



Pride Academy

MONTESSORI CURRICULUM BOOK

SENSORIAL



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MONTESSORI LESSONS

Addition

Age

- ❖ 4 - 5 years

Materials

- ❖ 3 boxes with sets of small cards, including 9 units, 9 tens, 9 hundreds and 3 thousands.
- ❖ 1 box with a set of large cards from 1 to 9000.
- ❖ An ample quantity of loose unit beads, ten-bars, hundred squares and thousand cubes.
- ❖ 3 trays and 3 little bowls for the loose beads.
- ❖ 1 larger tray with one extra bowl.

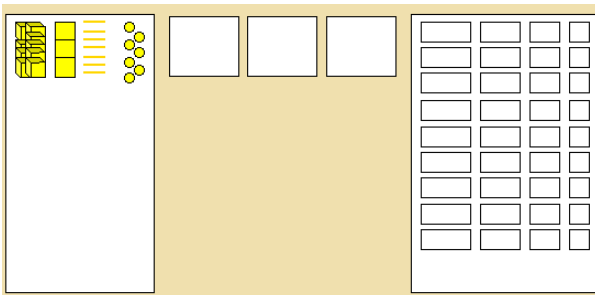
Notes

- ❖ When you give the cards or have the children read the numbers always start with the units.

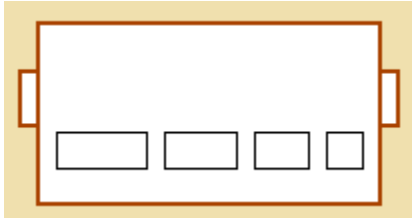
Static Addition

Presentation

1. Invite a minimum of three children to come and work with you. Have them unroll three large mats and have them bring the materials.
2. Have one child lay out the large cards as explained in Introduction to Symbols.
3. Have another child lay out the beads for the "supply mat".
4. Have the children place three small mats between the two large mats.
5. Have the children set up their set of small cards as with the large cards but only having 1000-3000.



6. On the third large mat, have the children place three trays.
7. Ask the three children to take their trays to the small mats.
8. Tell the first child to get the cards for: 2 units, 3 tens, 2 hundreds, and 3 thousand. Have the children place each card at the bottom of their tray. See diagram:



9. Have the second child take the cards for: 2 units, 1 ten, 3 hundreds, and 2 thousands.
10. Have the third child take the cards for: 1 units, 2 tens, 5 hundreds, and 3 thousands.
11. Have the children bring their trays back to the large empty mat and have the children sit on the opposite side as the directress.
12. Review with each child how many units, tens, hundreds, and thousands are on his cards before sending them one by one to the Supply Mat to get the appropriate beads on their trays.
13. Once each child has returned, check what each child got by having him count his beads: units, tens, hundreds, thousands.
14. Once the first child has checked, have him super-impose his cards (as shown in the Formation of Numbers).
15. Have the child read with you that this child has 2 units, 3 tens, 2, hundreds, and 3 thousand. Then say, "So he has 3232 beads."
16. Repeat after each child has verified his beads.
17. Tell the children that you are going to get something very special. Bring back a large scarf and place it on the directress tray.
18. Tell the children that we are going to see how many beads we all have if we put them together.
19. Ask each child, one by one, to gently place their beads anywhere on the tray.
20. Say, "Wow, we have a lot of beads." To reinforce this idea, lift the scarf by the four corners to show that it is heavy.
21. Tell the children that we are now going to count how many beads we have altogether.
22. Ask the first child to take out all of the units and to place it in the directress' dish.
23. Have each child take out the tens, hundreds, and thousands and place them to the side of the directress tray.
24. Remove the cloth.
25. Have the first child count the units and then go to the large mat to get the appropriate number card. Have him place the card below the unit dish.
26. Have the second child count the tens. Have him get the appropriate number card from the large mat and place it below the ten-bar pile.
27. Repeat for the hundreds and thousands.
28. Have a child superimpose the cards together.

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29. Tell the children that when we put all of the beads together we had (as you point have the children say with you): "7 units, 9 tens, 7 hundreds, 6 thousands."
30. Then say, "So altogether we have: six thousand, seven hundred, and ninety-seven beads."
31. As you tell the children, collect their small cards, keeping them superimposed and place them in the top right corner of the mat. "So we put 3232, and 2312, and 1253 all together and when we did this we got (move 6797 below the small cards) 6797."
32. "And you have just done addition!"
33. Do several examples of Static Addition before moving on to Dynamic Addition

Dynamic Addition

Presentation

- ❖ The presentation begins exactly as in Static Addition but have the children take cards for a problem where they will have to carry over. These numbers could be: 3323, 2456, 1345.
- ❖ Repeat all the steps through 23 as above but there is no need for the scarf this time.
- ❖ When the first child counts the units and reaches 10, point this out and have him exchange ten units for a ten-bar. Have him count the rest of the units and then go get the card for that amount. (4)
- ❖ Repeat for the tens, hundreds, and thousands, changing when needed.
- ❖ Finish the exercise as for Static Addition.

Exercise

- ❖ Children who are secure in both Static and Dynamic Addition can work without the teacher.

Adapted from: <http://www.infomontessori.com/mathematics/decimal-system-addition.htm>



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MONTESSORI LESSONS

Cards and Counters

Age

4 years - After work with the Spindle Boxes

Materials

- ❖ A series of cards with numbers from 1 to 10
- ❖ A box with 55 counters

Presentation

Introduction

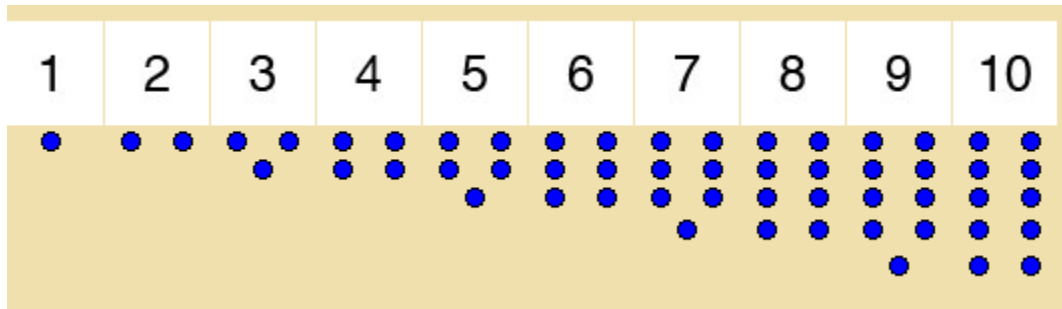
1. Invite a child to come work with you. Bring him over to the shelf and have him bring the material to the table.
2. Open the box and place it on the lid.
3. Show the different cards to the child and have him say the numbers out loud.
4. Lay the cards on the table in front of the child.
5. Have the child put the card written 1 to the left side of the table.
6. Explain that you will need a little space between the cards.
7. Ask the child to put the other cards to the right of the first card in numerical order.
8. Tell the child that you are going to put the number of counters each card asks for under the corresponding card.
9. Point to card 1 and ask the child how many counters should you place under this card.
10. The child should answer 1.
11. Take one counter out of the box and gently slide it (using your right index finger) under the card written 1.
12. Have the child count the counter.
13. Repeat for card 2 by placing the counters next to each other.
14. Repeat for card 3 but place the last counter under and to the middle of the two counters.
(See diagram below)



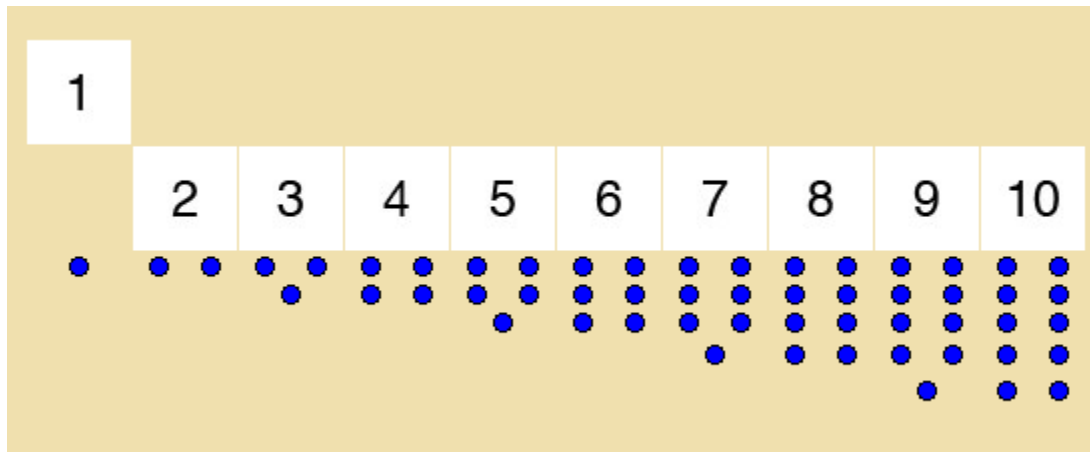
15. Repeat until the child seems to understand.
16. Have the child place the rest of the counters in a similar way as you have shown. Direct the child on how many counters and where he will place them through questions.
17. Repeat until all of the counters have been placed.



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18. Tell the child that you are going to see if you can run your fingers through the counters.
19. Place your right index finger above the first counter (under card 1) and try to run it down the table through the counter.
20. Stop before touching the counter and tell the child that you cannot divide it. Move card 1 a little above where it was.



21. Repeat for counters 2 and after you have run your finger through the two counters, tell the child that you can divide it.
22. Repeat for 3 and after, move the card a little higher to the level of card 1.
23. Have the child repeat for the others. You or the child move the cards up for those numbers where you can't run your fingers through.
24. Once the child is finished, look at all of the cards that are slightly higher than the others (cards 1, 3, 5, 7, 9) and tell the child that these numbers are odd.
25. Point to the other cards (cards 2, 4, 6, 8) and tell the child that these numbers are even.
26. Do a Three Period Lesson for odd and even.

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-cards-and-counters.htm>



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MONTESSORI LESSONS

Changing

Age

- ❖ 4 1/2 years

Materials

- ❖ Supply box
- ❖ A mat

Presentation

1. Invite the child to come and work with you.
2. Have him unroll a mat and have him bring the supply box over to it.
3. Have the child set out the material on the mat as in the Supply Mat.
4. Have the child count out the units and place them in a vertical line.
5. When he gets to ten units, show him how it looks just like the ten-bar.
6. Have the child continue in this manner, each time noticing the look alike to the ten-bar.
7. Continue until there are no more units. Look at the remaining units that cannot be formed into a ten-bar and ask the child if there are enough units to create a ten-bar. Ask the child why this is so.
8. Have him count how many ten-bars he had made by using the units.
9. Have him then count the ten-bars and place them side by side.
10. When he has counted ten ten-bars, notice how it looks just like the hundred square.
11. Repeat until all of the ten-bars have been used. If there are some ten-bars left over, ask the child if there are enough to make a hundred square. Discuss why with the child.
12. Have the child count how many hundred squares he made by using the ten-bars.
13. Then have the child count the hundred squares by stacking them on top of each other.
14. When the child reaches 10 hundreds, discuss how this looks like the thousand cube.
15. Repeat until there are no more hundred squares. If there are any leftover that cannot be made into a thousand cube discuss why with the child.
16. Have the child count how many thousand cubes he made using the hundred squares.
17. Go back and count how many units, tens, and hundreds were left over.
18. Then put the material away.



MONTESSORI LESSONS

Concept of Zero

Age

- ❖ 4 years onwards (after work with the spindle boxes)

Materials

- ❖ none

Presentation

- ❖ Invite a small group of children to come and play this game.
- ❖ Ask one child, "Jump 5 times."
- ❖ Have the group whisper 8, eight times.
- ❖ Have another child do another action a certain amount of time.
- ❖ Ask a child to do something zero times.
- ❖ "Why didn't you do anything?"
- ❖ Discuss the concept of zero.
- ❖ As the children carry out the activity, encourage them to count out the number as they are doing the action.
- ❖ Give each child a chance to carry out an activity as well as a chance to do so something zero times

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-concept-of-zero.htm>



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MONTESSORI LESSONS

Formation of Numbers

Age

- ❖ 4 1/2 years

Materials

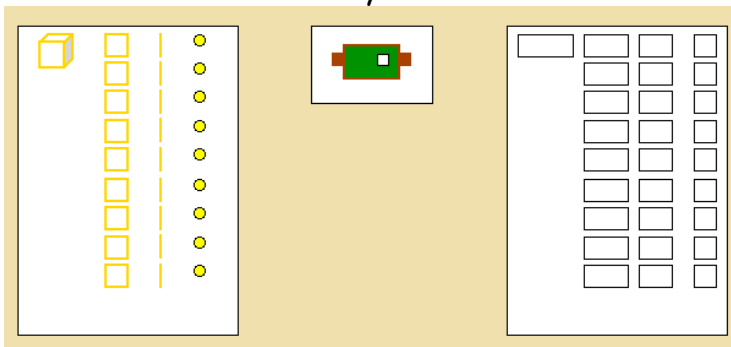
- ❖ The supply of limited golden bead materials
- ❖ The large cards to 1000
- ❖ Trays for participating children
- ❖ Two mats

Notes

- ❖ This can be done with one or more children.

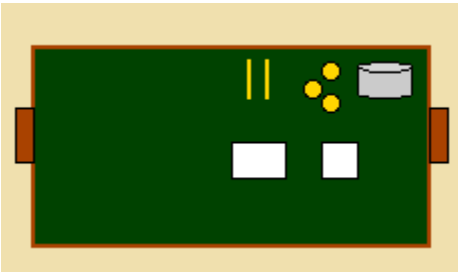
Presentation

- ❖ Invite a child to come with you. Have him unroll two mats and bring the material to one mat. Place a small mat between the two larger mats and place the tray onto the smaller mat.
- ❖ Have the child put out the unit beads in a vertical row from 1 to 9 from the top of one of the large mats.
- ❖ Have the child put out the ten-bars to the left of the unit beads in a vertical row, the hundred squares to the left of the ten-bars, and the 1000 cube to the left of the hundred squares.
- ❖ Have the child place the large cards 1 - 1000 (only 1000) on the other large mat as in the Introduction to Symbols exercise.



- ❖ Choose a card from the layout and give it to the child for him to put it on his tray.
- ❖ Ask the child to go and get the amount of beads written on the card.
- ❖ The child should take his tray with the card on it to the mat with the beads and collect the correct amount of beads.
- ❖ Have the child place the beads onto the smaller mat and count to check.
- ❖ Have the child replace the material from his tray and repeat by giving him another card.

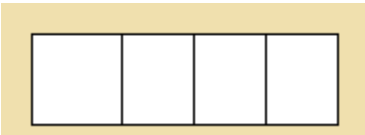
- ❖ Repeat this a few times.
- ❖ After some time, reverse the activity by giving the child an amount of beads. Have him count the beads and then go get the corresponding card to match the number of beads.
- ❖ Check the child's work with him.
- ❖ Have the child replace the material from his tray and repeat.
- ❖ Once the child seems to understand, give him two cards such as 20 and 3.
- ❖ Have the child name then: 2 tens and 3 units.
- ❖ Have the child go to the mat and collect the correct amount of beads.
- ❖ When he comes back to the small mat, check his work.



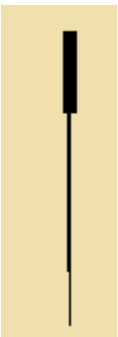
- ❖ Repeat using the hundred cards and the one thousand card.
- ❖ After a while, reverse the activity by giving the child an amount of beads to which he must find the correct corresponding card.
- ❖ Begin with one category (such as units). Later move one to two adjacent categories (such as units and tens), three adjacent categories, and four adjacent categories. Then non adjacent categories.

Show how to correctly place the cards

- ❖ Have the child bring over (for example) 1426 in beads.
- ❖ Have the child bring over the corresponding cards.
- ❖ Place the 400 card on top of the 1000 card with both of their left sides lining up.
- ❖ Place the 20 on top in a similar manner and then the 6.



- ❖ Pick up the cards by holding them from the side near the far left. Rotate them up vertically clockwise.





- ❖ Slide the numbers down to the lower side.

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- ❖ Place the cards back onto the mat and then number you have created is 1426.

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- ❖ Read it saying: 1 thousand, 4 hundred, 2 tens, and 6 units.
- ❖ Have the child repeat it with you.
- ❖ Read it again but this time saying: one-thousand, four hundred and twenty-six.
- ❖ Read it again with the child.
- ❖ Have the child replace the material back onto the correct mats and repeat.

Adapted from: <http://www.infomontessori.com/mathematics/decimal-system-formation-of-numbers.htm>



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MONTESSORI LESSONS

Introduction of Quantity

Age

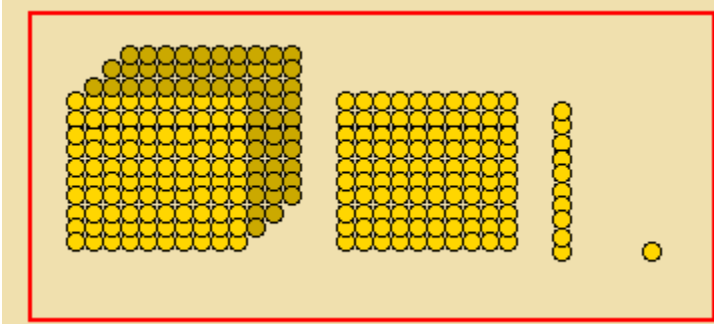
- ❖ 4 - 4 1/2 years

Materials 1

- ❖ A tray containing 1 golden bead unit, 1 golden ten-bar, 1 golden hundred square and 1 thousand cubes.
- ❖ A small mat for the table.

Presentation 1

1. Invite a child to come and work with you. Bring him to the shelf, name the lesson and have him bring the material over to the shelf.
2. Have him unroll the small mat onto the table.
3. Take the unit, feel it, and name it. "This is a unit."
4. Give it to the child to feel and name it.
5. Have him place it on the right side of the small mat.
6. Repeat for the ten-bar.
7. When the child places it onto the small mat, count the beads.
8. Place the ten-bar vertically to the left of the unit.
9. Repeat for the hundred squares.
10. Lay it on the mat to the left of the ten-bar.
11. Use the ten-bar to count how many tens are in the hundred.
12. Repeat for the thousand cubes.
13. Place it to the left of the hundred square and use the hundred to count how many hundreds are in a thousand



14. Do a Three-Period Lesson for them.
15. End the 2nd Period with the categories in the correct order: (from left to right) thousand, hundred, ten, unit.
16. For the 3rd Period, point to each category and ask the child to name it.

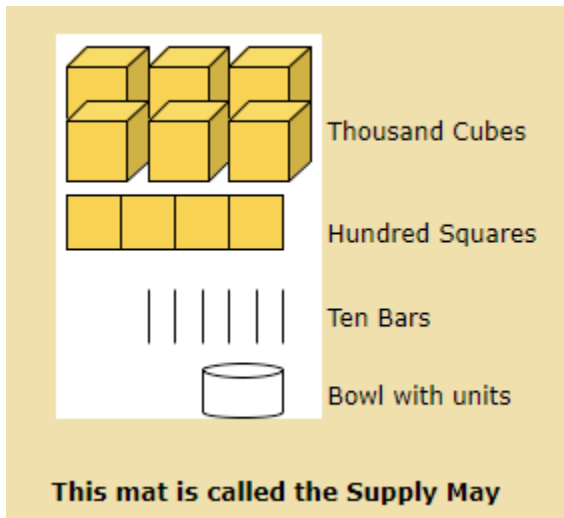
17. Show the child how to put the material away, making sure the beads are placed in the correct order on the tray.

Materials 2

- ❖ A mat
- ❖ A supply box with unit beads, ten-bars, hundred square and thousand cubes with beads drawn on them.
- ❖ A tray as in Presentation 1
- ❖ A tray with a dish on it.

Presentation 2

1. Invite a child to come and work with you. Have him bring the material over to the table.
2. Have him unroll a mat and have him bring over the material.
3. Compare the material in the box to the material that is on the tray that was used in Presentation1. This will show the child that units and tens are the same.
4. Take out a hundred from the box and compare it to the hundred on the tray.
5. Tell the child that the hundred on the tray is made of beads but the hundred in the box has beads drawn on it. But explain that they are still both hundreds.
6. Put the hundred from the box at the top of the mat.
7. Repeat and discuss for the thousand.
8. Place the thousand from the box above the hundred at the top of the mat.
9. Take the material out of the box and set it up as shown:



10. Have the child bring over a small mat and place it far away from the supply mat.
11. Have him also bring over a tray with a small dish on it and have him place it onto the small mat.
12. Sit next to the small mat with the child.
13. Ask the child for a precise amount of units, such as 5 units.



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14. Have the child go over to the supply mat with the tray and count out 5 units. Have him place these units into the dish on the tray. If needed, go with the child.
15. Have the child bring the material over to the small mat and have him count it to check.
16. Repeat by giving the child other amounts to get, such as: 4 tens, or 7 hundreds, or 5 thousands.
17. After some time, you place an amount of material onto the tray and have the child count to tell you how much there is.
18. Repeat this until the child seems comfortable with this exercise.
19. When the child can work well with one category, introduce two categories such as 4 units and 2 tens. Continue like this for three categories and then four categories.

Adapted from: <http://www.infomontessori.com/mathematics/decimal-system-intoduction-to-quantity.htm>



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MONTESSORI LESSONS

Memory Game

Age

- ❖ Approximately 4 years, at the end of Group 1

Materials

- ❖ 11 pieces of paper folded and placed in a container. Each has a number written on it, ranging from 0 to 10.
- ❖ 10 pieces of material that you can use without taking a whole set. (cotton balls, doilies, yellow and blue cloths, pencils, crayons, paper, metal insets for language and for math, sandpaper letters)
- ❖ 11 sheets of paper
- ❖ 11 trays

Presentation

- ❖ Invite 11 children and have them all sit in a circle.
- ❖ Give each child a yellow sheet of paper and tell them to put it in front of them. Then give them each a tray and have them put it on the sheet of paper.
- ❖ Have each child take a ticket from the basket but tell them not to look at their ticket!
- ❖ Tell the children that you are going to come around and tell them what to get. They will then look at their folded ticket and will be excused to go get however many of the objects you told them to get by the number written on the ticket.
- ❖ Go around the circle and tell each child what to get. For example, cotton balls, books, colored pencils, paper, etc.
- ❖ Excuse each child separately.
- ❖ Once all of the children have collected what they had been asked for and back at the circle, go around the circle and have each child count out loud how many objects he brought back. Then have him check his ticket to see if he brought back the correct amount.
- ❖ For the child who had the ticket of 0, discuss informally how because his ticket had 0, he brought back nothing because zero means nothing.
- ❖ Collect the tickets and have the children separately put the materials back on the shelves.

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-memory-game.htm>



MONTESSORI LESSONS

Number Rods and Cards

Age

- ❖ 4 years onwards, after the sandpaper Numerals

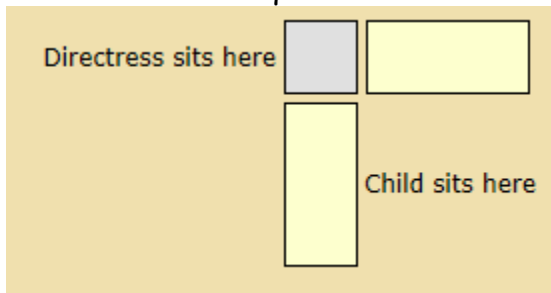
Materials

- ❖ The numbers rods
- ❖ A set of cardboard or wooden cards with symbols from 1 to 10
- ❖ Floor mats

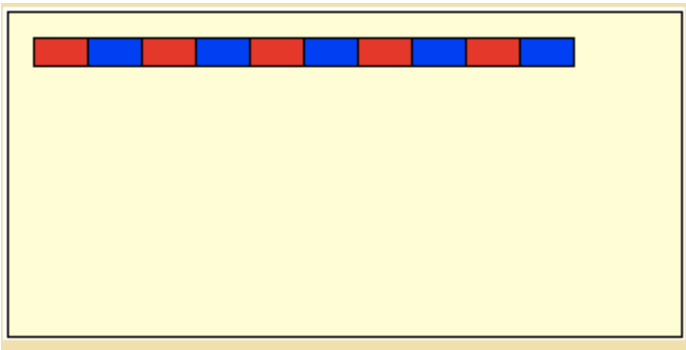
Presentation 1

Stage A

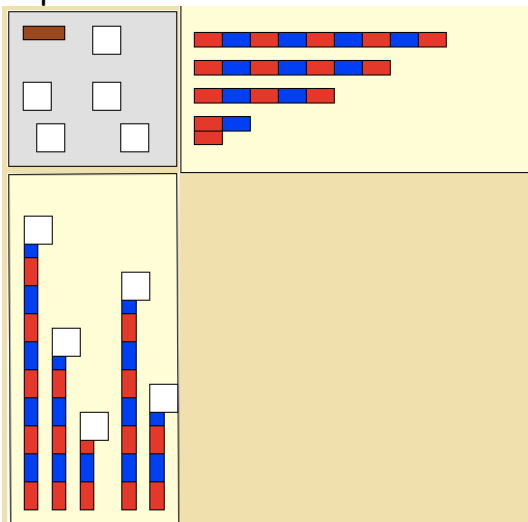
1. Set the mats as in the Number Rods.
2. Place a small square mat as shown in the diagram.



3. Have the child set up the Number Rods on the horizontal mat.
4. Place the box of cardboard cards on the square mat.
5. Take out the cards and read through them with the child. After each card is read, place it randomly on the square mat.
6. When you get to the 10 card, introduce it by saying that this is a new number and it represents the 10 rod.
7. Ask the child to get the 10 rod, have him count it, and have him place it at the top of the empty mat. Show the child that we can represent this 10 rod with the card. Show the child how to place the card at the end of the 10 rod (and leaning up against it) as shown in the diagram.



8. Place one of the number cards from the square mat at the bottom of the almost empty mat and have him read it.
9. Then have him choose the rod that corresponds to the number written on the card and then count the rod to check.
10. If it is the correct rod, have the child place the rod on under the 10 rod and have him place the card as for the 10 rod.
11. Repeat for all of the number cards. (See diagram below for the exercise done half way.)



12. Collect all of the cards and lay them out randomly on the square mat.

Stage B

- ❖ Have the child choose a rod, place it on the horizontal mat, say the number, count it, and then choose the correct card to go with it. Place the card as before.
- ❖ Repeat until all of the rods have been moved over to the horizontal mat.
- ❖ Collect the cards and have the child build the rods in stair formation on the vertical mat. As he does so, have the child count each rod.
- ❖ As the child builds, place the cards randomly out onto the square mat.



- ❖ Have the child place each card (as in Stage A) to its corresponding rod. (Do this randomly)
- ❖ With the child, count all the cards in order from 1 - 10.
- ❖ Then, with the child, count the numbers from 10 - 1.
- ❖ Have the child put the material away.

Exercise

- ❖ The child works with the rods and cards as in the presentation.

Extension

- ❖ To prolong the lesson, move the mats far apart from each other and do as in the presentation.

Presentation 2: A Glimpse of Addition

Making 10's

1. Set out the number rods in stair formation mid-way down the rug.
2. Take out the cards and place them randomly onto the square mat.
3. Separate the 10 rod from the others by moving it up to the top of the mat.
4. Have the child count it and mark it with the appropriate card.
5. Move the 9 rod up a little below the 10 rod.
6. Have the child say what rod it is, count it and place the correct card.
7. Tell the child, "I wonder what we could put to make this nine the same size as the ten."
8. Have the child place the 1 rod at the end of the 9 rod to make it the same length of as the 10 rod. Then place the 1 card at the end of the 1 rod.
9. As you point to the numbers, say: "9 + 1 is 10."
10. Repeat this with the child.
11. Repeat in the same way for the 8 rod and make it the same length as the 10 rod. Say, "8 + 2 is 10."
12. Repeat for the 7 rod and the 6 rod.
13. When you get to the 5 rod, have him place the end at the far tip right side to line it up with the 10 rod and place the card at the end.
14. Ask the child if we have something in the classroom that is similar to the 5 rod.
15. Have the child bring over the fifth rod from the Red Rods and see if it is the same length as the 5 number rod.
16. Place it to the left of the 5 number rod and notice that it makes the same length as the 10 rod.
17. Replace the Red Rod back on the shelf and have the child rebuild the rods in stair formation.



18. Replace the cards in the box.

Exercise

- ❖ The child can work as shown in the presentation.

Making 9's, 8's, 7's, 6's, 5's, 4's, 3's, and 2's

- ❖ Repeat as in Presentation 2 but this time start with the number rod 9 and have the child make 9's. (Remove rod 10 and place it on the empty mat, out of the way.)
- ❖ *Note: For making 8's, remove the 10 rod and the 9 rod. For making 7's, remove the 10, 9, and 8 rods. Etc...*

Presentation 3: A Glimpse of Subtraction

Making 10's

1. To be done on a day the child has made 10's or you have asked him to make 10's.
2. Show the child the first 10 (with the 5 rod)
3. Flip it over to the left side and say if we take 5 away, we have... 5.
4. Look at the 6 and 4 rods.
5. Ask, "Do we have another 10? ... Yes!"
6. "If we 10 and we take away 4 we have ... 6."
7. Move the 4 rod down under the 5 rod and move the card.
8. Repeat for the others.

Exercise

The child can work as shown in the presentation.

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-number-rods-and-cards.htm>



MONTESSORI LESSONS

Number Rods

Age

4 years onwards (after the child is competent with the red rods)

Materials

- ❖ Ten rods identical with the Red Rods in length but divided into red and blue sections. The shortest rod is red. The second is twice the size of the first; one half is painted red and the other half is blue. The third red is three times the size of the first and is divided into three sections; the first painted red, the second is blue, and the third red. All the other rods are divided in a similar fashion, alternating red and blue, the first section always being red. The number of sections represent the numbers of the rod.
- ❖ A floor mat

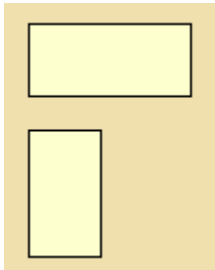
Notes

- ❖ Carry and assemble the rod as you would with the Red Rods.
- ❖ Do the Three Period Lesson to teach the names, be sure to count the red rods each time.
- ❖ Continue through the activities as the child is ready. You must be sure the child understands the quantities before moving on from the naming.
- ❖ Some children will be able to do this work in one sitting.
- ❖ Be sure to review previous names before moving on to new ones.
- ❖ Continue through the series on consecutive days.

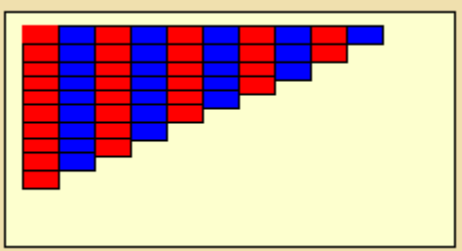
Presentation

Stage A: Naming and Counting

1. Invite the child to come and work with you. Bring the child over to the Red Rods and discuss with the child how he knows how to use them.
2. Tell the child that we have other set of rods that are almost like the Red Rods.
3. Show the child the Number Rods and tell the child that they are almost like the Red Rods except for they are red and blue.
4. Have the child bring over two mats. Unroll one horizontally and the other vertically. (See diagram)



5. Have the child bring over each number rod and place them randomly onto the vertical mat.
6. Sit in front of the horizontal mat.
7. Ask the child to build the rods as he would with the Red Rods on the horizontal mat.



8. Point out that we will always start with the red section to the left.
9. Isolate the first three rods.
10. Point to rod 1. Say, "This is one." Count.
11. Point to the blue on rod 2. Say, "This is two." Then count.
12. Point to the red on rod 3. Say "This is three." Then count.
13. Repeat this a few times. (This is the 1st Period of the Three Period Lesson.)
14. Move the rods so they are on the same horizontal line. Do the 2nd Period of the Three Period Lesson.
15. Do the 3rd Period of the Three Period Lesson.
16. Ask the child to replace the three rods back with the others.
17. Take out rods 4, 5, and 6.
18. Count each section of rod 4
19. Repeat as you did with the first three rods.
20. Repeat for rod 7, 8, and 9.
21. Then repeat with rods 8, 9, and 10.
22. Depending on the child, this may be taught over a few days.

Stage B: Identification by Name

- ❖ The Number Rods are in random order on the mat.
- ❖ The directress sits between the two mats and has the child sit in front of the vertical mat.



- ❖ The directress asks for a specific number rod, the child chooses it, counts it, and places it on the empty mat.

Stage C: Random Identification by Quantity

- ❖ The rods are laid out randomly on a mat.
- ❖ The directress randomly takes a Number Rod, places it in front of the child and asks, "What is this?"
- ❖ The child counts it, and gives you what Number Rod it is.
- ❖ Then have the child place it on the empty mat.
- ❖ Repeat for all of the rods.

Stage D: Identify Rod Randomly

- ❖ The rods are laid out randomly on a mat.
- ❖ The child chooses a rod, isolates it on the empty mat and tell the directress what number it is.
- ❖ Then the child counts to verify.
- ❖ Repeat for all of the rods.

Stage E: Identify Rod in Order

- ❖ The rods are in the stair formation.
- ❖ Point to one rod in the stair formation and have the child say the number of the rod.
- ❖ Then have the child count it to verify.
- ❖ Repeat for each rod.

Purpose

- ❖ To experience the qualities of each number and to learn their respective names.
- ❖ To show that each number is represented by a single object, as a whole, separate from others.
- ❖ To help memorize the sequence of numbers from 1 to 10.

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-number-rods.htm>



MONTESSORI LESSONS

Sandpaper Number

Age

- ❖ 4 years onwards, when number rods have been introduced.

Materials

- ❖ Numerals from 0 to 9, cut out of sandpaper and mounted on separate green boards. (The 0 is presented after the Spindle Boxes, when the concept of zero has been introduced.)

Presentation

(Done in a similar way as with Sandpaper Letters)

- ❖ Have the child bring over the material.
- ❖ Begin by sensitizing your fingers.
- ❖ Take out 1, trace three times and say its name: "one"
- ❖ Give to the child to repeat.
- ❖ Place the board at the top of the table.
- ❖ Repeat for numbers 2 and 3.
- ❖ Do a Three Period Lesson with numbers 1, 2, and 3.
- ❖ Repeat for numbers 4, 5, and 6.
- ❖ Then repeat for numbers 7, 8, and 9.
- ❖ Depending on the child, this may be taught over a few days.

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-sandpaper-numbers.htm>

MONTESSORI LESSONS

Spindle Boxes

Age

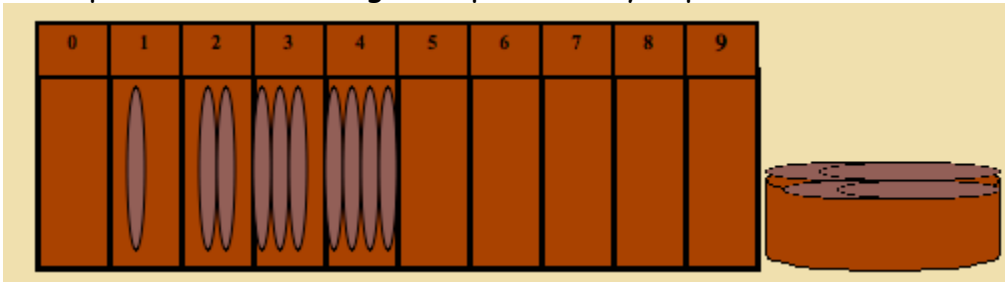
- ❖ 4 years onwards (after the child has worked with the number rods and cards)

Materials

- ❖ Two boxes exactly the same, each with five compartments. At the back of each compartment is painted a symbol in black, starting from 0 and progressing serially up to 9.
- ❖ A container with 45 spindles
- ❖ A container with 8 ribbons or elastic bands

Presentation

1. Introduce the child to the materials on the shelf and have him bring them over to the table.
2. Point out the compartments and the numerals the child knows. Point to them all, one at a time, and have the child give the number's names.
3. Tell the child that these numbers will tell us how many spindles to put in the box.
4. Point to the number 1. Have the child read it and then say, "We will put 1 spindle in this box."
5. Place one spindle in the compartment.
6. Repeat for 2, counting the spindles as you place them, "One, two." Continue this up to 4.



7. Have the child place the correct spindles in the remaining compartments.
8. Once all of the spindles have been placed, look at compartment 0 and notice that there is nothing in it.
9. Say, "This is zero. Zero means nothing. That is why there is nothing in this spot."
10. Have the child take out the two spindles from container 2. Have him do this one by one and count as he does so.
11. Have the child tie a rubber band around the two spindles and replace them in the 2 slot.
12. Repeat for the other spindles.
13. Then take out the 1 spindle and place it gently back into the basket.



Pride Academy

14. Take out the other spindles group by group, and after taking off the rubber bands, place them one by one (counting as the child does this) back into the basket.
15. Ask the child why there was no spindle in the 0 container.
16. Have the child replace the material on the shelf.

Adapted from: <http://www.infomontessori.com/mathematics/numbers-through-ten-spindle-boxes.htm>



MONTESSORI LESSONS

Subtraction

Age

- ❖ 4-5 years

Materials

- ❖ As for addition but including a fourth set of small cards to 9000 and a small mat to put those cards on.

Notes

- ❖ Specify the vocabulary: minuend, subtrahend, and the different.

Static Subtraction

Presentation

1. Invite three children to come and work with you.
2. Set up the material as in Addition, including the new set of cards. This new mat should be placed next to the large mat with the large number cards.
3. Take the directress tray and with the children, go over to the Supply Mat.
4. Ask one child to put 7 units into the dish on the tray.
5. Ask another child to place 8 tens onto the tray.
6. Ask another child to place 7 hundreds on the tray.
7. Ask another child to place 9 thousands on the tray.
8. Emphasize that you have a lot of beads on your tray.
9. Take the tray back to the large mat.
10. Ask each child to count the units, tens, hundreds, and thousands. Have each child get the corresponding card after each is counted.
11. Superimpose the cards to get: 7879
12. Have each child take their trays to the small mats and tell them each what to get. For example:

3 units, 2 tens, 4 hundreds, and 3 thousands
2 units, 4 tens, 5 hundreds, and 6 thousands
1 unit, 3 tens, 4 hundreds, and 5 thousands
13. Tell the first child that you are going to give him some of your beads.
14. Ask him how many units his card asks for. (3)
15. Have him count three from the directress's tray and place it into his own dish.
16. Repeat for the tens, hundreds, and thousands.
17. Have the child superimpose his cards and read it with the others: 3 units, 4 tens, 2 hundreds, and 3 thousands. Then read, 3423
18. Ask, "Do I still have 7879?" No!
19. Move the cards 7879 up to the top left corner of the mat.



20. Ask one child to count how many beads you have left and choose the new small cards to mark each set of beads.
21. Have the child superimpose the cards to read: 4456.
22. Say, "So let's see what we did here. We started off with 7879 but then I gave some away." (Ask for the first child's cards and place them below 7879.) "I gave away 3423. And in the end, (place the new total below 3423) I ended up with...4456 beads."
23. "And this is called subtraction!"
24. Give the cards back to the child to replace and have him give you back the beads.
25. Beginning at when you started with 7879 beads, repeat the subtraction for the second child.
26. Once done, begin again at 7879 and repeat the subtraction with the third child.
27. Once each child has had a turn, say: "What we have just done is subtraction. I had a lot of beads and you took some from me so I no longer had the same amount of beads."

Dynamic Subtraction

1. Done as in the above presentation.
2. The only different is you will have to change, just as in Dynamic Addition.

Multiple Subtraction

- ❖ This is done in the same way as in the above presentation but this time, the first child will take some of your beads away, the second will take from what is left of the directress tray, and the third child will take from what is left after that.
- ❖ After the first quantity is taken from the original pile, place the large number cards at the top left corner of the mat. Place the small cards from the child below it. Keep placing the cards in this manner after each child take some of the beads away.

Adapted from: <http://www.infomontessori.com/mathematics/decimal-system-substraction.htm>



Pride Academy

MONTESSORI LESSONS

Symbols

Age

- ❖ 4- 4 $\frac{1}{2}$

Materials

- ❖ A box containing 4 sets of cards:
- ❖ 1 set for units - 1 to 9 in green symbols
- ❖ 1 set for tens - 10 to 90 in blue symbols
- ❖ 1 set for hundreds - 100 to 900 in red symbols
- ❖ 1 set for thousands - 1000 in green symbols
- ❖ A mat

Presentation

1. Invite a child to come and work with you.
2. Have him unroll a mat and have him bring over the material to the mats.
3. Put the box of cards on the lower part of the mat.
4. Take out the card for 1 and ask the child what it is.
5. Take out the card written 10 and ask the child what it is.
6. Notice how many zeros are in the number 10.
7. Take out the card written 100 and name it.
8. Notice how many zeros 100 has.
9. Take out the card written 1000 and name it. Notice the zeros.
10. Also notice the colors of the cards.
11. Do a Three-Period lesson for 1, 10, 100, 1000.
12. Place card 1 at the top right of the mat.
13. Take out the unit cards and place card 2 under card 1.
14. Have the child name card 2.
15. Repeat for all of the unit cards (the child can do this).
16. Repeat for the 10's by placing them in a column to the right of the units.
17. Repeat for the and 100's and 1000's cards. Always making the column to the right of the preceding cards.



Pride Academy

18. Do a Three Period Lesson. Each time, ask how many zeros are in the number.
19. Have the child collect the cards.
20. Mix them and place them randomly in their correct columns.
21. Have the child pick up one column at a time (beginning with the unit cards) and replacing them in the column in order.
22. Have the child repeat for the other three columns.
23. Each time the child replaces the cards in order, have him say what it is. For example, "1 unit" for 1, or "3 tens" for 30, or "8 hundreds" for 800, or "5 thousands" for 5000, etc.
24. Once all of the cards have been laid out, have the child count, using the decimal quantity: 1 unit, 2 units, 3 units, etc.
25. Repeat for the tens, hundreds and thousands.
26. Each time, asking how many zeros there are.
27. Once done, have the child put the material away

Adapted from: <http://www.infomontessori.com/mathematics/decimal-system-symbols.htm>