Nifty Numbers

and connections with **TEKS**

Mathematical Process Standards
Apply mathematics to problems arising in everyday life, society, and the workplace.
Use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
Select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems.
Communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
Create and use representations to organize, record, and communicate mathematical ideas.
Analyze mathematical relationships to connect and communicate mathematical ideas.
Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

All of the *Nifty Numbers* activities were designed to promote critical thinking skills. The parent participation booklet offers some suggested higher-order thinking questions for parents to ask their children as they are involved in the activity. As parents work with their children and enter into deeper mathematical conversations, they will be addressing the *Mathematical Process Standards* and promoting greater learning and understanding.

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Knowledge and Skills	Coordinate Graphing	Dominoes	Growing Equations	Pattern	Pattern Blocks	The Unknowns	What's My Rule?	Who Am I?
Grade K								
Number and Operations								
Count forward and backward to at least 20 with and without objects	•	•	•		•	•	•	•
Read, write, and represent whole numbers from 0-20	•	•	•			•	•	•
Count a set of objects and demonstrate that the last number said tells the number of objects			•			•	•	
Recognize instantly the quantity of a small group of objects in organized and random arrangements		•				•		
Use comparative language to describe two numbers up to 20 presented as written numerals							•	
Compose and decompose numbers up to 10		•	•			•		
Model the action of joining to represent addition		•	•			•		•
Solve word problems using objects and drawings to find sums up to 10 and differences within 10							•	•
Geometry and Measurement								
Identify two-dimensional shapes	•				•			
Identify attributes of two-dimensional shapes using informal and formal geometric language	•				•			
Create two-dimensional shapes	•				•			

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Grade 1								
Number and Operations								
Recognize instantly the quantity of structured arrangements		•						
Use objects, pictures, and expanded and standard forms to represent numbers up to 120			•			•	•	
Use objects and pictorial models to solve word problems involving joining, separating, comparing within 20 and unknowns as any one of the terms			•			•	•	•
Compose 10 with two or more addends with and without concrete objects			•			•		
Apply basic fact strategies to add and subtract within 20		•	•			•		•
Explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models and number sentences		•	•			•	•	•
Algebraic Reasoning								
Skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set							•	
Understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same value		•						
Determine the unknown whole number in an addition or subtraction equation		•				•		
Apply properties of operations to add and subtract			•			•		
Geometry and Measurement								
Classify and sort regular and irregular two-dimensional shapes based on attributes using informal language	•				•			
Create two-dimensional figures	•				•			
Identify two-dimensional shapes	•				•			

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Grade 2								
Number and Operations								
Use standard, word, and expanded forms to represent numbers up to 1,200			•					
Use place value to compare and order whole numbers up to 1,200 using comparative language and numbers								•
Partition objects into equal parts and name the parts, including halves and fourths, using words					•			
Explain that the more fractional parts used to make a whole, the smaller the part; the fewer the fractional parts, the larger the part					•			
Recall basic facts to add and subtract within 20 with automaticity		•	•	•		•	•	•
Model, create, and describe contextual multiplication situations in which equivalent sets of concrete objects are joined							•	•
Model, create, and describe contextual division situations in which a set of concrete objects is separated into equivalent sets						•		
Geometry and Measurement								
Classify and sort polygons with 12 or fewer sides					•			

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Grade 3								
Number and Operations								
Represent fractions greater than zero and less than or equal to one with denominators of 2, 3, 4, 6, and 8 using concrete objects and pictorial models					•			
Explain that the unit fraction 1/b represents the quantity formed by one part of a whole that has been partitioned into b equal parts where b is a non-zero number					•			
Compose and decompose a fraction a/b with a numerator greater than zero and less than or equal to b as a sum of parts 1/b					•			
Compare two fractions having the same numerator or denominator in problems by reasoning about their sizes and justifying the conclusion using symbols, words, objects, and pictorial models					•			
Represent equivalent fractions with denominators of 2, 3, 4, 6, and 8 using a variety of objects and pictorial models					•			
Explain that two fractions are equivalent if they both represent the same portion of a same size whole for an area model					•			
Determine the number of objects in each group when a set of objects is partitioned into equal shares or a set of objects is shared equally						•		
Represent multiplication facts by using a variety of approaches such as repeated addition, equal-sized groups, skip counting							•	•
Determine the value of a collection of coins								•
Determine if a number is even or odd using divisibility rules								•
Recall facts to multiply up to 10 by 10 with automaticity			•	•			•	•
Determine the unknown whole number in a multiplication or division equation			•			•	•	
Algebraic Reasoning								
Represent real-world relationships using number pairs in a table and verbal descriptions							•	
Geometry and Measurement								
Decompose two congruent two-dimensional figures into parts with equal areas and express the area of each part as a unit fraction of the whole and recognize that equal shares of identical wholes need not have the same shape					•			

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Grade 4								
Number and Operations								
Represent a fraction a/b as a sum of fractions 1/b, where a and b are whole numbers and b > 0, including when a > b			●		●			
Decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations					●			
Determine if two fractions are equivalent using a variety of methods					●			
Compare two fractions with different numerators and denominators and represent the comparison using the symbols >, <, =					●			
Solve with fluency one- and two-step problems involving multiplication and division		●						●
Algebraic Reasoning								
Represent multi-step problems involving the four operations with whole numbers using strip diagrams and equations with a letter standing for the unknown quantity			●	●		●	●	
Represent problems using and input-output table and numerical expressions to generate a number pattern that follows a given rule representing the relationship of the values in the resulting sequence and their position in the sequence							●	

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Grade 5								
Number and Operations								
Represent and solve addition of fractions with unequal denominators referring to the same whole using objects and pictorial models					●			
Add and subtract positive rational numbers fluently			●		●			
Geometry and Measurement								
Describe key attributes of the coordinate plane	●					●		
Describe the process for graphing ordered pairs of numbers in the first quadrant of the coordinate plane	●						●	
Graph in the first quadrant of the coordinate plane ordered pairs of numbers arising from mathematical problems	●							
Algebraic Reasoning								
Identify prime and composite numbers								●
Represent and solve multi-step problems involving the four operations with whole numbers using equations with a (letter) standing for the unknown quantity						●		
Generate a numerical pattern when given a rule in the form of y = ax or y = x + a							●	
Recognize the difference between additive and multiplicative numerical patterns in a given table or graph				●	●			
Describe the meaning of parentheses and brackets in a numeric expression			●					

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