



## Building a Strong Math Foundation

Dear Parents,

We know that most families have a full schedule, and it can be hard to find time for that extra focus we want to have on math. But, with these tips and ideas, we hope to make it easier to find ways to work a little math fun into everyday family activities, and keep it from becoming a chore!

If you have questions at any time, feel free to contact your teacher or Christy Douglas, Math Specialist at [cdouglas@naperville203.org](mailto:cdouglas@naperville203.org), or 630-420-2924.

Enjoy!



## **In Kindergarten, we suggest...**

### **Give your child plenty of opportunities to count**

- Play number games during everyday activities, such as counting the number of steps, the number of trucks you see while driving, or counting the number of items going in the laundry.
- Read the calendar, and determine the number of days until an upcoming event.
- Young children can count the number of items that you bought at the store. If you buy multiples of 1 item (such as 10 cans of cat food), practice counting by 2's, 3's, or higher numbers
- Have your child count the change needed to pay for an item.
- Watch your child play to understand her mathematical knowledge. When your child counts, does she touch each object once? Is his voice in sync with his tag?
- Have your child distribute cookies or toys to family members, with each person getting an equal number

### **Help your child recognize shapes and size relationships**

- At the grocery store, ask your child to find items that are triangles, circles, rectangles, and other shapes.
- Ask your child to recognize or stack the groceries you bought by container shape or organize by size.
- Organize a scavenger hunt where your child has to find objects of different shapes
- Make snowflakes using symmetry. Fold a square piece of paper in half diagonally to make a triangle, then fold in half 2 more times. Cut out small diamond or circular shapes from the edges, and then unfold it. Experiment with different numbers of folds and shapes.

### **Find ways to collect and organize information**

- Look around the house to find groups of 2 objects, like pairs of gloves or socks. Look for groups of 3's, 4's, and on up to 10's.
- Have your child help sort the laundry by various categories — by color, or by whom an item belongs to.
- Take measurements for a project around the house.
- Using paper of different colors, make a paper chain with paper strips and tape. Encourage your child to create patterns by repeating colors and numbers of rings in a

regular order. This can be done in connection with reading the calendar and counting down days to a special event.

- Collect objects in nature— leaves, rocks, shells and the like. When you get home, sort them by color, size, or type. How many different categories can you find? How many objects are in more than 1 category?

### **Help your child develop reasoning skills**

- Help your child think about the permanence of a set. Put 6 pennies in a row, and then change the arrangement. Ask “did the quantity change?”
- Kindergartners love repetition and patterning, which fosters mathematical thinking. Clapping patterns help your child discover sequences and predict what comes next.

### **Some family games that use kindergarten math skills:**

- Many card games require counting and score keeping.
- Dice games and dominos help kids learn to quickly recognize groups of dots from 2 to 12.
- Play board games that involve counting squares, such as Chutes and Ladders.
- Tic Tac Toe and Connect Four build recognition of rows of 3 and 4 counters.
- Tangrams
- Mancala

## **For 1<sup>st</sup> Graders...**

### **Give your child plenty of opportunities to count and measure**

- Read a recipe and have your child measure the amounts for the ingredients. Use different measures such as teaspoons, cups, and pints.
- Using a calendar, count by 7's and then 1's to find the number of days until an upcoming event.
- Plan a meal you'd like to cook together, then make a shopping list for items that fit your budget.
- If you bring some vegetables home from the store, have your child count them, counting on from the number of vegetables you already have.
- Find creative ways to measure: how many paper clips long is this sheet of paper? How many hands high is the dog?
- Read *How Big is a Foot?* by Rolf Myller, about a creative apprentice who comes up with a more accurate way of measuring size.

### **Find ways to practice number operations**

- Pick a number between 1 and 20 (or between any 2 numbers up to 100). Have your child guess the number, then you tell if your number was greater than or less than his guess. Have your child keep revising his guess until he guesses your number. Then trade roles.
- Count 8 pennies, then hide 4. Ask "How many are hidden?" Does she know there are 4?
- Go berry picking. Explore the berry patch with your child. Which color berries are ripe and good to pick? Have your child pick ten berries, then eat one. How many does he have left?

### **Find ways to collect and organize information**

- Read weather charts, movie schedules, and other common numerical information you find in the news.
- When you're doing the laundry, have your child match all the pairs of socks. How many socks are there? How many pairs?
- Compare and organize tools, dishes, or other objects based on size, color, or weight.

### **Some family games that use math skills:**

- Dice, cards, and board games can help your child learn addition combinations.

- Dominoes helps practice counting by 5's.
- The card game "War" helps kids recognize which number is greater and which is less.
- Yahtzee
- Mancala
- Checkers and Chinese Checkers
- Any game that includes counting board steps, such as Chutes and Ladders

## **For your 2<sup>nd</sup> grader...**

### **Find ways to practice number operations**

- Practice counting down from any double-digit number. For example, use a calendar to count down the number of days to an upcoming event.
- Prepare for multiplication by helping your child think in groups. Ask “how many fingers do five people have?”
- Try a variation on the card game “War.” When the higher card takes the lower card, subtract the lower number from the higher number, and the player who won that play wins those points.
- Give your child the change in your pocket and ask how many different ways she can make 25 cents.
- Play a variation on the game “Go Fish.” Instead of asking for cards with numbers that match, players take turns asking for cards that, added to the card she has, adds up to 10. Count face cards as zero, aces as 1’s.

### **Find ways to develop reasoning skills**

- If your child knows that 4 quarters is 1 dollar, can he figure out what 6 quarters is?
- Ask your child to estimate the height of a tree by estimating how much higher it might be than an 8’ fence next to it.

### **Find ways to collect and organize information**

- Read sports score tables, weather charts, and other common numerical information you find in the news.
- As you’re shopping, compare the amounts in the Nutrition Facts on packaged foods or the amounts in various containers of similar products.
- Take measurements for a project around the house. How many inches are there? How many feet? How many yards?

### **Some family games that help develop math skills:**

- At this age kids are developing more complex ways of reasoning — they like strategic thinking games like checkers, chess, Monopoly, and Clue.
- Dominoes
- Mancala
- Cribbage

## For your 3<sup>rd</sup> – 5<sup>th</sup> Grader:

### Find ways to practice number operations

- Skip counting is a fun foundation for, or reinforcement of, multiplication. If you have several kids, have them take turns counting by 2s, 3s, 5s, or 10s. As they get better, see how high they can count by numbers like 7 or 12 or higher numbers.
- Story problems can be fun, and they grow naturally out of everyday family life. For example: if you give your child \$5 for lunch, first ask him to total up the cost of the items he's buying. Then ask him to tell you before he makes his purchase how much change he'll get. (If he can explain how he arrived at his answer you might even let him keep the change!)
- A trip to the store presents learning opportunities at every age. As you're comparing different brands for the same item, ask your child how much you'd save by buying the lower-priced item.
- When reading the store receipt, how many totals can your child add up doing mental math?
- If you're going to make a meal together, there are even more chances to practice the math your child is learning. Now that she's beginning multiplication, ask her figure out the amounts to double a recipe. Or triple it.
- When you stop at a gas station, have your child check the price per gallon. Then ask how much you'll spend if you buy 2 gallons. Or 10 gallons.
- Lots of things in the kitchen come in groups: eggs, soda cans, juice boxes, pet food, etc. Talk about different ways to regroup the amounts. For example, a dozen eggs can also be grouped in 3s or 4s, or it can be 2 groups of 6. If you have 2 or 3 dozen eggs, and ask how many there are in all. This can be fun no matter what you're doing: you can take turns asking how many tires are there on 5 cars; or how many fingers are there on 4 hands.
- As your student advances, find things around the house that come in arrays (rows and columns), like kitchen tiles, a wine or spice rack, or a candy box. Ask your child to identify smaller arrays within it. For example an egg carton that holds a dozen eggs would be a  $2 \times 6$  array. Cutting it in half vertically would make two  $2 \times 3$  arrays. Or, cutting it in half horizontally (into two rows) would make two  $1 \times 6$  arrays.
- If your child is interested in sports you have built-in math fun! Talk about some common statistics used to rank baseball player performance, such as batting averages and earned run averages.

### **Find ways to collect, sort, and organize information**

- Do you have a lot of change to sort? Ask your child to make equivalent amounts in other coins for a given number of pennies. For example if you have 135 pennies, she could make an equivalent amount using one dollar and 35 pennies, or 13 dimes and 5 pennies, or one dollar, 3 dimes and 5 pennies. How many different combinations can she come up with!?
- For children who may find math a struggle, making an individualized chart where your child can see a record of her improvements can help her gain confidence in herself.

### **Some family games that help develop math skills:**

- As your child develops more sophisticated reasoning ability, he is likely drawn to games that can be explained within the logic of the system, like checkers, chess, Monopoly, and Clue, which require strategic thinking.
- Games that involve manipulating flat shapes on a game board or grid, such as tangrams, Logix, Blokus, and Shapes Up, develop logical thinking as well as spatial awareness.

- Adapted from *(and more can be found!)* at: <http://www.dreambox.com/parent-tips>



# Working with your child...

## **Forward Number Word Sequence (FNWS) range of 1-31**

Parents can say:

- "Count forward from one"
- "Count from any number"
- "What number comes just after"
- "What number is one more than"

## **Backward Number Word Sequence (BNWS) range of 1-31**

Parents can say:

- "Count backward from any number"
- "What number comes just before"
- "What number is one less than"

## **Written Numeral I.D. range of 1-31**

Parents can say:

- "Write the number \_\_\_\_"  
Use the teen numbers: 11, 12, 13, 14, 15, 16, 17, 18, 19  
Use close confusers such as: 12 and 21, 13 and 31. 14 and 41, etc.

## **Relative Magnitude range of 1-31**

Parent can say

- Which number is greater \_\_\_\_ or \_\_\_\_ ?
- Randomly give your students five number playing cards. Ask them to put the cards in order.
- Play solitaire with your child
- Play the card game WAR with your child.

## **Subitizing- What is it?**




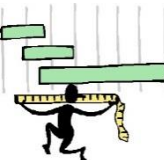

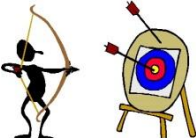


Subitizing is "instantly seeing how many." From a Latin word meaning suddenly, subitizing is the direct perceptual apprehension of the numerosity of a group.

- Roll a set of dice and quickly identify the numbers.
- Play family board games that use dice to move along the board.
- Play Dominos.
- Play Bunco as a family

## **Structuring Number range of 1-5 and then when that is secure 1-10**

Parents can say:

- "What are the partners of \_\_\_\_\_?"
- "If I have 3 teddy bears, and you gave me some more teddy bears. Now I have 8 bears altogether How many bears did you give me? (10 and under)

<b>Standard for Mathematical Practice</b>	<b>Student Friendly Language</b>
<p>1. Make sense of problems and persevere in solving them.</p> 	<ul style="list-style-type: none"> <li>I can try many times to understand and solve a math problem.</li> </ul>
<p>2. Reason abstractly and quantitatively.</p> 	<ul style="list-style-type: none"> <li>I can think about the math problem in my head, first.</li> </ul>
<p>3. Construct viable arguments and critique the reasoning of others.</p> 	<ul style="list-style-type: none"> <li>I can make a plan, called a strategy, to solve the problem and discuss other students' strategies too.</li> </ul>
<p>4. Model with mathematics.</p> 	<ul style="list-style-type: none"> <li>I can use math symbols and numbers to solve the problem.</li> </ul>
<p>5. Use appropriate tools strategically.</p> 	<ul style="list-style-type: none"> <li>I can use math tools, pictures, drawings, and objects to solve the problem.</li> </ul>
<p>6. Attend to precision.</p> 	<ul style="list-style-type: none"> <li>I can check to see if my strategy and calculations are correct.</li> </ul>
<p>7. Look for and make use of structure</p> 	<ul style="list-style-type: none"> <li>I can use what I already know about math to solve the problem.</li> </ul>
<p>8. Look for and express regularity in repeated reasoning.</p> 	<ul style="list-style-type: none"> <li>I can use a strategy that I used to solve another math problem.</li> </ul>

## **Sites and Apps:**

### **Common Core Sheets**

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

Common core practice problems for almost any concept!

### **IXL Math**

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

### **Count Me in Too**

<http://www.curriculumsupport.education.nsw.gov.au/countmein/index.htm>

### **Bedtime Math**

<http://bedtimemath.org/>

### **Khan Academy**

<https://www.khanacademy.org/>

### **Learn Zillion**

[www.learnzillion.com](http://www.learnzillion.com)

### **Study Jams**

[www.studyjams.com](http://www.studyjams.com)

### **Mega Math**

[www.megamath.com](http://www.megamath.com)

**Arcademics:** <http://www.arcademicskillbuilders.com/>

A safe site filled with online games where you can compete with others around the country.

**Abcya.com:** <http://www.abcya.com/>

Grade level practice around mathematics

**Math Magician** <http://resources.oswego.org/games/mathmagician/cathymath.html>

Online games from Oswego City School District that teach math.

**Granny Prix** <http://www.multiplication.com/flashgames/GrannyPrix.htm>

Granny Prix is a fun activity that helps students work on fluency.

**Math Apps for the iPad** <http://pinterest.com/mikefisher821/math-apps-for-the-ipad/>

**Dare to Compare** <http://nces.ed.gov/nceskids/eyk/>

Dare to Compare, a part of the Kids' Zone website, contains questions from the Trends in International Mathematics and Science Study (TIMSS), the Civic Education Study (CivEd) and National Assessment of Education Progress (NAEP).