

**Mason City Community Schools  
Summer Math Activities  
For Students Entering Grade 6**



It is very important that you continue to practice your mathematical skills over the summer to be ready for 6<sup>th</sup> grade. In this document, you will find a chart of activities for the months of June, July, and August. Print off the chart. Once you have completed an activity, have an adult family member initial in the box on the chart. Some activities tell you to solve and show your work in your math journal. This math journal will be used to record your answers, responses and to show your work. Use a new page for each activity (use both sides), write the month, and the number of the activity at the top of the page. You will also find a list of websites you can go on to practice your math skills, especially math facts. There is also a list of books you can find at your local library that are great math thinking stories!

**Directions:**

Create a personal Math Journal by stapling several pieces of paper together or use a spiral notebook or binder with paper. Be creative and decorate the cover with markers or crayons or other materials to show math in your world.

•Each journal entry should:

- Have the week number and the word problem or activity number
- Have a clear and complete answer that explains your thinking
- Be neat and organized.

Choose 3 of the 5 required activities and include them in your journal.

Try to play a board game or card game at least one day each week. Write about the game in your journal. Be sure to title the page with the name of the game. Here are some suggestions of games for you to play: Monopoly, Stratego, Othello, Connect Four, Chess, War, Battleship, Risk, Mancala, Yahtzee and Mastermind.


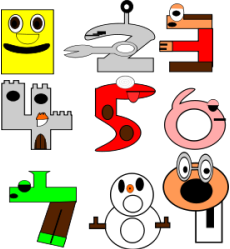
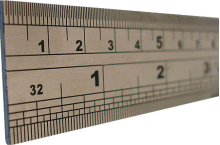
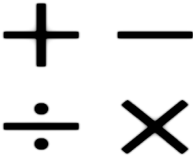
Don't forget to bring your journal, calendar, and required activities to school on the first day of sixth grade. Your new teacher will be so proud of your summer math work!

**Happy Thinking!**

## June, July, and August

*Students, remember - show your work and answers in your Math Journal!*

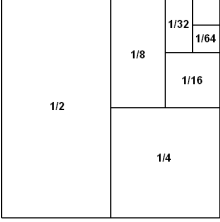



**Parents/Guardians, please confirm completion of each task by writing your initials in the appropriate box.**

<p><b>WEEK 1 PLACE VALUE</b></p> 	<p><b>#1</b> Which means the same as 7500? a. 75 hundreds b. 75 ones c. 75 tens d. 75 thousands</p>	<p><b>#2</b> Which sum has the value of 524? a. 5 tens + 24 ones b. 5 hundreds + 24 tens c. 5 hundreds + 2 tens + 4 ones d. 4 hundreds + 24 tens</p>	<p><b>#3</b> In the numeral 2,564 the digit 5 has a value of: a. 5 b. 50 c. 564 d. 500</p>	<p><b>#4</b> In what numeral does 4 have the least value: a. 648 b. 438 c. 2004 d. 4002</p>	<p><b>#5</b> Express <math>(3 \times 1000) + (2 \times 100) + (1 \times 10) + (8 \times 1)</math> in standard form.</p>
<p><b>WEEK 2 ESTIMATION</b></p> 	<p><b>#6</b> David completed 100 questions on the test. His teacher said he did <math>\frac{1}{4}</math> of them correctly. How many were correct? Describe how you figured that out.</p>	<p><b>#7</b> Jane needs to add <math>7\frac{1}{8}</math> and <math>4\frac{3}{4}</math>. Explain why <math>8 + 4</math> is not a good expression to use to estimate the answer.</p>	<p><b>#8</b> John wanted to <b>ESTIMATE</b> the product of 5.2 and 6.7 What's the best estimate for his problem? Explain.</p>	<p><b>#9</b> Joan spent \$682 on groceries last month. This month she spent \$423. <b>ABOUT</b> how much less did she spend on groceries this month than last month?</p>	<p><b>#10</b> Christy earned about \$18 for mowing lawns and \$29 for babysitting. <b>ABOUT</b> how much did she earn? Explain your reasoning.</p>
<p><b>WEEK 3 MEASUREMENT</b></p> 	<p>Find the length of a kilometer, compared to a mile. Is a kilometer more or less than a mile. Use the information you found to prove your answer.</p>	<p>A scale shows a weight of 1 kilogram. Is that more or less than 1 pound? Prove it with numbers.</p>	<p>A football field is 100 YARDS long. How many FEET would you run if you ran exactly half way down the field?</p>	<p>The 18-wheel truck is 360 inches long. How many feet is that?</p>	<p>Measure the height of each member of you family using standard units. Record the height of each person in inches and feet.</p>
<p><b>WEEK 4 COMPUTATION</b></p> 	<p>Solve <math>5476 + 345 =</math></p>	<p>The trip is 1567 miles in total. We have traveled 268 miles. How many more miles do we need to travel?</p>	<p>Solve <math>23 \times 68 =</math></p>	<p>In a car lot there are 38 rows with 25 parking spots in each row. How many parking spots are there in all?</p>	<p>Solve <math>434 \div 7 =</math></p>

## June, July, and August

*Students, remember - show your work and answers in your Math Journal!*

**Parents/Guardians, please confirm completion of each task by writing your initials in the appropriate box.**

<p><b>WEEK 5 FRACTIONS</b></p> 	<p>Which improper fraction is equivalent to <math>2\frac{3}{4}</math>?</p> <p>a. <math>\frac{5}{4}</math> b. <math>\frac{14}{4}</math> c. <math>\frac{11}{4}</math> d. <math>\frac{9}{4}</math></p>	<p>Maria needs <math>\frac{5}{8}</math> of a yd of fabric to complete a project, but she only has <math>\frac{1}{2}</math> of a yd of fabric. How much more fabric does she need?</p>	<p>Johnny drank <math>\frac{3}{4}</math> of a cup of milk and Tasha drank <math>\frac{1}{2}</math> of a cup of milk. How much milk did they drink in all?</p>	<p>Nico ran <math>\frac{4}{5}</math> of a mile and Sarah ran <math>\frac{2}{3}</math> of a mile. How many miles did the run all together</p>	<p>Show how you would find a common denominator for <math>\frac{3}{5}</math> and <math>\frac{2}{3}</math>.</p>
<p><b>WEEK 6 DECIMALS</b></p>  <p style="text-align: center;"><b>0.25</b></p>	<p>Which decimal is greater .9 or .77 Explain your answer.</p>	<p>I spent \$18.95 on a large box of greeting cards, \$2.95 for a roll of ribbon, \$15.64 for a scrapbook, and \$5.00 for writing paper. The cashier gave Daisha \$7.46 change. How much did Daisha give to the cashier?</p>	<p>Neil, Amon, Liam and Jose earned \$55 for a landscaping project. If they divided the money evenly, how much money would they each receive?</p>	<p>Write these numbers in standard form:</p> <p style="padding-left: 40px;">seven hundredths</p> <p style="padding-left: 40px;">twelve thousandths</p> <p style="padding-left: 40px;">fifteen ten-thousandths</p>	<p>Look through a grocery store flyer. Find the cost of at least 3 different items that are sold by weight (fruits, vegetables and meat). Write how much of each item you need for your family. How much will the total cost be.</p>
<p><b>WEEK 7</b></p>  <p><b>PROBLEM SOLVING</b></p>	<p>You want to earn \$200 to buy a skateboard. You can earn \$10 for each lawn you mow. You mow at most 4 lawns per week. How many weeks must you mow lawns to buy the skateboard?</p>	<p>Alexandria works at a bakery. On Monday, she baked 388 cookies. On Tuesday, she baked 200 LESS cookies than on Monday. How many cookies did Alexandria bake on Tuesday?</p>	<p>The Pizza Cafe sells veggie pizza and cheese pizza. Today they sold 25 pizzas. They sold seven more cheese pizzas than veggie pizzas. How many of each pizza did they sell?</p>	<p>John, Tim and Jose went out for dinner and spent a total of \$25.02. If they split the bill evenly, how much would each boy pay?</p> <p>* Challenge: what would a 15% tip be?</p>	<p>A brownie recipe calls for <math>\frac{2}{3}</math> cup oil. If you tripled the recipe, how much oil would you need?</p>
<p><b>WEEK 8 GEOMETRY</b></p> 	<p>Draw a picture of three different quadrilaterals. Name them.</p>	<p>.Is a circle a polygon? Why or why not?</p>	<p>What is the difference between an octagon and a hexagon? Draw one of each.</p>	<p>Find the perimeter and area of a square that has a length of 15 ft.</p>	<p>Use a Venn diagram to compare and contrast a square and a rectangle.</p>

## Summer Math Reading for 6th Grade

<b>Math Topic</b>	<b>Title</b>	<b>Author</b>
<b>Addition, Subtraction, Multiplication and Division</b>	<i>Anno's Mysterious Multiplying Jar</i> <i>The King's Chessboard</i> <i>Spaghetti and Meatballs for All</i> <i>Less Than Nothing is Really Something</i> <i>A Remainder of One</i> <i>One Hundred Hungry Ants</i>	Anno, Mitsumasa and Masaichiro Anno Birch, David Burns, Marilyn Froman, Robert Pinczes, Elinor J. Pinczes, Elinor J.
<b>Data, Chance and Probability</b>	<i>Jim and the Beanstalk</i> <i>Do You Wanna Bet?</i> <i>Esio Trot</i>	Briggs, Raymond Cushman, Jean Dahl, Roald
<b>Fractions, Decimals, and Percents: Rates and Proportions</b>	<i>Fourscore and 7: Investigating Math in American History</i> <i>Only One</i> <i>Fraction Action</i> <i>Gator Pie</i> <i>Eating Fractions</i> <i>If you Hopped Like a Frog</i>	Franco, Betsy  Harshman, Marc Leedy, Loreen Matthews, Louise McMillan, Bruce Schwartz, David M.
<b>Geometry</b>	<i>Flatland</i> <i>Mr. Archimedes' Bath</i> <i>Who Sank the Boat?</i> <i>A Cloak for the Dreamer</i> <i>The Librarian Who Measured the Earth</i> <i>Sir Cumference and the Sword in the Cone</i> <i>Sir Cumference and the First Round Table</i> <i>Pi: A Math Adventure</i> <i>The Boy Who Reversed Himself</i> <i>Grandfather Tang's Story</i> <i>Jumanji</i>	Abbot, Edwin Allen, Pamela Allen, Pamela Friedman, Aileen Lasky, Kathryn Neuschwander, Cindy  Neuschwander, Cindy  Neuschwander, Cindy Sleator, William Tompert, Ann Van Allsburg, Chris
<b>Number and Order</b>	<i>Counting on Frank</i> <i>Speed Mathematics</i> <i>12 Ways to Get to 11</i> <i>Math Talk: Mathematical Ideas in Poems for Two Voices</i> <i>How Much is a Million?</i> <i>Math Curse</i>	Clement, Rod Handley, Bill Merriam, Eve Pappas, Theoni  Schwartz, David M. Scieska, Jon
<b>Patterns and Algebra Concepts</b>	<i>Anno's Magic Seeds</i>	Anno, Mitsumasa



## Sunsational Websites

At the time this summer mathematics packet was created, the websites listed were checked by teachers and deemed child appropriate. However, parents should always monitor their child's use of any Internet site.

- **Khan Academy** - If your child isn't already signed up, it's free, and is a great site for learning and practicing skills. <http://www.khanacademy.org/>
- This free website will help your child improve his/her accuracy and automaticity in addition, subtraction, multiplication and division facts. [xtramath.org](http://xtramath.org)
- **Subtracting Fractions:** This site will lead you through the process of subtracting fractions and mixed numbers. <http://www.webmath.com/subfract.html>
- **Adding Fractions:** This site will lead you through the process of adding fractions and mixed numbers, with and without like denominators. <http://www.webmath.com/addfract.html>
- **Math Cats** is a great site with lots of fun games and activities in math <http://www.mathcats.com/contents.html>
- This website will help with multiple math skills interactively. <http://www.aplusmath.com/>
- An amusement park of math designed for fun! <http://www.coolmath.com/>
- This website has a variety of math activities! <http://www.funbrain.com/>
- **Create a graph!** This page will allow you to insert your information and create any kind of a graph that you want!! <http://nces.ed.gov/nceskids/graphing/>

## **SIMPLE MATH GAMES TO PLAY AT HOME WITH A DECK OF CARDS**

### ***WAR AND DOUBLE WAR:***

Use a regular deck of cards (optional: remove face cards for young children). Deal out the cards evenly between game participants. Aces represent one and face cards are ten. Play one of these versions:

**Highest card wins:** This is the traditional game where each player turns over the top card from their own pile and the player with the largest card wins all the cards. In the event of ties, everyone turns over an additional card and the winner takes the larger pile. In this version, students practice numeral recognition, number value, and greater than and less than.

**Addition Double War:** Follow the rules of War with each player turning over two cards at a time. Players add the value of their two cards and the largest sum wins. Students can practice addition strategies: counting all the “pips” on both cards for the sum, starting with one card and counting on using the pips on the second card, doubles facts, special “tricks” for adding ten and nine, sharing, and making a ten. To make this game a little more challenging, turn over three cards each time and find their sum.

**Subtraction Double War:** Follow the directions for Addition Double War, only the biggest difference wins. Good opportunity to practice subtraction strategies and facts.

**Multiplication Double War:** Follow the directions for Addition Double War, only this time the largest product wins. For a student just learning multiplication facts, use two decks of cards and start with the easiest fact families first, gradually adding the larger numbers.

**Fraction War:** Each player turns over 2 cards at once and tries to make the largest fraction by laying the cards vertically. For example with a 3 and 5, you can make  $\frac{3}{5}$  or  $\frac{5}{3}$ ; if the other person has a 2 and 8, the fraction could be  $\frac{2}{8}$  or  $\frac{8}{2}$ . Variations: only allow fractions less than one or use three cards at a time and create mixed numerals.

### ***SALUTE:***

This game helps students practice adding (or multiplying) and finding the missing addend (or factor).

This is a game for three players. Remove the face cards from a regular deck of cards (ace represents one). Deal out the cards evenly to two players who sit facing each other; each holds the stack of cards face down. The third player sits where s/he can see the other two players. When the third player says “Salute,” the two players with cards simultaneously take the top cards off their respective piles and hold them on their foreheads with the face of the card outwards so that they can only see the other person’s card. The third player announces the sum (or product for a more advanced version) of the two cards. Each of the two players holding a card tries to be the first to announce the number on his own card (which he cannot see). The winner takes both cards. Rotate players so everyone gets a chance to be the one who says, “salute,” and gives the sum and product.

### ***PYRAMID:***

Discard the face cards and use the aces to represent one. Lay out a pyramid of face up cards with one card at the top, two cards overlapping the bottom edge of that card, three cards overlapping the edges of the two cards, and so on, until there are six cards at the bottom of the pyramid. Only cards that are fully uncovered can be used. Pick up and discard cards with number combinations that equal ten. The easiest version is to discard cards in pairs that add up to ten ( $2 + 8$ ,  $3 + 7$ , etc.) and the ten by itself. Make the game progressively more challenging by allowing any combination of cards that can be strung together in an equation to equal ten, for example,  $9 + 3 - 2$  or  $2 \times 3 + 4$ . The game can also be played with the face cards with these values: J is 11, Q is 12, and K is 13 (change the target number to 13 for this version).

### ***MAKE THE MOST OF IT:***

Remove kings and jacks from the deck. Ace is one and Queen is zero. Players take turns drawing one card at a time, trying to create the largest 5 digit number possible. As each card is drawn it is placed (and cannot be moved) into the ones, tens, hundreds, thousands, or ten-thousands place. When the sixth card is drawn, the player can choose one of the cards on the table to discard and replace it with the sixth card. Largest 5 digit number wins.

Make this game easier or harder by varying the number of digits.

**CLOSE TO 20:**

Remove the kings and jacks from a deck of cards. In this game Aces are one and Queens are zero. The object of the game is to make an addition problem with three addends as close to 20 as possible (see the sample game board below). Each game has five rounds.

To play deal out five cards and place them so all players can see them. Each player uses the numbers on *any three* of the cards to make a total that is as close to 20 as possible; you may use each card only once. The player writes the numbers they chose and total on their score sheets. The points for each round is the *difference between the sum and 20* (for example a sum of 24 scores 4 points and so does a sum of 16). Put all five cards in a discard pile and deal out five more for the next round. After five rounds, players total their points and the player with the lowest score wins.

Score sheet:

Round 1: \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ pts

Round 2: \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ pts

Round 3: \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ pts

Round 4: \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ pts

Round 5: \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ pts

Variations:

1. Play Close to 25 and deal out six cards for each round and players may use any four cards to total as close to 25 as possible.

2. Instead of dealing the cards face up and everyone using the same numbers, deal out five cards to each player and spread the remainder in the center of the table face down. Each player uses three cards in his/her hand to add up to 20 and then discards those 3 cards face down to the center of the table. For the next round, each player chooses 3 cards from the center pile and so on until five rounds have been played.

**MAKE 100:**

In this game Aces are one, Queens are zero, and Kings and Jacks are wild cards. Each game has 5 rounds. To play deal six cards to each player. Players choose any four of the cards to make two double-digit numbers that when added come as close as possible to the total of 100. Wild cards can be assigned any value. Players record their numbers and the sums on the score sheet. The player's score for each round is the difference between the sum and 100 (for example sums of 95 and 105 both score 5 points). The used cards are discarded and the two cards remaining in each hand are kept for the next round. For rounds 2 to 5, deal out four cards to each player and make two double-digit numbers, add them, and score your points. At the end of five rounds, the player with the lowest value wins.

Scoring variation: Play is the same, but when you score use positive numbers for sums above 100 and negative numbers for score below 100. The player then adds up positive and negative numbers and the one with the grand total closest to zero after five rounds wins.

Score Sheet:

Round 1: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ points

Round 2: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ points

Round 3: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ points

Round 4: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ points

Round 5: \_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_ points

## 6th Grade Vocabulary

exponent: a number that tells how many times a base is to be used as a factor.

base: a number used as a repeated factor.

perfect square: a number that is a square of a whole number.

square root: one of the two equal factors of a number.

standard form: the form in which numerals are usually written, with digits 0 through 9, separated into periods by commas.



algebraic expression: an expression that is written using one or more variables.

compensation: changing one addend and adjusting the other addend to keep the balance.

equation: a mathematical sentence that uses an equals sign to show that 2 quantities are equal.

evaluating: what you do when you replace the variable with a number and perform the operation in an algebraic expression.

inverse operations: operations that undo each other; addition/subtraction and multiplication/division.

variable: a letter used to represent one or more numbers.

Associative Property of Multiplication: the property that states that 3 or more factors can be grouped in any order without changing their product.

Distributive Property of Multiplication over Addition: the property that states that multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products together.

overestimate: an estimate that is greater than the actual answer.

underestimate: an estimate that is less than the actual answer.

Zero Property of Multiplication: the property that states that the product of 0 and any number is 0.

compatible number: a number that is close to the actual number and is easy to compute mentally.

divisible: a number is divisible by another number if the quotient is a whole number and the remainder is zero.

divisor: the number by which a dividend is divided in a division problem.

expression: a name for a number that contains at least one of the operations of addition, subtraction, multiplication, or division.

quotient: the answer to a division problem.

circle graph: a graph using a circle that is divided into pie-shaped sections showing percents of parts of the whole.

histogram: a bar graph that show the number of times data occurs within certain ranges or intervals.

line graph: a graph in which line segments are used to show changes over time.

median: the middle number or the mean of the 2 middle numbers of a group of numbers arranged in numerical order.

mode: the number of numbers that occur most often in a collection of data; there can be more than one mode or none at all.

range: the difference between the greatest and least numbers in a set per class.

probability: the chance that an event will occur expressed as the ratio of the number of favorable outcomes to the number of possible outcomes.





composite number: a whole number greater than 1 with more than 2 whole-number factors.

greatest common factor (GCF): the largest number that is a factor of 2 or more numbers.

least common denominator (LCD): the smallest number, that is a multiple of 2 or more denominators.

least common multiple (LCM): the smallest number, other than zero, that is a multiple of 2 or more given numbers.

like fractions: fractions that have the same denominator.

mixed number: a number that is made up of a whole-number part and a fraction or a decimal part.

prime number: a whole number greater than 1 whose factors are itself and 1.

prime factorization: a number written as the product of all its prime factors.

denominator: the number below the fraction bar in a fraction; tells the total number of equal parts or groups into which the whole or group has been divided.

estimate: an answer that is close to the exact answer and is found by rounding, by using front-end digits, or by using compatible numbers.

renaming: regrouping whole numbers is similar to renaming mixed numbers

simplest form: a fraction is in simplest form when the numerator and denominator have no common factor greater than 1.

unlike fractions: fractions whose denominators are not the same.

decimal system: a numeration system based on grouping by tens.

divisor: the number by which a dividend is divided in a division problem.

fraction: a number that names part of a group or whole.

less than: (<) smaller in size, quantity, or amount.

reciprocal: one of 2 numbers whose product is 1.

capacity: the amount a container will hold when filled.

customary measurement system: a measurement system that measures length in inches, feet, yards, and miles; capacity in cups, pints, quarts, and gallons; weight in ounces, pounds, and tons; and temperature in degrees Fahrenheit.

gram: a metric unit for measuring mass.

inches: a customary system for measuring length.

liter: a metric unit for measuring capacity.

meter: a metric unit for measuring length.

metric system: a measurement system that measures length in millimeters, centimeters, meters, and kilometers; capacity in liters and milliliters; mass in grams and kilograms; and temperature in Celsius.

ounces: customary system for measuring weight.

precision: a property of measurement that is related to the unit of measure used; the smaller the unit of measure used, the more exact the measurement.

weight: the measure of the force of gravity on an object.

percent: the ratio of a number to 100; % means per hundred.

proportion: an equation which states that 2 ratios are equivalent.

rate: a ratio that compares different kinds of units, such as miles per hour, beats per minute, or students per class.

ratio: a comparison of 2 numbers.

unit rate: a rate in which the second term is 1.



congruent figures: figures that have the same size and shape.

diagonal: a line segment that joins the vertices of a polygon but is not a side.

isosceles triangle: a triangle in which at least 2 sides and 2 angles are congruent.

obtuse angle: an angle whose measure is greater than 90 degrees and less than 180 degrees.

perpendicular line: lines that intersect to form 90 degree, or right angles.

plane: a flat surface that goes on forever in all directions.

polygon: a closed plane figure whose sides are line segments.

ray: a part of a line that has one endpoint and goes on forever in only 1 direction.

rotation: a turn of a figure about a fixed point without reflection.

similar figures: figures having the same shape but not necessarily the same size.

skew lines: lines that are different planes, are not parallel, and do not intersect.

area: the number of square units needed to cover a surface.

chord: a line segment whose endpoints lie on a circle.

circumference: the distance around a circle.

diameter: a chord that passes through the center of a circle.

perimeter: the distance around a polygon.

pi: the ratio of the circumference of a circle to its diameter.

radius: a line segment with one endpoint at the center of a circle and the other endpoint on the circle.

volume: the number of cubic units that can fill a container.

axes: 2 perpendicular lines that form a coordinate plane.

coordinate plane: grid; a plane formed by a horizontal line (x axis) that intersects a vertical line (y axis) at a point called the origin.

negative integer: the opposite of a positive whole number; zero is neither positive or negative.

opposites: two integers that are the same distance from 0 on a number line.

origin: the point where both axes of a coordinate plane intersect.

positive integer: a whole number that is greater than 0.

algebra: when you use variables to represent unknown quantities.

equation: a mathematical sentence that uses an equal sign to show that 2 quantities are equal.

inequality: a mathematical sentence containing  $<$  or  $>$  to show that 2 expressions do not represent the same quantity.

rational number: any number that can be expressed as a ratio in the form of  $a/b$  where  $a$  and  $b$  are integers and  $b$  doesn't equal 0.

relation: a set of ordered pairs.

variable: a letter used to represent one or more numbers.