

Nifty Numbers

a Family Math Night event

Participant Booklet



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Welcome to Family Math Night! Tonight we present *Nifty Numbers™*, a look into our base 10 number system.

Numbers are cool. Very cool. Especially if we think about them in terms of patterns. For example, when skip counting by fives...5, 10, 15, 20...the numbers in the ones column will always be a '0' or '5'. That's a pattern. And that pattern helps us figure out that any time we multiply (an integer*) by the number '5', the answer will **always** end in a '0' or '5'. That's a nifty number pattern!

Tonight, we go on a journey to explore these numbers...how they're represented, how they relate to each other, and the effects that operations (+, -, x, ÷) have on them. You and your child just might discover some amazing things. And along the way, you'll find yourself having fun doing and talking about math in a way where making sense of numbers is mere child's play.

We hope you enjoy our presentation of Nifty Numbers!

*a positive or negative number, or zero

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Rolling Numbers



Beginning	<p>Play the <i>Fish Bowl</i> game. Each partner will need his/her own game board. The winner is the one to cover all their bubbles first.</p> <p>Use the counting strip to help with matching the numeral with the quantity.</p>
Intermediate	<p>Play the <i>Frog Hop</i> game. Find the difference between the two dice rolled by taking the smaller number from the larger number. Hop along the paths to the Finish line.</p> <p>Use the number line to help with the subtraction and/or odd/even numbers.</p>
Advanced	<p>Play the <i>Chasing Expressions</i> game. Keep a running score on the <i>Chasing Expressions</i> score pad. The first one to reach 100 points is the winner.</p>

Questions to ask your child:

- If you counted the fish in a different order, would you still have (5) fish? (B)
- How do you know if a number is odd or even? (I)
- If the expression $2w + b$ remains the same, how come you can get different answers? (A)
- When a letter is right next to a number in algebra, what operation do you perform? (Answer: multiplication) (A)

Nimble Numbers



Beginning	Pick a number between 1-20 that your child is comfortable with and write it in the four boxes on the <i>My Number Is</i> activity sheet. Have your child count out and place an appropriate number of stickers in each of the 10-frames. Use the bean counters and counting strip to help, if you need.
Intermediate	Each person gets a Closest to 100 recording sheet. Play the game by rolling two dice and keeping track on the recording sheet. The goal is to be the one who gets closest to 100 without going over. Use the 0-140 number line to help with the addition/subtraction, if necessary.
Advanced	Choose one of the paper bags and a Prime Time activity sheet. Prime factor the number on the outside of the bag. When you think you know all the prime factors of the numbers, peek inside the bag to see if you were right.

Questions to ask your child:

- If (3) is less than (7), how many more stickers would you need to make (7)? (B)
- How many place values can you name? (I) (1s, 10s, 100s, etc.)
- If a number ends in a '0' or a '5', what color MUST be in the bag? (A) (Answer: green)
- If a number is even, what color MUST be in the bag? (A) (Answer: red)

How To "Do" Family Math Night

- There are 8 stations to explore. Each station has one or two station facilitators to help with materials and questions.
- There is no particular order to complete the stations.
- If you become involved in one of the activities, stay there. You will learn more through an in-depth study.
- Each activity can be done on a variety of levels. You may choose to start at a beginning level (B), or you may choose to start at an intermediate (I) or advanced level (A). Loosely, the levels run K-1, 2-3, and 4-5.
- Work with your child. It is more fun to learn things together.
- At the bottom of each activity in this booklet are questions you may ask your child while doing the activity. They are a guide to help get your child to think about the math they are working on at a deeper level. This is a starter list. Feel free to ask your own questions. Question levels:
 - B = Beginning
 - I = Intermediate
 - A = Advanced
- Some stations get you and your child involved in making a project. These are yours to take home and share with others.
- And, finally...HAVE FUN! Enjoy the time you are spending together.



Pattern Blocks

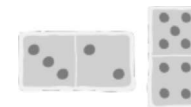


Beginning	<p>Discuss the attributes of each of the shapes: number of sides, parallel sides, etc.</p> <p>Work on the <i>Designs with Pattern Blocks</i> activity cards.</p>
Intermediate	<p>Discuss the idea of different blocks being one whole. What value do the other blocks have relative to the whole?</p> <p>Work on the <i>Exploring Fractions with Pattern Blocks</i> activity sheet.</p>
Advanced	<p>Use the <i>Fractions with Pattern Blocks</i> activity card to create designs with different fractional values.</p> <p>See if you can simplify the fractions in the second design. Flip over for the answers.</p>

Questions to ask your child:

- How do you know that this shape is a...square...triangle...? (B)
- What's another way of saying one whole? ($2/2$, $3/3$, $6/6$) (I)
- If ' $\frac{1}{2}$ ' is just a number, then why is $\frac{1}{2}$ of one dollar so different than $\frac{1}{2}$ of one million dollars? (I, A)
- Can you come up with more than one solution for one of the designs? (A)

Dominoes



Beginning	<p>Have your child use the index cards and sticky dots to make their own dominoes. Then help them practice their number facts by completing the <i>Number Facts with Dominoes</i> activity sheet.</p>
Intermediate	<p>Have your child fill in the missing dots on the <i>Domino Balance</i> activity sheet. You can use the bean counters to help you figure out how many dots are missing.</p> <p>Then they create their own domino balance equation using the sticky dots.</p>
Advanced	<p>Win as many points as you can by playing the <i>Dominate with Dominoes</i> game. Keep your running score on the <i>Dominate with Dominoes</i> score card.</p>

Questions to ask your child:

- Ex: I'm covering half of this domino. All together there are 7 dots. How many dots are covered? (B)
- $3 = 3$ doesn't seem like it's a proper equation, but it is. Can you explain why? (I)
- Can you come up with a word problem for the multiplication problem $9 \times 6 = 54$? (I,A)

Growing Equations



Beginning	Pick a number your child is comfortable with. Use the counters to help your child come up with 4 - 6 expressions for the chosen number and write them on the recording sheet. Then make the flower and transfer the expressions onto the petals. Young students can draw pictures on the petals that represent their number.
Intermediate	Have your child choose a number then record 4 - 6 expressions of their number on the recording sheet. Then make the flower and transfer the expressions onto the petals.
Advanced	Have your child choose a number then record 6 expressions of their number on the recording sheet. See if they can use fractions or decimals in their expression. Then make the flower and transfer the expressions onto the petals. Don't forget to follow the Order of Operations. See table tent.

Questions to ask your child:

- Here are 10 counters. How many do you need to take away/add to get to (your number)? (B)
- Can you create an expression that uses both multiplication and subtraction? (I)
- Can you create an expression using one prime number? (A number with exactly two factors. EX: 2, 3, 5, 7, 11...) (I,A)
- Why is the 'order of operations' important? (A)

Pattern



Beginning	Use the stickers to help your child create repeating patterns. In an AB pattern, all the As are the same and all the Bs are the same. Turn the pattern into a bracelet by taping the ends together.
Intermediate	Use the beans and 10-frames to help look for patterns in the <i>Cool Number Patterns</i> activity sheet. Help your child figure out the hidden numbers on the pattern strips. Then peek under the sticky note and see if you're right!
Advanced	Help your child figure out the hidden numbers on the pattern strips. Then peek under the sticky note and see if you're right! If you get stumped, flip the strip over to discover the pattern/rule then use that information to help figure out the answer.

Questions to ask your child:

- How would you create an ABC repeating pattern? (B)
- Why do you think adding two odd numbers results in an even number? (I)
- Why is looking for patterns helpful? (I, A)
- Can you create a pattern for me to guess the rule? (A)

Who Am I?



Beginning	<p>Read the <i>Who Am I?</i> clue(s) and have your child find the number on the 0-110 number chart.</p> <p>See if your child wants to make up a clue for you to show on the number chart.</p>
Intermediate	<p>Read the <i>Who Am I?</i> clue(s) and have your child solve for the mystery numbers by following the clues. Use the 0-110 chart and dry erase marker to help eliminate numbers along the way.</p>
Advanced	<p>Read the <i>Who Am I?</i> clue(s) and have your child solve for the mystery numbers by following the clues. Use the 0-110 chart and dry erase marker to help eliminate numbers along the way.</p>

Questions to ask your child:

- When you add numbers together, do you end up with more or less? (B)
- How many do you need to add to get the next number? (B)
- What does 'find the difference' mean? (I)
- How are multiplication and addition similar? (I)
- How do you figure out how many factors a number has? (A)

Finding the Unknowns



Beginning	<p>Using the Gingerbread House game board, hide some gingerkid chips upstairs and some downstairs. Open up the downstairs. Have your child guess how many people are hiding upstairs.</p> <p>Now have your child create one for you to solve!</p>
Intermediate	<p>Use the activity strips and bean counters to figure out which numbers belong in each shape. For each problem, the same shape contains the same number.</p>
Advanced	<p>See if you can figure out which numbers belong in each shape. For each problem, the same shape contains the same number.</p>

Questions to ask your child:

- How did you figure out how many gingerkids were hiding upstairs? (B)
- How does division help you solve some of the problems? (I, A)
- Explain how substitution can be used to solve for some of the unknowns. (I,A)