

Montessori House

Curriculum for the Junior Class

First Grade

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Math Sample

Banker's Game: Long Addition (Large Numerals)

The steps below are integrated into the initial exercise above when working with large numerals.

The concept applies to any situation in which large numerals are used, so your child should be very comfortable with long addition using large numerals before he or she starts the other exercises.

Steps for large numbers:

1. Whenever the sum of two digits equals ten, your child will make an exchange with the bank. If your child is working alone, he or she will simply swap the pieces out (but this is much more fun as a game with two children).
2. For example, if there are 12 unit beads, your child will exchange ten of them for one ten-bar. If there are 15 ten-bars, your child would exchange ten of them for one hundred-square, and if there are 18 hundred-squares, your child would exchange ten of them for a thousand-cube.

In this part of the long addition exercise, you can present the concept of ten thousands and hundred thousands when you create the cards for the equations. For example, when you set up the equation $9879 + 9095$, your child will practice exchanging ten units for one ten-bar, ten ten-bars for one hundred-square, adding no hundred squares from one part of the equation, and seeing 18 thousand squares. You can show your child how to add the comma after the thousandth digit, too.

Next, you would create an equation that uses as many thousand cubes as you have. If you need extras, you can now go ahead and use paper or cardboard models of the cubes because your child has already become familiar with the quantities.

If your child enjoys drawing, he or she can draw the results of the long addition exercises with the units through thousands. Displaying mathematical results visually is an important skill.

Children love this stage, especially when there are at least two children involved, so that one can play the banker. It is much better to have the two children working on the game because if you play the banker you already know the right answer and it disturbs the process a bit. If there are no other children available, you can play up the part of the banker, which is actually more of a teller function, and leave off your parent or teacher role entirely. Give your child whatever he or she requests in the way of an exchange, even if the amount requested is wrong.

Banker's Game: Long Subtraction (Large Numerals)

Using the set up below for the Long Addition exercise, you can introduce subtraction with small numerals that do not require changing. The steps are the same except that your child will remove the quantity to be subtracted from the stack of units, tens, hundreds, and thousands.

When you introduce equations that require changing, the process is the same as with addition.

Sample:

1. Take an equation that requires changing (e.g. $2983 - 1817 = ?$)
2. Your child takes prepares three unit beads, eight tens, nine hundreds, and two thousands.
3. As always, your child will start with the units. He or she will see that seven units cannot be taken away from three units, so he or she goes to the banker and requests that one ten bar be exchanged for ten units.
4. Now there are seven tens and 13 units in the original stack. He or she subtracts seven units.

All the steps remain the same. The process should be very simple and streamlined.

If your child is hopelessly lost, you have proceeded too quickly. The steps all seem basic, but the concepts need a bit of time to be absorbed. Did your child master the long addition steps with small numerals? What about the long addition steps with changing? If it is only a problem with subtraction, change the equation to only units and tens. For example, have your child set up the beads for $83 - 17$, using tens and units. Now add hundreds (e.g. $983 - 817$).

Multiplication Control Chart for Reference

If you do not have the Multiplication Control chart for the multiplication exercise, you can use this print out in an emergency.

0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

Long Division Sets



After your child has worked with the Golden Beads in the Banker's Game, he or she will be ready to work with long division using this set of four division boards.

You can also simplify this exercise and use fewer boards to work on short division or easier long division problems: one board for the division of units, two boards for the division of tens, or three boards for the division of hundreds.

You will notice that the colors in all the math equipment are the same: green for units and thousands, blue for tens, and red for hundreds.

Material needed:

- Long division problem cards, e.g. $4882 \div 2 = \underline{\quad}$
- The long division set shown in the photo
- Math paper with grids, colored pencils, and an eraser
- A mat for floor work or a large table

Since your child has already worked with the Banker's Game, the presentation is very simple.

What to do:

1. Invite your child to join you in this exercise.
2. You and your child can bring all of the equipment to the table.
3. Sit on your child's non-dominant side as you make the presentation (so he or she will have greater freedom of movement with whichever hand is used most).
4. Ask your child to choose a problem card to hand to you.
5. Count out the number to be divided. For example, using the sample problem above, count out four thousand pegs, eight hundred pegs, eight ten pegs, and two unit pegs.
6. Your divisor is two, so put two markers along the top of each board.
7. Put the four thousand pegs on the thousand board under the markers. You should get two rows of two pegs (under the two markers).

8. Repeat the step with the eight hundred pegs (four rows of two), eight ten pegs (four rows of two), and two unit pegs (one row of two).
9. Write the equation and the answer on the grid paper using colored pencils for each color.
10. Put all the pegs and markers back. Let your child try the next one.
11. Let your child work independently. You can get up and go do something else so your child can focus all of his or her attention on the work.

Just as you did in the Banker's Game, work first with problem cards for small numerals that do not require changing. When your child is comfortable with these equations, introduce numerals that require changing such as 5482 divided by 2. The extra thousand gets changed into ten hundreds, so you will have 14 hundreds to divide by 2.

Also start with numbers that divide evenly with no remainder. After your child has mastered these problems, he or she can work with different numbers and simply write the remainder after the equation.

For those of you making your own equipment, this set consists of 4 color-coded division boards and a wooden tray that holds the seven racks of tubes with beads, 7 cups and 36 skittles.

Compound Words

This is a good exercise for a range of abilities because compound words can be easy or hard. Our example today uses fairly simple words, but you can scale them up in difficulty by substituting words such as motorcycle, masterpiece, skyscraper, smokestack, buttermilk, backstage, or collarbone.

Each of these more difficult compound words can also become the beginning of another type of exercise such as looking words up in the dictionary or, in the case of collarbone, researching bones in the human body.

Materials needed:

1. Word cards for the words rain, drop, rain, coat, bed, room, bed, and time.
2. Writing paper and a pencil for your child.
3. A tray for the word cards (you can also use a large envelope).
4. A permanent place for the paper and pencil.
5. A permanent place for the word card tray.



What to do:

1. Invite your child to learn this new exercise.
2. Your child takes the tray from the shelf.
3. Sit down at the table. You should be on your child's non-dominant side (on the left, for a right-handed child). This exercise can also be done on a mat on the floor.
4. Introduce your child to the concept of compound words by asking him or her to read each of the component words. For example, show the words "rain" and "drop" to your child. Ask him or her to read each of the words.
5. Put the words together. The visual process of seeing the word cards come together is important, so do this in a deliberate manner. You can grasp one card in each hand and move them together.
6. Ask your child to read the word.
7. Ask your child if he or she sees another compound word that can be made using the word "rain".
8. If he or she is unsure, present the "coat" card.
9. Let your child continue matching the cards, helping as needed in the above manner.
10. When all the words are matched, your child presents them to you by reading each of them.
11. Suggest that your child writes all of the words on the writing paper.
12. Your child puts the tray away on the shelf.

When you ask your child to read a word, it should be in a joyful and relaxed tone. Remember that some concepts click more quickly with some children than with others, so it is fine if your child needs more time to master this particular exercise.

The word cards should be created with red or orange vowels and blue or green consonants. You can print them easily on a computer or use fine point magic markers and a ruler. Blank rolodex cards are inexpensive and work well for both printed and handwritten cards.

Grammar in Sentences

	The happy children watched the tiny frog.
	The small boy helped the new child.
	The huge hawk spotted a tiny mouse.
A	
The	
The	

This exercise is a perfect follow up to our last Language issue that discussed the parts of speech.

After your child is comfortable with the grammar symbols, he or she is ready for this project.

If your child has worked comfortably with, say, the article, noun, and conjunctions, you can present the introductory sentences or phrases, but make sure that the material covers only the parts of speech that your child has

mastered.

Make five to ten sets of introductory sentences that include basic parts of speech such as the article, adjective, and verb. Cut out each word in the sentence, so your child can easily move them around (and he or she can mix and match them in later exercises). Now your child can place the appropriate symbol under each sentence.

Store these sentences in a separate box on the Language shelf of your home classroom. Now put together another five to ten sentences with more complicated parts of speech. If your child had trouble with the first set of sentences, you can save this step for later.

Your child can now write his or her own sentences and use the symbols.

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