"Math is Cool" Masters – 2012-13

Sponsored by: REC Silicon, Inc.

5th Grade – May 18, 2013

GENERAL INSTRUCTIONS/INFORMATION applying to all tests and awards:

- *Good sportsmanship is expected throughout the competition by all involved; both competitors and observers. Display of poor sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise, all rational, non-integer answers need to be expressed as reduced common fractions except in case of problems dealing with money. In the case of problems requiring dollar answers, answer as a decimal rounded to the nearest hundredth (ie, to the nearest cent).*
- *For fifth and sixth grade, all fractions and ratios must be reduced to simplest form.*
- *Counting or natural numbers refer to the numbers 1,2,3,4 and so on – zero (0) is NOT included.*
- *Units are not necessary as part of your answer unless it is a problem that deals with time and in that case, a.m. or p.m. is required. However, if you choose to use units, they must be correct.*
- *Leave all answers in terms of π where applicable.*
- *Do not round any answers unless stated otherwise.*
- *Record all answers on the colored cover sheets in the answer column only.*
- *Make sure all answer sheets have all the information (name, team number, etc.) at the top of the sheet filled out.*
- *Tests will be scored as a 0 if answers are not recorded on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will be scored as a 0.*
- *Individual Awards are determined by the sum of an individual's Mental Math score and Individual Test score. Individual Mental Math contributes to approximately 8% of the individual score. Individual ties are broken based on the following in this order: total individual points, total questions answered correctly, individual Mental Math score, total correct from Individual Test problems 31-40, total correct from Individual Test questions 16-30, single questions answered correctly on the Individual Test starting with question 40 and working backwards.*
- *Team Awards are determined by the team score which is calculated by 2(Top 3 Mental Math scores) + 2(Multiple Choice) + 6(Team) + 3(Relay) + (College Bowl) for approximate weights of 25%, 20%, 30%, 15% and 10% respectively. Team ties are broken based on highest event score in order of events starting with Mental Math.*

MENTAL MATH - 30 seconds per question – 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong****. Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

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5th Grade – May 18, 2013

Mental Math Contest

MENTAL MATH - 30 seconds per question – 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong.*** *Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

Question	
1	What is the largest counting number you can make using all the following digits once each? The digits are four, seven, two, zero, and five.
2	What is 15 percent of 80?
3	Up to four penguins can live on one iceberg. What is the least number of icebergs that could hold 25 penguins?
4	If a polygon has 9 sides, how many vertices does it have? Answer "can't tell" if there is not enough information to answer the question.
5	Chris catches fish at a rate of five fish per hour. Dana catches fish at a rate of seven fish per hour. If they both fish for three and a half hours, how many fish will they catch altogether?
6	Ravens have 2 feet and wolves have 4 feet. In a zoo enclosure, there are 3 ravens and some wolves. There are 90 feet total in the enclosure. How many wolves are in the enclosure?
7	I am thinking of an odd counting number that has two digits, both the same. What is my number if it has a remainder of 1 when divided by 6?
8	There are five different books on a bookshelf. Three of them are colored red, one is colored blue, and one is colored green. How many ways are there to arrange the books in a row such that the red books are next to each other?

"Math is Cool" Masters – 2012-13

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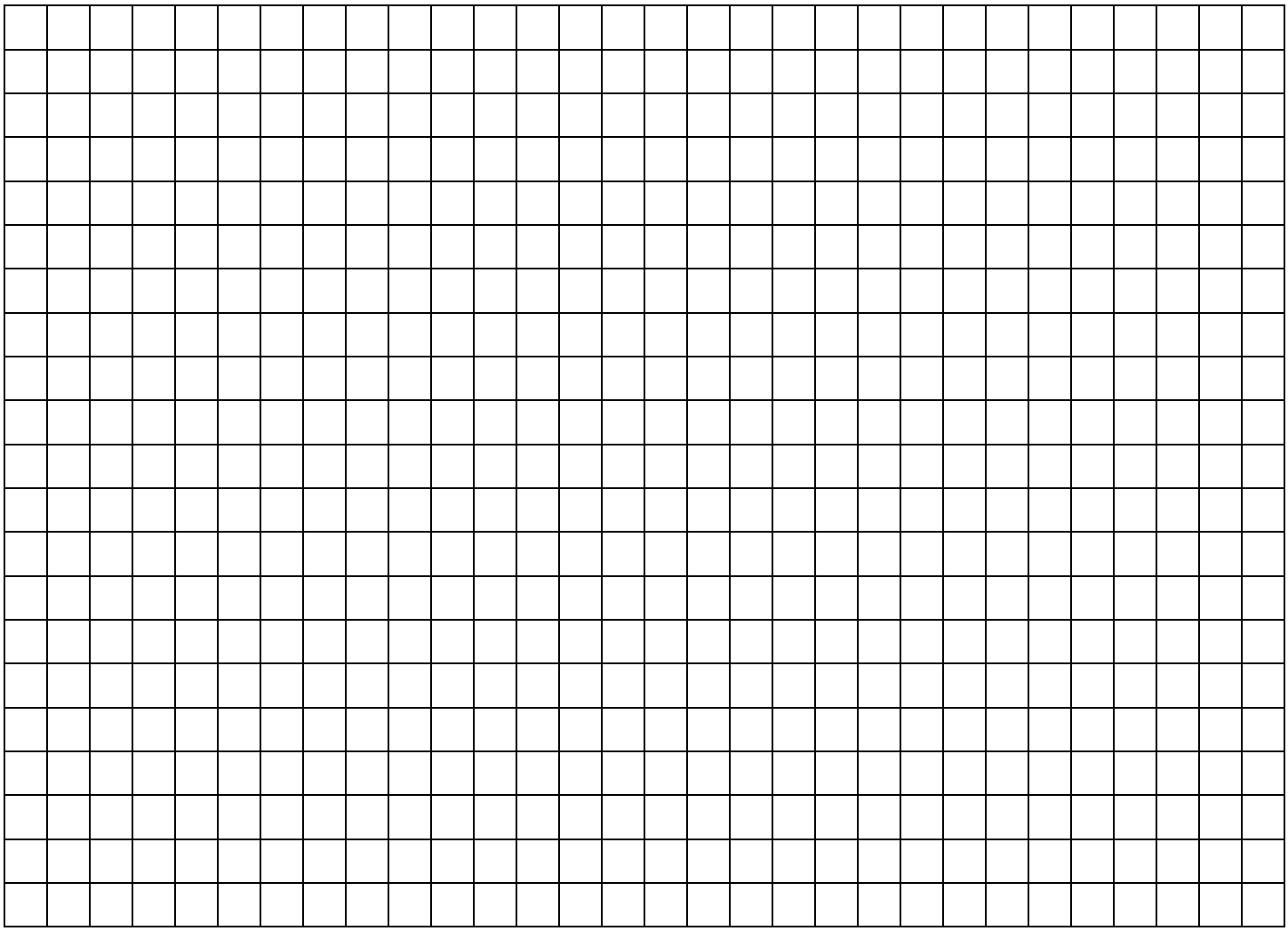
5th Grade – May 18, 2013

Individual Contest

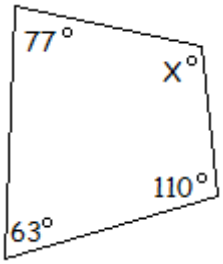
INDIVIDUAL TEST - 35 minutes – 40 problems

You may NOT be seated next to anyone from your school. If you are, MOVE NOW to avoid being disqualified! When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. The raw score will be 2 points for correct answers to problems 1-30 and 3 points for 31-40. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute time warning.



Record all answers on the colored cover sheet.

	Questions 1-30: 2 points each
1	Ali is taller than Barbie. Chris is taller than Diana. Evan is taller than Ali, but shorter than Diana. Of these five, who is the tallest?
2	A biologist studied 7 forest plots and found the same number of monkeys in each plot. There were a total of 707 monkeys in the seven plots. How many total monkeys would be found in **six** of these plots?
3	In one roll of a standard cubical die, what is the probability that the number showing will be even? Answer as a reduced fraction.
4	Drew spent three quarters, a dime and two pennies, and then spent another dime and a nickel. If he had six nickels, four pennies, and a half-dollar left, how much money (in dollars) did he start with?
5	Find the value of 7 + 6 + 6 + 7 + 7 + 6 + 6 + 7 + 7 + 6 + 6 + 7 + 7.
6	It's currently 10:00 AM and my watch is set correctly. If my watch loses 40 seconds per hour, what time will my watch show when it is actually 1:00 PM? [It is not necessary to include "AM" or "PM" in your answer, but if you do include it, it must be correct.]
7	Which mathematical symbol (<, >, or =) can be placed in the blank to make the statement true? 77 x 888 ___ 88 x 777
8	There are 5280 **feet** in a mile. The Pacific Crest Trail is 2663 miles long. How many **yards** long is the Pacific Crest Trail?
9	What is one-third of 258?
10	Donnie got a 70 on his first test, an 80 on his next test, and an 87 on his last test. What was his average (mean) score on these tests?
11	Jimmy will do 400 push-ups on Saturday. If he can do at most 41 push-ups per hour, what is the largest number of hours on Saturday in which he could do **no** push-ups?
12	If the pattern RED ORANGE YELLOW BLUE RED ORANGE GREEN RED ORANGE YELLOW BLUE RED and so on continues, what will be the 2013^{th} color in the pattern?
13	Rita chose a counting number, multiplied it by 5, and then added 17. Her answer was less than 100. What was the largest number Rita could have chosen?
14	Jessica put out 100 carrots for her rabbits on Monday morning. The rabbits ate 18 carrots on Monday, 16 on Tuesday, and so on, eating two fewer carrots each day for the rest of the week. How many carrots remained at the end of the following Sunday?
15	Xavier subtracts 229 from 635 and gets the number X. Yvonne subtracts 178 from 229 and gets the number Y. Find the sum of X and Y.
16	How many times is the digit '3' used in writing the counting numbers less than 150?
17	How many zeros would it take to write the number of **millimeters** in seven hundred thousand **meters**?
18	Let X stand for a positive number such that the product of X times itself is 95. What is the largest counting number smaller than X?
19	Lianne has U.S. coins worth two dollars and nineteen cents. She has no dollar coins or half-dollar coins, and she has more dimes than quarters. What is the smallest number of coins Lianne could have?

20	What is the value of X? 
21	When a certain bouncy ball hits the ground, it bounces back up to half its original height. If it is dropped from 40 feet above the ground, what is the total distance in feet it has travelled by the time it hits the ground the third time?
22	Sammy is reading two books, *Cat's Cradle* (CC) and *Dog's Dinner* (DD). He reads them alternately, first reading two chapters of CC and then 1 chapter of DD, then 2 chapters of CC, and so on. If CC has 29 chapters and DD has 33 chapters, how many more chapters will he have left to read in DD by the time he finishes CC?
23	Trudy bought two flowering plants for six dollars and twenty-five cents each. The total cost of her purchase, including tax, was $13.50. As a percent, what was the tax rate?
24	How many ways can the letters in the word "word" (W-O-R-D) be rearranged so that no letter is in its original position?
25	Assume that 5 of the 26 letters of the English alphabet are vowels and the rest are consonants. Rasheed has a box of letter tiles holding one tile of each consonant and four tiles of each vowel. If Rasheed selects tiles at random, how many will he have to take out of the box to be sure of getting at least one vowel and at least one consonant?
26	What is the smaller angle, in degrees, between the hands of a 12-hour wall clock when the time is seven-thirty?
27	A rectangular block of frozen spinach is 2 by 4 by 6 inches. Without moving or stacking pieces, Jinglin cuts this block into equal rectangular blocks that are two by one-and-a-half by one-and-a-third inches. What is the least number of straight cuts it could have taken her?
28	When two copies of a counting number are multiplied together, the result is called a square number or perfect square (eg, 10 x 10 = 100 is a square number). When three copies of a counting number are multiplied together, the result is called a cubic number or perfect cube (eg, 10 x 10 x 10 = 1000 is a cubic number). Subtract the sum of the five smallest square numbers from the sum of the five smallest cubic numbers.
29	One cup of a certain soil sample contains five billion bacteria, of which 1/8 are pathogens (bacteria that cause disease). How many pathogens are in the one-cup sample? Give your answer as a number (in numerals, not in words).
30	Rena has five dollars more than twice as many dollars as Shila, who has five dollars less than twice as many dollars as Tim. If Rena has $31, how many dollars does Tim have?

Challenge Questions: 3 points each	
31	My 12-hour digital clock shows hours and minutes, but not seconds. The hour may have either 1 or 2 digits, but the minute always has 2 digits (with leading zeros used as necessary); for example, at 5 minutes after 7 PM, the clock displays "7:05". I list in order all the times between noon and midnight that my clock displays no digit that isn't either a "1" or a "2". What is the greatest number of minutes between two consecutive times on my list?
32	Ton has 5 mangos. One mango can be traded for 4 durians, and each durian can be traded for either 3 apricots, or 2 peaches, or 1 orange. How many smoothies can Ton make, if each smoothie requires 1 durian, 2 apricots, 1 peach, and 1 orange?
33	When one line intersects a circle, the greatest number of regions that can be created within the circle is 2. What is the greatest number of regions within a circle that can be created by four distinct lines intersecting the circle?
34	Melanie has 2013 marbles and some boxes, numbered 1, 2, 3, and so on. She puts 1 marble in box #1, 2 marbles in box #2, 4 marbles in box #3, 8 marbles in box #4, and so on, doubling the number of marbles in each successive box as long as possible. What is the number of the box in which she puts her last marble?
35	At the same time, Stuart and Theo start walking toward each other along a number line. Stuart starts at point 78 and walks at a speed of 4 units per minute. Theo starts at point 14 and walks at 3 units per minute. When Theo reaches point 95, how many units past 0 will Stuart have walked?
36	Miya has 30 beads. Eighteen of them are glass, and 22 of them are blue. If Miya takes one bead at random, what is the probability that it will be glass but not blue? Answer as a reduced fraction.
37	A "safe prime" is a prime number of the form (2 x p) + 1, where p is another prime number. For example, 7 is a safe prime because (2 x 3) + 1 = 7, and both 3 and 7 are prime numbers. Find the sum of all safe primes less than 100.
38	Jan, Kim, and Len are rockhounds, and together have 96 rocks. Jan has one-third as many rocks as Kim and Len together. Kim has one-third as many rocks as Len. How many rocks does Len have?
39	If the product of 2013 times N is greater than 300,000 but less than 500,000, what is the sum of the largest and smallest possible whole-number values of N?
40	In the multiplication problem 4A7 x B3 = 24C51, the letters A, B, and C stand for digits, not necessarily different. Find the sum of A, B, and C.

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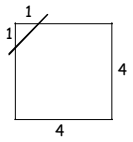
5th Grade – May 18, 2013

Team Multiple Choice Contest

USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 1-3.
Each of the corners (vertices) of a 4 by 4 inch square is cut off by a single straight cut one inch from the vertex in each direction. One such cut is shown.



1 When all cuts are made and the cut-off portions removed and discarded, what is the name of the polygon that remains?
A) square B) hexagon C) octagon D) diamond E) Answer not given

2 When all cuts are made and the cut-off portions removed and discarded, what is the area in square inches of the polygon that remains?
A) 4 B) 9 C) 12 D) 16 E) Answer not given

3 If the cut-off portions are put together with no overlap to form a polygon, what is the smallest possible perimeter of the figure that could result?
A) 2 inches B) 4 inches C) 6 inches D) 8 inches E) Answer not given

The Seattle Mariners baseball team has 5 pitchers on their staff. Some of their statistics are given in the table below. All numbers are totals for the season so far.
USE THIS INFORMATION AS NEEDED TO ANSWER QUESTIONS 4-7.

Pitcher Name	Innings Pitched	Strikeouts	Groundouts	Games Pitched
Felix	220	?	100	34
Jason	200	140	?	30
Hector	160	150	132	25
Blake	?	100	140	20
Kevin	110	150	122	22

4 If Blake pitched 6 innings in one-fourth of his games, 7 innings in half his games, and 8 innings in one-fourth of his games, how many innings did he pitch so far this season?
A) 180 B) 168 C) 140 D) 112 E) Answer not given

5 If Felix averages 5 strikeouts for every 4 innings he pitches, rank the pitchers (greatest to least) by their average number of strikeouts per game pitched. Use initials (F = Felix, J = Jason, H = Hector, B = Blake, K = Kevin).
A) FKHBJ B) KHFBJ C) FHKBJ D) KFHBJ E) Answer not given

6 By a strange coincidence, the average number of groundouts recorded by all five pitchers is equal to the total number of games pitched by the 5 pitchers. How many groundouts did Jason record?
A) 131 B) 161 C) 230 D) 124 E) Answer not given

7 Every pitcher named has won either one-half, two-thirds, or two-fifths of the games he has pitched so far. If the total number of games won by the five pitchers is 66, how many games has Jason won?
A) 8 B) 12 C) 15 D) 20 E) Answer not given

	USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 8-10. Assume that when building with Legos, each person always works at a constant rate. Alida works at one-third the rate of Beth, and at three times the rate of Carol. Didi works at one-third the rate of Carol.
8	If it takes Beth 33 minutes and 33 seconds to complete a Lego windmill, how long will it take Didi to complete the windmill? A) 5 hr, 1 min, and 57 sec B) 15 hr, 5 min, and 51 sec C) 1 hr, 40 min, and 39 sec D) 11 min and 11 sec E) Answer not given.
9	Beth can build a Lego starship in ten **hours**. How many **minutes** will it take Alida and Beth working together to build the starship? A) 240 B) 200 C) 400 D) 450 E) Answer not given.
10	Carol and Didi work together to build a Lego bridge. When they are one-third finished, Didi has to leave, so Alida joins Carol and the two of them work together to finish the bridge. What fraction of the work on the bridge was done by Carol? A) 4/9 B) 5/12 C) 1/2 D) 1/3 E) Answer not given.

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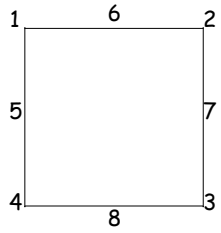
Team Contest

1	A marching band marches "eight to five" — that is, eight equal paces (steps) to each five yards. How many **inches** long is each of the band's paces? If your answer is not a whole number, give it as a **decimal**.
2	Subtract two thousand thirteen from thirteen thousand two.
3	How many years old will Lucy be 100 months after her 10th birthday? Give your answer as a MIXED NUMBER of years.
4	The vertices of a paper square and the midpoints of its sides are numbered as shown. The square is folded once to create a 2-layered figure with half the area of the square. When a numbered point lies on top of another numbered point, the two numbers are added to get a point sum. Find the largest possible total of all point sums for any one figure created as described. 
5	Cam the Turtle is crawling across a path at a rate of 5 inches per day. He only crawls during the daytime. Every night, Joel moves Cam back 2 inches. If the path is two feet wide, what is the total number of inches that Cam must crawl to reach the other side?
6	The Yogurt Yurt sells Frozen Yogurt Treats (frozen yogurt plus toppings) at 40 cents an ounce. Strawberries are a quarter of an ounce each and blackberries are an eighth of an ounce each. I get 5 ounces of frozen yogurt, topped with 3 strawberries, 12 blackberries, 1 ounce of whipped cream, and half an ounce of hot fudge sauce. How much (in dollars) does my Frozen Yogurt Treat cost?
7	There were more than two dozen cookies in a jar, two-thirds of them chocolate and the rest ginger. After Tara ate some of the cookies (all of them her favorite flavor), four-fifths of the remaining cookies were chocolate. What is the smallest number of ginger cookies there could have been in the jar before Tara ate any cookies?
8	For Rodeo Days, Dale buys a cowboy hat and two bandanas, for a total cost of $17. The hat cost $12 more than the total cost of the two bandanas. If the more expensive bandana cost a dollar more than the cheaper one, what was the cost in dollars of the more expensive bandana?
9	Mr. McMorrow is moving his 114 boxes of math materials to a new classroom. Five boxes can fit on a trolley and seven boxes on a cart. If he takes one trolley or cart (fully loaded) per trip, how many trips will it take him to move all his boxes? GIVE ALL POSSIBLE ANSWERS.
10	There are 12 people in a room. N people leave the room, decreasing the number of people in the room by X%. When these same N people re-enter the room, it increases the number of people in the room by Y%. If the ratio of X to Y is 2 to 3, what is N?

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5th Grade – May 18, 2013 – Relay Contest

RELAYS - 5 minutes per relay – 4 problems per relay - 2 relays – 15% of team score

There is no talking during this event and you must always be facing forward. Person #1 will be given an answer sheet and will need to fill out the information at the top. The proctor will hand out a strip of paper to each person containing problem(s). These need to be face down on your desk until it is time for the relay to start. Person #1 will have problem #1 on his/her paper. Person #2 will have problem #1 and #2 printed on his/her paper. Person #3 will have problem #2 and #3 on his/her paper and Person #4 will have problem #3 and #4 on his/her paper. Once the relay begins, everyone may turn over their strip of paper and begin working. You may write on the strip of paper to come up with answers to the problems on your strip of paper. However, when person #1 figures out his/her problem, he/she will record ***ONLY his/her final answer*** *on the answer sheet and pass only the answer sheet back to the person #2. Person #2 has the option of changing Person #1's answer if he/she wants by crossing it out and putting a new answer. Once Person #2 records at least an answer for problem #2 on the answer sheet, he/she passes only the answer sheet behind to Person #3. This continues until person #4 puts an answer on the answer sheet and gives it to the proctor. A correct answer for problem #1, #2 and #3 is worth 1 point each. A correct answer from problem #4 is worth 2 points making each relay worth 5 points. You will see the expression* ***TNYWG*** [Proctor: write this on the board] *which means: "the number you will get". This is where you insert your teammate's answer into the new problem that you have on your paper so you can finish solving it. Once the relay begins, turn over your strip of paper and* ***make sure you have the right person number.*** *Each teammate has the option of changing any answers on the answer sheet when they have it in their possession, but once it is passed back, they will not see the answer sheet again. Remember, no talking and remain facing forward to avoid being disqualified!*

	Relay #1	Answer
Question 1	When 48 coins are divided into stacks so that each stack has 12 coins, how many stacks will there be?	4 [stacks]
Question 2	Victoria is on the fourth floor (floor #4) of a tall building. She gets on an elevator and travels TNYWG floors up, then two floors down, then six floors up. What is the number of the floor she ends on?	[#] 12
Question 3	Randy has TNYWG **gallons** of lemonade. He drinks TNYWG **pints** of lemonade. How many **quarts** of lemonade does he have left?	42 [quarts]
Question 4	Jack is selling dumplings for seven cents each and rice cakes for twelve cents each. How much money (in dollars) will he take in if he sells TNYWG dumplings and 24 rice cakes?	[$] 5.82
	Relay #2	Answer
Question 1	Subtract 2.437 from 6.436, and give your answer as a decimal.	3.999
Question 2	What is the smallest counting number greater than the product of TNYWG multiplied by itself?	16
Question 3	What is the largest counting number you could add to TNYWG so that the sum is less than the product of 38 and 3?	97
Question 4	Lulu has 125 bins holding 400 apples each. When she puts all these apples in boxes holding TNYWG apples each, the last box won't be completely full. How many more apples would she need to completely fill the last box?	52 [apples]

"Math is Cool" Masters – 1012-13

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5th Grade – May 18, 2013

COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	If you flip a fair coin 38 times, how many times would it be expected to land on heads?	19 [times]
2	What is the remainder when three thousand four hundred sixty-seven is divided by seven?	2
3	Jay walks at a constant speed of 6 miles every two hours. He walks for four hours every day except for Sundays, when he walks for only two hours. How many miles does Jay walk in two weeks?	156 [miles]
4	Find the sum of the next **two** terms in the arithmetic [pronounced: a-rith-MET-ic] sequence whose first four terms are: 6, 9, 12, 15	39
5	When the fraction "eight over seventy-two" is fully reduced, what is the denominator?	9
6	A palindrome number reads the same backwards as forwards, like "seven hundred forty-seven". How many counting numbers larger than 747 but smaller than 800 are palindromes?	5 [numbers]
7	Convert two thousand thirteen hours to the nearest whole number of days.	84 [days]
8	Mario likes red flowers. Forty percent of the flowers in a field are red. If he picks a flower at random, what is the probability that he **won't** get a red flower? Give your answer as a reduced **fraction**.	3/5
9	A tire has a diameter of two feet. How many **complete** revolutions will this tire make in rolling forty feet?	6 [revolutions]
10	Terry has 4 books to read for English class. The first book has 304 pages, the second has 226 pages, the third has 453 pages, and the fourth has 1,150 pages. If Terry reads 27 pages every day, how many days will it take her to finish all four books?	79 [days]

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COLLEGE KNOWLEDGE BOWL ROUND #2 - SET 2

#	Problem	Answer
1	When the sum of 47 and 16 is divided by 7, what is the quotient?	9
2	A bowl holds twenty tiles. There are two tiles labeled with each of the ten digits. Eric takes four tiles from the bowl, and uses the tiles to make a 4-digit counting number. What is the smallest such number Eric could possibly make?	1001
3	Eeyore the donkey requires three buckets of oats per day. How many buckets of oats will be required to feed Eeyore for 23 days?	69 [buckets]
4	What is the median of the counting numbers from twenty-three through forty-one, inclusive?	32
5	How many months of the year have 30 days?	4 [months]
6	A checkerboard with 13 rows and 13 columns of congruent squares has alternating black and white squares. If at least one corner square is black, how many of the squares are black?	85 [squares]
7	A cookie jar holds 5 chocolate, 6 vanilla, and 9 lemon cookies. Pat eats one of each flavor, and then pulls out one more cookie at random. As a fraction, what is the probability that this cookie is vanilla?	6/17
8	Give the value of X that makes the following equation true: 14 plus two X is equal to 76	[X=] 31
9	For a fruit salad, Julia mixes 7 apples to every orange, and 4 oranges to every banana. If she uses 24 oranges for the salad, how many fruits in all would she need?	198 [fruits]
10	Bill and Jane leave from the same point and travel along the same road. Bill drives at 50 miles per hour and Jane drives at 70 miles per hour. If Bill leaves 30 minutes before Jane, how many MINUTES after Jane leaves will it take her to catch up with Bill?	75 [min]

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COLLEGE KNOWLEDGE BOWL ROUND #3 - SET 3

#	Problem	Answer
1	What is the result when 7 is squared?	49
2	Eho collects one hundred eggs from the hen house. He has cartons that hold a dozen eggs each. How many of these cartons can he fill completely?	8 [cartons]
3	A pile of lemurs sleeping on a platform at the zoo has a total of 28 legs, tails, and ears. How many ears are there?	8 [ears]
4	What is the perimeter in inches of a regular dodecagon with side length five inches?	60 [inches]
5	Ramona is delivering pizzas. She can only go north, south, east, or west on a grid of streets one block apart in all directions. From the Pizza Shop, she first went 13 blocks east, then 7 blocks North, then 5 blocks West, then 9 blocks South, and finally 2 blocks North. What is the least number of blocks Ramona can travel to get back to the Pizza Shop?	8 [blocks]
6	What is the result when five more than the product of three and six is subtracted from the product of seven and eight?	33
7	A faucet leaks water at the rate of 3 quarts per hour. How many hours would it take for the faucet to fill a 15-gallon container?	20 [hours]
8	What is the probability of getting a king in one random draw from a standard deck of 52 cards? Answer as a reduced fraction.	1/13
9	Whenever Brendan hits a golf ball, he loses it. At the start of Monday, he has 29 golf balls. He hits 4 balls on Monday and three times that many on Tuesday. On Wednesday he buys twice as many balls as he lost on Monday. How many golf balls does he have now?	21 [balls]
10	A famous speech refers to an event that happened "fourscore and seven years ago". The event happened in 1776 and a "score" is twenty. When he made his speech, what year was as far in the future to the speaker as 1776 was in the past?	1950

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5th Grade – May 18, 2013

COLLEGE KNOWLEDGE BOWL ROUND #4 - SET 4

#	Problem	Answer
1	Corinne had three quarters, eight nickels, one dime, and seven pennies. She spent two quarters, three nickels, four pennies, and the dime. How many **cents** did she have left?	53 [cents]
2	A math class period lasts one and a half hours. A guest speaker gives a presentation lasting 20 minutes, and then the class members get 50 minutes to work on their assigned problems. How many minutes of the class period are left?	20 [minutes]
3	Lynn adds three numbers from the following list and gets a sum with zero in the **tens** place. Which number did she leave out? The numbers on the list are sixty-four, fifty-three, ninety-six, and eighty-eight.	96
4	A right angle is divided into two adjacent angles. One of these angles is 73 degrees. What is the degree measure of the other angle?	17 [degrees]
5	Kay wants to round a five-digit counting number to the nearest thousand. However, the middle digit is blurred. She can only see "eight zero BLUR four seven". If the number rounds to eighty thousand, what is the **sum** of all the digits that could be in the middle position?	10
6	Let A equal one-eighth, B equal one-ninth, and C equal two-seventeenths. Put the values of these three fractions in order from smallest to largest. Your answer should be three letters in the correct order.	BCA
7	There are 270 fish and one fish-eating turtle in a pond. In three minutes, there will be zero fish and one well-fed turtle left in that pond. On average, how many fish per **second** does the turtle eat? Express your answer as a **decimal**.	1.5 [fish]
8	The Yogurt Yurt sells 8 different types of frozen yogurt, 30 different toppings, and 7 different syrups. How many different sundaes can you make if each sundae has one type of frozen yogurt, one topping, and one type of syrup?	1,680 [sundaes]
9	What is the area in square inches of a square whose perimeter is two inches? If your answer is not a whole number, give it as a fraction.	1/4 [sq. inch]
10	Oliver's function machine produces 17 when five is entered, produces 32 when ten is entered, and produces 41 when thirteen is entered. Following this same rule, what number will the machine produce when 17 is entered?	53

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COLLEGE KNOWLEDGE BOWL ROUND #5 - SET 5

#	Problem	Answer
1	How many of the counting numbers less than 2013 can be divided by 2 with no remainder?	1006 [numbers]
2	Ariel multiplies 7 times 5 times 7 times 5 times 4 times 4. The product she gets will end in how many zeros?	2 [zeros]
3	The Moses Lake Math Team has 26 members. The Moses Lake Lacrosse Team has 16 members. Combined, the two teams have 34 different members. How many people are on both the Math Team and the Lacrosse Team?	8 [people]
4	A rectangular garden bed measures 7 feet by 8 feet. If there are an average of 27 flowers per square foot in this bed, how many total flowers are there in it?	1512 [flowers]
5	A rhombus has a perimeter of 60 inches. What is its side length, in inches?	15 [inches]
6	Your teacher assigns 24 math problems for you to solve. If you can solve four problems every three and a half minutes, how many minutes will it take you to finish your assignment?	21 [minutes]
7	I am thinking of a certain counting number. There are exactly twelve multiples of four that are less than my number but greater than zero. How many different numbers could I be thinking of?	4 [numbers]
8	A widget factory operates 24 hours a day, seven days a week. It produces widgets at the rate of 17 widgets per hour. How many widgets would it produce in 13 days and 4 hours?	5372 [widgets]
9	A "stone" is a unit of weight equal to 14 pounds. Santa thought he'd picked up a little too much weight over the holidays, so he started a diet in January. From a starting weight of 16 stone and 8 pounds, he lost half a stone a month for the next 8 months. How many pounds did Santa weigh at the end of the 8 months?	176 [pounds]
10	Tony and Jimmy are brothers. The sum of their ages 14 years ago was 14 years. If Tony is four years older than Jimmy, how many years old is Jimmy now?	19 [years]

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COLLEGE KNOWLEDGE BOWL ROUND #6 - SET 6

#	Problem	Answer
1	What is the product when four point six two is multiplied by zero?	zero
2	William has 400 dollars. Every week he earns 17 dollars, but every day he spends 6 dollars. How many dollars will he have after three weeks?	325 [dollars]
3	The product of two consecutive **even** counting numbers is 48. What is the sum of these two numbers?	14
4	Ruthie was digging up the dandelions in her lawn. When she was working, she dug up ten dandelions every four minutes. After every twenty minutes of work, she took a 5-minute rest break. How many minutes did it take until Ruthie had dug up 120 dandelions?	58 [minutes]
5	Lola's test scores from her past four math tests are 90, 50, 83, and X. If her average test score is exactly 79, what is X?	[X=] 93
6	I am thinking of a 4-digit counting number. All its digits are different, and all are odd. What is the difference between the largest and smallest numbers I could be thinking of?	8396
7	How many more diagonals than lines of symmetry can be drawn in a regular hexagon?	3 [more diagonals]
8	Mama Tang's famous cookie recipe requires 10 pounds of butter per gross of cookies. A gross is a dozen dozen. How many pounds of butter will Mama Tang need to make 90 cookies? If your answer is not a whole number, give it as a decimal.	6.25 [lbs]
9	What is the sum of the prime numbers between 30 and 50?	199
10	Adam is trying to call from a pay telephone that costs 50 cents per call. He has quarters, dimes and nickels, at least ten of each type of coin. How many ways can he pay the 50 cents?	10 [ways]

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COLLEGE KNOWLEDGE BOWL ROUND - EXTRA

#	Problem	Answer
1	What is the least common multiple of 12 and 15?	60
2	What is the quotient of 312 divided by 24?	13
3	Mitchell is flipping fair coins. He has just flipped 3 heads in a row. As a reduced fraction, what is the probability that he flips another head on his next flip?	1/2

Final Score:
KEY

First Score
(out of 8)

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5th Grade – May 18, 2013

Name_____Team #_____ Room #_____

School Name _____ Proctor Name_____

Mental Math Contest

MENTAL MATH - 30 seconds per question – 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong****. Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	75420		
2	12		
3	7 [icebergs]		
4	9 [vertices]		
5	42 [fish]		
6	21 [wolves]		
7	55		
8	36 [ways]		

"Math is Cool" Masters – 2012-13

5th Grade – May 18, 2013

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

KEY

First Score

(out of 20)

TEAM MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score

This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1	C		
2	E [14]		
3	E [4√2 inches]		
4	C		
5	A		
6	B		
7	D		
8	B		
9	D		
10	B		

"Math is Cool" Masters – 2012-13

5th Grade – May 18, 2013

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

KEY

First Score

(out of 10)

TEAM TEST - 15 minutes – 10 problems – 30% of team score

*When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as **1 or 0**. Record all answers on colored answer sheet.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	22.5 [inches]		
2	10989		
3	$18\frac{1}{3}$ [years]		
4	32		
5	38 [inches]		
6	[$]3.50		
7	7 [cookies]		
8	[$]1.75		
9	18, 20, 22 [trips] (any order)		
10	[N=] 4		

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KEY

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School:_____Team #_____

Proctor: _____ Room #_____

RELAY # 1

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
4 [stacks]	**[#] 12**	**2 [quarts]**	**[$] 5.82**
1 or 0	1 or 0	1 or 0	2 or 0

RELAY # 2

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
3.999	**16**	**97**	**52 [apples]**
1 or 0	1 or 0	1 or 0	2 or 0

Final Score:

First Score
(out of 8)

Math is Cool" Masters – 2012-13

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5th Grade – May 18, 2013

Name_____Team #_____ Room #_____

School Name _____ Proctor Name_____

Mental Math Contest

MENTAL MATH - 30 seconds per question – 25% of team score

When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. ***You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong****. Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			

"Math is Cool" Masters – 2012-13

5th Grade – May 18, 2013

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

First Score
(out of 20)

TEAM MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score

This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

"Math is Cool" Masters – 2012-13

5th Grade – May 18, 2013

School Name_____Team #_____

Proctor Name_____Room #_____

Final Score:

First Score
(out of 10)

TEAM TEST - 15 minutes – 10 problems – 30% of team score

When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as ***1 or 0****. Record all answers on colored answer sheet.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

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May 18, 2013

Final Score: 1-15	Final Score: 16-30	Final Score: 31-40
KEY	KEY	KEY

STUDENT NAME: _____ **School Name:** _____

Proctor Name: _____ Team #: _____ Room #: _____

5th Grade Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	Chris		
2	606 [monkeys]		
3	1/2		
4	[$]1.86		
5	85		
6	12:58 [PM]		
7	=		
8	4,686,880 [yds]		
9	86		
10	79		
11	14 [hours]		
12	blue		
13	16		
14	16 [carrots]		
15	457		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	35 [times]		
17	8 [zeros]		
18	9		
19	18 [coins]		
20	110 [degrees]		
21	100 [feet]		
22	19 [chapters]		
23	8 [%]		
24	9 [ways]		
25	22 [tiles]		
26	45 [degrees]		
27	5 [cuts]		
28	170		
29	625,000,000 [pathogens]		
30	[$] 9		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	529 [minutes]		
32	6 [smoothies]		
33	11 [regions]		
34	[#] 11		
35	30 [units]		
36	4/15		
37	235		
38	54 [rocks]		
39	398		
40	18		
31-40 TOTAL:			

5th Grade

Final Score: 1-15	Final Score: 16-30	Final Score: 31-40

"Math is Cool" Masters – 2012-13

May 18, 2013

STUDENT NAME: _____ **School Name:** _____

Proctor Name: _____ Team #: _____ Room #: _____

5th Grade Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
31-40 TOTAL:			

5th Grade