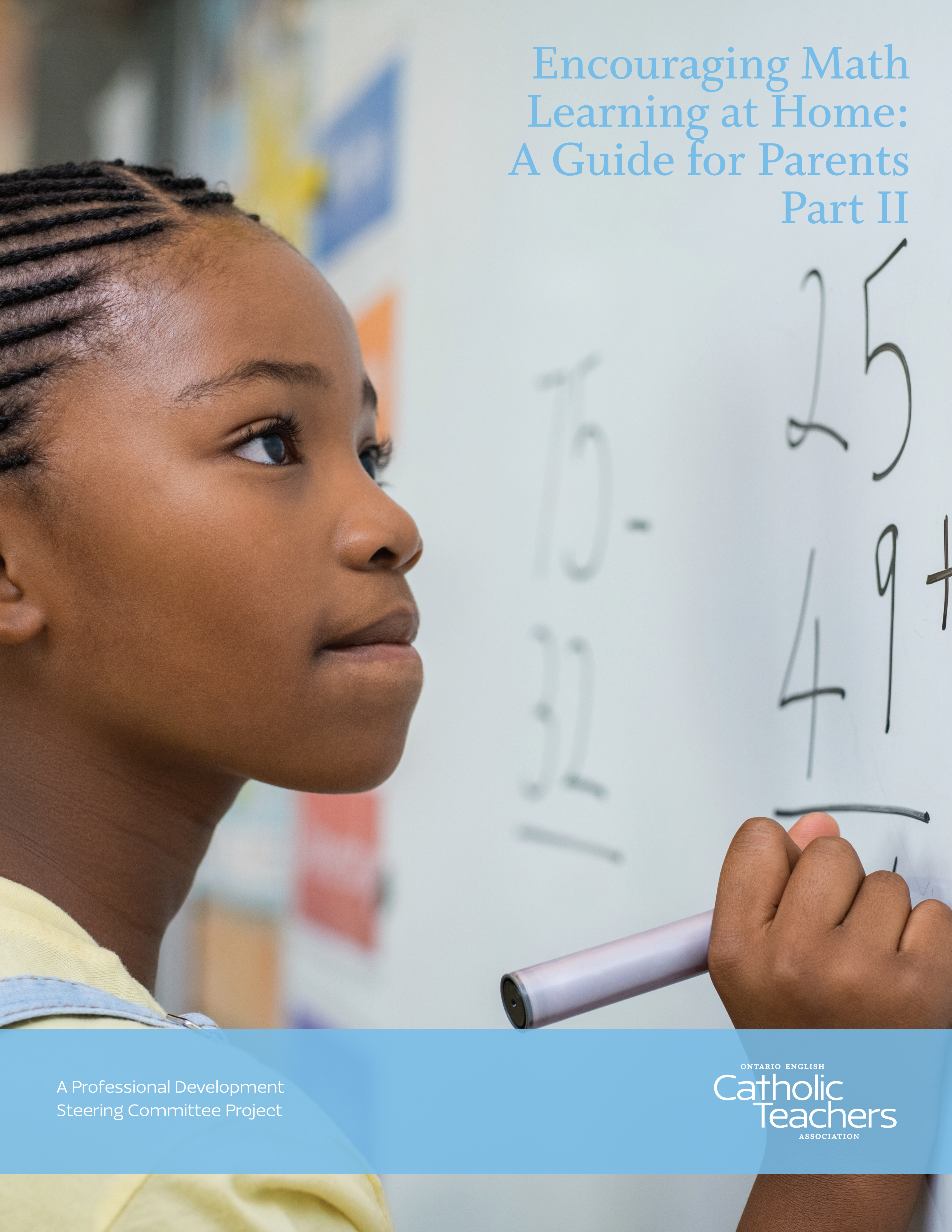

Encouraging Math Learning at Home: A Guide for Parents Part II

A Professional Development Steering Committee Project

ONTARIO ENGLISH Catholic Teachers ASSOCIATION

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Ontario English Catholic Teachers' Association
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INTRODUCTION

This guide is for parents and their children, particularly those in the junior grades. As a parent you have the task of helping your child develop a positive disposition towards the learning of mathematics. In cultures where children are exposed to mathematics through games and other activities, children do very well in mathematics in the school setting. What happens at home matters. This resource is intended to bring children and parents together to explore some of the mathematical ideas that will arise in the classroom. Embedded within these activities are opportunities to reinforce key mathematical concepts, especially the more difficult concepts, including those identified by EQAO reports.

A special focus on number and the operations permeates most of the activities because much of the mathematics curriculum is intertwined with number sense proficiency. In addition, the mathematics of numbers and their operations is one of the areas where parents can provide the most effective and comfortable support. Using mathematics to estimate and count money, role-playing games involving number, creating number patterns, and playing board games with dice are some examples of the activities shared within this guide.

We hope that this resource will provide you and your children with many enjoyable opportunities to engage in mathematics learning.

OUTDOOR
GAMES

Ladder Game Math (Younger children)

Lay the ladder on the ground. Verbally (or with a sticky note, if necessary) number the first space between the rungs as number one, the next space as number two, the next space as number three, etc. Throw a dime, or a two-sided, two-coloured counter. Designate heads for even numbers and tails for odd numbers or one side of the coloured counter as even and the other as odd. Each child jumps to the next even or odd number after saying, for example, "I am on number two. I am going to the odd number which is three. Or I am on number two, the next even number is number four.."

If the ladder has wide gaps between the rungs, have the children step through. If they are closer together, and it is safe, they can jump from one space to the other.

Understanding even and odd numbers helps with number sense as well as with adding and subtracting ones and twos. Ones change the number to something different than what it is to begin with (even to odd; odd to even); twos keep it as an even or as an odd.

Shaker Can Math (Younger children)

Put pennies (nickels, dimes, depending on age of child) in a can with a hole about 10 centimetres in the bottom. First child shakes the can twice, then counts out the value of the coins that fall out of the can and writes it down. Second child refills the can, shakes the can and writes down the value of the coins that fall out. The person with the highest value 'wins'.

Alternatively, put nickels, dimes and pennies in the can. Follow the same rules as above. The person with the most wins.

Newspaper Basketball (Younger children)

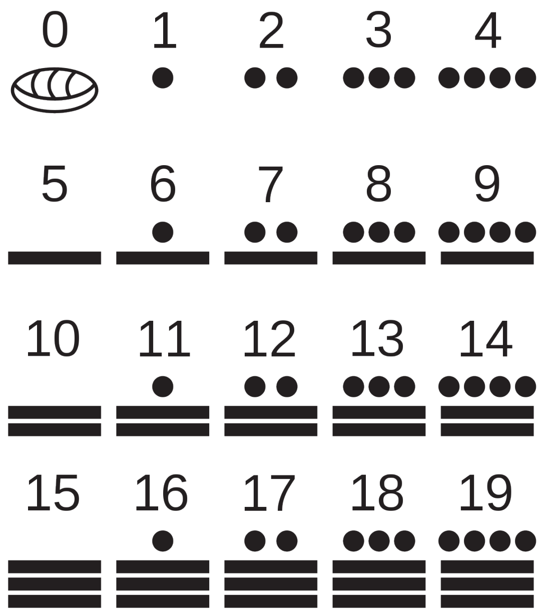
Children roll newspaper sheets into balls (five per child). They take turns throwing the balls into a basket. They count each other's successes. They count all the balls in the basket. The one with the most balls in the basket wins. Alternatively, the children number their balls from one to five and then throw one at each of their turns. At the end they count up their 'points' based on the number on each of their successfully thrown balls.

Jump the Squares (Younger children)

Make a four by four grid out of newspaper. Number the squares from one to sixteen (if you want smaller numbers to work with, just do a two-by-two grid.) The goal is to throw coins or other markers onto the grid. One child throws a coin on a number and then the other child throws another coin and says what the total of the two numbers will be. For instance, Child One throws a coin onto a two. Child Two calls out six and throws a coin on a four. If it is correct, Child Two keeps their coins and any other coins that have already been thrown. The second child then goes first and throws a coin on a number. The next child calls out a new total and throws a coin on another square so that the two squares add up to that total.

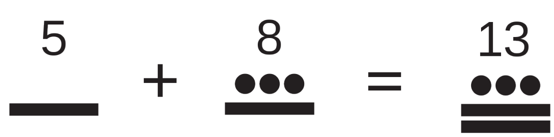
Mayan Number System (Any Age)

The Mayan Number system is shown below. Can you figure out the pattern they use for their number system?



How would you write your age?

Below is a number sentence for 5 + 8. Write a number sentence for 10 + 2; 11 + 3; 6 + 6 using the Mayan number system.



ADDITION GAMES WITH DICE

Crossing Lake Simcoe (All Ages)

Each child is given twelve counters, pennies or other small items to represent people. They each draw a long oval on paper representing Lake Simcoe, with the numbers one to twelve evenly spaced along the line as shown below. The object is to be the first to get your 'people' across the lake. Each number represents a crossing. The child distributes the counters as they wish under the numbers in the Start section above the lake - counters can be evenly or randomly distributed. Then the two dice are thrown and the numbers added. If that number is one that had a counter under it, that counter is then moved to the other side of the lake. Play the game a few times. What is the best strategy for winning? Why? (Consider which total is most likely to come up based on the numbers on the dice.)

Place twelve counters under chosen numbers on the start side of the lake.

START

1 2 3 4 5 6 7 8 9 10

FINISH

1 2 3 4 5 6 7 8 9 10

Making Sevens (All Ages)

Each child starts with ten points. The goal of the game is to roll two dice and have two numbers that add up to seven. If they add up to less or more than seven, you lose a point. If they add to seven, you get two points. Each child takes a turn rolling the two dice and adding or subtracting their score to the original ten points.

Example: The first person rolls the two dice and the sum is six (a two and a four were rolled). Their score is minus one, so they subtract that one from ten which makes nine. On their second turn, they roll a four and a three and get two points, which they add to their nine points.

Adding Tens (All Ages)

The goal of the game is to roll two dice and come up with two numbers that add up to ten. This time, you roll the first die and then calculate how many dots you need on the second die to get ten. Your partner checks that you are correct. Then the second die is rolled. If your answer was correct, you get all the points on the second die.

Example: Roll the first of two dice. Count the number of pips on the first die and determine how many you will need on the second die in order to have a total of ten. Your partner checks whether you are correct. If you are correct, roll the second die and whatever number is on the die is the number of points you get. If you were incorrect, you lose your turn and your partner takes her turn. If the number on the second die is actually the number you said you needed to have a total of ten, you get an extra point.

MULTIPLICATION GAMES

Jumping Through Numbers (All Ages)

Choose a pattern such as counting by 2s, 3s, 4s, 5s or any other number. At the same time, give children a jump pattern. When the number in their jump pattern comes up, they must jump. For instance, if the counting pattern is by 2s and my jump pattern is any multiple of ten, everyone counts aloud by 2s and I have to jump when the count by 2s gets to 10, 20, 30, etc. If my jump is for any multiple of 4 then I would jump at 4, 8, 12, etc.

To simplify for younger children, stick to counting by 1s, 2s, 5s and 10s. For older children use any multiples.

Reaching for Multiples of Ten (All Ages)

Each child takes turns throwing two dice, adding up the number of points and adding them to their score. Every time, they get up to a score of a multiple of ten (10, 20, 30…), they add ten extra points to their score. For example, my score is 12 and then I roll 8, I will get an extra 10 points as well as the 8. The first child to get to 100 exactly wins (e.g., if they are slightly over, that roll doesn't count and they need to keep taking turns and rolling the dice until they get the exact amount that, if added to the previous one, makes 100).

Making Multiples Card Game (All Ages)

Divide a deck of cards (remove queens, kings, jokers) among the players. Cards are kept in a pile, face side down in front of each child. On their turn, each child turns up a card and places it in the middle. If the card is a multiple of 2, they get two points, (2, 4, 6, 8, 10); a multiple of 3, they get three points, (3, 6, 9); a multiple of 4, they get four points, (4, 8); a multiple of five is five points (5, 10). Each child records their scores and calculates the total at the end.

SUBTRACTION GAMES

What a Difference Game (All Ages)

Play with pairs of children/adults or on teams of two people each.

Use two ten-sided dice or two sets of cards with the numbers zero to nine written on them (alternatively, if you use a deck of cards, use a set of hearts and a set of spades with all the cards Ace to Jacks (e.g., Ace, one, two, three, four, five, six, seven, eight, nine, Jack). The Aces will be one and the Jacks will be zero.

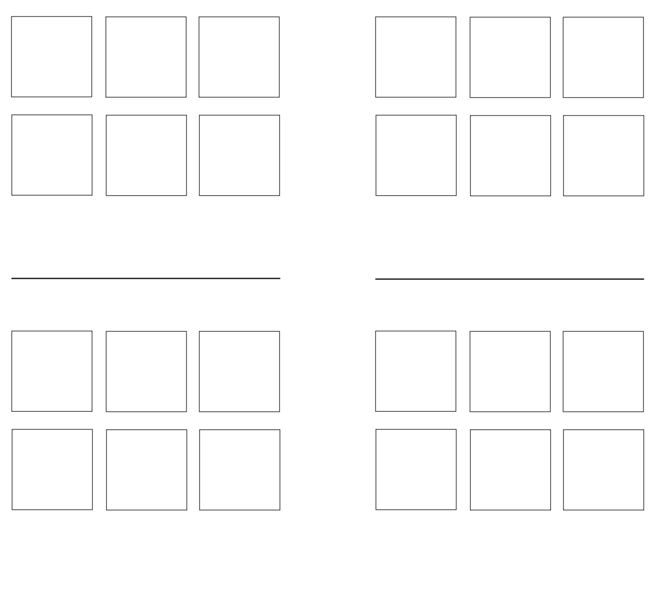
Each player rolls the ten-sided dice, or chooses a card from each deck, and arranges them to make the largest two-digit number possible. The player with the largest number wins. The winner gets points equal to the value of the cards or dice (e.g., if the winning cards or dice were a two and a one, the winner gets three points).

If you use decks of cards instead of dice, keep them stacked and each player takes turns taking the two top cards. Again they arrange the cards to make the largest number possible. To add a level of difficulty, do the same thing but with three cards chosen each time. Return the cards to the bottom of the pile each time and shuffle.

Largest Difference (All Ages)

Use playing cards zero to nine (with the Ace acting as a zero), or a ten-sided die, as well as an addition box similar to the ones beneath for each person. One person chooses a card or throws the die. The players record that digit in any one of the boxes in their set of boxes with the intention of creating the largest sum. The process is repeated until all the boxes are filled. Then the teams add their sums. The team with the largest sum wins a point. The game should be played for a set number of rounds. The team with the highest number of points wins.

(Variations: It can be played so the team with the smallest sum or difference wins, or changed to the team with the largest sum or difference. Be aware that you could end with negative scores which should be fine with older students. With younger students, make a rule that the digit on top left must be bigger than the digit in the bottom left. Without that rule, they will need to be familiar with negative numbers.)



PLAYING WITH NUMBERS

123

Four-digit Challenge (All Ages)

Using the numbers zero to ten, do the following:

- Make the largest possible number.
- Make the largest possible number without using any number more than once. Make the smallest possible number.
- Make the smallest possible number without using any number more than once.

Mindreader Math (All Ages)

The child asks someone in their 'audience' to pick a number from one of the boxes below. That person must then indicate all boxes that contain the same number. This step is very important to the success of the 'mindreading'. If the audience member says the number is contained in a box, the mindreader keeps that box in mind. When the audience member has indicated all the boxes their number is in, the 'mindreader' adds the top left-hand numbers in the boxes that the audience member said contained their number. For instance, if an audience member secretly chose seven as their number, they would indicate that their secret number was in boxes one, two, and three but not in any other boxes. The mindreader would then add the numbers one, two, and four from the top left of each of those boxes and determine that the number was seven.

1 3 5 7 9 11
13 16 18 20 22 24
26 29 31 33 35 37
39 41 44 46 48 50
52 54 57 59 61 63
65 67 69 72 74 76
78 80 82 85 87 89
91 93 95 97 100

2 3 6 7 10 11
14 17 18 21 22 25
26 30 31 34 35 38
39 42 45 46 49 50
53 54 58 59 62 63
66 67 70 73 74 77
78 81 82 86 87 90
91 94 95 98

4 5 6 7 12 13
14 19 20 21 22 27
32 33 34 35 40 41
42 47 48 49 50 55
60 61 62 63 68 69
70 75 76 77 78 83
88 89 90 91 96 97
98

8 9 10 11 12 13
14 23 24 25 26 27
36 37 38 39 40 41
42 51 52 53 54 55
64 65 66 67 68 69
70 79 80 81 82 83
92 93 94 95 96 97
98

28 29 30 31 32 33
34 35 36 37 38 39
40 41 42 43 44 45
46 47 48 49 50 51
52 53 54 55 84 85
86 87 88 89 90 91
92 93 94 95 96 97
98 99 100

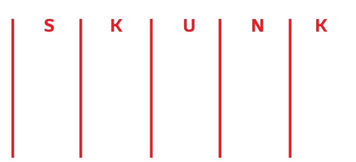
15 16 17 18 19 20
21 22 23 24 25 26
27 43 44 45 46 47
48 49 50 51 52 53
54 55 71 72 73 74
75 76 77 78 79 80
81 82 83 99 100

56 57 58 59 60 61
62 63 64 65 66 67
68 69 70 71 72 73
74 75 76 77 78 79
80 81 82 83 84 85
86 87 88 89 90 91
92 93 94 95 96 97
98 99 100

Poison (All Ages)

This is a two person game. Each person takes turns crossing out one or two items (use a different coloured pen for each person). The object of the game is to avoid being the player who crosses out the last item. Play a few times. Think of a winning strategy. For example, if I go first, I may cross out one or two stars. The second person goes and decides to cross out two stars, then I cross out two, and so on.

SKUNK (April 1994 issue of Mathematics Teaching in the Middle School, Vol. 1 No. 1, pages 28–33) (All Ages)



You need two dice and the word SKUNK written on a piece of paper. This game is best played in a group but two can also play.

Each player stands. A pair of dice is rolled. All players standing get the total of the dice and record it on his or her SKUNK sheet unless a 'one' comes up. If a one comes up, play is over for that round and all the player's points for that column are eliminated. At any time, a player can choose not to chance a one showing up and sit down and keep all points accumulated to that point. If a pair of ones shows up, and a player is standing, all prior points are also eliminated. If a one doesn't occur, the player may choose either to stand to get more points or sit to avoid losing all points for that round. Each letter of skunk represents a round. At the end of the last "K" round, the total points are added up to find the winner(s).

Children can fill in a chart showing all the possible combinations to help them determine the chances of getting one or two ones in a round.

Below are all possible number combinations from throwing two dice. How many possible double one combinations are there? How many possibilities of getting one and another number are there?

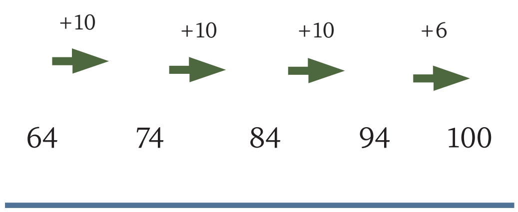
	1	2	3	4	5	6
1	1,1					
2	2,1			2,4		
3						
4						
5						
6						6,6

STRATEGIES TO SIMPLIFY MATH OPERATIONS

In school, students are taken through processes and problem-solving strategies to learn concepts in mathematics. In the following section, some of the strategies that may not be as familiar to parents are explained. Let your child try these examples. They may be new to parents, but they provide some helpful alternative strategies for children who are having difficulty working with larger numbers.

Number Lines

Sometimes using a number line helps children to do quick calculations (with understanding). Add questions such as 64 + 36 using a quick draw number line. Count up by tens and then add six. Sometimes strategies that help children think about the next ten rather than, say, counting on their fingers, helps them to do calculations in their heads or to double-check questions they have answered in writing.



Try these:

75 + 29

83 + 77

Algorithms to Simplify Addition: Problem 1

Students who have difficulties with large numbers and addition may find it easier to use the associative property to help them.

Example: 345 + 138 can be changed to 345 + 100 + 30 + 5 + 3. For many students, they will be able to solve this mentally because most of the addends are numbers that are easy to add.

Try these:

445 + 38

339 + 256

265 + 234

279 + 21

Algorithm to Simplify an Addition: Problem 2

Sometimes using both addition and subtraction to change the addends to numbers that are easy to work with can make a question easier to solve. It helps if children understand the principle that addition and subtraction undo each other:

357 + 597

357 + 600 (3 too many)

= 957 – 3

= 954

Try these:

547 + 496.   326 + 499

Algorithm for Addition

Similar to the strategy above. Sometimes you can simplify numbers by taking away from one addend and adding to the other.

389 + 197 = (389 – 3) + (197 + 3)

386 + 200

= 586

Try this:

287 + 153; 279 + 121

Make Tens

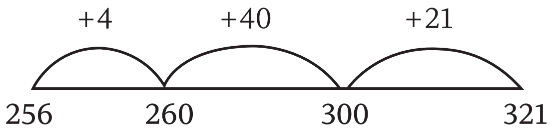
Tens tend to be the easiest numbers to work with. If your child is having difficulty memorizing their basic facts, help them 'look for tens.' For instance, if they have forgotten the math fact 7 + 4, they may remember that 7 + 3 is ten and then there is one more number to add and 10 plus 1 is 11. This also works with larger numbers. So if the math fact was 27 + 4, they may remember that 3 more will bring 27 to the next ten of 30 and there will be 1 more so the answer is 31. For some children, this strategy is very effective for helping them strengthen their math fact knowledge and speed.

How would 'making tens' help you with these questions?

7 + 4	27 + 4	109 + 3	109 + 8
18 + 5	78 + 5	19 + 3	119 + 3
6 + 5	26 + 5		
6 + 7	36 + 7		
8 + 5	88 + 5		
9 + 6	89 + 6		
8 + 7	88 + 7		
9 + 3	29 + 3		

Simplifying Subtraction

321 – 256



321 – 256

Can be simplified by thinking of using tens so it can be though of as counting down to 256 and keeping a record of the 'jumps.'

300 - 21 gets you to 300; 300 - 40 gets you to 260; 260 - 4 gets you to 256.

Try these:

60 – 27

369 – 227

Based on the principle that to subtract two numbers you can add or subtract the same amount to make it easier.

414 – 296 = 418 – 300 (added 4 to each side)

Try these:

391 – 295

261 – 192

Subtraction in Parts

414 – 302

414 – 300 – 2

114 – 2

112

Try these:

424 – 214

536 – 305

Times Tables

Below are some methods for strategizing the learning of the times tables. Often, without a strategy such as this, children are overwhelmed by the many facts they need to learn.

Zero and One Times Tables

The 0 and the 1 times table are usually very easy to learn for young children. One times anything is the same number. Zero times anything is zero. Young children can feel very positive about multiplication because of their confidence with these two sets of facts.

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

Multiplication Facts - 0, 1,

Two and Four Times Table

The 2 times table is often easy for children because they learn about doubles in Grade One. Because the 4 times table is the same as the 2 times table, it can readily become an easy fact if the 2 times relationship is pointed out to them. The 4 times table is just double the 2 times table. Example: if 2 X 3 is 6 then 4 X 3 is double the 6 which is 12.

Multiplication Facts - 0, 1, 2, 4

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

Three Times Table

3 times table strategy: use the 2 times table and then add one more of the same number. For example, to figure out 3 x 4, remember that 2 x 4 is 8 and add one more 4. See diagram.

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

Multiplication Facts - 0, 1, 2, 3

Five Times Tables

5 times tables are usually fairly easy to remember. Count by 5's.

Multiplication Facts - 0, 1, 2, 3, 4, 5

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

Six, Seven, Eight and Nine Times Facts Remaining

Once all the multiplication facts up to the 5 times tables are known, there are 16 multiplication facts left to learn. Memorizing the 9 times table can be done by using the 10 times table and subtracting one 9 (10 x 9 = 90 so 9 x 9 is the same as 10 x 9 - 9 = 81). Another way to self-correct the 9 times table is to remember that all of the multiplication fact answers add up to 9.

1 x 9 = 9

2 x 9 = 18 (1 + 8 = 9)

3 x 9 = 27 (2 + 7 = 9)

4 x 9 = 36 (3 + 6 = 9)

5 x 9 = 45 (4 + 5= 9)

6 x 9 = 54 (5 + 4 = 9)

7 x 9 = 63 (6 + 3 = 9)

8 x 9 = 72 (7 + 2 = 9)

9 x 9 = 81. (8 + 1 = 9)

Another useful strategy is to use your fingers as reference points. If you are multiplying by 2, fold down your second finger. The fingers on the left represent the tens. The fingers on the right represent the ones. In the example below, the folded finger represents 'times two'. The finger to the left represents one ten. The fingers to the right represent 8 ones. Try this with 3 x 9, 4 x 9, 5 x 9, 6 x 9, 7 x 9, 8 x 9, 9 x 9. Just fold the appropriate finger each time.

After mastering the 9x table, the only facts left to memorize are 6 x 6 = 36; 6 x 7 = 42; 6 x 8 = 48; 7 x 7 = 49; 7 x 8 = 56; 8 x 8 = 64. Help your child think of ways to use what they already know to help remember these facts (e.g., If I know 5 x 6 = 30 then 6 x 6 is 36). Alternatively, they could use rhyming or word play to memorize 6 x 8 and 6 x 6 (e.g., 6 x 8 is 48 and 6 x 6 is 36 both rhyme). This leaves 6 x 6, 6 x 7, 7 x 7 and 8 x 8 as the only facts that have to be memorized. Encourage your child to make up their own strategies for these last remaining math facts or simply try memorizing them since there are only four.

There is some debate about memorizing multiplication facts. However, having the facts memorized frees up memory to concentrate on problem-solving and reasoning without being held back by weak multiplication facts recall.

Box Multiplication

A strategy to help your child with double digit multiplication is to have them draw it out.

For instance, 21 x 33 could be calculated by splitting 21 into 20 + 1 and 33 into 30 + 3 and then multiplying as follows: **21 x 33**

	20	1
30	20 x 30 is 600	1 x 30 = 30
3	20 x 3 is 60	1 x 3 = 3

Add all the pieces: 600 + 60 + 30 + 3 = 693

Try this one on your own: **25 x 35**

	30	5
20		
5		

Simplifying to Make Multiplication Easier

Sometimes mental math is the easiest way to answer a multiplication question. If the numbers are too difficult to do mentally, see if they can be transformed into an easier question. For example in multiplication questions, the one number can be doubled as long as the other one is halved and the answer will still be correct. Sometimes this provides easier numbers to work with. Try these:

15 x 14 is the same as 30 x 7 or 210 . (The 15 was doubled and the 14 was halved.)

Simplify and mentally solve:

15 x 12

15 x 16

15 x 18

25 x 14 is the same as 50 x 7 or 350

25 x 16

25 x 18

25 x 32 is the same as 100 x 8 (Multiply 25 x 4; divide 32 by 4)

25 x 16

25 x 12

25 x 24

25 x 64

25 x 88

Simplifying to Make Division Easier

Sometimes doing mental math is the easiest and quickest way to answer a math question. For instance, instead of taking out a piece of paper to solve a question such as 126 ÷18, an alternative way of solving is to simply divide each number by 2 (126÷2 = 63 and 18 ÷ 2 = 9). The question becomes 63 ÷ 9 which is a simpler question to answer. The answer is 7.

For example: 100 ÷ 4 is the same as 50 ÷ 2 = 25

126 ÷ 14 is the same as 63 ÷ 7 = 9

96 ÷ 16 is the same as 48 ÷ 8 = 6

(Hint: If both sides can be evenly divided by the same number, do that to simplify the question and then solve.)

Simplify these and mentally solve:

108 ÷ 18 =

128 ÷ 16 =

112 ÷ 16 =

98 ÷ 14 =

Hundred Chart Hunting (All Ages)

Use the hundreds chart below. Play in pairs or groups. On their turn, players choose a secret number. The other participants have to guess the number by asking questions. They are allowed to ask ten questions each. For instance, if the player chooses 36 as the secret number and someone asks if it is a multiple of 6, he would say yes. If they ask it if is a multiple of 5, he would say no. Once they know it is a multiple of 6, they may ask whether there is a 2 or an 8 in the answer (so the possibilities would be 12, 24, 42, 48, 72, 78. If the answer is no, a participant might ask if there is a 6 in the number (so the possibilities would be 6, 36, 60, 66, 96).

It is easier to play if the children have access to a hundreds chart so they can put markers on the numbers that are not the secret number as they ask their questions.

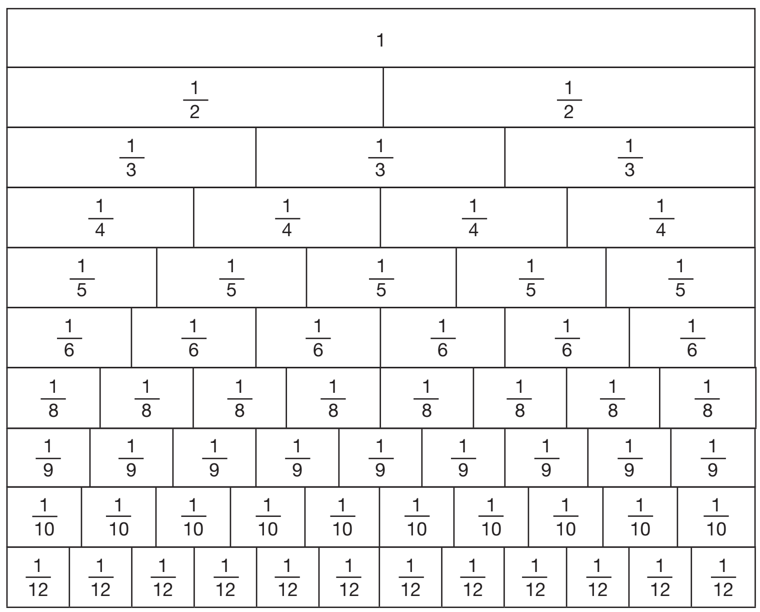
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Fraction Action (All Ages)

Play in groups of two or four.

Roll two dice. The one with the higher number will become the denominator. The one with the smaller number will be the numerator. For instance, if you roll a 4 and a 2, your denominator will be 4 and your numerator will be 2 so the fraction would be 2/4. The fraction grid below will help you.

Write down your fraction. The winner is the one with the bigger fraction (e.g., 1/2 is bigger than 1/3, 2/6 is equal to 1/3, etc.) Draw your fraction to help you determine which is bigger. You may have to find equivalent fractions. Keep a record of each round.



Fraction Grid

Last Words

Encouragement and participation in mathematics at home will nurture your child's belief in their ability to do math. This book offers some ideas, but they are just a starting point. Make your home a haven for natural interactions with the mathematics permeating everyday activities. Cooking, building, sports, sewing, stories, and songs provide outlets for embedding an understanding of how math works, just to name a few. Cultivate a culture of mathematical thinking in your home. Discuss the effects of mathematical decisions such as percentage rises in the cost of living, distances and the cost of gas, lengths and widths of materials used for building, etc. These natural outlets for reasoning with numbers and problem-solving will extend and enhance your child's understanding of mathematical ideas. Children are not limited to what they can do once they have a solid mathematical foundation. Mathematics success opens up a world of possibilities for lifelong opportunities. Home-based math opportunities can help nourish the confidence and competence that will serve children well in the classroom and beyond. Experiences such as the ones shared in this book will extend and enhance children's mathematical understanding.

Math Resources

Many mathematics activities are available online. As a parent, however, it is important to realize that the computer can become an isolating and static learning environment. Join your child on these sites. Make it an interactive experience. A parent's guidance and mutual interest will go a long way to making the activity on the computer a rich and rewarding learning experience. Some effective sites are listed below.

Arcademics — Math in an arcade format: www.arcademics.com

Canada Science and Technology Museum (CSTM) — Kids' Zone: Activities, articles and interactive features like the Inventions Gallery, where kids can submit their own inventions to be showcased online. www.ingeniumcanada.org/scitech/index.php

Canada 2067 — Math resources for K-12: www.canada2067.ca/en/articles/the-top-online-math-resources-for-k-12/

David Suzuki Foundation — Activities that can be combined with math engagement: www.davidsuzuki.org/take-action/act-at-home/

Dear Teacher — Math picture books: www.dearteacher.com/math-books

Ecokids — Canada's interactive environmental web site for students of all ages: www.ecokids.ca/take-action

Edugains — multiple e-learning opportunities: www.edugains.ca/newsite/math/homesupport.html

e-Learning Ontario — e-Learning Ontario is developing an e-learning strategy to provide all students in the province with access to high-quality courses and resources through emerging information and communication technologies. Eworkshop Learning Modules and videos: www.eworkshop.on.ca/edu/core.cfm?p=modView.cfm&L=1&modID=9&c=0&navID=mod

Kamii, Constance — Math games: www.sites.google.com/site/constancekamii/materials-for-the-classroom

Khan Academy — Free online courses, lessons and practice. Expert created, for every course and level: www.khanacademy.org/

Homeschooling math resources: www.homeschoolingwithdyslexia.com/100-best-resources-struggle-math/

Martin Gardner — Well-known math writer who also designs math games: www.en.wikipedia.org/wiki/List_of_Martin_Gardner_Mathematical_Games_columns

Math Songs: www.mathstory.com/mathsongs/mathsongs.htm#earlylearners

Mathmagic (Did you know that many tricks performed by magicians and illusionists are based on mathematical principles?): www.ingeniumcanada.org/scitech/education/try-this-out.php
National Museum of Mathematics: www.gothamjoe.com/momath

NCTM Illuminations Project — an interactive tool for learning mathematics: www.illuminations.nctm.org/

NCTM games: www.nctm.org/Classroom-Resources/Illuminations/.../The-Game-of-SKUNK/

Prodigy (Game and education content): www.prodigygame.com

Roman Numeral Memory Game: www.ingeniumcanada.org/scitech/index.php

Science Tricks Shopping List, CSTM: www.cstmuseum.techno-science.ca/en/education/try-this-out-incredible-science-tricks-shopping-list.php

Songs for Math: www.theimagen.eu/math-song-lyrics.html

The Canadian Atlas Online — State-of-the-art interactive atlas from The Royal Canadian Geographical Society: www.canadiangeographic.ca/atlas/

TVOKids — A range of educational projects, activities grouped by topic and age level: www.teachontario.ca/community/explore/parents-as-partners/

TVOKids Math City: www.tvokids.com/shows/mathcity

TVOKids Math Master: www.tvokids.com/school-age/search/math

What Do We Do All Day? Math Picture books, blog with ideas for math books for kids: www.whatdowedoallday.com/2015/02/math-picture-books.html

Zapzapmath: www.zapzapmath.com

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