular paper, cut so that an exact number of inch-tiles fits, or a sheet of 1" grid paper. Tape measure, markers and paper.

The Activity

The student will work on calculating the **area** of squares and rectangles. Explain that the word area means the whole shape, inside and outside.

Ask the student to use square inch tiles to make squares and rectangles, and count the total number of tiles. Explain that because they are using "square inch tiles" the number you get is in "square inches", or in^2 . Then show that if you multiply the number in the top row, by the number in the 1st column, you get the same number.

Next, show that the number of tiles in the top row is equal to the length of that row, for instance 7", and that the number of tiles in the columns is equal to the length of that side, for instance 5". Therefore, a rectangle with a width of 7" and a height of 5" has an area of $7 \times 5 = 35$ square inches (35 in^2).

Variations

- Ask the student to calculate the length of one side if the area and one other side are given. For instance: area is 42 in^2 and one side is 7". The other side is $42 : 7 = 6$ ".

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 will we do first? Next?

Act:

The student will calculate the area of differently sized squares and rectangles.

Questions: What is the slow way and what is the fast way to calculate the area of a square? Where are the parallel sides of the rectangle? What does parallel mean? If you know the length of one side of a square, what can you say about the other sides? If you know one side of a rectangle, can you calculate the area? Of a square? How come?

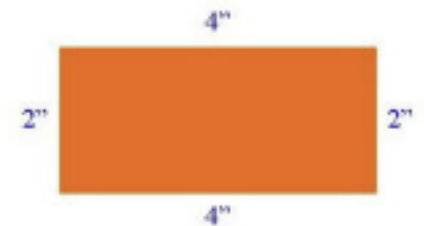
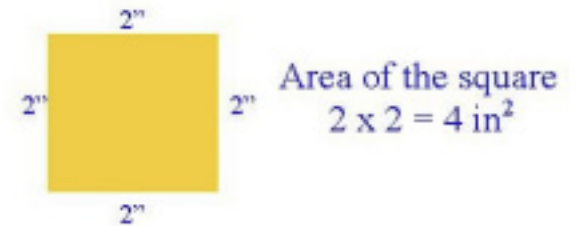
Reflect:

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

Questions: What did you do? What math operation did you have to use to calculate the area of a shape? If you knew the area and one side, what math operation did you have to use to calculate the length of the other side? Why?

Math Observation Checklist:

This activity will give insight into the student's ability to understand size, sequencing, position, addition, multiplication, area, attend to more than one piece of information, and attend to relevant information.



Area of the Rectangle
 $2 \times 4 = 8 \text{ in}^2$

Supplies

Plastic or cardboard 1"-tiles. Several sizes of rectangular and square sheets of construction paper or regular paper, cut so that an exact number of inch-tiles fits. Tape measure, markers and paper.

The Activity

The student will work on calculating the **perimeter** of composite figures (irregular shaped rectangles and/or squares.) Explain that the word perimeter means the outside of the shape, like "putting a fence around it."

Explain to the student that the perimeter of a composite (or irregular) shape is calculated the same way as a square or a rectangle, namely by adding the lengths of all the sides. The student can draw shapes on grid paper, or cut them out and then measure the sides and calculate the perimeter

Variations

- Ask the student to calculate the perimeter of a composite shape where the length of one side is unknown. They has to calculate the missing side first. (See example.)

Focus:

Encourage the student to focus the student 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 will we do first? Next?

Act:

The student will calculate the perimeters of differently sized composite shapes.

Questions: How can you calculate the perimeter of a composite shape? If all the corners of the shape are marked with a letter, how could we describe this shape? How would you describe the longest side? The shortest?

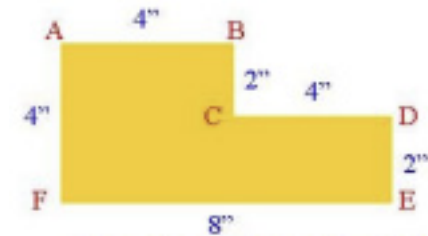
Reflect:

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

Questions: What did you do? How could you tell which shape was larger than another one? When you were using the inch-tiles, how did you know how long a side was without measuring? How did you calculate the perimeter?

Math Observation Checklist:

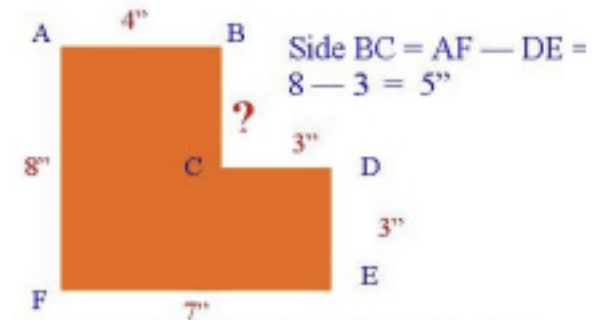
This activity will give insight into the student's ability to understand size, sequencing, position, addition, perimeter, attend to more than one piece of information, and attend to relevant information.



$$AB + BC + CD + DE + EF + FA =$$

$$4 + 2 + 4 + 2 + 8 + 4 =$$

The Perimeter of shape ABCDEF = 24"



Side BC = AF — DE =

$$8 - 3 = 5''$$

The Perimeter of shape ABCDEF = 30"

Supplies

Plastic or cardboard 1"-tiles. Several sizes of rectangular and square sheets of construction paper or regular paper, cut so that an exact number of inch-tiles fits, or a sheet of 1" grid paper. Tape measure, markers and paper.

The Activity

The student will work on calculating the **area** of composite shapes made up of squares and rectangles. Make sure the student understands the word "area". Ask the student to use square inch tiles to fill in the shapes, and count the total number of tiles. Explain that because they are using "square inch tiles" the number you get is in "square inches", or in^2 .

The student may measure the sides with a ruler.

Show how the composite figure can be broken up and that the area of each separate shape can be calculated by multiplying the length and the width. Then the resulting numbers are added to get the total area of the whole figure.

Variations

- Ask the student to calculate the **length** of one side if the area and the other sides are given .

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 will we do first? Next? And then?

Act:

The student will calculate the area of differently sized composite figures.

Questions: How can you calculate the area of a composite figure? What do you need to do? When you use inch-tiles, what are 2 ways to discover the area? How can you break up this composite figure into 2 figures to calculate the area?

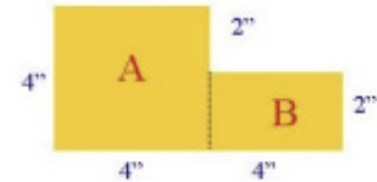
Reflect:

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

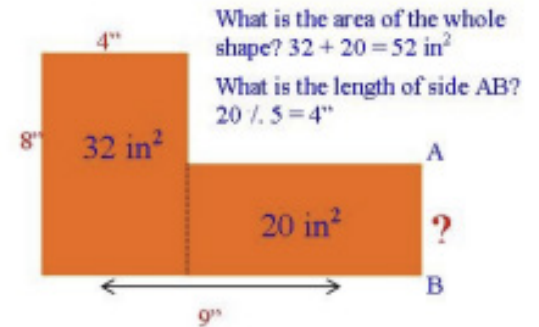
Questions: What did you do? What math operation did you have to use to calculate the area of a shape? If you knew the area and one side, what math operation did you have to use to calculate the length of the other side? Why?

Math Observation Checklist:

This activity will give insight into the student's ability to understand size, sequencing, position, addition, multiplication, area, attend to more than one piece of information, and attend to relevant information.



The area of shape A is $4 \times 4 = 16 \text{ sq.in}$
 The area of shape B is $2 \times 4 = 8 \text{ sq.in}$
 The area of the whole shape is 24 sq.in



Supplies

Plastic or cardboard 1"-tiles. Several sizes of rectangular sheets of construction paper cut so that an exact number of the inch-tiles fit on it. Cut the paper into other shapes, such as circles, ovals, and triangles. Make sure that the rectangular sheets and the non-rectangular are similar in size.

The Activity

The student will choose a rectangular sheet of construction paper and fill it with rows of inch-tiles until the complete sheet is covered. Next they will calculate the area by counting how many tiles it took to completely cover the sheet and record the number. They will then choose a non-rectangular shape, cover it with the inch-tiles and record the number.

Variations

- Ask the student to calculate the number of tiles by using multiplication instead of counting.

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 will we do first? Next?

Act:

The student will pick a sheet to be covered and lays out the tiles.

Questions: How many rows do you have? How many columns? How many tiles in total? Can you completely cover this round sheet with the square tiles? How come?

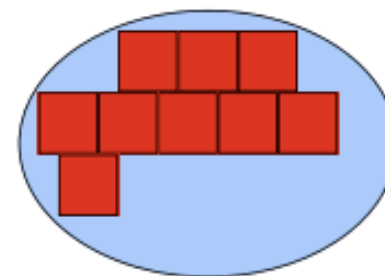
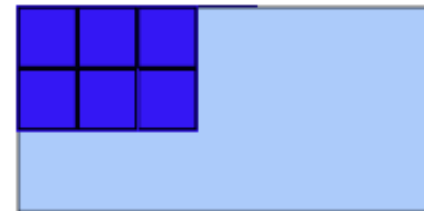
Reflect:

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

Questions: What did you do? What happened when you covered the triangle and the rectangular shapes? Could you give the exact area? What did we call it when you could not exactly say how many there were?

Math Observation Checklist:

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



Supplies

Large plastic pattern blocks of different shapes, such as oval, circle, rectangle and square. You can also cut large shapes out of construction board. String, paper and markers are also needed.

The Activity

First the student will put the shapes in order from largest to smallest, by estimating which one has the greatest perimeter. Next They will use string to measure the perimeter of each block and line up the strings (marked with the shape it measured) from longest to shortest. The student will then compare if they lined up the shapes correctly.

Variations

- Measure the strings with a ruler and write down the actual size of the perimeter.

Focus:

Encourage the student to focus the student 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 will we do first? Next?

Act:

The student orders the shapes according to estimated size and will then measure them by wrapping a piece of string around their perimeters.

Questions: Which one do you think is the largest? The smallest? What makes you say that? What can you do to find out?

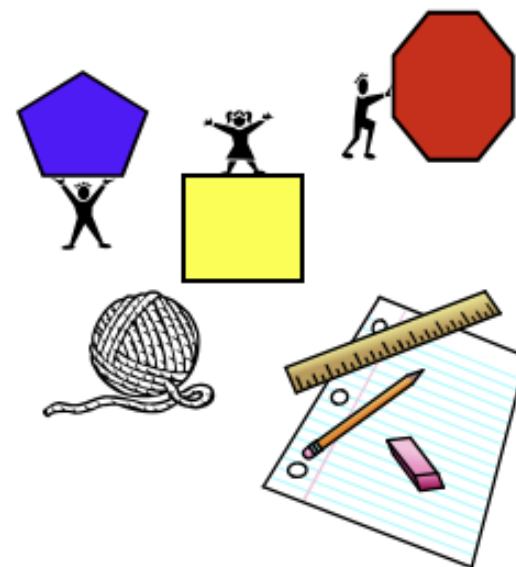
Reflect:

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

Questions: What did you do? Were your estimates accurate? What was tricky about this exercise?

Math Observation Checklist:

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



Supplies

Different sized squares or rectangles cut out from poster board or construction paper (make sure the sides are an exact number of inches or centimeters so that no fractions have to be added when calculating the perimeter). Ruler, string or yarn, paper and markers.

The Activity

The student will measure each side and write the addition sentence to calculate the perimeter. Repeat with different sizes.

Variations

- The student can make a greeting card from the measured item. After calculating the perimeter, the student can measure a piece of colored yarn to fit around the card and glue it on as a border.

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 will we do first? Next?

Act:

The student uses a ruler to measure each side of a rectangle and writes the math sentences.

Questions: Which one do you think is the largest? The smallest? What makes you say that? What can you do to find out? How many sides are the same in this rectangle? How many are different? What is your number sentence?

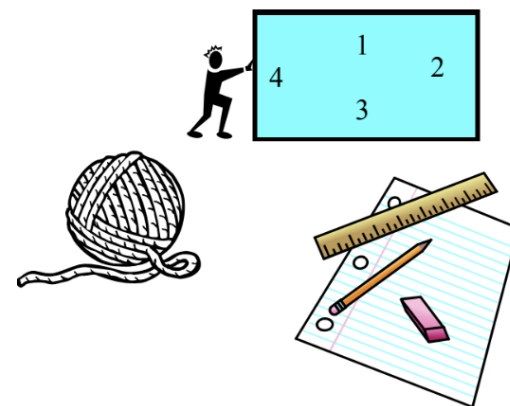
Reflect:

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

Questions: What did you do? How did you calculate the perimeter?

Math Observation Checklist:

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



Side 1 is 12 inches

Side 2 is 6 inches

Side 3 is 12 inches

Side 4 is 6 inches

$12 + 6 + 12 + 6 = 36$

The perimeter is 36 inches

Supplies

Scissors, string, markers, index cards cut in smaller pieces, and masking tape for labeling the strings used for measuring.

The Activity

The student will choose 5 or 10 objects in the room to be measured. They will measure the object with the string, making sure the end of the string is lined up with the top of the object before cutting it. Student or instructor will make a label for the string and attach it.

Variations

- The student can compare the sizes of the objects by ordering them from tallest to shortest, or from shortest to longest.

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? Do you know what “height” means? “Length”?

Act:

The student will pick a sheet to be covered and lays out the tiles.

Questions: How many rows do you have? How many columns? How many tiles in total? Can you completely cover this round sheet with the square tiles? How come?

Reflect:

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

Questions: What did you do? What did you find out about the objects you measured? If something is shorter than something else, can it at the same time be taller than something else? How come?

Math Observation Checklist:

This activity will give insight into the student’s understanding of size, conservation, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.

Supplies

Blocks for building towers (or interlocking cubes), cardboard cylinders from toilet tissue rolls, paper-towel rolls, string, yardstick or ruler for measuring.

The Activity

The student will build differently sized towers from blocks or interlocking cubes and will compare them as to which one is tall, taller, tallest. The instructor can then help measure the towers with the ruler or yardstick and write down the numbers so the student can see which numbers are higher.

Variations

- The student can compare and measure cardboard cylinders and discuss the words “short” and “shorter.”
- The student can measure different objects in the room, such as pencils, toys, cabinets, and discuss their comparative height or length.

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? Do you know what “height” means? “Length”?

Act:

The student will build towers and measure and compare them.

Questions: Which one is the tallest? The shortest? What makes you say that? What can you do to find out? What can you do to make this tower taller? Shorter? Who is the tallest in your family? Who is the shortest? Why do you think that is? How many blocks are in this tall tower? How many in the short one?

Reflect:

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

Questions: What did you do? What did you find out about these towers? If you are shorter than somebody, can you also be taller than somebody else? How come?

Math Observation Checklist:

This activity will give insight into the student’s understanding of size, conservation, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.

Supplies

Yard stick, tape measure, or ruler. Paper and markers.

The Activity

The student will choose 5 or 10 objects in the room to be measured. Then they will estimate/guess how many inches the object is and record that on a sheet of paper. Next they will measure the object with the ruler, tape measure or yardstick and record the actual size, rounded off to the nearest inch.

Variations

- The student can make a greeting card from the measured item. After calculating the perimeter, the student can measure a piece of colored yarn to fit around the card and glue it on as a border.

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 will we do first? Next?

Act:

The student will estimate and measure the objects, and record their findings.

Questions: Which one is the tallest? The shortest? Can everything be measured with a tape measure? How come? What could you not measure with a tape measure? What measuring unit would you need to use?

Reflect:

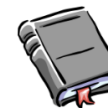
During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? What did you find out about the objects you measured? How close were your guesses?

Math Observation Checklist:

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

Item	Guess	Actual Size
Book	8"	10"
Marker	7"	6"



Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

Supplies

Different sized containers, such as plastic cups, margarine tubs, shampoo bottles, measuring cups, and measuring spoons; items that can be poured from one container into another, such as beans, rice, macaroni, or sand; 3 place cards with the words “MORE,” “LESS,” and “SAME.”

The Activity

The student fills containers with rice (or beans, etc.) and will compare the containers to determine which has more or less. The student can then check by pouring the contents into a measuring cup or by using a measuring spoon to remove the contents while counting the number of scoops. The student can also pour contents from one container into another and draw some conclusions about “too much,” “too little,” or “just enough.”

Variations

- The student can estimate before measuring which container will hold more/less/same and then check by using a measuring tool to fill the containers.

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? What do you think we can do with these containers.

Act:

The student will fill the containers and compare them while making predictions about same, more, or less.

Questions: Which one do you think is the largest? The smallest? What makes you say that? What can you do to find out? How come this tall container and this flat one held the same amount of rice?

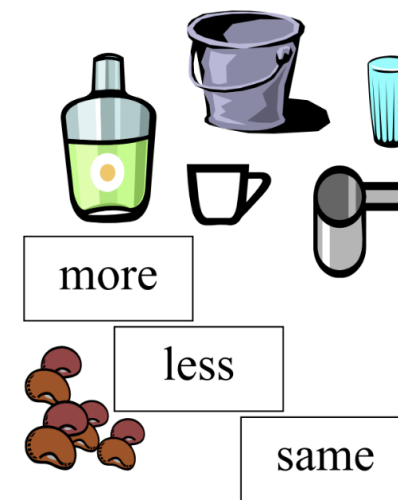
Reflect:

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

Questions: What did you do? What did you find out about the objects you measured? If something is shorter than something else, can it at the same time be taller than something else? How come?

Math Observation Checklist:

This activity will give insight into the student’s understanding of size, conservation, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.



Supplies

Different sized containers, such as plastic cups, margarine tubs, shampoo bottles, measuring cups, and measuring spoons; items that can be poured from one container into another, such as beans, rice, macaroni, or sand.

The Activity

The student fills containers with rice, beans, or sand with a measuring spoon or measuring cup and records the number or spoonfuls or cupfuls on a sheet of paper.

Variations

- The student can estimate how many spoons or cups will be needed to fill the container and compare the estimate with the actual number.
- The student can use interlocking cubes to tally the number of cups or spoons. Each time a cupful is added, a cube is added to the tower of cubes. The towers can then be compared and ordered according to length.
- The student can make a bar graph¹ for the results.

Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

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? What do you think we can do with these containers.

Act:

The student will fill the containers with the measuring spoon or measuring cup and keep a tally of the number.

Questions: Which one do you think is the largest or smallest? What makes you say that? What can you do to find out? What will go faster, the cup or the spoon? What would be the best measuring tool for this (small, medium, large) container?

Reflect:

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

Questions: What did you do? What did you find out about these containers? What happened when you used the spoon to fill this large container? And when you used the measuring cup? How come this tall container and this flat one held the same amount of rice?

Math Observation Checklist:

This activity will give insight into the student's understanding of size, conservation, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.



Supplies

Beads and string; pegboard and pegs; interlocking cubes; a 30-second and a 1-minute sand timer.

The Activity

The student will do an activity, for instance putting beads on a string, putting pegs in a pegboard, or making 10-towers by putting 10 same color interlocking cubes together. The activity lasts as long as the sand in the sand timer is running (30 seconds or 1 minute). The student will record the number of beads, pegs, or cubes that were used. Next, they can use one of the other objects to put together and compare the two activities.

Variations

- The student can estimate how many cubes, pegs, or beads they can put together during the time period. Then do the activity and compare the actual number with the estimate.
- The student does the same activity, once using the 30-second timer and once using the 1-minute timer. Then the numbers are compared.

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 estimate and measure the objects and record their findings.

Questions: How many beads did you string in 30 Seconds? Do you think you can string more if I set the timer again? How come? How many more did you string when the timer ran for 1 minute? How come the numbers for the pegs and the beads were different, even though the time was the same?

Reflect:

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

Questions: What did you do? What did you find out about the objects you measured? If something is shorter than something else, can it at the same time be taller than something else? How come?

Math Observation Checklist:

This activity will give insight into the student's understanding of size, conservation, focused perception, systematic exploration, attending to more than one piece of information, attending to relevant information, and inhibition of impulsivity.



Supplies

Small sealed containers (small tupperware boxes or ziplock bags) filled with rice, beans, sand, rocks, and something light like feathers - 2 of each. Balancing scales.

The Activity

The student will explore the sealed containers by holding and comparing weights. They will pair up the ones that weigh the same, and contrast the ones that are light and heavy, by holding them. Next, the student will use the scale to determine which ones are heavier than others.

Variations

- The student can make their own weights by for instance putting 1 scoop of rice in one ziplock bag, 2 scoops in the next and 3 in the third. They can then weigh them and order them by heavy and light, or heavy, in between, and light.
- With 2 containers of the same size, student fills up one with feathers and one with something heavy like rocks. They will then determine which one is heavy and which is light. Discuss with student how come, even though they are the same size, one is heavy and one is light.

Focus:

Encourage the child 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 child to accomplish the goal.

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

Act:

The student will explore and weigh the containers.

Questions: How do these two containers feel? Which one is heavy? How can you tell? Can you find one that feels the same as this? How are these containers different? Can you line them up with the lightest on this side and the heaviest on that side?

Reflect:

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

Questions: What did you do? What did you find out about the containers? What was the easiest way to weigh them.

Math Observation Checklist:

This activity will give insight into the student's understanding of weight, quantity, ordering, conservation, focused perception, systematic exploration, attending to more than one piece of information, attending to relevant information, inhibition of impulsivity.

Supplies

Small objects that can be weighed and can serve as measuring units of weight, such as washers, bolts, popsicle sticks or pennies. Balancing scales.

The Activity

The student will take two items and estimate which one is the heaviest. They then weigh the objects on the scales and records the result on a sheet of paper with the headings Heavy and Light. Recording can take place by drawing a picture in the correct column, or writing down the name of the object.

Variations

- The student can make their own units of weight with, for instance washers. They then select an object to be weighed and puts washers on the other side of the scale until the scale balances. They then record, for instance “my eraser weighs 3 washers”.
- The student will estimate the weight first and then check the estimate by weighing the object.

Focus:

Encourage the child 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 child to accomplish the goal.

Questions: What is the plan? What do you need to do first? Next? What do you think we can do with these containers.

Act:

The student will explore and weigh the objects using the units of measurement.

Questions: Which one do you think is heavier? How can you find out? How many washers do you think this eraser weighs? How many popsicle sticks? Does this eraser weigh more washers or popsicle sticks? Can you tell which object is the heaviest by looking at your list?

Reflect:

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

Questions: What did you do? What did you find out about the objects? What was the easiest way to weigh them? Were your results the same when you weighed with popsicle sticks or washers? What was the difference?

Math Observation Checklist:

This activity will give insight into the student’s understanding of weight, quantity, ordering, conservation, focused perception, systematic exploration, attending to more than one piece of information, attending to relevant information, inhibition of impulsivity.



HEAVY	LIGHT

Supplies

Sheet of 1" grid paper; small counters such as beans, buttons, beads, or counting cubes; number card with products (i.e. numbers that are answers to multiplication questions, for instance 20, which is 2×10 , or 4×5); graph paper and markers.

The Activity

The student will choose a number card and lay out that number of counters in equal rows and columns. For instance 18 could be laid out in 3 columns of 6, or 2 columns of 9. The student will record the multiplication sentences: $3 \times 6 = 18$ and $2 \times 9 = 18$. Then the instructor rotates the mat so that the reverse shows, namely 6 columns of 3 or 9 columns of 2. The student will record the new multiplication sentences, while relating them to the old ones.

Variations

- Have the student roll a number die two times. The 2 numbers represent the multiplication sentence, and the student will lay out the array for those numbers.

Focus:

Encourage the student to focus they 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 pick a product number, lay out the arrays for that number, and record the math sentences.

Questions: How many rows/groups are in your array? How many are in each group? How could we say $5 + 5 + 5 + 5 + 5$ a little shorter? What do you think multiplication is? Trick question! Is 3×5 more or less than 5×3 ?

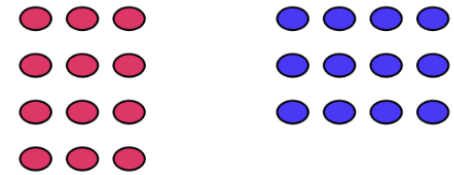
Reflect:

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

Questions: What did you do? What happened when you had 3 groups of 5 and we rotated the mat? What is easier to say, the addition sentence for the groups or the multiplication sentence?

Math Observation Checklist:

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



$$3 + 3 + 3 + 3 = 12$$

$$4 + 4 + 4 = 12$$

4 groups of 3 are 12

3 groups of 4 are 12

$$4 \times 3 = 12$$

$$3 \times 4 = 12$$

Supplies

Sheet of 1" grid paper; multiplication chart; Base 10 blocks (cubes and rods); tens-and-ones chart (see example on the right); number cards or number dice to create the numbers to be multiplied; markers.

The Activity

The student will multiply double-digit numbers by a single digit number, without regrouping. Ask the student to write down the multiplication problem vertically. Explain that multiplication always starts with the ones column and then the tens column. For instance 14×2 . Ask the student to lay out the array for 2 groups of 4 with the ones-cubes in the ones-column. Next they will lay out the array for the tens with the tens-rods and decide what the product of 14 and 2 is.

Variations

- Use three-digit numbers to be multiplied by a one-digit number. In this case the 100 flats are also needed, as well as a hundreds-tens-ones chart (see example on the right of the tens-and-ones chart, and add a column for the hundreds).

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 pick a double digit number, write down the math problem vertically, and lay out the arrays for the ones and the tens for each number to be multiplied, Then they will record the math problem with the product.

Questions: What number needs to be multiplied first? Why do you think that is so? How can you check if you got the right number?

Reflect:

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

Questions: What did you do? When you multiplied 14 and 2 what was the product? How could you tell? What did you need to do after you had laid out all the blocks and rods?

Math Observation Checklist:

This activity will give insight into the student's ability to understand that multiplication is repeated addition, knowledge of multiplication tables, procedure for single digit multiplication, systematic exploration, attend to more than one piece of information, and attend to relevant information.

$$14 \times 2 = \begin{matrix} 2 \times 4 \\ 2 \times 10 \end{matrix}$$

Tens	Ones

$$\begin{array}{r} 14 \\ \times 2 \\ \hline 8 \end{array}$$

Tens	Ones

$$\begin{array}{r} 14 \\ \times 2 \\ \hline 28 \end{array}$$

Supplies

Sheet of 1" grid paper; multiplication chart; tile counters in different colors; markers; pencils

The Activity

The student will build arrays of numbers by laying out rows and columns of tiles and determine the number sentences for each row. You will introduce the term "factor". For instance, in $3 \times 4 = 12$, the factors are 3 and 4. Show that the 3 and the 4 can be flipped around (commuted) and the answer will still be 12. Choose a times-table, for instance 3 or 4, and ask the student to lay out the complete table. Note: Multiplication tables are learned in different formats, namely: 1×3 , 2×3 , 3×3 , 4×3 , and so on; OR 3×1 , 3×2 , 3×3 , 3×4 , and so on. Check with the student how he/she is learning the tables in school and use that format.

Variations

- Do this exercise with "doubles" such as 2×2 , 3×3 and so on. Point out the "square" formation of the tiles laid out, and ask the student to plot the patterns on multiplication chart. (The pattern of the squared pairs will form a diagonal on the chart.)

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 pick a times-table, lay out the arrays for that number, and record the math sentences.

Questions: How many rows are in your array? How many are in each row? When looking at your array, how can you tell which product will be higher, without counting? What makes you say that? How does adding one row change the total? If you know that $3 \times 4 = 12$, what can you tell me about 4×3 ? How can you show that in the array you just made? (Rotate the array.) Tell me what the factors are for the rows you just put down.

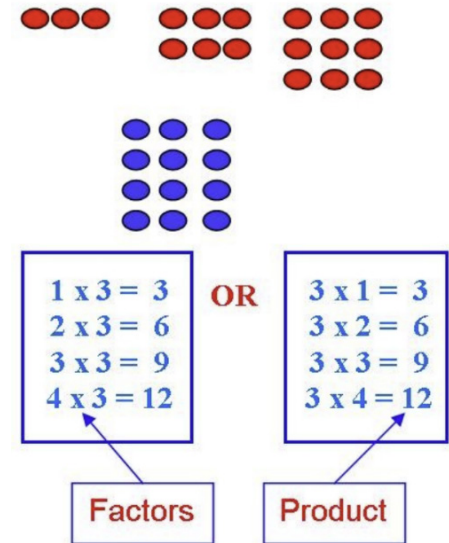
Reflect:

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

Questions: What did you do? What happened when you had 3 rows of 5 and then added a row? When you had $3 \times 4 = 12$, what are the 3 and 4 called? The 12?

Math Observation Checklist:

This activity will give insight into the student's understanding of multiplication, knowledge of multiplication tables, systematic exploration, attending to more than one piece of information, and attending to relevant information.



Supplies

Sheet of 1" grid paper; multiplication chart; tile counters in different colors;

The Activity

The student will build arrays of numbers by laying out rows and columns of tiles. Explain “rows” and “columns” to the student. The number of rows will increase by one for each array, for instance, one row of 3 tiles, then next to it, 2 rows of 3 tiles, then 3 rows of 3 tiles, and so on. Then the student will determine the number sentences for each row.

Note: Multiplication tables are learned in different formats, namely: 1×3 , 2×3 , 3×3 , 4×3 , and so on; OR 3×1 , 3×2 , 3×3 , 3×4 , and soon. Check with the student how they is learning the tables in school and use that format.

Variations

- Do this exercise with different numbers and ask the student to plot the patterns on multiplication chart.

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 pick a product number, lay out the arrays for that number, and record the math sentences.

Questions: How many rows are in your array? How many are in each row? When looking at your array, how can you tell which product will be higher, without counting? What makes you say that? How does adding one row change the total? If you know that $3 \times 4 = 12$, what can you tell me about 4×3 ? How can you show that in the array you just made? (Rotate the array.)

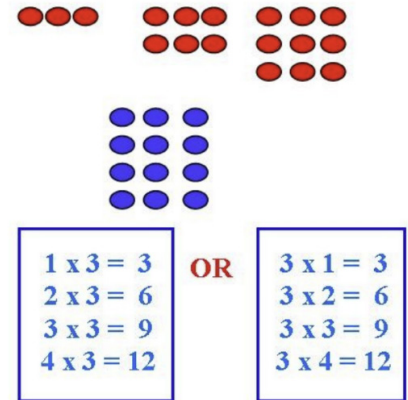
Reflect:

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

Questions: What did you do? What did you find out about the objects you measured? If something is shorter than something else, can it at the same time be taller than something else? How come?

Math Observation Checklist:

This activity will give insight into the student’s understanding of multiplication, knowledge of multiplication tables, systematic exploration, attending to more than one piece of information, and attending to relevant information.



Supplies

Sheet of 1" grid paper; multiplication chart; Base 10 blocks (cubes, rods, flats, blocks); tens-and-ones chart; number cards or number dice to create the numbers to be multiplied; markers.

The Activity

The student will multiply double-digit numbers by a double-digit number, with regrouping. Ask the student to write down the multiplication problem vertically. Explain that multiplication always starts with the ones column and then the tens column. Discuss for each problem which number is in the ones column and which one is in the tens column. When multiplying with the number in the tens column, it is necessary to "scoot over" by placing a 0 in the ones column.

Use the base 10 blocks to lay out the arrays for the numbers to be multiplied

Variations

- Use three-digit numbers to be multiplied by a two-digit number. In this case a hundreds-tens-ones chart is also needed.

Focus:

Encourage the student to focus they 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 pick a double digit number, write down the math problem vertically, and lay out the arrays for the ones and the tens for each number to be multiplied, Then they will record the math problem with the product.

Questions: What number needs to be multiplied first? Why do you think that is so? How can you check if you got the right number?

Reflect:

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

Questions: What did you do? When you multiplied 7 and 2 what was the product? How could you tell? Why did you need to "scoot " and write a 0 in the ones place when you multiplied with the tens number?

Math Observation Checklist:

This activity will give insight into the student's ability to understand that multiplication is repeated addition, knowledge of multiplication tables, procedure for multiple digit multiplication, systematic exploration, attend to more than one piece of information, and attend to relevant information.

$$47 \times 32 = ?$$

1. Multiply by the 2 (the Ones-number)

$$\begin{array}{r} 1 \\ 47 \quad 2 \times 7 = 14, \text{ write the 4, carry the 1} \\ \times 32 \quad 2 \times 4 = 8 \text{ plus } 1 = 9 \\ \hline 94 \end{array}$$

2. Multiply by the 3 (the Tens-number)

"scoot over" and write a 0

Cross out the old carried numbers

$$\begin{array}{r} 2 \quad \text{Scoot: write a 0 in the ones place} \\ 47 \quad 3 \times 7 = 21, \text{ write the 1, carry the 2} \\ \times 32 \quad 3 \times 4 = 12 \text{ plus } 2 = 14 \\ \hline 94 \\ 1410 \quad \text{Add } 94 + 1410 = \\ \hline 1504 \end{array}$$

$$47 \times 32 = 1504$$

Supplies

Sheet of 1" grid paper; multiplication chart; Base 10 blocks (cubes and rods); tens-and-ones chart (see example on the right); number cards or number dice to create the numbers to be multiplied; markers.

The Activity

The student will multiply double-digit numbers by a single digit number, with regrouping. Ask the student to write down the multiplication problem vertically. Explain that multiplication always starts with the ones column and then the tens column. For instance 14×3 . Ask the student to lay out the array for 3 groups of 4 with the ones-cubes in the ones-column. Next they will lay out the array for the tens with the tens-rods and decide what the product of 14 and 3 is. Because $3 \times 4 = 12$, the student will have to make a ten with the cubes and carry it to the tens column. Make sure the student adds the one ten after the multiplication has taken place (i.e. 3×10 plus the extra, carried 10)

Variations

- Use three-digit numbers to be multiplied by a one-digit number. In this case the 100-flats are also needed, as well as a hundreds-tens-ones chart (see example on the right of the tens-and-ones chart, and add a column for the hundreds).

Focus:

Encourage the student to focus they 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 pick a double digit number, write down the math problem vertically, and lay out the arrays for the ones and the tens for each number to be multiplied, Then they will record the math problem with the product.

Questions: The student will pick a double digit number, write down the math problem vertically, and lay out the arrays for the ones and the tens for each number to be multiplied, Then they will record the math problem with the product.

Reflect:

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

Questions: What did you do? When you multiplied 14 and 2 what was the product? How could you tell? What did you need to do after you had laid out all the blocks and rods?

Math Observation Checklist:

This activity will give insight into the student's ability to understand that multiplication is repeated addition, knowledge of multiplication tables, procedure for single digit multiplication, systematic exploration, attend to more than one piece of information, and attend to relevant information.

$14 \times 3 = 3 \times 4$
 3×10

Tens	Ones

$$\begin{array}{r} 1 \\ 14 \\ \times 3 \\ \hline 2 \end{array}$$

Tens	Ones

$$\begin{array}{r} 1 \\ 14 \\ \times 3 \\ \hline 42 \end{array} \rightarrow 3 \times 1 + 1$$

Supplies

Vertical number line, graph paper, bunny, carrot, two other small objects.

The Activity

The student will use the vertical number line to count how many “hops” it takes the bunny to get to the carrot. It is important to make sure the student starts counting from the next number. That is, the first hop is counted, not the number where the bunny is standing. Explain that when the bunny goes up, the number gets larger and you are adding the number of hops to the number the bunny started from. When the bunny goes down, the number gets smaller and you are subtracting.

Variations

- The student can say and/or write the math sentence.
- Show a card with a math sentence and have student figure out where the bunny and the carrot should go.
- Use another bunny and put the carrot in between the bunnies. Have the student figure out which bunny is closer to the carrot.

Focus:

Encourage the child 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 child to accomplish the goal.

Questions: What is the plan? Do you want to “be” the bunny or the carrot? Where shall we put the bunny? The carrot?

Act:

Student counts how many hops it takes to get to the carrot and figures out the math sentence.

Questions: How will you count the hops? When the bunny is standing on the number, is that a hop you need to count? How come? What happens to the number when you go up? Down?

Reflect:

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

Questions: What did you do? What did you like best about this? How did you know where to start counting? What was the biggest number of hops your bunny did?

Math Observation Checklist:

This activity will give insight into the student’s understanding of order of numbers, intuitive number line, understanding of addition, understanding of subtraction, position, orientation in space, attending to more than one piece of information, attending to relevant information.



10
9
8
7
6
5
4
3
2
1
0

Supplies

Groups of similar objects but different sizes [small, medium, large], for instance, toys, blocks, or teddy bear counters.

The Activity

The student will make a three item pattern going from small to large or large to small. Ask the student to name the objects and indicate them as small, smaller, or smallest; first, second, or third; or first, next, or last. Discuss the position of the item with the student; for instance, next to, between, or in the middle.

Variations

- Use interlocking cubes and ask the student to build a tower that is small, medium, and large with the cubes. Discuss the relative sizes with the student.

Focus:

Encourage the child 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 child to accomplish the goal.

Questions: What is the plan? What do you need to do first? Next? What do you think we can do with these containers.

Act:

The student will make sets with the differently sized objects and talk about the relative sizes.

Questions: Which one comes first in this pattern? If I call this large block in your pattern small, what can we call the one before it? What do we call block number 1 in this row? And block number 2? And 3?

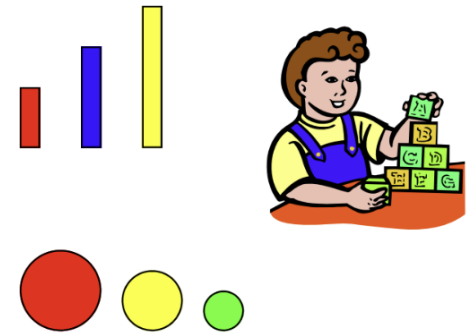
Reflect:

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

Questions: What did you do? What did you like best about this? What happened when we called the largest teddy bear “small”? How come?

Math Observation Checklist:

This activity will give insight into the student’s understanding of size, shape, quantity, ordering, sequencing, position, orientation in space, attending to more than one piece of information, and attending to relevant information.



Supplies

Groups of similar objects but different sizes (small, medium, large), textures (smooth to rough), color hues (light to dark), such as toys, teddy bear counters, paint chips, or shells.

The Activity

The student will make a three item pattern going from, for instance, smallest to largest, smoothest to roughest, lightest to darkest. Ask the student to name the objects and the characteristics, such as small, smaller, smallest, and their position such as first, next, last. Discuss the position of the item with the student, for instance, next to, between, or in the middle.

Variations

- Use two dimensions, for instance size and texture and sort from smallest smooth to largest rough.

Focus:

Encourage the child 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 child to accomplish the goal.

Questions: What do you need to do to focus on when we play this game? What is the plan? What will we do first? Next? And then? Can you tell me what this is? What does this feel like?

Act:

The student will make sets with the objects and talk about the different characteristics, such as size, texture, color and their order.

Questions: Which one comes first in this pattern? How are you ordering these shells? How do you decide where these objects go? What do we call block number 1 in this row? And block number 2? And 3?

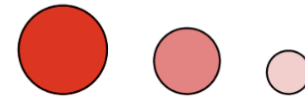
Reflect:

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

Questions: What did you do? What did you like best about this? Which was easiest to put in a set? How come? Which was most difficult? How come?

Math Observation Checklist:

This activity will give insight into the student's understanding of size, shape, quantity, categorizing, ordering, sequencing, position, orientation in space, attending to more than one piece of information, and attending to relevant information.



Supplies

Index cards, string, clips, clothes pins, markers, and push pins.

The Activity

The student will describe a day in school while the instructor marks each event on an index card. The student makes a picture of each event on the card and will hang them up on the string in the sequence in which the events occur, using the words such as, first, second, next, or after that.

Variations

- The student makes a time-line for the weekend events.
- The student thinks of a route the family drives regularly and marks/draws the main landmarks.

Focus:

Encourage the child 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 child to accomplish the goal.

Questions: What do you need to do to figure out what to put on the card? How do you do that? What do we need to do first? Next? What is our plan?

Act:

Student counts how many hops it takes to get to the carrot and figures out the math sentence.

Questions: What happens first? Does anything happen before that? Where shall we start with the card? Does the actual day start there? Do these things happen every day? Which ones are the same every day? Which ones are different? How?

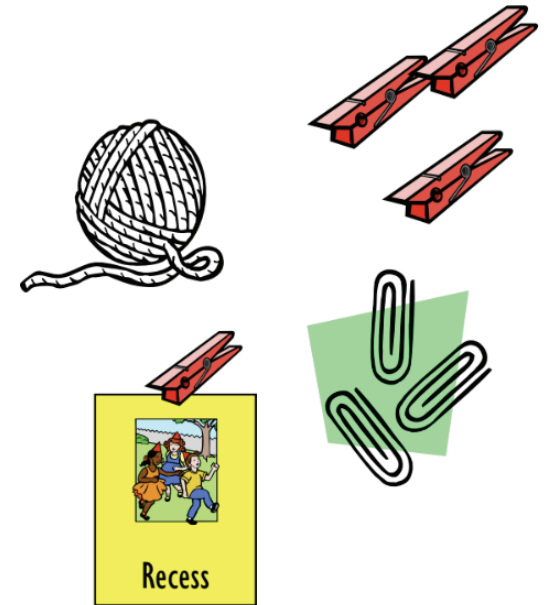
Reflect:

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

Questions: What did you do? What did you like best about this? How did you know where to put the cards?

Math Observation Checklist:

This activity will give insight into the student's understanding of ordering, sequencing, orientation in time, attending to more than one piece of information, and attending to relevant information.



Supplies

Construction paper, large pictures from magazines or calendar, glue sticks, markers, ruler, and a file folder.

The Activity

The student will make a puzzle from the picture by gluing it on a sheet of construction paper. Then they will draw a grid on the construction paper, marking the rows and columns. For instance row 1/column 1 in the first box of the grid. Afterwards, the student will construct the puzzle upside down by mixing up the puzzle pieces and then putting them in the right place by reading the column and row numbers on the back. The student puts the pieces in an opened file folder. When finished, the folder will be closed and turned over. If the pieces are put in the proper rows and columns, the picture will appear.

Variations

- Different size grids can be used, for instance 3 x 3, 4 x 4 or 5 x 5. The more pieces, the more complex the task becomes.

Focus:

Encourage the child 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 child to accomplish the goal.

Questions: What is the plan? What do you need to do first? How can you use the ruler to make the grid? If you draw two vertical lines, how many columns do you get?

Act:

The student makes the puzzle and puts it together.

Questions: How are you going to put the puzzle together? Will you start with the rows or the columns? Does it make a difference? What do you need to look at to find the right piece?

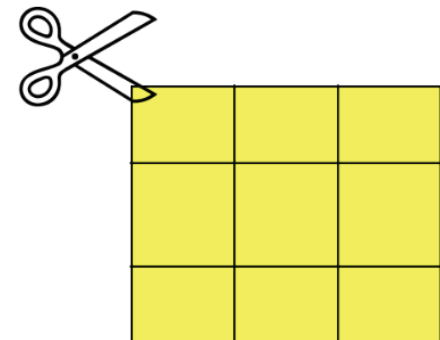
Reflect:

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

Questions: What did you do? What did you like best about this? How did you know where to put the puzzle pieces? What was your strategy to put it together?

Math Observation Checklist:

This activity will give insight into the student's understanding of ordering, sequencing, position, orientation in space, attending to more than one piece of information, and attending to relevant information.



Supplies

Two sets of geometric shapes made from colored poster board, tangrams consisting of no more than 5-6 pieces.

The Activity

The student will put together the shapes to make a pattern.

Variations

- Use small toys or counters instead of the shapes and have the student make a pattern or a shape with the objects. For instance, line up toy cars in a circle.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to choose the shapes and explain what the activity is. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What do we need to do first? Next?

Act:

The student makes patterns, for instance like the one shown.

Questions: What are you doing? What shape is this? What shape is the pattern you made? What pattern would you like to make? Which pattern is bigger? Which one is smaller? Smallest? Biggest?

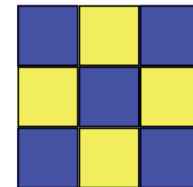
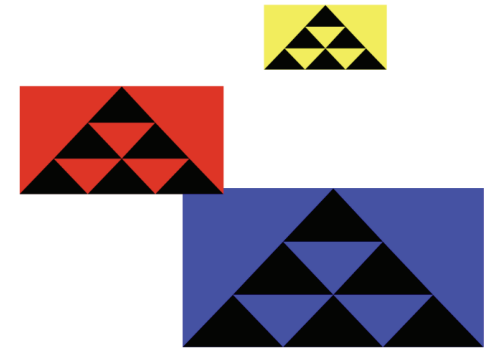
Reflect:

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

Questions: What did you do? What did you like best about this? How did you know where to put the puzzle pieces? What was your strategy to put it together?

Math Observation Checklist:

This activity will give insight into the student's understanding of ordering, sequencing, position, orientation in space, attending to more than one piece of information, and attending to relevant information.



Supplies

Groups of similar objects, such as toys, blocks, teddy bear counters, crayons, or buttons. It is best to use objects that have the same size, color, weight, or shape.

The Activity

The student will put together the objects to make an A-B A-B pattern, using color as the dimension for the pattern.

Variations

- Use another dimension to make the pattern, for instance size or shape.
- Make an A-B-C A-B-C pattern

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching, holding, and talking about them. Then explain what they will do. Introduce the word “Pattern”. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What would you like to use to make your pattern? What do we need to do first? Next?

Act:

The student makes patterns, for instance like the one shown.

Questions: What are you doing? What shape is this? What pattern are you making? What pattern would you like to make? Which pattern is bigger? Which one is smaller? Smallest? Biggest? If I make this pattern, what should I put next?

Reflect:

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

Questions: What did we do? How many pieces did you use to make this pattern? And that pattern? How did you find out? What was your favorite pattern?

Math Observation Checklist:

This activity will give insight into the student’s skills of counting, shapes, sequencing and planning, taking more than 2 pieces of information into account, and attending to relevant information.



Supplies

Groups of similar objects, at least 3 objects per group. For instance toys, blocks, teddy bear counters, crayons, buttons.

The Activity

The student will put together the objects to make an A-B-C A-B-C pattern, using color as the dimension for the pattern.

Variations

- Use another dimension to make the pattern, for instance size or shape.
- Use two different dimensions, such as color and shape.
- The student can draw the pattern with colored markers.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to choose the shapes and explain what the activity is. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What would you like to use to make your pattern? What do we need to do first? Next?

Act:

The student makes patterns, for instance like the one shown. Ask the student to look at the pattern for a short time and then remove it and ask them to recreate it.

Questions: What are you doing? What shape is this? What pattern are you making? What pattern would you like to make? Which pattern is bigger? Which one is smaller? Smallest? Biggest? If I make this pattern, what should I put next?

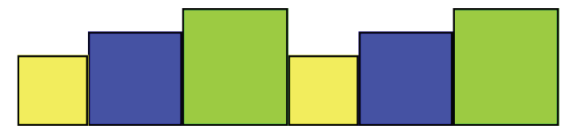
Reflect:

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

Questions: What did we do? How many pieces did you use to make this pattern? And that pattern? How did you find out? What was your favorite pattern?

Math Observation Checklist:

This activity will give insight into the student's skills of counting, shapes, sequencing and planning, taking more than 2 pieces of information into account, and attending to relevant information.



Supplies

Different size boxes, circle-, square, and triangle shapes, blocks, leaves.

The Activity

The student will compare small - smaller - smallest and form patterns.

Variations

- Walk around the room and identify things that are small, smaller and smallest and then identify big, bigger and biggest.
- Discuss that if compared to something bigger, an object may seem small. However, the same object may seem big if it is compared to something smaller.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching, holding, and talking about them. Then explain what they will do. Introduce the word “Pattern”. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What would you like to use to make your pattern? What do we need to do first? Next?

Act:

Ask the student to find the small objects and put them in a pile/set, then the smaller ones, and then the smallest ones. Encourage them to make a pattern starting with small, smaller, smallest. Repeat these steps with all the materials. When using the boxes, see if the student can find a box to put their small box in and then their smallest box.

Questions: What are you doing? Which one is smaller? Smallest? Biggest? How can you tell? If I say this one is small, which one is smaller? If it is big, which one is bigger? Biggest? If I make this pattern, what should I put next?

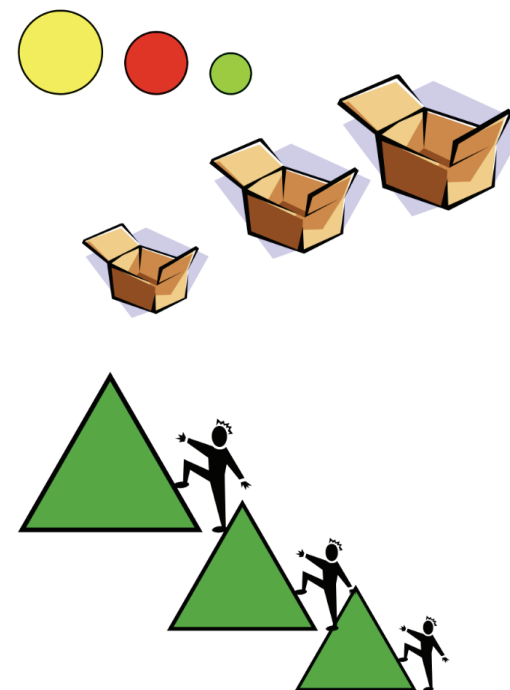
Reflect:

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

Questions: What did we do? How many pieces did you use to make this pattern? And that pattern? How did you find out?

Math Observation Checklist:

This activity will give insight into the student’s skills of counting, shapes, sequencing and planning, taking more than 2 pieces of information into account, and attending to relevant information.



Supplies

Small objects that can be glued, for instance macaroni, beans, beads, pop corn, or stickers.
Strips of paper or craft paper. Glue sticks.

The Activity

The student will create an A-B or A-B-C pattern with the objects and glue them on a strip of paper.

Variations

- The student can make paper chains with pre-cut paper strips in different colors or sizes.
- The student can create the pattern by lining up the objects or counters.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to choose the shapes and explain what the activity is. Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What do you need to do first? Next? And then?

Act:

Ask the student to create an A-B or A-B-C pattern. You can start a pattern first and ask the student to continue your pattern or to create one like yours.

Questions: How are you making your pattern? What comes next in this pattern? How could you tell? How are these two patterns the same? How are they different?

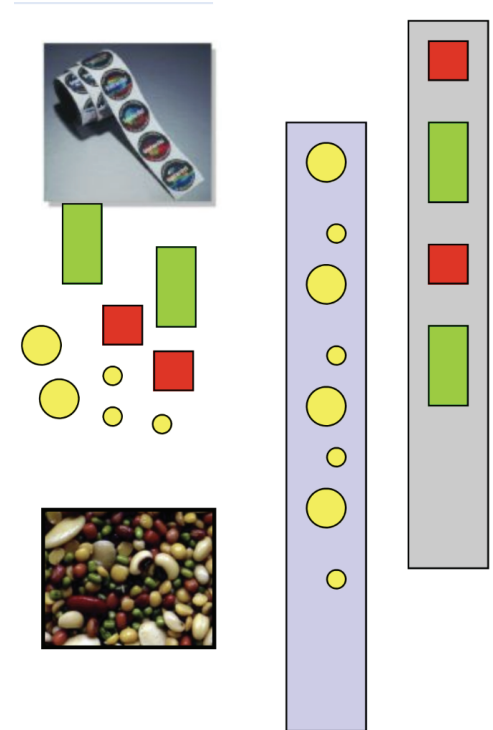
Reflect:

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

Questions: What did we do? How many pieces did you use to make this pattern? And that pattern? What was the pattern? How did you decide how to extend the pattern?

Math Observation Checklist:

This activity will give insight into the student's understanding of ordering, sequencing, position, orientation in space, attending to more than one piece of information, and attending to relevant information.



Supplies

Groups of similar objects, such as toys, blocks, teddy bear counters, crayons, or buttons. It is best to use objects that have the same size, color, weight, or shape.

The Activity

The student will put together the objects to make an A-B A-B pattern, using color as the dimension for the pattern.

Variations

- Use another dimension to make the pattern, for instance size or shape.
- Make an A-B-C A-B-C pattern

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching, holding, and talking about them. Then explain what they will do. Introduce the word “Pattern”. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What would you like to use to make your pattern? What do we need to do first? Next?

Act:

The student makes patterns, for instance like the one shown.

Questions: What are you doing? What shape is this? What pattern are you making? What pattern would you like to make? Which pattern is bigger? Which one is smaller? Smallest? Biggest? If I make this pattern, what should I put next?

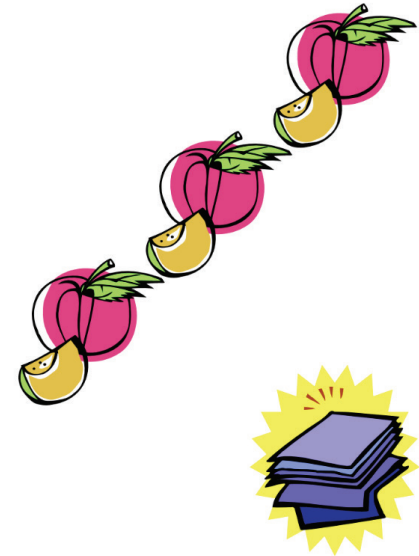
Reflect:

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

Questions: What did we do? How many pieces did you use to make this pattern? And that pattern? How did you find out? What was your favorite pattern?

Math Observation Checklist:

This activity will give insight into the student’s skills of counting, shapes, sequencing and planning, position, taking more than 2 pieces of information into account regarding spatial orientation, and attend to relevant information.



Supplies

Different shapes cut out of construction paper, for instance big and little circles, big and little squares, and big and little triangles. You can also make them in different colors. Attribute blocks, or building blocks. Paper and markers or coloring pencils.

The Activity

The student will create an A-B or A-B-C pattern with the shapes and then trace the shapes on paper.

Variations

- Instead of tracing, the student can draw the shapes in the pattern using coloring pencils or markers, and making sure the sizes are correct.

Focus:

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

Questions: What do you need to do to focus on what you are going to do? What is the plan? What do you need to do first? Next? And then?

Act:

Ask the student to create an A-B or A-B-C pattern. You can start a pattern first and ask the student to continue your pattern or to create one like yours.

Questions: How are you making your pattern? What comes next in this pattern? How could you tell? What shape is this? How are these two shapes different from each other?

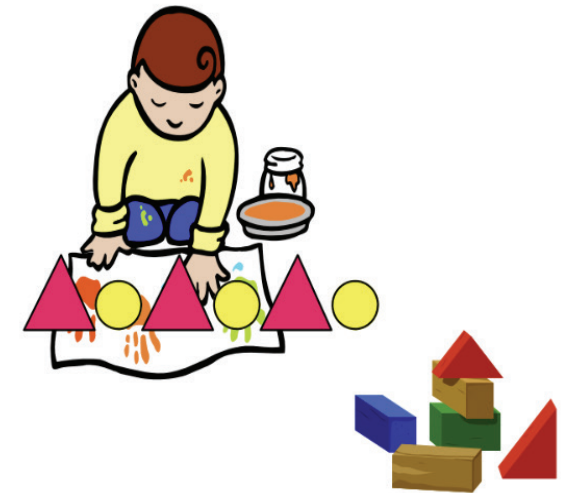
Reflect:

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

Questions: What did we do? How many shapes did you use to make this pattern? How is this pattern different from that one?

Math Observation Checklist:

This activity will give insight into the student's skills of counting, shapes, sequencing and planning, position, taking more than 2 pieces of information into account regarding spatial orientation, and attending to relevant information.



Supplies

Interlocking cubes.

The Activity

The student will create number patterns by adding a number of cubes to each new cube tower. For instance, start with a tower of 3 cubes and add 2. So the next tower will be 5, then 7 and so on. The instructor and student take turns and have to guess what the pattern is in each other's towers.

Variations

- Instead of interlocking cubes, colored inch-tiles can be used and laid out on 1 inch graph paper to form the pattern.
- The student can also draw the pattern on graph paper.

Focus:

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

Questions: What do you need to do to focus on what you are going to do? What is the plan? What do you need to do first? Next? And then?

Act:

Ask the student to create number pattern by choosing a number to start with and then choose the number of tiles that will be added each time.

Questions: How are you making your pattern? What pattern am I making? What is the number sentence when you start from this tower to the next?

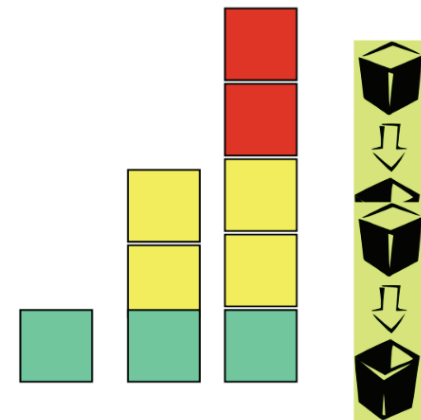
Reflect:

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

Questions: What did we do? How is this pattern different from that one? What was the pattern? How did you decide how to make the pattern?

Math Observation Checklist:

This activity will give insight into the student's skills of sequencing and planning, understanding addition, taking more than 2 pieces of information into account regarding spatial orientation, recognizing a problem, and attending to relevant information.



Supplies

10 x 10 addition chart (see picture of a 5 x 5 addition chart), coloring pencils.

The Activity

The student will create number patterns by adding a fixed number to a starting number. For instance start with 3 and add 2. So the next number will be 5, then 7 and so on. Next, a new number and a new addend are chosen. The student will color in the numbers on the 10 x 10 chart with different colored pencils and look at the patterns that are formed.

Variations

- Use pages of an old calendar and have the student draw a pattern on it; for instance, one square to the side and then two squares down. The student will determine what the number pattern is, for instance $+ 1 + 15 + 1 + 15$. The student colors in the squares for the pattern and then chooses another pattern

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 they will do. Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What do you need to do first? Next? And then? What number pattern would you like to make?

Act:

Ask the student to create number pattern by choosing a number to start with and then choose the number that will be added each time.

Questions: How are you making your pattern? What is the number sentence when you start from this number to the next?

Reflect:

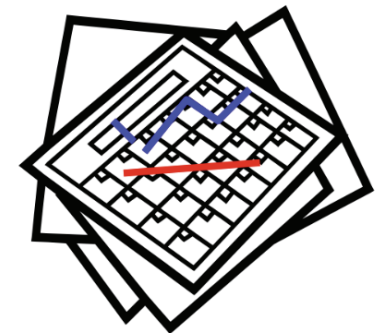
During and after the activity reflect on what the student is doing/has done.

Questions: What did we do? How is this pattern different from that one? What was the pattern? How did you decide how to make the pattern?

Math Observation Checklist:

This activity will give insight into the student's skills of sequencing and planning, taking more than 2 pieces of information into account, regarding spatial orientation, recognizing a problem, and attending to relevant information.

+	1	2	3	4	5
1					
2					
3					
4					
5					



Supplies

Interlocking cubes in 2 colors (about 20 of each color). Markers in the same color as the cubes and graph paper.

The Activity

The student will make a pattern with the interlocking cubes, for instance yellow-green, until all the cubes have been used. Then they break up the cube-tower into even sections and line these sections up underneath each other. The student will then draw the resulting pattern on graph paper and see if another pattern emerges.

Variations

- Use two different colored inch-tiles and line them up on 1" graph paper in a predetermined pattern, but only putting 4 or 5 in each row. Have the student analyze the 2-d pattern that emerges because of the change from a linear pattern to a block pattern.

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 they will do. Formulate a plan with the student.

Questions: What do you need to do to focus on what you are going to do? What is the plan? What do you need to do first? Next? And then? What pattern would you like to make?

Act:

Ask the student to create a color pattern and put together the interlocking cubes in a linear fashion. Next, the student breaks up the linear pattern and forms a block pattern and records the block pattern on graph paper.

Questions: How are you making your pattern? What happens when you break it up? Can you break it up differently? What does your block pattern look like now?

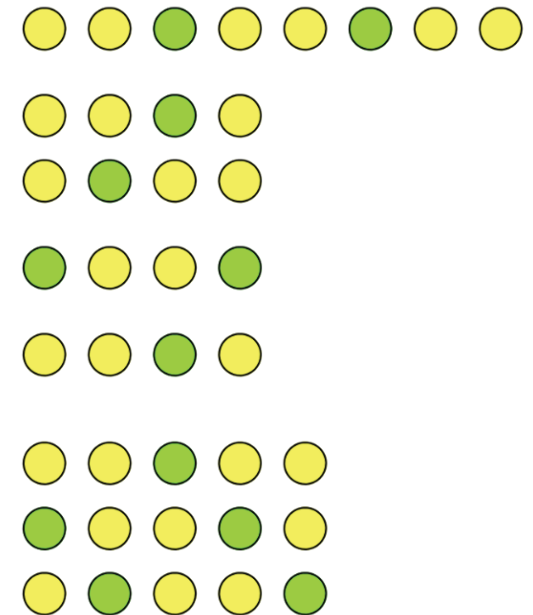
Reflect:

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

Questions: What did we do? How is this linear pattern different from the block pattern? How is it the same? What new pattern emerged?

Math Observation Checklist:

This activity will give insight into the student's skills of sequencing and planning, take more than 2 pieces of information into account, taking all information into account regarding spatial orientation, recognizing a problem, and attending to relevant information.



Supplies

Hundreds-Tens-Ones mat (a sheet of paper with 3 columns marked H-T-O), base-ten flats (representing the 100's), rods (representing the 10's), cubes (representing the ones), spinner, number cubes, or number cards, paper, markers
Note: You can make "base-ten flats," "rods," and "cubes" by cutting craft paper and dividing it into 10 equal columns or peices.

The Activity

In this activity, students will practice identifying the value of each digit in a three-digit number. They will learn that each digit holds different value depending on its placement within the number. For example, in the number 345, the 3 represents three hundreds, the 4 represents four tens, and the 5 represents five ones.

The student will generate numbers by rolling a number die or using a spinner. Then, they will place the corresponding base ten blocks in the appropriate places on the H-T-O-mat, write down the number in long and short form, and rearrange the numbers to form larger or smaller numbers.

Variations

- Create a stack of cards with different 3-digit numbers. Each card should have one of the numbers circled. Take turns drawing cards. The person with the highest value of the circled number wins both cards. If both cards have the same circled number, the higher number wins the card. The person with the most cards at the end wins the game.

Focus:

Encourage the child 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 child to accomplish the goal.

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

Act:

The student will make up three-digit numbers and determine the value of each number.

Questions: How come the 3 here means thirty and here it means 300 - it's the same 3? When you have a 3, a 4, and a 5 what is the biggest number you can make? The smallest? How come?

Reflect:

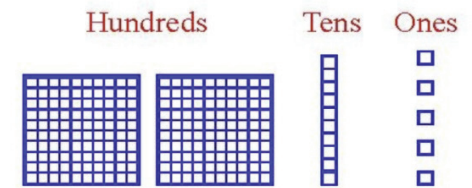
During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? What happened after 99? After 199? Which 5 was more, the one in the hundreds column or the one in the tens column? How come?

Math Observation Checklist:

This activity will give insight into the student's ability to understand whole numbers; place value; focused perception, correct orientation in space, attend to relevant information.

What is two hundred fifteen?



$$2 \text{ hundreds} + 1 \text{ ten} + 5 \text{ ones}$$

$$200 + 10 + 5 = 215$$

What is the value of the circled number?

4⑧7
⑤39
16②

Supplies

Thousands-Hundreds-Tens-Ones mat (paper with 4 columns labeled Th-H-T-O), base-ten blocks (thousands, hundreds, tens, ones), spinner, number cubes or cards, paper, markers. To create DIY base-ten blocks: cut a square of paper with 10 columns for flats, cut the columns into strips for rods, and then cut rods into 10 pieces for cubes. Tape 10 flats together in 2 rows of 5 for a thousands block.

The Activity

The student will determine the value of each digit in a four-digit number. Start by rolling a die or using a spinner to generate the number. Have the student place the base-ten blocks in the correct columns on the Th-H-T-O mat. Then, ask the student to write the number in long form (e.g., $2000+300+40+5$) and short form (2345). Next, have the student rearrange the digits to create a new number (e.g., 5342). Explain that digits are grouped in threes (hundreds, tens, ones) and that thousands are separated by a comma. For example, starting from the ones, count three digits and place a comma: 2,345. Emphasize that a 0 in a number acts as a placeholder, so 201 is read as two hundred one, not twenty-one, because the 0 indicates there are no tens.

Variations

- Create 5- or 6-digit numbers (e.g., 10-thousand, 100-thousand). Reinforce the concept of grouping digits in threes, separated by commas: ones, tens, hundreds, then thousands, ten-thousands, hundred-thousands.

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 make up four-digit numbers and determine the value of each number.

Questions: How come the 3 here means 30 and here it means 300—it's the same 3? When you have a 2, a 3, a 4, and a 5, what is the biggest number you can make? The smallest? How come?

Reflect:

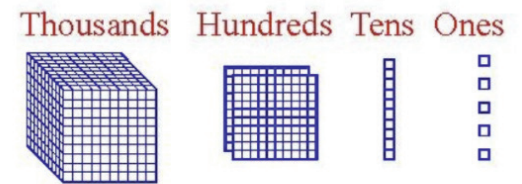
During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? What happened after 99? After 999? Which 5 was worth more, the one in the hundreds column or the one in the tens column? How come? What was the use of putting a comma in the number?

Math Observation Checklist:

This activity will give insight into the student's ability to understand whole numbers, place value, focused perception, correct orientation in space, and attention to relevant information.

What is one thousand two hundred fifteen?



$$1 \text{ Thousand} + 2 \text{ hundreds} \\ + 1 \text{ ten} + 5 \text{ ones} \\ 1000 + 200 + 10 + 5 = 1,215$$

What is the number and what is the value of the circled number?

3,4⑧7
7,⑤39
1,16②
⑥,981

Supplies

Sheet of craft paper or poster board divided into two columns and four rows. Small counters such as beans or buttons. Plastic lids.

The Activity

The student will make groups of 5 by filling up the rows in the right-hand column. When they reach 4 and there is no more room for the 5th counter, all 5 counters will be placed in a lid and the lid will be “carried” to the left-hand column. The student will then make the next group of 5, by counting: “1 lid plus 1, 1 lid plus 2,” until the next lid can be filled. When 4 lids are filled, the student will start counting backward by emptying out the lids and putting the counters back on the rows on the right side. Counting down goes: 2 lids and 4, 2 lids and 3, and so on.

Variations

- Use (play) pennies and nickels. Five pennies can be exchanged for one nickel. Counting will be: 1 nickel and 1 penny, 1 nickel and 2 pennies, and so on.

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 count out the counters and make groups of 5.

Questions: What do you need to do when you have 4 counters in the rows? Where does the 5th one go? When you have 2 lids and 4 counters, what comes next? When you count down by emptying the lids, where does the 1st bean go?

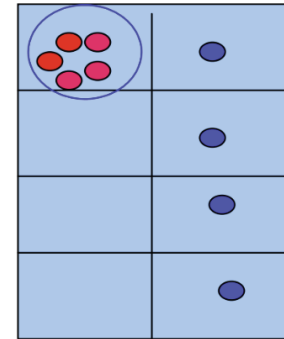
Reflect:

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

Questions: What did you do? Where did you start putting the beans when you were emptying out the lids?

Math Observation Checklist:

This activity will give insight into the student’s understanding of number order, ordinality, sequencing, position, conservation, attending to multiple pieces of information, and focusing on relevant details.



Supplies

Sheet of craft paper or poster board divided into two columns and nine rows with the numbers 1–9 written in the rows. Small counters such as beans or buttons. Plastic lids.

The Activity

The student will make groups of 10 by filling up the rows in the right-hand column. When they reach 9 and there is no more room for the 10th counter, all 10 counters will be placed in a lid and the lid will be “carried” to the left-hand column. The student will then make the next group of 10 by counting: “1 ten plus 1, 1 ten plus 2,” until the next lid can be filled. When 9 lids are filled, the student will start counting backward by emptying out the lids and putting the counters back on the rows on the right side. Counting down goes: 9 lids and 9, 9 lids and 8, and so on.

Variations

- Use interlocking cubes to make a group of 10. When 9 cubes have been placed in the right-hand column, the student will build a tower of 10 and carry it to the left-hand 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 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 count out the counters and make groups of 10.

Questions: What do you need to do when you have 9 counters in the rows? Where does the 10th one go? When you have 2 tens and 4 counters, what is that called? What comes after 1 ten and 9?

Reflect:

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

Questions: What did you do? Where did you start putting the beans when you were emptying out the lids? What happened after the right-hand column was full? What did you call the next number after the right-hand column was full?

Math Observation Checklist:

This activity will give insight into the student’s understanding of number order, transition to the next decade, ordinality, sequencing, position, conservation, attention to multiple pieces of information, and focus on relevant details.

	TENS	ONES
1		● 1
2		● 2
3		● 3
4		● 4
5		● 5
6		● 6
7		● 7
8		● 8
9		● 9



Supplies

Sheet of craft paper or poster board divided into two columns labeled "tens" and "ones." Small counters such as beans, macaroni, buttons, or small counting cubes. Plastic lids or small cups. Graph paper and markers.

The Activity

The student will estimate how many beans (or macaroni, buttons) are in a handful. They will then check the estimate by making groups of 10, counting out ten, and placing them in a cup. Each cup is then placed in the tens column. Both the estimate and the actual number are recorded and compared.

Variations

- Use interlocking cubes to make a group of 10. Have the student use both hands to take a handful to ensure they gather more than 10.
- Have the student calculate the difference between the estimated and actual number.

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 estimate the handful and then count out the counters by making groups of 10.

Questions: How do you guess how many you have? Do you know the difference between guessing and estimating? Once you have guessed a few times, will it be easier to estimate? How come?

Reflect:

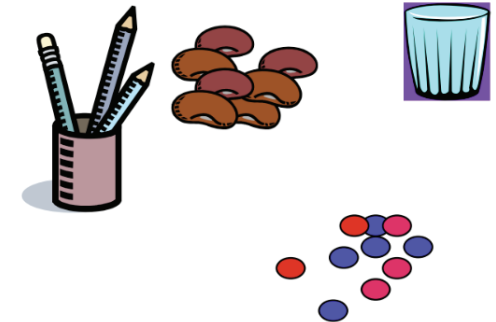
During and after the activity reflect on what the student is doing/has done.

Questions: What did you do? What was the largest handful you had? The smallest? How close were your estimates? Were your earlier or your later estimates closer to the actual number? How come?

Math Observation Checklist:

This activity will give insight into the student's understanding of number order, transition to the next decade, ordinality, attention to multiple pieces of information, and focus on relevant details.

TENS	ONES



Supplies

Sheet of craft paper or poster board divided into two columns labeled "tens" and "ones." Interlocking cubes, small counters, place value cards, plastic lids or small cups, graph paper, and markers.

The Activity

The student will "build" a number by making groups of 10 and ones with the interlocking cubes. The student then selects the place value card for the tens and the place value card for the ones and arranges them appropriately. See the example on the right side of this page.

Variations

- Have the student roll a number die twice. The first roll represents the tens, and the second roll represents the ones. Ask the student to choose the appropriate number value card.
- Have the student record the numbers on a sheet of paper.

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 pick a teen number or count out a handful of counters, making groups of 10, and then construct the number with the place value cards.

Questions: How many tens are in your number? How many ones? Which number cards do you need? Where do you need to put the ones card? If you put the ones card next to the tens card, do you get the right number?

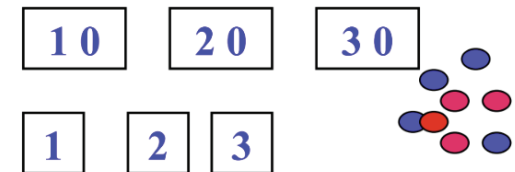
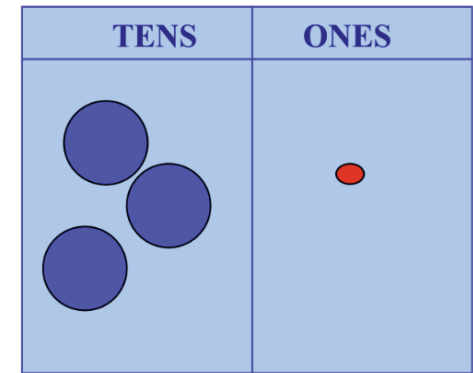
Reflect:

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

Questions: What did you do? What was the largest number you had? The smallest? What would be the highest number you can make with these cards?

Math Observation Checklist:

This activity will give insight into the student's understanding of number order, transition to the next decade, ordinality, attention to multiple pieces of information, and focus on relevant details.



Student puts the 2 on top of the 0 to make 32

Supplies

Sheet of craft paper or poster board divided into two columns labeled "tens" and "ones." Interlocking cubes or small counters to represent ones and larger counters to represent tens. Pennies and dimes can also be used to represent the ones and the tens. Graph paper and markers.

The Activity

Lay out two different numbers on the mat, for instance, 38 and 24 (that is, 3 tens and 8 ones, and 2 tens and 4 ones). The student will compute $38 + 24$ by adding the 8 and the 4, then regrouping the resulting 12 as 10 and 2. Each step of the process will be recorded.

Variations

- Have the student roll a number die twice. The first roll represents the tens, and the second roll represents the ones.
- Have the student record the number sentences vertically on a sheet of graph paper, ensuring the columns align properly.

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 pick two teen numbers, count out the counters for those numbers, and place them on the place value mat. Then they will add and regroup the resulting numbers.

Questions: How many tens are in your number? How many ones? Where do you always have to start when you add? What happens when the number in your ones column gets higher than 9?

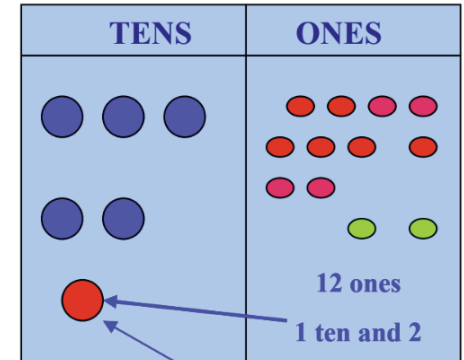
Reflect:

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

Questions: What did you do? What was the largest number you could have in your ones column? What happened when it got larger than 9?

Math Observation Checklist:

This activity will give insight into the student's understanding of number order, transition to the next decade, ordinality, attention to multiple pieces of information, and focus on relevant details.



$$\begin{array}{r}
 1 \leftarrow 12 \\
 38 \\
 + 24 \\
 \hline
 62
 \end{array}$$

Supplies

A variety of differently shaped objects such as balls, coins, square blocks, rectangular blocks, flat squares, triangles, rectangles, and circles. A cloth bag or a closed box with a hole cut in it for the student to put their hand in to retrieve an object.

The Activity

Show the different shapes to the student and discuss their names. If the student is unfamiliar with many shapes, start by naming only one or two, and repeat this activity another time to introduce more shapes. Next, "hide" the shapes in the bag or box, and have the student put their hand in. Ask the student to feel the shape and tell you which one it is. Then the student will pull out the shape and see if they guessed correctly.

Variations

- Instead of shapes, objects with different textures, such as hard, soft, or fuzzy, can be used to hide in the bag.
- Different sizes of the same shape can also be used, such as a large square and a small square. The student will describe both attributes when "guessing."

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 identify the shapes by feeling them in the bag or box and then pulling them out to check if they were right.

Questions: How many sides does a square have? A triangle? What can you tell me about the sides of this rectangle and the sides of this square? How many corners does the square have? The triangle? Does the circle have any corners?

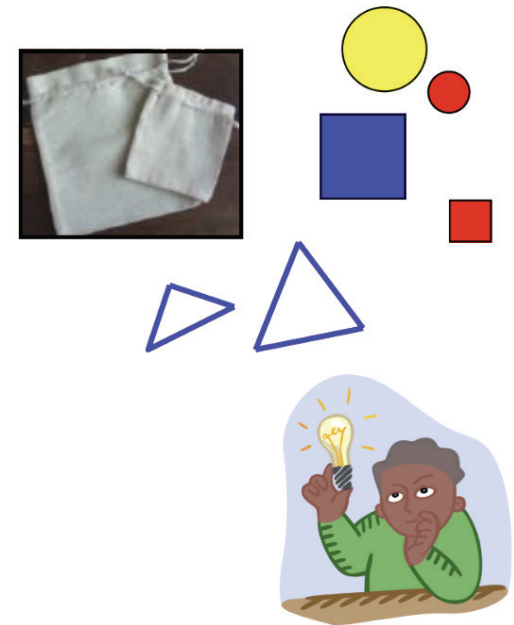
Reflect:

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

Questions: What did you do? How did you know what it was when you had your hand in the bag? What is easier, to use your eyes or your hands to tell what shape it is?

Math Observation Checklist:

This activity will give insight into the student's understanding of shape, size, focused perception, systematic exploration, attention to multiple pieces of information, attention to relevant information, and inhibition of impulsivity.



Supplies

Multicolored pieces of construction paper cut into different shapes, such as circles, squares, triangles, and rectangles. Stickers in these shapes may also be used. Whole sheets of construction paper and a glue stick are also needed.

The Activity

The student will create a collage of shapes by gluing them onto a sheet of construction paper, identifying each shape used. The paper can be divided into four areas, with each area decorated with a different shape.

Variations

- Instead of construction paper, the student can glue the shapes onto two-dimensional objects, such as a small cardboard box or a paper towel roll.
- After making the collage, ask the student to go around the room and identify objects that have the shapes they used for the collage.

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 make a collage using different shapes.

Questions: What shapes did you use for your collage? Where did you glue them? How many squares did you use? How many circles? Which shapes have curves? Which shapes have straight lines?

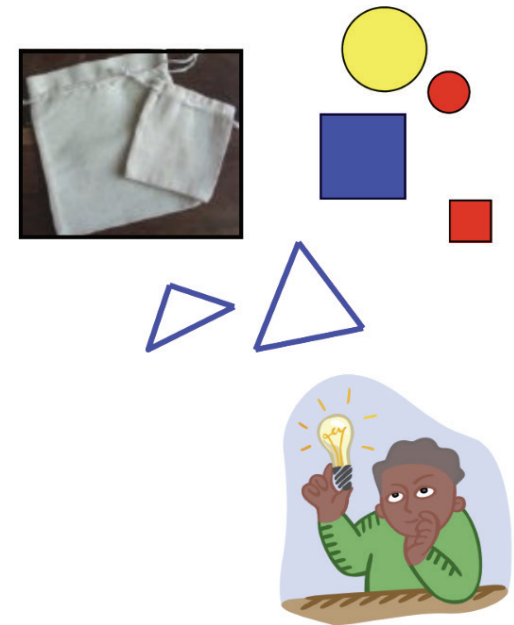
Reflect:

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

Questions: What did you do? How did you know what the shape was? Did all the shapes fit on your paper?

Math Observation Checklist:

This activity will give insight into the student's understanding of shape, size, focused perception, systematic exploration, attention to multiple pieces of information, attention to relevant information, and inhibition of impulsivity.



Supplies

Multicolored pieces of construction paper cut into different shapes, such as squares, diamonds, triangles, rectangles, and hexagons, or attribute blocks. Geoboard¹ and rubber bands.

The Activity

The student will pick a shape and construct it with rubber bands on the geoboard. Then they will record the number of sides and corners of each shape, noting the similarities and differences between the shapes.

Variations

- After constructing the shape, the student will draw it on a sheet of paper, trying to match the size as closely as possible to the one on the geoboard. The student can then cut out the shape and compare the sizes to see how close they are.

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 makes the shapes on the geoboard.

Questions: What shapes did you make? Can you describe a square? A triangle? Can you make a square in more than one way? A triangle? What is the difference between a square and a triangle? What is the same? What is the difference between a square and a diamond?

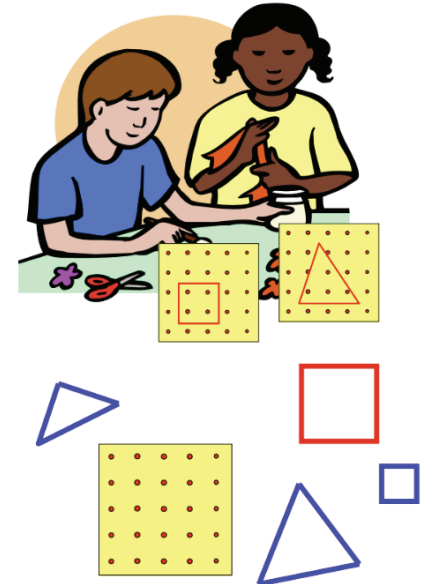
Reflect:

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

Questions: What did you do? How did you know what the shape was?

Math Observation Checklist:

This activity will give insight into the student's understanding of shape, size, focused perception, systematic exploration, attention to multiple pieces of information, attention to relevant information, and inhibition of impulsivity.



Footnote

¹ A geoboard is a square board with pegs that can be used to make various shapes by wrapping rubber bands or string around the pegs. See above picture.

Supplies

Three-dimensional geometric shapes such as a cone, cylinder, cube, pyramid, rectangular prism, and/or sphere. Paper, graph paper, and markers.

The Activity

The instructor and student will identify, name, and discuss the three-dimensional shapes. The student will then search the room for objects that resemble these shapes and create a graph of the objects found. The columns of the graph will be labeled with the names of the shapes, and the student will write the name of each object in the appropriate column.

Variations

- For shapes that are not found in the room, the instructor and student can discuss where they might be found and what those objects could be.

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 searches for the shapes and creates the bar graph.

Questions: What shapes did you find the most? The least? How does that show in your graph? What shape did you not find at all? Why do you think that is?

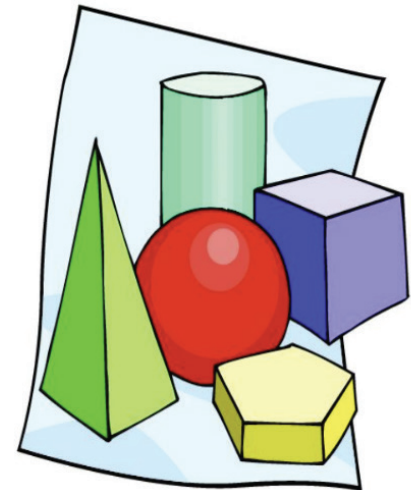
Reflect:

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

Questions: What did you do? When looking for the shapes, what did you need to focus on? Were the shapes exactly the same? How were they different?

Math Observation Checklist:

This activity will give insight into the student's understanding of shape, size, focused perception, systematic exploration, attention to multiple pieces of information, attention to relevant information, and inhibition of impulsivity.



Supplies

A small mirror, origami squares or 1-inch-square graph paper, and symmetrical pictures cut from magazines or catalogs.

The Activity

The student will draw symmetrical designs or pictures on the origami squares or graph paper, then fold the paper in half to ensure both halves are symmetrical. The student can also fold the paper into symmetrical designs and color them, using the center fold as the division line. A small mirror can be used to check for symmetry by holding it up against one half of the design.

Variations

- The student can look for symmetrical pictures in magazines, cut them out, and glue them on poster board.
- The instructor can prepare a picture cut in half and glued on a sheet of paper, and the student will draw the other side to complete the picture.

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 searches for the shapes and creates the bar graph.

Questions: What makes a design symmetrical? How can you use the mirror? Where do you need to hold it? Can you cut this picture in half any way you want to show symmetry?

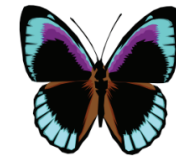
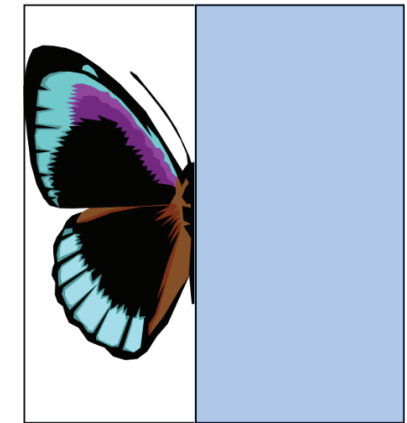
Reflect:

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

Questions: What did you do? How did the mirror show you that the picture was symmetric?

Math Observation Checklist:

This activity will give insight into the student's understanding of shape, size, focused perception, systematic exploration, attention to multiple pieces of information, attention to relevant information, and inhibition of impulsivity.



Supplies

A box containing various items such as pretend fruit and vegetables, household tools, transportation vehicles, little dolls, articles of clothing, and other small toys. Use something to hold the sorted categories, such as opened manila folders, paper plates, or boxes.

The Activity

The student will sort the objects according to a category that you both decide upon, such as "things we eat," "things we wear," "things we use in the kitchen," or "things we play with."

Variations

- Cut (or have the student cut) pictures of different items such as household appliances, tools, toys, or clothing from old catalogs or magazines. The student can then make collages by gluing different categories of pictures onto a sheet of colored craft paper.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that these items need to be sorted. Discuss what "to sort" means. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What does it do? What is it used for? Can you find something that would go with it?

Act:

The student sorts the items into different groups. While the student sorts, observe how they do it and ask them to explain their thinking.

Questions: How come you put this item in the group for that category? How do these go together? What if I put this one over here? Tell me what you are doing? Can you find all the things that belong together and put them in this box? How many are in here? Which group has the most?

Reflect:

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

Questions: How did you sort the different items? What were some of your favorite things to sort? What can you sort at home? What kinds of things does your mom/dad sort at home? Why do you think they do that?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Big and small shapes; big and little blocks; big and little figurines; boxes, paper plates, or string to delineate areas for grouping.

The Activity

The student will sort the items into groups, such as all big shapes, all little shapes, or all circles. Another grouping could be all squares, all yellow shapes, or all people. The student can then compare the different items within the groups.

Variations

- Put all items in one pile and ask the student to choose a dimension to sort by, such as size or color. Discuss the dimension and ask questions during the process.
- Have the student create a picture based on the dimensions chosen for sorting, such as big houses and small houses.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that the items need to be sorted and discuss how they can be sorted. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What does it do? What is it used for? Can you find something that would go with it?

Act:

The student sorts the items into different groups. Observe how they do it and ask them to explain what is happening.

Questions: Look, this one is big and this one is...? What is the name of this shape? What color is it? How many of these do we have? Good idea. What made you say/do that? Can you think of another way to sort these? How are these two items the same? Different?

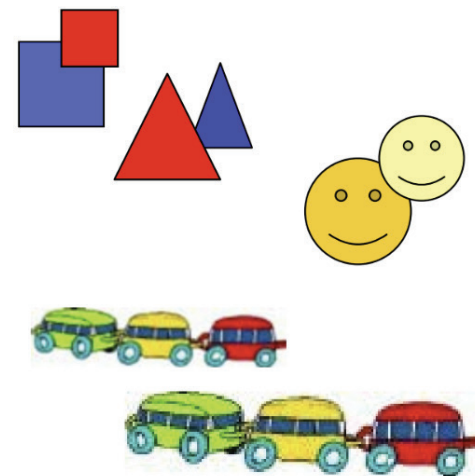
Reflect:

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

Questions: What did we do? How did you sort these objects? Remember when you first sorted them like this? What did you do afterward?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Counters, red and black checkers, blocks, shapes, buttons, or any other counters. Boxes, paper plates, or string to delineate areas for grouping.

The Activity

The student will sort the items into sets, such as number sets of 1, 2, or 3 bears; sets of blue, red, and yellow counters; or sets of shapes.

Variations

- Ask the student to draw a picture of the sets and explain them to you.
- Have the student play the role of the teacher and explain what kind of sets they want you to make. (Make some "mistakes" and have the student correct you.)

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that these items need to be sorted and discuss how they can form "sets." Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What could we do with these? What shall we do first? And then?

Act:

The student sorts the items into different groups. Observe how they sort and ask them to explain their thinking. If necessary, model the sorting first by suggesting a category for a set and demonstrating how to do it.

Questions: What kind of set are we making? Where does this one need to go? Can you think of another way to put these counters into sets? How are these sets the same? Different? How many are in this set?

Reflect:

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

Questions: What did we do? What did you learn today? How did you sort these objects? Remember when you first sorted them like this? What did you do afterward?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Pieces of cloth, pieces of colored paper in different colors or textures (such as paint chips or wallpaper samples), sheets of construction paper, glue.

The Activity

The student will sort the scraps into groups using different categories, such as texture, number, shape, or color. Then, they will create pictures by gluing each group onto a sheet of construction paper.

Variations

- Instead of scraps of cloth, have the student sort through magazine pictures and make groups, then glue the pictures onto sheets of construction paper. You can also divide a large poster board into four compartments and have the student glue pictures (or the cloth scraps) in the designated areas.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity and have the student choose the materials they want to use to make the collage. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? How could we sort these to make a collage of different groups? What shall we do first? And then?

Act:

The student sorts the items into different groups. Observe how they do it and ask them to explain what is happening.

Questions: What sort of texture is this (rough, smooth, bumpy, silky)? What kind of group are you making? How are these groups the same? Different? If we put these two groups together, will it be bigger or smaller? Where do we have the most? The least?

Reflect:

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

Questions: What did we do? What did you learn today? How did you sort these scraps? How were your pictures the same? How were they different?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Sorting mat or paper plates; assortment of small items that can be sorted, such as bottle caps, shells, counters, or buttons.

The Activity

The student will sort the items into groups, choosing a category such as texture, shape, or color.

Variations

- Instead of objects, have the student sort through magazine pictures and make groups. Then glue the pictures onto sheets of construction paper.
- You can also divide a large poster board into four compartments and have the student glue pictures in the designated areas.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity and have the student choose the materials they want to use. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? How could we sort these? What shall we do first? And then?

Act:

The student sorts the items into different groups. Observe how they do it and ask them to explain what is happening. Then have the student re-sort the items according to a different category. Discuss the switch with the student to ensure they understand what is happening.

Questions: What kind of group are you making? Where does this one need to go? Good idea. What made you say/do that? How are these groups the same? How are they different? Let's count how many are in this set.

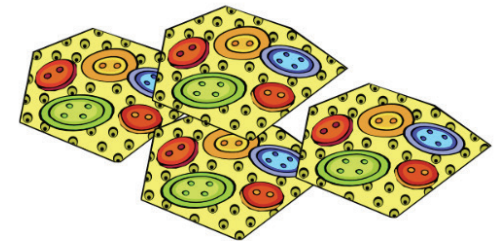
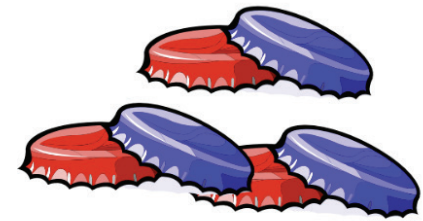
Reflect:

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

Questions: What did we do? What did you learn today? How did you sort these objects? What could you sort at home (toys, laundry, utensils)?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Assortment of small items that can be sorted, such as bottle caps, shells, counters, or buttons. Ensure you have enough items for several sorts, such as by size, color, texture, or utility. You will also need a sorting mat or paper plates.

The Activity

You and your student will work together. One of you will decide on a category and sort the items without revealing the category. The other will then try to figure out what the secret category is for sorting the objects.

Variations

- Make a record of the categories that were chosen and write down the items that ended up in each category. The student can then create a bar graph¹ of the numbers.
- Each of you can write down the categories you chose on a separate sheet and create bar graphs for each one, then compare the numbers.

Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the items and discuss what they are. Then explain the activity and have the student choose who will go first. Ensure the student understands the purpose of the game. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is?

Act:

The student and instructor take turns sorting items according to a secret category.

Questions: What kind of group am I making? Did you figure it out? Okay, where does this one need to go? Good idea. What made you say/do that? How many are in this group? How many more are in this group than in that one? Where do we have the most? The least?

Reflect:

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

Questions: How did you sort the different items? What did we do? What did you learn today? How did you sort the pictures?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, counting, adding, and graphing.



Supplies

Sorting mat or paper plates; assortment of small items that can be sorted, such as bottle caps, shells, counters, buttons, paper, coloring pencils, or markers.

The Activity

The student will sort the objects into groups based on a category such as texture, shape, or color, and then subdivide the groups into smaller groups. The student will then make a record of the groups and the number of objects in each group.

Variations

- Instead of objects, have the student sort through magazine pictures and make groups. Then, have the student glue the pictures onto sheets of construction paper. If using one sheet, make a dividing line in the middle or fold it in half. You can also divide a large poster board into compartments and have the student glue pictures in the areas, ensuring that the divisions of the groups are clear.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity and have the student choose the categories for sorting. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? How could we sort these? What shall we do first? And then?

Act:

The student sorts the items into different groups and then subdivides the groups into smaller groups. For example, if one group is buttons, this group could be subdivided into large and small buttons. Discuss the category for subdivision and ensure the student understands what is happening. Next, have the student make a record of the groups and note the numbers. If the student cannot write the words, you can do it, or they can draw a picture of the object.

Questions: What kind of group are you making? Where does this one need to go? How can we divide this group into smaller groups? How many are in this group? How many more are in this group than in that one?

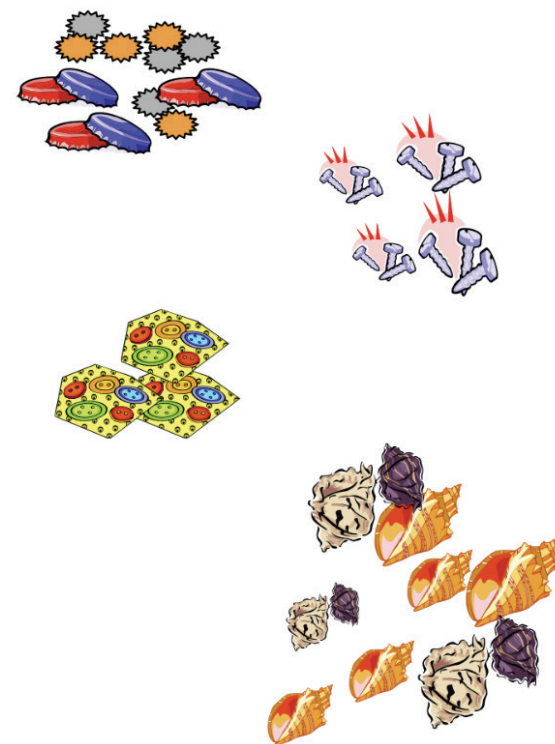
Reflect:

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

Questions: What did we do? What did you learn today? How did you sort these objects? What happened to the groups when you re-sorted the objects?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Pictures cut from magazines in several different categories (such as babies, cars, food, or animals), construction paper, glue, and markers.

The Activity

The student will select two categories, such as babies and cars, and find corresponding pictures. Next, they will find pictures that overlap the categories, like babies in cars or baby animals. The student will then glue the pictures onto construction paper and label the categories on top of the picture.

Variations

- On a sheet of construction paper, draw a Venn diagram¹, and together with the student, write in the two different categories and the overlapping category. Then have the student count and place the numbers in the diagram. This may be repeated by choosing other categories.

Footnote

¹ A Venn diagram is a graph that uses circles to represent relationships between groups of sets of items. They can be used to represent inclusion, exclusion, or intersection of the items within the sets..

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the pictures and discuss what they are. Then explain the activity and have the student choose the categories for sorting. Discuss the word "similar." Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? How could we sort these? Can you tell me why you made that choice? What shall we do first? And then?

Act:

The student sorts the pictures into categories. Observe how they do it and ask them to explain what is happening. Then, have them create the picture collage and write the category on top of the page. Next, have the student find pictures that contain both items and make a collage.

Questions: What kind of group are you making? Where does this one need to go? Good idea. What made you say/do that? How many are in this group? How many more are in this group than in that one? Where do we have the most? The least?

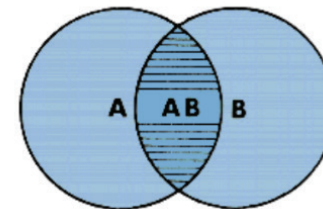
Reflect:

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

Questions: What did we do? What did you learn today? How did you sort the pictures?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, and counting.



Supplies

Assortment of small items that can be sorted, such as bottle caps, shells, counters, buttons, or teddy bear counters. Ensure you have enough items for several sorts, such as by size, color, texture, or use. You will also need a sorting mat or paper plates, graph paper, and colored pencils or markers.

The Activity

The student will sort the objects into groups, then perform a second sort of each group according to a different criterion. For example, sort the teddy bear counters by color, then further sort each color group by size, resulting in groups of large, medium, and small bears for each color.

Variations

- Make a record of the categories chosen and list the items in each category. The student can then create a bar graph of the numbers.

Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the items and discuss what they are. Then explain the activity and have the student choose how to divide the items. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is?

Act:

The student sorts and subdivides the groups.

Questions: What kind of group are you making? How did you decide how to sort? Where does this one need to go? Good idea. What made you say/do that? How many are in this group? How many more are in this group than in that one? Where do we have the most? The least?

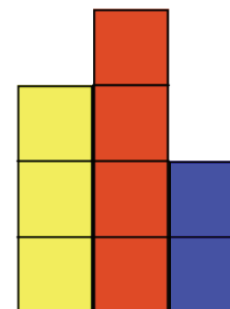
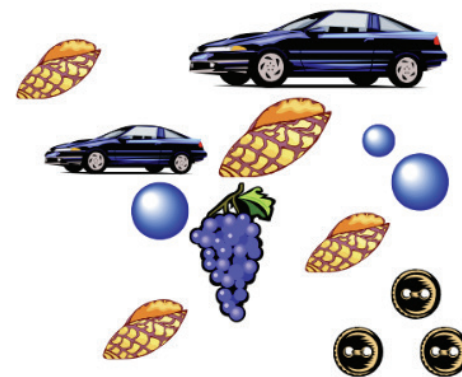
Reflect:

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

Questions: What did we do? What did you learn today? How did you sort the pictures?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, counting, adding, and graphing.



Supplies

Assortment of counters that can be sorted by color (such as cubes, teddy bears, or color chips—use only 2 or 3 colors), bowls or plates for sorting, graph paper, colored pencils or markers, and a sheet with charts for the different groups.

The Activity

The instructor divides the counters into 2 or 3 unequal groups. The student sorts each group by color, ensuring the groups remain separate. The student will then create bar graphs¹ for each group and compare the groups to determine which color occurred the most in each group or which group had the most counters. The student will create a chart to record these findings.

Variations

- Choose different objects, such as plastic animals, which the student can sort into categories (wild animals, zoo animals, domestic animals, etc.). Ask the student to identify overlapping groups (e.g., a zoo animal can also be a wild animal) and have them create a Venn diagram².

Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

² A Venn diagram is a graph that uses circles to represent relationships between groups of sets of items. They can be used to represent inclusion, exclusion, or intersection of the items within the sets.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the items and discuss what they are. Then explain the activity and have the student choose how to divide the items. Formulate a plan with the student.

Questions: What do we have here? What do you need to do first/next? What shall we use to do this?

Act:

The student sorts and subdivides the groups, then counts to create the graphs and charts.

Questions: Without counting, which color do you think we have the most of? The least of? Without counting, which group seems to have the most red counters? How can we check that?

Reflect:

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

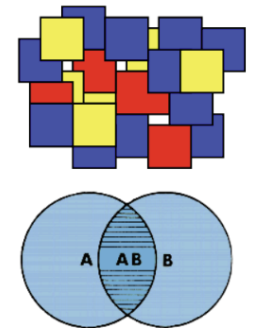
Questions: What did we do? What did you learn today? Look at the bar graph and the chart. Which one tells you how many counters there are? Which one is easier to read? What makes it easier/harder to read the graphs?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, counting, adding, and graphing.

Groups	Color found most often	How many?
<u>1</u>		
<u>2</u>		
<u>3</u>		

Group 1	How many?
red	
blue	
yellow	



Supplies

Groups of identical or similar objects, such as toys, blocks, teddy bears, counters, geometric shapes, or socks. (All objects are mixed together in one pile.)

The Activity

The student will create matching patterns of identical objects, such as sock—sock—sock or teddy—teddy—teddy.

Variations

- Have the student start an A-B pattern with similar objects and explain what the pattern is. For example, one doll, one bear, doll, bear... Even though there may be different dolls and bears, the pattern would still be A (doll) - B (bear).

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that they will line up identical objects and create a pattern. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What can we do with these pieces? Let's make a plan—what shall we do first? And then?

Act:

The student will take one of the objects and start lining up all the same items. When a different object is picked up, start a new line, until all the objects have been lined up into patterns of "same" objects.

Questions: What pattern are you starting with? How are all the things in this line alike? How many pieces are in this line? How did you know that? How can you find out? Look, this one is a big teddy bear, and this is a small one. How come you put them in the same line?

Reflect:

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

Questions: What did we do today? What did you do first? Next? Last? How did you know how to match the pieces? What did you like the best? Which line had the most? The least?

Math Observation Checklist:

This activity will give insight into the student's skills in size, shapes, quantity, sorting, counting, sequencing, position, systematic exploration, correct orientation in space, taking all the available information into account, and attending to relevant details.



Supplies

Pairs of objects that go together, such as (socks, shoes, comb), (hairbrush, toothbrush, empty toothpaste tube), or (baby doll and bottle). For the initial presentation, mix all the objects together into one pile.

The Activity

The student will create matching sets of objects.

Variations

- Walk through the room and discover things that go together (e.g., door and door knob, lock and key, whiteboard and eraser).

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that they will make sets with things that go together. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What can we do with these things? Let's make a plan—what shall we do first? And then?

Act:

The student will take one object from the pile and search for something that would go with it to form a set. After all the sets are sorted, break them up again and put one half in a box. Pull out one object at a time and ask the child what goes together with the object and why (same function, similar items). Discuss the words "pair" and "set."

Questions: What goes together with this? How are they alike? How are they different? How many sets do we have? How many objects do we have altogether?

Reflect:

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

Questions: What did we do today? What did you do first? Next? Last? How did you know how to make sets?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, matching, counting, sequencing, position, systematic exploration, correct orientation in space, taking all the available information into account, and attending to relevant details.



Supplies

Paper or plastic plates; plastic spoons, forks, and knives; napkins; paper cups; and some play food.

The Activity

The student will work on one-to-one correspondence by setting the table, matching each place setting to a person.

Variations

- Ask the student to serve soup in bowls and set the table again. Discuss why fewer utensils are needed. Compare the number of utensils required for different types of meals, such as meat and potatoes, sandwiches, or finger food.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that they will set the table. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What can we do with these things? Let's make a plan—what shall we do first? And then?

Act:

Ask the student to draw a picture of each person who will attend the “dinner party.” Then place the drawings on the table and ask the student to set the table with the utensils and plates.

Questions: How many place settings do we need? How many objects are in each place setting? How many things altogether? How did you know that? If we have this many people at our party, how many cookies do we need? Why? If one person does not want a cookie, how many cookies do we need?

Reflect:

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

Questions: What did we do today? What did you do first? Next? Last? How did you know how to set the table? How did you know how many plates you needed?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, matching, counting, ordinality, one-to-one correspondence, position, systematic exploration, correct orientation in space, and taking all available information into account.



Supplies

Poster board of different colors cut into puzzle pieces; front of a cereal box cut up as a puzzle; simple puzzles; floor puzzles.

The Activity

The student will assemble the puzzle by putting the pieces together.

Variations

- Have the student create a puzzle by making a drawing, then glue it onto poster board and cut it into different-sized pieces. The student will then reassemble the pieces to form the complete picture again.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What can we do with these pieces? Let's make a plan. What shall we do first? And then?

Act:

The student will put together the puzzle. Discuss the strategy to use, such as sorting out all the corner pieces first, then the side pieces, and finally assembling the outline of the puzzle.

Questions: What do you need to look for when you want to find a corner piece? A side piece? How can you tell which pieces fit together (e.g., color, shape)? How many corner pieces do we have? How many side pieces? Do we have more corner pieces or side pieces?

Reflect:

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

Questions: What did we do today? What did you do first? Next? Last? How did you know how to match the pieces? What did you like the best? What did you do when I asked you?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, sorting, shapes, position, systematic exploration, taking all the available information into account, and attending to relevant information.



Supplies

Several different puzzles with knobs, puzzles with pieces to be fitted in (such as numbers), and large floor puzzles.

The Activity

The student will take the puzzle pieces out and then put them back together.

Variations

- Take two puzzles and mix up all the pieces. Have the student determine where each piece belongs.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What can we do with these pieces? Let's make a plan. What shall we do first? And then?

Act:

The student will take the puzzle apart and decide on a strategy to put it back together, such as matching by the picture underneath or by the shape. Encourage the student to look first and try to determine where each piece goes, rather than relying on trial and error.

Questions: What do you need to look for to find out where this piece goes? How can you tell if it fits? How many pieces are in this puzzle? How did you know that? Which of these two puzzles has more pieces? How can we find out?

Reflect:

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

Questions: What did we do today? What did you do first? Next? Last? How did you know how to match the pieces?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, sorting, shapes, position, systematic exploration, taking all available information into account, and attending to relevant information.



Supplies

Objects to be matched (such as plastic utensils, toy cars and drivers, cups and plates), workmat or construction paper, string, and markers.

The Activity

The student will work on one-to-one correspondence by matching each item with another, describing how and why certain items go together.

Variations

- After matching and categorizing the items, ask the student to determine which category has more or fewer items. Have the student create a bar graph of the categories using markers and graph paper. Then, go around the room and have the student find things that match, asking which category those items would fit into.

Footnote

¹ A bar graph is a graphic means of comparing the amount of something by using rectangles with lengths proportional to the amount of the groups or categories being compared. The do2learn.com website has graph paper you may download for this exercise.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain that they will match objects that go together. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What can we do with these pieces? Let's make a plan. What shall we do first? And then?

Act:

Ask the student to lay out the objects and connect the ones that go together by drawing a line or by placing a piece of string between them. Then, have the student organize the items into categories (e.g., utensils, transportation, or toys).

Questions: How many groups of [category] do we have? How many things altogether? How did you know that? Why do these [items] go together? What if I put this [item] here—how would they go together now? Are there any items that did not match?

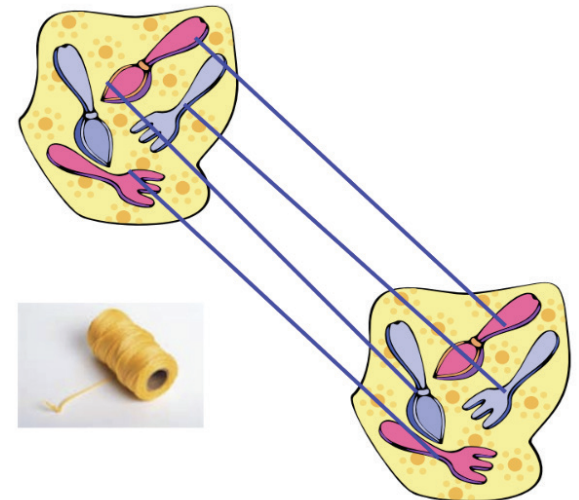
Reflect:

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

Questions: What did we do today? What did you do first? Next? Last? How did you know which items to match?

Math Observation Checklist:

This activity will give insight into the student's skills in sorting, categorizing, matching, counting, ordinality, one-to-one correspondence, systematic exploration, correct orientation in space, taking all available information into account, and attending to relevant details.



Sorting-Categorizing

Page: 101

Supplies

Small paper plates, cookies, M&M candies, crackers, raisins, or play food. Ensure to check with the caregiver if the student is allowed to eat candy.

The Activity

The student will count out candies (or cookies) and determine which plates have more, less, or the same amount of candies, cookies, or food.

Variations

- Use animal-themed paper plates and counters. Ask the student to pretend the counters are food for the animals and feed the animals. If the animal is a large one, ask the student to feed it more than the small ones.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is?

Act:

The student will count the candies on each plate and determine which one has more or less. Invite the student to add more candies to a plate and observe what happens.

Questions: Which plate has more candies than this one? Can you see a plate with one candy? Two candies? More candies? Which plate has fewer candies? How many are on these two plates altogether? Which one has the most? How did you know that? How can you find out?

Reflect:

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

Questions: What did you do to make more candies on a plate? Fewer candies? What happened when you added candies? When you took some away?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, quantity, cardinality, conservation, systematic exploration, taking more than two pieces of information into account, and attending to relevant information.



Sorting-Same/Different

Page: 102

Supplies

Workmat with two areas and small items such as beans, counters, shells, buttons, and bottle caps.

The Activity

The instructor and the student will work as a pair, matching the items on each side of the work mat. The items matched do not need to be identical but should match in quantity.

Variations

- Instead of a work mat, use bowls. The student and instructor take turns dropping a small item into a bowl while counting. After dropping a few items, ask the student how many are in each bowl. Then count to check if they were right.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What do we need to do first? Next?

Act:

When the student and instructor take turns lining up and matching the counters.

Questions: How many counters do you have? How many do I have? Does anyone have more? Less? How did you know that? How can you find out? How can you make your side have more than mine? What did you just do?

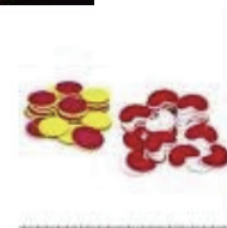
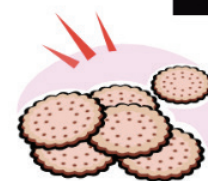
Reflect:

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

Questions: What did you do to make more? Less? What happened when you added counters? When you took some away?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, quantity, cardinality, conservation, systematic exploration, taking more than two pieces of information into account, and attending to relevant information.



Supplies

Counters with different colors on each side, bottle caps, numeral cards or number dice, 1-inch graph paper or graph mats, and a cup or bowl.

The Activity

The student will roll the number die or select a number card and place that number of objects in a cup or bowl. They will then empty the bowl and place each counter in one of the columns on the graph mat based on its color or which side came up. Ask the student to identify which column has more, less, or the same.

Variations

- Instead of using a work mat, use 1-inch graph paper and have the student record the numbers by making bar graphs with colored markers.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity. Formulate a plan with the student.

Questions: what do we have here? Can you tell me what this is? What do we need to do first? Next?

Act:

The student mixes up the items in a cup or bowl and empties it. They count how many fell one way (e.g., upside down) and place those items in one column of the graph mat. The remaining items are placed in the other column, ensuring they line up. Repeat this process several times.

Questions: How many counters landed upside down? Upside up? Which side has more? Less? How did you know that? How can you find out?

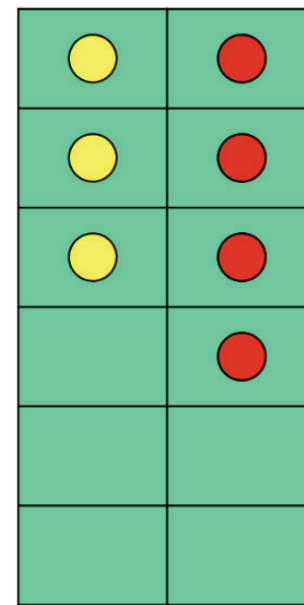
Reflect:

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

Questions: What did you do to make the graph? What happened when you emptied the cup again?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, quantity, cardinality, conservation, sequencing and planning, systematic exploration, taking more than two pieces of information into account, and attending to relevant information.



Supplies

Counters, bottle caps, popsicle sticks, markers, construction paper, and work mats.

The Activity

The instructor and student will work together, each laying out a set, such as a set of bottle caps and a set of popsicle sticks on a large sheet of construction paper. The student will then match the sets by drawing lines between one object in one set and one in the other.

Variations

- Use small objects for counters and have the student draw two handfuls. Ask the student to estimate which handful has more and check the estimate by counting or lining up the objects with a one-to-one correspondence.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to get acquainted with the objects by touching and discussing what they are. Then explain the activity. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What do we need to do first? Next?

Act:

The student and instructor create sets, and the student determines which set has more, less, or the same amount.

Questions: How many counters are in your set? How many in mine? Which set has more? Less? How do you know that? How can you find out?

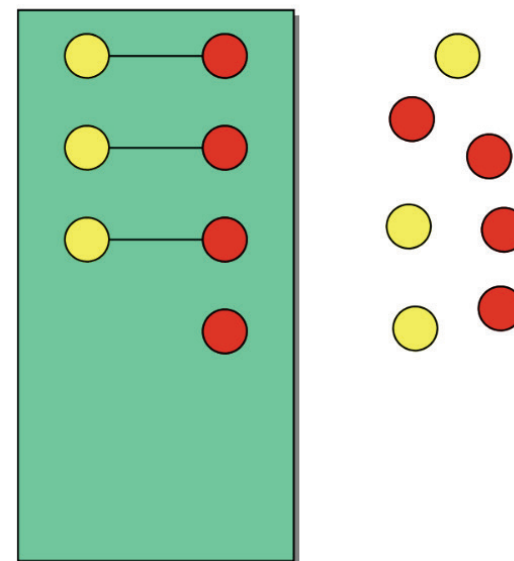
Reflect:

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

Questions: How did you know which set had more? How could you tell if there were the same number in each set? Different?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, quantity, one-to-one correspondence, cardinality, conservation, sequencing and planning, systematic exploration, taking more than two pieces of information into account, and attending to relevant information.



Supplies

Pictures cut from old catalogs or magazines, construction paper, markers, scissors, and glue sticks.

The Activity

The student will find pictures that go together, such as cars and garages, and glue them onto construction paper. The student will connect each pair by drawing a line between the two pictures. They will choose several categories and create different pictures, then compare the pictures to determine which has more, less, and what is the same.

Variations

- Use small toys instead of pictures and line up the ones that go together. Discuss why they go together and how they are the same or different. Help the student understand that a set can be the same because of the number of items and different because of the kind, color, or shape of the items.

Focus:

Encourage the student to focus their attention on the task at hand. Allow the student to choose the pictures and explain the activity. Formulate a plan with the student.

Questions: What do we have here? Can you tell me what this is? What would go together with this to make a pair? What do we need to do first? Next?

Act:

The student glues the pictures, connects the pairs, and determines which has more, less, or the same.

Questions: How many pairs are in this picture? How many in that one? Which one has more? Less? How do you know that? Show me something that is the same. How can you find out?

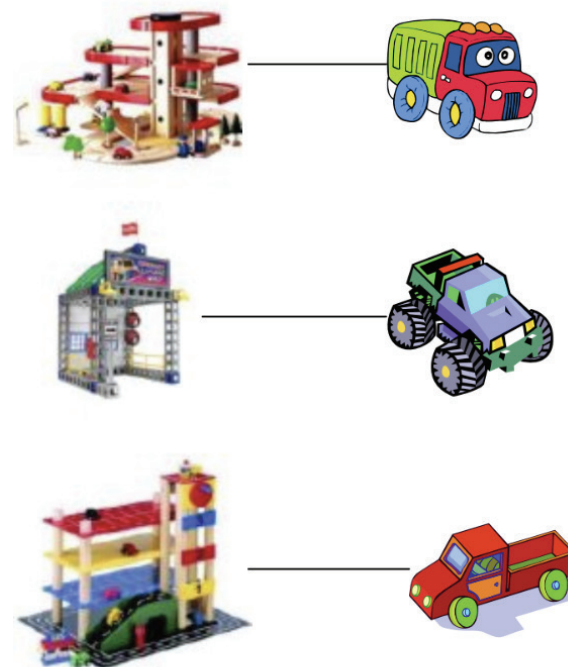
Reflect:

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

Questions: How did you know which picture had more? How could you tell if there were the same number in each set? Different?

Math Observation Checklist:

This activity will give insight into the student's skills in counting, quantity, one-to-one correspondence, cardinality, conservation, sequencing and planning, systematic exploration, taking more than two pieces of information into account, and attending to relevant information.



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?

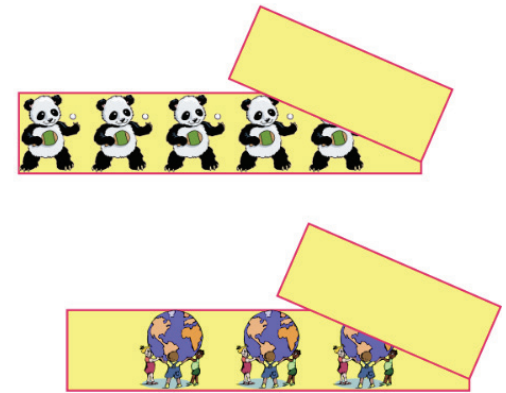
Reflect:

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?

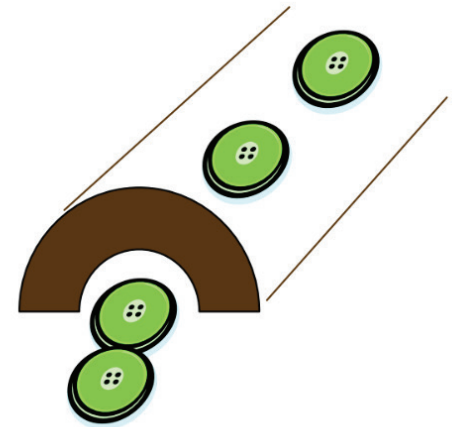
Reflect:

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

Page: 108

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?

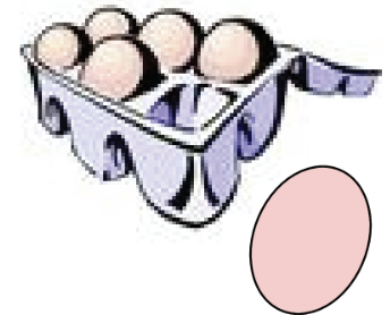
Reflect:

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?

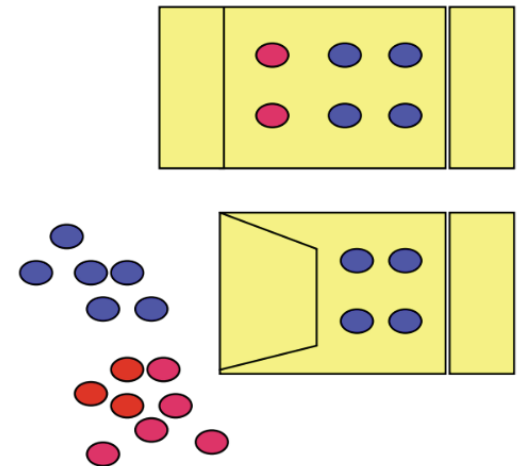
Reflect:

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.



$6 - 2 = 4$	$6 - 4 = 2$
$4 + 2 = 6$	$2 + 4 = 6$

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?

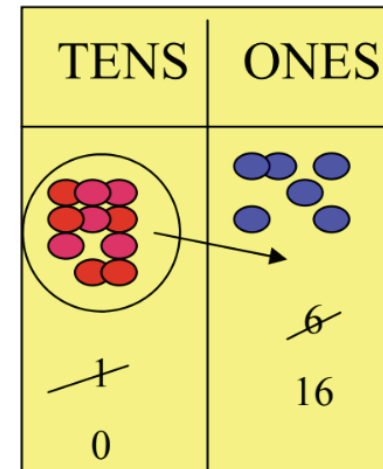
Reflect:

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:

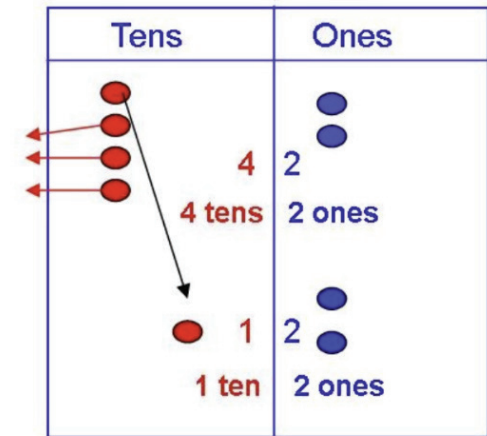
During and after the activity, reflect on what the student is doing/has done.

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.

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



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.

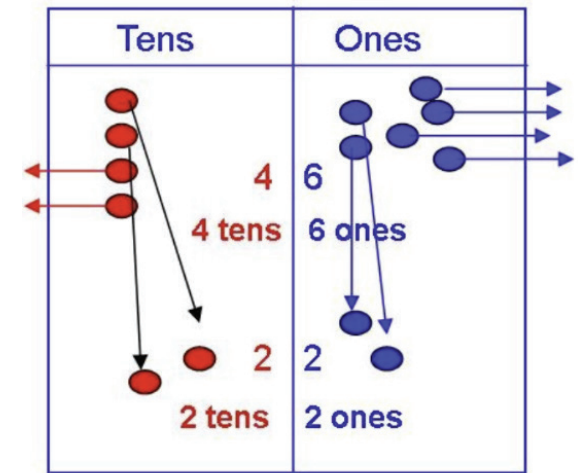
Questions: What did you do? What happened when you subtracted 3 red counters from 4 red counters? How many tens are in 46? How many ones?

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"?

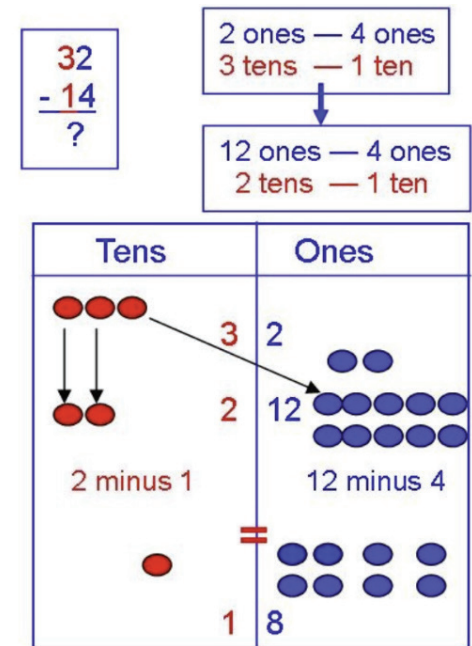
Reflect:

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 (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?

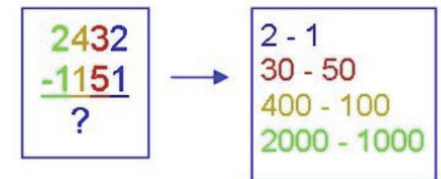
Reflect:

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.

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

END ← START