

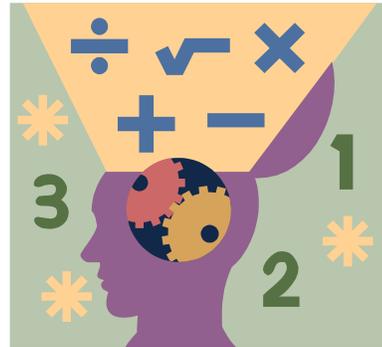
# Math Matters!



## Kindergarten Summer Math Fun

Colonial School District

June



Dear Parents/Guardians,

First, we would like to thank you for all of the additional support you offer at home. Education is a true partnership between school and family that is essential to a child's success.

As this school year comes to a close, we wanted to again encourage you to continue to reinforce and foster the mathematical skills and practices that have been developed this year by scheduling time for your child to work through this summer math packet. The activities were selected by our grade level experts with the key mathematical concepts of the school year in mind. The ultimate goal is to reinforce and strengthen the skills that will serve as building blocks for future learning. Also, remember that your child's **DreamBox Learning account remains active over the summer months.** This is another resource that will help your child continue to progress during the summer months. In addition to these resources, there are a wealth of others on our district website.

Wishing you a relaxing, yet exciting, math-filled summer!

Sincerely,

The Curriculum Department

# A Month of Math

K going to 1<sup>st</sup>

<i>Sunday</i>	<i>Monday</i>	<i>Tuesday</i>	<i>Wednesday</i>	<i>Thursday</i>	<i>Friday</i>	<i>Saturday</i>
	Line up your family members from youngest to oldest. Who is first? Who is last?	Get a spoon. Find things around the house that are longer or shorter than the spoon.	Draw a picture using only triangles and circles.	Play "Simon Says" with your family. Use words like over, under, behind, beside, between.	<b>Math Game Night!</b> <b>Play a game with your family.</b>	
	Mary has 6 balls. Jack gives her 2 more. How many balls does she have now?	Line up your toy cars/dolls. Which is fourth? Sixth? Last?	Draw a shape pattern. Have someone guess the pattern and draw the next two shapes	Are there 6 Fridays in July? Yes or No? How do you know?	Make a number collage. Use old newspapers or magazines to find lots of numbers.	
	Measure the kitchen counter with your hands. How many hands long is your kitchen counter?	How many things did you eat today that are shaped like a square? Draw a picture.	Ask someone for a handful of pennies. Count them. How much money is there?	Pick 5 of your toys. Put them in order from smallest to largest.	<b>Math Game Night!</b> <b>Play a game with your family.</b>	
	Sort cans of food. Have someone guess your sorting rule.	Tell someone what you did yesterday.	Grab a handful of cereal. How many pieces do you think you can hold? Count them.	Look in a magazine. What shapes can you find?	Look at family pictures. How many eyes do you see in each picture?	
	Start at 10 and count as high as you can. Write the last number you counted.	Draw a picture of 14 flowers. Add 4 more to the picture. How many are there?	Draw a picture of 10 birds. Then show 2 flying away. Show how many are left.	Pick 8 of your toys. Put them in order from largest to smallest.	<b>Math Game Night!</b> <b>Play a game with your family.</b>	





# Ideas for Math at Home

Math is all around us...we encounter it everyday as we go about our lives. Here are some opportunities for you to use these encounters to help your child explore math this summer.

## Good Clean Fun!

Have your child help sort the laundry to be washed. Explore all the ways it can be sorted. Practice counting out loud while sorting...how many shirts are in the load of laundry?



## Rainy Day Math

Place a variety of small items in a container for your child to sort into piles: keys, buttons, etc. Ask how they are alike and how they are different. Extend the activity by using the items to solve math problems: i.e. if you have 3 big buttons and three small ones, how many buttons do you have altogether?

## More or Less

Divide a deck of playing cards into two even stacks. You and your child turn over one card at a time and compare: is mine more or less? How many more? How many less? With older children, each of you draw two cards at a time and add them together before you compare.



## Let Me Count the Ways...

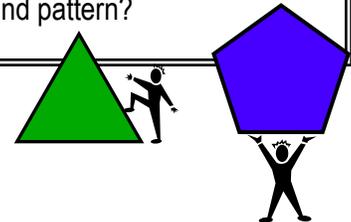
Visit a restaurant. Identify the toppings for burgers (or pizza!). Ask your child to think about all the ways you can order a burger with three different toppings from the list. Ask him to share some strategies for solving the problem.

## Scavenger Hunts

**Numbers:** Look everywhere and talk about the numbers you find. Numbers on the wall, in the closet, on signs, in the car, on shelves.

**Shapes:** Look for shapes in the refrigerator, on TV, on doors, on shelves, on streets...what shape did you find the most?

**Patterns:** Look for patterns on floors, wallpaper, on ceilings, on clothing, on wrapping paper, in nature... can you describe the pattern? Can you make your own sound pattern?



## Grocery Math

Make a game out of putting away groceries. As you empty the bags, group the items according to some common feature. You might, for example, put together all the items that go into the refrigerator or all the canned goods. Play "Guess My Rule" – your child has to guess what rule you used for grouping the groceries.



## Number Search

Create a chart that lists the numbers from 1 to 50. Write down each number as your child locates that number on a car license plate, a sign, a building or other objects in your community. Include "number words" that you see such as "one-stop shopping," "two-day service," "buy one, get one free," or "open seven days a week."

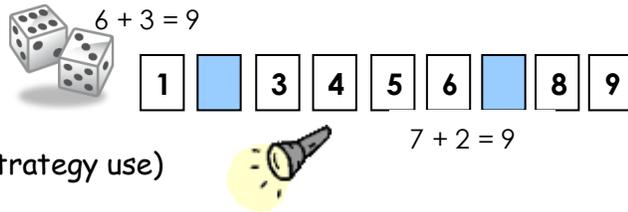
# Math Games

Learning and Family Fun all in One!

## Some Sums (2 players)

**Materials:** Dice and Number Cards (1 - 9)

**Focus:** Grades 1, 2, and 3 (Addition and strategy use)



Here's a fun way to help your child become fluent with basic addition facts and strategies for figuring out different sums that make up the same number. Encourage your child to share the strategy he/she used to find the sums as you play.

- Lay out the nine number cards (1 - 9) **face up** in a row. Player 1 rolls two dice and **add them together** to find the sum. In the row of cards, find a combination of two or more cards whose sum is the same as the sum of the dice; Turn these cards **face-down**.
- Player 1's turn continues until there are no more cards left in the row to make the sum of the number rolled. Player 1 adds up the total of the cards remaining in the row; this is his score for the round. (Be sure to explain the strategy used!)
- It is then Player 2's turn to do the same.
- For each round the goal is to be the player with the lowest score.

## Two-Fisted Pennies Game (2 or more players)

**Materials:** 10 - 20 pennies for each player (or other counters)

**Focus:** Grades K and 1 (number combinations / math facts)

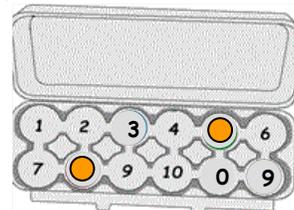


Players count out 10 pennies, and then split them between their two hands. (help identify right and left). "My left hand has 1 and my right hand has 9; left hand 3 and right hand 7; left hand 4 and right hand 6; and so on. Record the various splits for any given number on chalkboard. i.e.  $3 + 7 = 10$  Continue to play using different total numbers of pennies (9, 12, 20)

**Variation:** (*mostly appropriate for gr 1*) Players take turns grabbing one part of a pile of pennies (up to 20). The other partner takes the remainder of the pile. Both players count their pennies, *secretly*. The partner making the grab uses the count to say how many pennies must be in the partner's hand. ("I have 12, so you must have 8".) Change the number of pennies in the pile to practice facts for other numbers.

## Break the Eggs!

**Materials:** Styrofoam egg carton (no holes); 2 beans, marbles or similar small object  
Recording Sheet



**Focus:** Grades 1 and 2 (Addition facts)  
Grade 3 (Addition, Multiplication facts)

Write the numbers 0 through 10 in the bottom of the cups of the egg carton (use the number 9 twice). Place the 2 marbles in the egg carton. Close the lid and shake the carton; Open the lid and add (or multiply) the two numbers in which the marbles have landed.

A terrific way to practice math facts without flash cards!

## Race Me (2 players)

**Materials:** Deck of Playing Cards *with face cards removed*

**Focus:** Grades 1 and 2 (Addition, Subtraction and strategy use)

Grade 3 (Addition, Subtraction, Multiplication, and strategy use)

$$9 + 1 = 10$$



$$9 \times 1 = 9$$

$$9 - 1 = 9$$

Deal out the cards so that each player has the same number. Decide which operation you will use for the game (*addition, subtraction or multiplication.*) Both players *quickly* turn over their top card and place it on the table. When the two cards are down, see who can add, subtract or multiply (*grade 3 only*) the two cards first. Whoever says the correct answer first keeps the cards. At the end of the game the players count their pairs of cards.

This is an excellent time to discuss which number is greater or less and how you know. Questions involving **even** and **odd numbers**, **ten more** or **ten less** (substitute 20 or 30) using the total number of cards will get players discussing numbers and strategies.

- **Example:** Lets say I have 7 pairs, is 7 even or odd and how do you know? If I add ten or twenty to my 7 what number am I at? Prove that to me. You could ask questions involving total number of cards which would be 14 and ask the same type of questions. Ask how far from 100 and discuss your strategies for solving. Keep the game about the learning and discourage winning or losing.

Encourage your child to use addition, subtraction, or multiplication strategies. **NO FINGERS!** Fingers prevent the brain from thinking logically unless they are used to keep track of tens. Your goal is to support your child in learning strategies that are used mentally. Counting on fingers is not a mental strategy and it will not help them gain computational fluency.

**Parents:** You may need to prompt your child.

- Try saying something like this: "What strategy could you use to help you?" "Could you use make 10, doubles, doubles + one and so on?"

## Salute! (3 players)

**Materials:** Playing Cards, no jokers (Ace = 1, face cards = 10)

**Focus:** Grades 1 and 2 (Addition, Subtraction and strategy use)   
Grade 3 (Addition, Subtraction, Multiplication, and strategy use)

- The game is played with 2 Players and a Dealer. The Dealer deals the entire deck of cards out to the Players.
- The Players count, "1, 2, 3, Salute!" As they say, "Salute!" they bring the first card in their piles to their foreheads, **without looking at it**, in a kind of salute.
- Next, the two Players look at one another's foreheads as the Dealer adds or subtracts the numbers. The Dealer says, "The sum is \_\_\_\_" or "The difference is \_\_\_\_". (This is great for vocabulary development.)
- Then, the two Players try to be the first to guess their own number by adding, subtracting, or multiplying (*gr 3 only*) the other player's number from/to the sum, difference, or product. If they do it correctly, they take the other Player's card and the process repeats.
- After all cards have been played, the Player with the most cards becomes the Dealer.

Encourage your child to use addition, subtraction, or multiplication strategies. **NO FINGERS!** Fingers prevent the brain from thinking logically unless they are used to keep track of tens. Your goal is to support your child in learning strategies that are used mentally. Counting on fingers is not a mental strategy and it will not help them gain computational fluency.

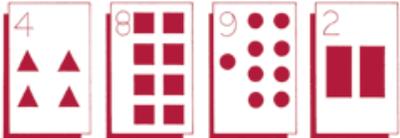
## How Many Numbers Can We Make?

**Materials:** Number cards, pencil, and paper 

**Focus:** Computation Grades 1, 2, and 3 -- can vary depending on skill level of child. Child should not be frustrated. (*gr 1 and 2 would normally focus on using addition and subtraction only*).

Give each player a piece of paper and a pencil. Using the cards from 1 to 9, deal four cards out with the numbers showing. Using all four cards and a choice of any combination of addition, subtraction, multiplication, and division, have each player see how many different numbers a person can get in 5 minutes. Players must write down the equations used for each number.

Players get one point for each answer. For example, suppose the cards drawn are 4, 8, 9, and 2. What numbers can be made?


$$4 + 8 + 9 + 2 = 23 \quad 4 + 9 - (8 + 2) = 3$$
$$(9 - 8) \times (4 - 2) = 2 \quad \text{or} \quad (8 - 4) \times (9 - 2) = 28$$

## Make the most of it (2 or more players)

**Materials:** Number cards, pencil, and paper

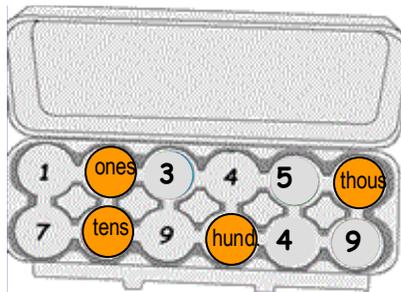


**Focus:** Place value; Comparing numbers

Grades 1, 2, and 3 -- can vary depending on skill level of child. Child should not be frustrated. (typically, for a gr 1 student create 2 or 3-digit numbers; gr 2 create 3 or 4-digit numbers; gr 3 create 3, 4 or 5-digit numbers)

This game is played with cards from 1 to 9. Each player alternates drawing one card at a time, trying to create the largest 4-digit number possible (size of number varies for each child, see above). As the cards are drawn, each player puts the cards down in their "place" (thousands, hundreds, tens, ones) with the numbers showing. Once placed, a card cannot be moved. The player with the largest 4-digit number wins. For example, if a 2 was drawn first, the player might place it in the ones' place, but if the number had been an 8, it might have been put in the thousands' place.

## Number Egg-stravaganza!



**Materials:** Styrofoam egg carton  
piece of card stock or construction paper (can also use 4 "bingo" chips)

**Focus:** Place Value, creating numbers

Grades K - 3 \*\* level of play varies based on skill level of child



- Write the numbers **0 through 9** in the bottom of the cups of the egg carton (you will need to write 2 numbers twice in order to fill the cups).
- Cut out 4 one-inch circles from a piece of card stock. Write "ones" on one of the circles, "tens" on another, "hundreds" on the third, and "thousands" on the last. \*\*
- Place the circles in the egg carton. Close the lid and shake the carton; Open the lid write / say the number that is created.
  - i.e. if the "ones" landed in the 2 cup, the "hundreds" in the 0 cup, the "thousands" in the 8 cup, and the "tens" in the 6 cup, the number created is 8,062.

**\*\* Important Note:** Gr K should use only 2 circles (tens and ones) to make 2-digit numbers; Gr 1 start with 2 circles, then progress to 3 (add "hundreds" circle. Gr 2 and 3 start with 3 circles and progress to four circles (add "thousands"))

## Fifteen Number Cross-Out (2 players)

**Materials:** Pair of Dice; paper and pencil  
piece of card stock or construction paper (can also use 4 "bingo" chips)

**Focus:** Grades 1 and 2 (Addition fact fluency; discuss thinking)



### To Play:

Players will create a list with 15 numbers. **Five of the numbers must be 5's.** The rest of the ten numbers can be any digit from 1 to 9. **See example:**

5  
5  
5  
5  
5  
9  
8  
7  
7  
6  
4  
3  
2  
1  
1

**Player 1** rolls the dice and makes a decision -

- Will you add the two digits together and cross out the total sum on your list?
- Will you cross out the digit represented on one of the dice and cross out the other digit on the other dice?
- Will you cross out two other numbers that equal that number?

**Example:** I roll a 6 and a 2. That equals 8. I have to either:

- cross out the 8 (*total sum*)
- cross out the 6 and the 2 (*digits shown on the dice*)
- cross out a 7 and 1, OR a 4 and a 4, OR a 5 and a 3 (*other ways to make 8*)
- I must explain to my partner what I am doing.

**Player 2** rolls the dice and is faced with the same decisions -

If, on your turn, you are cannot cross off any of the numbers you have left, you lose that turn and it's the other player's turn.

**The game ends when all of your numbers or your partner's numbers are crossed out 😊**

# NUMBER CARDS

*(For use with games)*

1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0
1	2	3	4	5
6	7	8	9	0



# Commercial Math Games for Learning

Math games can be a wonderful source for developing mathematical reasoning while practicing basic facts and honing reasoning and problem solving skills. Repeatedly playing these games supports student learning and deepens understanding.

*"Parents often ask me to recommend some good games that encourage math play at home. It's a question I love to be asked. How math is experienced in the home has a big impact on how children do with math at school. I'm always looking for challenging and fun math games—games that engage children in mathematical reasoning and help them experience the compelling nature of a good math challenge. Most of these games are available in toy stores, Wal-Mart, Target, Kmart, or Kohls for \$5 to \$15."*



**Set:** A card game of logic and visual perception that can be enjoyed by the whole family (ages 6 to adult). Adults, be forewarned that it can be humbling to play this game with youngsters!

**Tangos:** A game that focuses on spatial relationships and that challenges the whole family, young and old alike.



**Mastermind:** A game of logic enjoyed by both children and adults. Look for a version of Mastermind for younger children ages 6 and up.



**Cribbage:** A wonderful card game played on a pegged board that develops skill in adding series of small numbers. The game is enjoyable for children of all ages.



**Dominoes:** A game of strategy and numbers that children as young as 4 years of age can play as recognition game. Yet the regular game of dominoes is challenging for adults as well.



**Mancala:** A challenging African stone game of logic for adults that can be adapted to meet the needs of children ages 5 and up.



**Equate:** A game for reinforcing computation with whole numbers, decimals, and fractions. I haven't played this yet, but my nieces and nephews tell me it is challenging and fun.



**Checkers / Chess:** Great games for developing skill with logical reasoning.



## Our family likes to read together...

- Are there any good books that make math part of the story?

Math turns up in the most unexpected places! You'll find it hidden between the covers of almost any book. Children's books are great places to find math! This list is only a starter; check out your local bookstore or library for these and other engaging books.

You'll soon start finding math in everything you read. Talking about the math within the pages is just one more way to bring your family together. Enjoy!

### Counting:

Monster Math (Miranda)  
Spunky Monkeys on Parade (Murphy)  
100 Ways to Get to 100 (Palotta)  
Counting on Frank (Clements)  
The Wolf's Chicken Stew (Kasza)

### Addition and Subtraction:

A Bag Full of Pups (Gackenbach)  
A Collection for Kate (Derubertis)  
Mission: Addition (Leedy)  
More, Fewer, Less (Hoban)

### Multiplication and Division:

Amanda Bean's Amazing Dream (Burns)  
The Doorbell Rang (Hutchins)  
The Great Divide (Dodds & Mitchell)  
How Many Ants? (Brimner)

### Time:

Just a Minute (Slater)  
Pigs on a Blanket (Axelrod)  
Time to.... (McMillan)

### Measurement:

Inch by Inch (Lionni)  
Measuring Penny (Leedy)  
Twelve Snails to One Lizard (Hightower)

### Number Sense:

Among the Odds and Evens (Turner)  
Bats on Parade (Appelt)  
How Many Feet? How Many Tails (Burns)  
Even Steven and Odd Todd (Cristald)  
Math in the Bath (Atherlay)

### Money:

The Coin Counting Book (Williams)  
Bennie's Pennies (Brisson)  
Monster Money (MacCaron)  
Pigs Go to Market (Axelrod)  
Pigs Will Be Pigs (Axelrod)  
The Great Pet Sale (Inkpen)

### Geometry:

Shapes, Shapes, Shapes (Hoban)  
The Greedy Triangle (Burns)  
The Silly Story of Goldilocks & the Three Squares (MacCarone)  
Grandfather Tang's Story (Tompert)  
I Spy Shapes in Art (Micklethwait)

### Fractions:

Fraction Action (Leedy)  
My Half Day (Fisher & Sneed)  
The Half-Birthday Party (Pomerantz)

## Our family likes to use the computer...

- Are there any good web sites that would support my child's learning?

The web is packed with terrific sites with engaging activities. You can make this a family event by sitting with your child to support their understanding as they play.

This list is only a starting point. Additional websites can be found on the District web page. As sites change periodically, some of these may no longer be available.

<http://www.sowashco.org/ro/pages/studentlinks/math/k-1math.htm>

Many great math activities (K-1) in a variety of concept areas.

<http://www.sowashco.org/ro/pages/studentlinks/math/2-3math.htm>

Many great math activities (2-3) in a variety of concept areas.

[http://www.internet4classrooms.com/skills\\_1st.htm](http://www.internet4classrooms.com/skills_1st.htm)

Variety of activities and skill practice. Click on appropriate grade level/Math

<http://illuminations.nctm.org/>

Library of 94 online activities that help to make math come alive

<http://nlvm.usu.edu/en/nav/vlibrary.html>

Variety of activities and virtual manipulatives sorted by grade level and topic

<http://www.mathcats.com/storyproblems.html>

Many story problems at various skill levels

<http://www.battersupbaseball.com/index.html>

Practice addition / multiplication math facts

<http://www.mathplayground.com/>

Action-packed educational site. Lots of word problems and other activities

<http://www.usmint.gov/kids/games/>

Great money games and activities

<http://www.aplusmath.com/Games/index.html>

Math games in Java

**Dreambox Learning:** go to [www.colonialsd.org](http://www.colonialsd.org); click on STUDENTS in the upper left-hand corner of the page; click on Elementary School then on Math Resources; click your elementary school to go to the Dreambox log in page; have your child enter their student id number for both username and password

# Parents as Questioners

## Making Sense of Mathematics Together

Mathematical investigations present new and sometimes unexpected mathematical situations, so the teacher cannot have taught the way to solve the problem in advance. The student needs to apply prior knowledge in ways that make sense to the situation. There may be many paths to follow and many outcomes, depending on the problem; the student must make his or her own plan for finding a solution.

Parents can assist their children to be independent problem solvers by becoming guides or questioners. They do not need to know how to solve the problem themselves, but can help the students think through the problem and make a realistic plan for solving it.

**USE FREELY** any questions that will help students think about the way they are tackling the problem:

- What have you tried so far?
- Is there another way to look at the problem?
- Can you explain this to me?
- What makes sense so far?
- Is this like any other problem that you have worked on in any way?
- What is it you are trying to do/solve/find out?

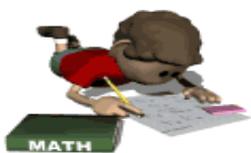
**USE SPARINGLY** those questions that tend to direct students' thinking:

- How might you organize this?
- Can you make a table of your results?
- Can you see any patterns?
- Have you tried smaller (or simpler) cases?
- How can you get started?
- Have you checked to see that the solution works?
- What would happen if . . . ?

**AVOID** any hint or question referring to the particular problem:

- Do you recognize square numbers?
- Explore it like this, or try this . . .
- Why not try three counters?
- That's not quite what I had in mind . . .
- No, you should . . .

# Suggestions for Working with Math Facts



As parents, when we think about our elementary years and the way we learned our basic facts we remember the days of memorizing flash cards. It's no wonder we tend to do the same with our children and are confused when it is suggested that we "wait until there is an understanding of what  $8 + 2$  looks like". The reality is, our children's learning of math is probably very different from the way we learned math in school.

Today's students are learning math facts by utilizing strategies such as doubles, doubles plus 1, make 10, difference of 1 and 2 and minus 0. Students of today are not required to learn their math facts "all at once" by memorizing. Instead, they are encouraged and supported through numeric strategies developed while playing games involving cards, dice, counters, number lines, and the hundreds chart. By linking strategic understanding and visual representation of the math fact to be learned, today's students use a combination of things to learn their basic facts.

The games listed throughout this booklet are designed to support your child's learning of basic facts and the development of numeric strategies. Each activity can be differentiated, made easier or more difficult based on numbers used, questions asked, and discussions held between you and your child. Please see the suggested questions for parents - titled, *Parents as Questioners*.

## Easy Addition facts involve:

Plus 0, 1, and 2  
Doubles ( $4 + 4$ )

## Hard Addition

Doubles plus 1  
Make 10 ( $8 + 2$ )  
No Strategy: The Left Overs

## Easy Subtraction facts involve:

Minus 0 Minus Itself ( $9 - 9$ )  
Difference of 1 and 2

## Suggestions for Working with Math Facts



### Some thoughts to keep in mind:

\*The **best way** to learn subtraction facts is to "think addition" - use fact families.  $2 + 3 = 5$        $3 + 2 = 5$        $5 - 2 = 3$        $5 - 3 = 2$

- Equations that are equal to 18 or less are considered "basic facts" with addition and subtraction
- As tempting as it is, don't teach all the facts at one time by memorizing
- Allow your child an opportunity to develop number strategies that will support their learning of basic facts. "If I know  $5 + 5 = 10$ , I know  $5 + 4 = 9$  because 9 is one less from 10."
- Work with manipulatives and visual representations (10 frames, number lines, fact families, 100 chart...)
- Even when numbers seem small, mathematical thinking can be complex
- The ability to take numbers apart (decompose) is a very important strategy that helps students learn their basic facts. Use games like 15 Number Cross Out to support children in their understanding that the number 8 can be made with 1 and 7, 2 and 6, 3 and 5, 4 and 4, 6 and 2...
- Games involving math and strategy help children learn their basic facts and understand number relationships
-  Above all, give children the freedom and opportunity to visualize and talk about what they are thinking.