PARENT PACKAGE

This package contains ideas for parents which they can do with their children. These ideas are based on the fact that the earlier we expose children to the mathematics out there in the real world, and the more often we do so, the easier it will be for them to make connections and understand the meaning behind what they do with numbers.

Parents (grandparents etc) do not have to be experts in mathematics in order to provide an opportunity for their children to play with mathematics at an early age. They just have to take the time to do so. Many of the ideas suggested will be familiar to parents already -- they are only reminders. Many of the ideas can be added to.

--Math is Everywhere
--A Dozen Things to Do
--Using Cards
-- Fun and Games
--Math and Money
--Letters of the Alphabet

MATH is EVERYWHERE

The opportunity to do "math" with your children is everywhere. I would just like to share a few locations with you where you can get them doing "math" and have fun at the same time.

AT THE BEACH

When you are walking along the beach, have them collect rocks, shells, and whatever else they can find. Have a bucket with you. When the opportunity arises, have them sort the objects into different categories depending on what they have collected and on their age. Have them count them; decide which they have more of etc. They could glue them onto a sheet of cardboard and make a collage. Lots of possibilities at the beach. If you are looking at live specimens, make sure they leave them behind, but they can still count them; they love to count crabs....

WHILE GROCERY SHOPPING

They can count the cans on a shelf; the number of apples in the bottom row of a pile of apples; in the next row etc. Have them count the items as they go in the cart. If they are sitting in the cart, have them arrange them from biggest to smallest; from heaviest to lightest. If they are a bit older, have them read the prices under each item and decide which is cheaper etc. Have them estimate how many items in your cart when you get to the checkout counter. Have them count the change you get back if your store has the machine that gives out the coins.

IN A RESTAURANT

If the restaurant has sugar packages, have them count them. Have them pick out the number of napkins, straws, salt, etc you need. Have them count the number of knives, forks,spoons etc. on the table. Does each place setting have the same arrangement? Have them pick out the most expensive (least expensive) item on the menu (in each section) Have them count the number of people in the restaurant; are there more women or men?; How many waitresses are there? Have them count things on the wall; etc. Lots to do in a restaurant....

AT THE LIBRARY

When you take your child to the library, have them count the

number of books on a shelf; give them a certain number they can bring home; count the number of other children there; how many chairs are there which are their size?

IN THE CAR

While children are sitting in their car seat, and asking you "when are we going to get there?" have them count the number of buses they see; the number of dump trucks they see; the number of red cars they see; etc. They can count the number of red lights you hit.

GOING FOR A WALK (and NOT in a hurry)

Have the children count the number of flowers they see; how many yellow etc; Have them count the number of cracks they can step on (if on a sidewalk). How many cars pass them by; How many bikes; How many telephone poles.

GOING TO THE PARK

At Beacon Hill Park, have them count the number of ducks they see; sort out the different kind of ducks; the number of flowers. On the stones which are engraved, have them pick out all the letter As and count them etc., --my children loved this one. They would trace them with their fingers and therefore learn their alphabet as well-- math and literacy do go together!

At any park, have them count the steps as they climb the slide; count the number of times you push them on the swing.

These are just a few of the ideas you can use. I have tried to pick the activities that most of us do in our daily routine with children. Make the most of the time you spend with your children -- get involved with what they are doing in situations where they are having fun and they will then associate math with having fun.

If you have any other ideas please email them to me at wswonnell@shaw.ca.

A Dozen Things You Can do with your youngster to ensure success in mathematics

This article appeared in the Times Colonist on Sept. 3, 2003. It was written by Steve Sparling, a teacher Campbell River.

Here are a dozen things that parents of young children even pre-schoolers can do to ensure success in mathematics by instilling early habits of mathematical thinking, strengthening brain pathways and fostering a positive attitude toward mathematics.

1. Use numbers. Never miss an opportunity to measure together, cut the cake together, cut the brownies in the pan together, and decide what portions to serve at the dinner table. That way your child will gain a strong intuitive number sense.

Ask, with interest, your young scholar's opinion on a number of topics: "on a scale of 0 to 10, zero being you hate with a passion and ten meaning you would crawl over broken glass for it, what do you think of chocolate? Broccoli? Playing at the wave pool?" Evaluate the numbers. "You gave a nine for the wave pool and ten for chocolate. Does that mean you would rather stay home and eat chocolate? Care to change your numbers?" When my second child, David, perfected this scale we called it the "Crunch scale". When we extended it to earthquakes and storms he wondered why Richter and Beaufort copied our Crunch scale.

2. If you do nothing else; count with your child. Numbers are the building block of mathematics and the sooner the concept of number is firmly planted in the young child's brain the more directions that brain can take. Make a game of it and when it gets boring - change the game. Educator Rick Garlikov proposes the bag game: "I have a bag and you have a bag, my bag has three less things in it than your bag; and you have five things in your bag. How many things do I have in mine?"

3. Group numbers. Try having three raisins form a triangle and see if your precocious youngster can identify that there are three without counting them. Be patient. It may take many tries before the concept that "a triangle is three" sinks in. These groupings are a form of multiplication and division (don't use these words as it spoils the game). When the idea is new use something that can, and will be eaten

right then; later, for variety change the counters to buttons, pennies or whatever interests both of you. Then, at the intermediate level, you can work with fractions using these same methods.

4. Work with remainders. Once groupings of two and three are easily recognised put twelve pennies on the table and, after counting together, ask, "How many groups of three are there in these?" At this point resist the temptation to demonstrate. Part of the fun and, incidentally, learning is for the young ones to figure it out. At one point we had all three children at the table working with problems involving popcorn: one counting, one grouping, and one looking at remainders. If today is not the right day then find a diversion and try another day. After groups of three try groups of four and pairs. Try groups of three and groups of five with fifteen. Don't move too fast, but when the time is right, place fifteen pennies down and ask for groups of four. Ask the counter what is happening and use that terminology for this game: is it three left over or is it one short? Now you have a new game and new concepts to explore.

5. Explore place value. Once a youngster learns to write numbers, a skill usually acquired between ages 3 and 6 according to the wellloved primary teacher of my three children, some kind of game to highlight place value is in order. "Make sure you do it in a playful way" she goes on to say. We lived on a hobby farm so we played the game of sheep math and chicken math – great excuse for a trip to the zoo! After pointing out that we count to nine with our fingers then write ten with a one followed by a zero to indicate one full hand (both hands) and 20 indicates two full hands so 24 means two hands and four .

6. Process is important. Ask, "How did you get that answer?" or " can you tell me how you did that?" This addresses two very important aspects of mathematical training: communication and process. Sometimes a mathematician doesn't know where the solution comes from but sooner or later the idea must be shared. Critical thinking Researcher Stanley Pogrow calls the process "controlled floundering"-- "floundering" because students must feel their way (along a line of reasoning, for example), but "controlled" because teachers stay with them and assist them to work through the steps of their tasks . As long as you are not looking for the right answer but are genuinely

interested in what is going on in your child's's brain these questions are an excellent way for you to invent the next mathematical game.
7. Give them problems they can't do. Through careful timing you can ask questions that your youngster doesn't know how to do but has the tools to get there. After taking a dozen beer bottles to the store my son was fascinated with the idea of getting sixty cents for a dozen empty bottles so, taking advantage of this new fascination, I asked him how much I got per bottle without giving him any idea how to solve the problem. For you and me this is a simple division problem but for a youngster it is a very complex problem involving counting out sixty pennies and grouping them in groups of twelve. The division part actually is not that important for a primary age child.
8. Speaking of games: play with them. Almost every activity is an opportunity to ask an innocent yet mathematical question. One of our children's favourite family activity was the wiener roast at the park. All sorts of mathematical problems present themselves on an outing like this: how to pack, how big to make the fire, what route to take (how many different routes are there from our house to the park?). At one of these roasts I asked, innocently, while pointing at the packages "did you notice that the wieners come in packages of ten and the buns come in packages of a dozen? How many of each do you suppose we need to buy so there isn't an excess of either wieners or buns?" Wow! When you ask a problem like that don't solve it for them. Give them time and if they don't get it drop it and bring it up at the next wiener roast.
9. Explore shape. A substantial part of mathematical thinking involves shape. Will the water from the tall skinny glass fill the short fat glass? As soon as they can crawl leave a cupboard unlocked so they can explore the shape of the pots and pans. Let your three year old decide on the arrangement of the living room for a week! Get a globe of the world and talk about the different countries. Before they can read they must recognize the countries geometrically. Nobel Physicist Richard Feynman's father used to do colour tile patterns with him when Richard was still in a high chair. There are special sewing classes that six year olds can take – a great opportunity to learn some geometry.

10. Extend the concepts of shape to three-dimensional problem solving. Remember to a young person (and even some adults) three dimensions are as difficult to comprehend as four and five dimensions are to a physicist. Even a very young child can offer suggestions on how to build a playhouse with you helping with the building. Your youngster may not have the manual dexterity to build a fort out of cardboard in the basement but could probably direct you in what to do. The question is "can you follow those directions even though you would build it differently?" When it falls down you both have an opportunity to try to figure out how to fix it.
11. Language is a big part of mathematics. Talk with your children. Ask them questions involving 'all', 'some', and 'none' as well as using connectives like 'and' and 'or'. Get them to ask you questions. "If all gumbies are klutzes and John is a klutz does that mean he is a gumbie?". I knew I was successful in teaching my youngest, Matt, these principles when we were at dinner at the neighbours and he said "I am getting full" so I took his plate but when he proceeded to take a large portion of dessert I confronted him with "I thought you were full – no dessert for you". He replied "I said I was getting full - I didn't say I was full". When the neighbour's daughter tried the same thing she found out that her dad didn't share my pedagogical philosophy! Nothing like being well versed in predicate logic.
12. Enrol your child in music. Rauche's famous experiment, published in 1997, showed that pre-schoolers with 6 months of piano lessons scored 27% higher than other students in a standard mathematics examination. Early music programs like Orf are available in most communities. This connection is corroborated by recent brain research revealing that music develops the area of the brain used to solve mathematical problems.
Finally, have fun with your future scholar. Don't take any of the above seriously as it is, hopefully, all fun. If you don't get a response to a question then you asked it too soon. Change the subject and do something you both can do. Your young Einstein will not be kept out of college because he or she hated music classes. There are plenty of opportunities for early development. The key is to have fun with all of this— the having fun part is the best teacher.

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FUN and GAMES

TO REVIEW THE BASIC OPERATIONS
DIRECTIONS (for following page)
Make up pieces of paper with the digits 0 through 9 on them (or use cards from a deck). Place them in a box, or whatever, and draw one out at a time. DO NOT put it back in the box.
As you draw out each one, your child places it in one ot the boxes. Once it is placed it cannot be changed. The idea is, for the first one, to create a 3 digit number plus a two digit number which add up as close to 500 as possible.
For younger children you can do a two digit number plus a two digit number closest to 100, say.
Once they have done that, then have them look at it and, now that they know the digits they have to work with, see if they can rearrange the digits to get a better answer.

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FUN and GAMES

NAME: _____

1. **Closest to 500**:

□□ □ + □□ = _____

Best: ____ ____ ____ + ____ ____ = _____

□□□ - □□ = _____

Best: ____ ____ ____ - ____ ____ = _____

□□□□ ÷ □ = _____

Best: ____ ____ ____ ____ ÷ ____ = _____

□□ x □ = _____

Best: ____ ____ x ____ = _____

2. **Largest answer:**

□□□ x □ □ = _____

Best: ____ ____ ____ x ____ ____ = _____

(□□ + □□) x □ + □□ = _____

Best: (____ ____ + ____ ____) x ____ + ____ ____ = _____

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MONEY

Using money is important for early years.

SHOPPING:
When you go shopping let them push their own buggy (for stores which have those child size buggies) Let them pick out the item you need and show them what it costs. Practice having them say how much. Get them to see that $1 is 100 cents.
As they get older let them estimate what each item costs and see if they can figure out about how much the total will be. I STILL love doing this when I go shopping and try to get within a couple of dollars.

USING COINS
At home, have them save pennies, nickels, dimes in a jar and periodically, take them out and have them sort them and count them etc. Have them put them in groups of ten. Have them replace one group of 10 pennies with a dime; or two nickels. Put out items like a pencil, a crayon, a book, etc and put a price on it (using pieces of paper) and have them pick out (from all the coins in a "bank") how much they need to pay for it. (eg if 24 cents they may pick 24 pennies, or 2 dimes and 4 pennies etc). Give them a quarter and ask how much change they would get back. Or from a $1. Use fake money if you have some -- use money cards -- get from dollar store.
DAY of the MONTH
Take the day of the month, say the 10th of November, and have your child make up math sentences which result in 10 as the answer. For example: 2+8 = 10 or 1+ 2 + 3 + 4 = 10 or 2x3 + 2x2 = 10. they will get really good at this.
There are many ideas you can get from the computer. Type in Math Activities and look at some of those.
A few sites are: http://www.k111.k12.il.us/king/math.htm
http://www.aaamath.com
http://www.syvum.com/online/math.htl
http://www.funbrain.com/math
http://www.coolmath4kids.com

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PRACTICE using CARDS

There are many ways you can use cards to practice doing mathematics in a fun way.

GAME #1 (see following page)

For younger kids, just use the cards as all positive numbers and the highest card takes the two. As they get older have them say how much bigger they are than the other.

When they get into integers, then red is negative and black is positive and they see right away that a black is always bigger than a red and, to get how much bigger, they are actually doing subtracting a negative which results in actually adding a positive; two blacks are easy and you just subtract to see how much bigger; BUT two red are difficult--it actually works out that the smaller red is actually bigger because you are less in debt.

GAME #2 (see following page)

We use 10 because that is an important number for kids to start working with.

When they get into integers, they see that two reds always add up to a red; two blacks always add up to a black, and with a black and red, it depends.

GAME #3 (see following page)

When they get into integers, they see that a black times a black is always black; a red times a red is always black; and a black times a red is always red.

SORTING or GROUPING

Using just the face cards, have younger kids sort them into different groups. It doesn't matter how they group them.

In one deck there are 12 face cards. Have them group the queens, kings and jacks together. How many in each group?

Have them group the hearts together; spades together etc. How many in each group?

Using the rest of the deck. Have them group the aces together, twos together etc. How many in each group? Have them group all the hearts together etc. How many in each group?

ADDITION

Using a deck, find two cards which add up to 7. (say a 6 and an ace) Find two other cards which also add up to 7. (a 5 and a 2) Keep going. Have you found them all? Similarly find two cards which add up to 10? find two others etc.

Extension: Find three cards that add up to 10 .....

YOU CAN ADD TO THIS LIST.....

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GAME #1
INTEGERS
(RED CARDS ARE NEGATIVE NUMBERS; BLACK CARDS ARE POSITIVE NUMBERS -- use this for kids in grades 8-9)
For younger kids, just use face value of cards.
1. DIVIDE A DECK OF CARDS (having removed the Jacks, Queens and Kings) between you and your child.
2. YOU AND YOUR CHILD EACH TURN OVER A CARD AT THE SAME TIME.
3. THE HIGHER CARD WINS AND WINNER TAKES BOTH CARDS.
4. GAME CONTINUES UNTIL ONE OF YOU HAS ALL THE CARDS or, YOU DECIDE TO STOP.
5. IF A TIE (BOTH CARDS OF EQUAL VALUE) , BOTH CARDS STAY, AND THE WINNER OF THE NEXT PAIR TAKES ALL THE CARDS.

GAME #2
INTEGERS
Decide who is going to be MR. (Ms.) Positive and who is going to be MR. (Ms) Negative. Red is negative, black is positive.
For younger children, it doesn't matter if they are red or black.
One of you is Over Ten and the other is Under Ten. Add them together and if the sum is more than 10, Mr. Over Ten gets the cards; If the sum is under ten, then Mr. Under Ten gets the cards. If the sum is exactly 10, they stay there and the next two cards decide the winner.
1. DEAL OUT THE CARDS TO YOU AND YOUR CHILD (after removing the Jacks, Queens and Kings).
2. YOU AND YOUR CHILD EACH TURN OVER A CARD AT THE SAME TIME.
3. ADD THE TWO CARDS TOGETHER. IF THE SUM IS POSITIVE, MR. POSITIVE TAKES THE CARDS. IF THE SUM IS NEGATIVE, MR. NEGATIVE TAKES THE CARDS. (see above for younger kids)
4. GAME CONTINUES UNTIL ONE OF YOU HAS ALL THE CARDS.
5. IF SUM IS ZERO (CARDS ARE OPPOSITES OF EACH OTHER) , BOTH CARDS STAY, AND THE WINNER OF THE NEXT PAIR TAKES ALL THE CARDS. (for younger kids, if the sum is 10)

GAME #3

INTEGERS
DECIDE WHO WILL BE MR. (MS.) POSITIVE and WHO WILL BE MR. (MS.) NEGATIVE
For younger children, ignore positives and negatives. Multiply the two numbers together. If product is even, Ms. Even gets them. If the product is odd, Ms. Odd gets them)
1. DEAL THE CARDS TO YOU AND YOUR CHILD. (after removing the Jacks, Queens and Kings)
2. YOU AND YOUR CHILD EACH TURN OVER A CARD AT THE SAME TIME.
3. MULTIPLY THE TWO CARDS TOGETHER. IF THE PRODUCT IS POSITIVE, MR. POSITIVE TAKES THE CARDS. IF THE PRODUCT IS NEGATIVE, MR. NEGATIVE TAKES THE CARDS. (for younger kids, see above)
4. GAME CONTINUES UNTIL ONE OF YOU HAS ALL THE CARDS or UNTIL YOU WISH TO STOP.

WHAT AM I WORTH?
PART ONE

SUPPOSE:

A = 1
B = 2
C = 3
D = 4
E = 5
F = 6
G = 7
H = 8
I = 9
J = 10

K = 11
L = 12
M = 13
N = 14
O = 15
P = 16
Q = 17
R = 18
S = 19
T = 20
U = 21
V = 22
W = 23
X = 24
Y = 25
Z = 26

1. FOR LITTLE KIDS, use A - J only and have them find the value of the following words:
   (a) C A B = _____
   (b) H A D = _____ etc
   (c) B I G = _____

2. FOR OLDER KIDS, use all the letters and have them find :
   (a)The value of their first name: _____
   (b)The value of the first names of others in their family.

   (c) Who has the highest value? _____
   (d) What is that value? _____
   (e) Who has the lowest value? _____
   (f) What is that value? _____

3 (a) Make up a word worth 50 points. _____
   eg CAT is worth 24 points
   Try and find the longest word you can worth 50 points

   (b) Make up words worth 100 points.

   (c) Make up words worth the same as Mathematics.

6. Try and find a word with the largest value you can.
7. Try and find the shortest word with the highest value.
8. Try and find the longest word with the smallest value.
9. Make up your own rules.....

WHAT AM I WORTH?
PART TWO

SUPPOSE:

A = -12
B = -11
C = -10
D = -9
E = -8
F = -7
G = -6
H = -5
I = -4
J = -3
K = -2
L = -1
M = 0
N = 1
O = 2
P = 3
Q = 4
R = 5
S = 6
T = 7
U = 8
V = 9
W = 10
X = 11
Y = 12
Z = 13

1. Print your FIRST NAME on the spaces provided (use as many spaces as you need)

____ ____ ____ ____ ____ ____ ____ ____ ____

2. Place the value of each Letter below it.
3. Add up the value of your name. _____
4. Find the value of the first name of others in your family.
   Who has the highest value? _____
   What is that value? _____
   Who has the lowest value? _____
   What is that value? _____

5 (a) Make up a word worth (-8) points. _____
   eg CAT is worth (-15)
   Try and find the longest word you can worth (-8)

   (b) Make up words worth 0 points.

   (c) Make up words worth the same as Mathematics.

6. Try and find a word with the largest value you can.
7. Try and find the shortest word with the highest value.
8. Try and find the longest word with the smallest value.
9. Make up your own rules.....

LINE MASTER 4.1

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LINE MASTER 4.1

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LINE MASTER 5a.1

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LINE MASTER 5a.1

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