"Math is Cool" Masters – 2012-13

Sponsored by: Columbia Energy Charitable Foundation

6th 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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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 80 percent of 15?
2	My rectangle has side lengths of 12 and 4 inches. What is the area in square inches of a square that has the same perimeter as my rectangle?
3	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.
4	Put the fractions A, B, and C in order of size, smallest first. Use letters for your answer. Let A equal 27 over 8, let B equal 7 over 2, and let C equal 13 over 4.
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. An enclosure at the zoo has some wolves and some ravens, with a total of 72 feet. If the ratio of ravens to wolves is as close as possible to 1, how many wolves are in the enclosure?
7	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?
8	Andrea meant to add all of the multiples of 7 between 1 and 100, but she accidentally left out one of them. She correctly added all the others and got a sum ending in 0. What number did she leave out?

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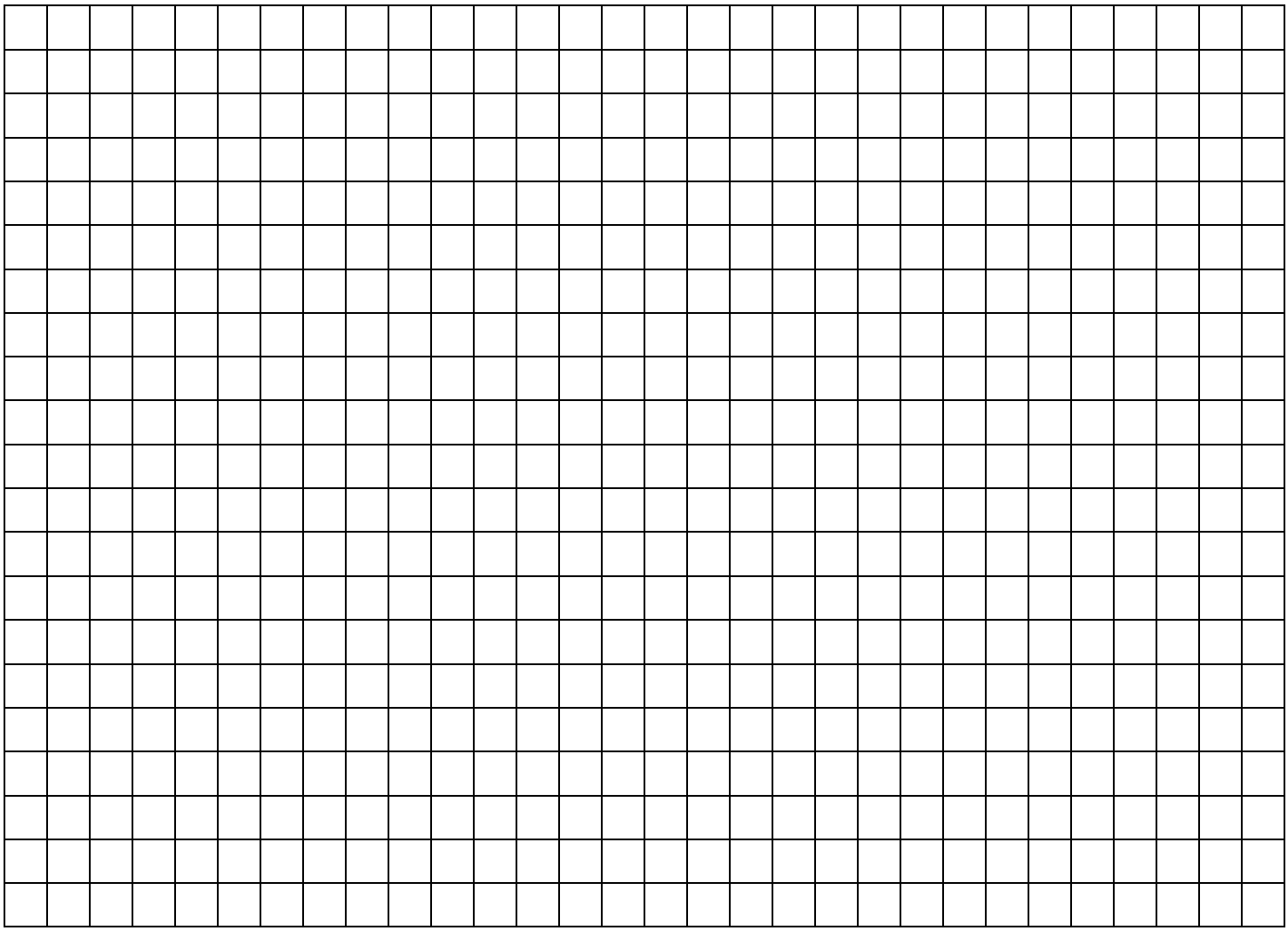
6th Grade – May 18, 2013

Individual Contest

INDIVIDUAL TEST - 35 minutes – 40 problems

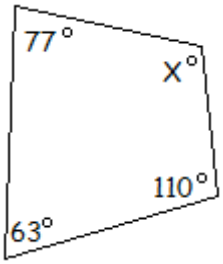
You may NOT be seated next to anyone from your school. If you are, MOVE NOW to avoid being disqualified! When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. The raw score will be 2 points for correct answers to 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.

6th Grade

	Questions 1-30: 2 points each
1	Ali (A) is taller than Barbie (B). Chris (C) is taller than Diana (D). Evan (E) is taller than Ali, but shorter than Diana. Using letters to stand for names, list these five people in order of increasing height, shortest to tallest. Your answer should be five letters in the correct order.
2	A biologist studied 7 forest plots and found the same number of monkeys in each plot. There were a total of 728 monkeys in the seven plots. How many total monkeys would be found in **six** of these plots?
3	In one random draw from a standard deck of cards, what is the probability that the card will be a red king? 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? **Round your answer to the nearest hundred yards.**
9	What is the value of (1/2) times 258 times (1/3)?
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 35 push-ups per hour, what is the largest number of hours on Saturday in which he could do **no** push-ups?
12	What day of the week will it be 2013 days after Tuesday?
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 135?
17	How many zeros would it take to write the number of **millimeters** in seven hundred thousand **kilometers**?
18	If X is a positive number whose square is 95, what is the largest counting number smaller than X?

19	Lianne has U.S. coins worth three dollars and thirty-seven 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	What is the area in square **feet** of a rhombus with diagonals of length 12 **inches** and four **inches**? If your answer is not a whole number, give it as a reduced fraction.
23	Trudy bought two flowering plants for $6 each, and a trowel for $3. The total cost of her purchase, including tax, was $16.26. As a percentage, what was the tax rate? (If your answer is not a whole number percent, give it as a decimal percent.)
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	Tron has $40 in paper money in his wallet. He has equal amounts of money in $10 bills, $5 bills, $2 bills, and $1 bills. If he takes bills from his wallet at random, how many bills will he have to remove to be sure of getting at least $15?
26	For a 12-hour analog wall clock, name all times between midnight and noon when it is exactly half-past an hour, and the hour and minute hands of the clock are 45 degrees apart. (It is not necessary to include "AM" or "PM" in your answer, but if you do include it, it must be correct.)
27	What is the sum of the number of vertices in a cube, the number of edges in a tetrahedron, and the number of faces in a dodecahedron?
28	As a decimal number of square inches, what is the surface area of a right rectangular prism with length, width, and height of 2.1 inches, 3.4 inches and 0.8 inches, respectively?
29	One cup of a certain soil sample contains five billion bacteria, of which 7/8 are decomposers (bacteria that live on rotting matter). How many decomposers are in the one-cup sample? Give your answer as a number (in numerals, not in words).
30	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?

Challenge Questions: 3 points each	
31	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?
32	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 five distinct lines intersecting the circle?
33	Two drinking glasses, A and B, are cylindrical in shape. Glass A has radius 2 cm and height 4 cm; glass B has radius 3 cm and height 3 cm. Jen fills glass B to the brim with water, then uses this to fill glass A. She then empties A into the sink, and pours the water remaining in B into A. She then fills B and pours as much as possible into A. No water is spilled. In cubic cm, how much water is left in B?
34	When the base 10 number 2013 is written in base 2, how many digits will it have?
35	Miya has 30 beads. Eighteen of them are glass, and 22 of them are blue. If Miya takes one bead at random, how much **greater** is the probability that it will be blue glass than that it will be glass but not blue? Answer as a reduced fraction. (If the bead is **less** likely to be blue glass than to be glass but not blue, your answer will be negative.)
36	A "safe prime" is a prime number of the form 2p + 1, where p is another prime number. For example, 11 is a safe prime but 13 is not. Find the sum of all safe primes less than 100.
37	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?
38	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?
39	This year, Alice and Rob will have their Wth wedding anniversary, their son Alan will have his Ath birthday, their daughter Bobbi will have her Bth birthday, and Rob will have his Rth birthday, all on the same date. If both W and R are perfect square numbers, A is a perfect cubic number, and B is a perfect fifth power, what is the sum of W, R, A, and B? Assume that 50>W>B>A>10, and that Rob was between 20 and 30 years old when he married Alice.
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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6th Grade – May 18, 2013

Team Multiple Choice Contest

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 1-3.

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

1 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

2 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

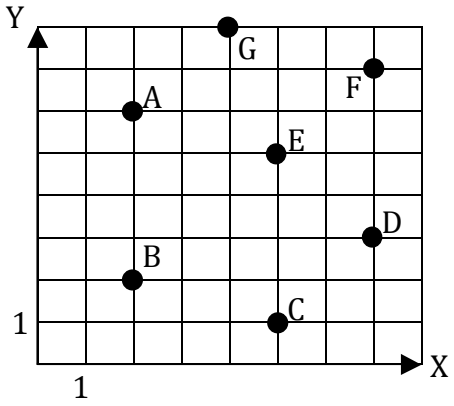
3 By a strange coincidence, the average number of groundouts recorded by all five pitchers is equal to the total number of games pitched by the 5 pitchers. How many groundouts did Jason record?
A) 131 B) 161 C) 230 D) 124 E) Answer not given

USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 4-6.
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.

4 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.

5 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.

6 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.

	USE THE FOLLOWING INFORMATION TO ANSWER QUESTIONS 7-10. 
7	What are the coordinates of point E? A) (4, 4) B) (4, 5) C) (5, 4) D) (5, 5) E) Answer not given.
8	In square units, what is the area of quadrilateral ECDF? A) 8 B) $8\sqrt{2}$ C) 16 D) $16\sqrt{2}$ E) Answer not given.
9	In square units, what is the area of triangle ABC? A) 6 B) 15/2 C) 12 D) 15 E) Answer not given.
10	How many different parallelograms can be created using four labeled points on the graph as vertices? A) 35 B) 3 C) 6 D) 1 E) Answer not given.

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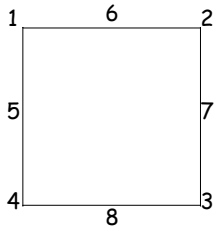
6th Grade – May 18, 2013 – Team Contest

1	How many years old will Lucy be 100 months after her 10th birthday? Give your answer as a MIXED NUMBER of years.
2	Let $A=\frac{3}{4}-\frac{3}{5}$, $B=\frac{3}{5}-\frac{3}{6}$, $C=\frac{3}{6}-\frac{3}{7}$, and $D=\frac{3}{7}-\frac{3}{8}$. Put these four values in order from least to greatest, using letters. Your answer should be four letters in the correct order.
3	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. 
4	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?
5	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?
6	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?
7	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.
8	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?
9	Henry has three thin rods, of lengths 17 inches, 14 inches and 12 inches, with which he forms a non-degenerate triangle (ie, one with positive area). At step 1, he cuts off 1 inch from each rod, and again tries to form a triangle. At step 2, he removes another inch from each rod and tries to make a triangle, and so on. At which step number will Henry first no longer be able to form a non-degenerate triangle with the three shortened rods?
10	Peggy enters three lotteries, in which numbers are drawn at random to receive prizes. She has a 10% chance of willing Lottery A, a 55% chance of winning Lottery B, and a 95% chance of winning lottery C. As a **decimal**, how much greater is the probability that Peggy will win exactly two of the lotteries than the probability that she will win exactly one of them? (Note: If she is more likely to win one than two of them, your answer will be negative.)

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6th 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 counting by threes (skip-counting), starting with 16, what will be the smallest number greater than 110 that you would say?	112
Question 2	Yoon drives for 270 **minutes** at a constant speed of TNYWG kilometers per **hour**. How many kilometers has he driven?	504 [km]
Question 3	I have TNYWG standard cubical dice (with the faces having 1 through 6 dots, as usual). How many dots are on all these dice altogether?	10,584 [dots]
Question 4	The average (mean) of TNYWG, 7, and 704 is how much more than the average of 4008 and 386?	1568
	Relay #2	Answer
Question 1	What is 17 less than the product of 13 and 17?	204
Question 2	How many counting numbers less than TNYWG are multiples of the **sum** of 15 and negative 6?	22 [numbers]
Question 3	Find the sum of the odd counting numbers less than TNYWG.	121
Question 4	How many prime numbers are between 50 and TNYWG?	15 [primes]

"Math is Cool" Masters – 1012-13

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6th 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 seventeen?	16
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 only two hours. How many miles does Jay walk in 7 weeks?	546 [miles]
4	What is the fourth term of an arithmetic [pronounced: a-rith-MET-ic] sequence with second term eight and sixth term twenty?	14
5	The fraction "eight over seventy-two" is equivalent to the fraction "X over four hundred thirty-two". What is X?	[X=] 48
6	An odometer measures the total number of miles traveled by a car. Fred's car odometer currently shows nineteen thousand, eight hundred ninety-one miles, which is a palindrome number. In how many miles will Fred's odometer **next** show a palindrome number?	100 [miles]
7	Convert 25,000 minutes to the nearest whole number of days.	17 [days]
8	Mario likes red flowers. Forty percent of the flowers in a field are red. If he picks two flowers at random, what is the probability that **neither** of them will be red? Give your answer as a reduced **fraction**.	9/25
9	A tire has a diameter of two feet. As a decimal to the nearest tenth, how many revolutions will this tire make in rolling forty feet?	6.4 [revolutions]
10	How many ways can we arrange the letters in "funny", spelled F-U-N-N-Y, if the letter "N" must be at either the beginning or the end of the arrangement, but not both?	36 [ways]

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COLLEGE KNOWLEDGE BOWL ROUND #2 - SET 2

#	Problem	Answer
1	What is the least common multiple of twenty-two and six?	66
2	The point THREE COMMA ONE is flipped over the x-axis. As an ordered pair, what are the coordinates of the new point?	(3, -1)
3	Eeyore the donkey requires 21 buckets of oats and one bale of hay each week, and gets the same amount every day. If a bucket of oats weighs 5 pounds and a bale of hay weighs 35 pounds, how many pounds of oats and hay combined will be required to feed Eeyore for 23 days?	460 [pounds]
4	What is the median of the counting numbers from twenty-three through forty-one, inclusive?	32
5	If every month of the year had 31 days, how many more days would the year have than a non-Leap Year does now?	7 [days]
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	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]
8	Give the value of X that makes the following equation true: two X minus 14 is equal to negative 76	[X=] minus 31 or negative 31
9	Angela is buying mangos costing fifty cents each and kiwis costing one dollar and twenty-five cents each. If she buys 24 pieces of fruit for sixteen dollars and fifty cents, how many mangos did she buy?	18 [mangos]
10	With two fair cubical dice, the probability of rolling a sum of N is equal to the fraction "one over N". What is N?	[N=] 9

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COLLEGE KNOWLEDGE BOWL ROUND #3 - SET 3

#	Problem	Answer
1	What is the volume in cubic inches of a square pyramid with height 12 inches and base side length 10 inches?	400 [cubic inches]
2	Eho collects the eggs from his hen house and puts them into cartons that hold a dozen eggs each. If he can completely fill at most eight cartons, what is the largest number of eggs he could have collected?	107 [eggs]
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 zero point five inches? If your answer is not a whole number, give it as a decimal.	6 [inches]
5	From a position facing northwest, Ramona turns by the smallest possible angle to face midway between southeast and due south. How many degrees did she turn? If your answer is not a whole number, give it as a decimal.	157.5 [degrees]
6	What is the result when five more than the product of three and six is subtracted from five less than the product of seven and eight?	28
7	A faucet leaks water at the rate of 2 quarts per hour for six hours, then leaks at the rate of 3 quarts per hour after that. How many hours would it take for the faucet to fill a 15-gallon container?	22 [hours]
8	When three standard cubical dice are rolled, what are the **two** most likely sums?	10 & 11 [either order]
9	What is the square of the difference between the square of 3 and the square of 7?	1600
10	The base 3 number "two one zero" can be expressed as the product of a prime number and a square number. In base 10, what is the sum of these two numbers?	7

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6th Grade – May 18, 2013

COLLEGE KNOWLEDGE BOWL ROUND #4 - SET 4

#	Problem	Answer
1	Mr. Pearson drinks at least one can of Cougar-Ade every day and on each day he has a 30 percent chance of drinking a second can. What is the expected number of cans of Cougar-Ade Mr. Pearson will drink in 20 days?	26 [cans]
2	Quincey has only quarters, Darren has only dimes, and Nathan has only nickels. Nathan has twice as many coins as Darren, who has twice as many coins as Quincy. If Nathan has 40 cents, how many **cents** do the three of them have altogether?	130 [cents]
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 seven hundred sixty-four, four hundred fifty-three, one hundred ninety-six, and three hundred eighty-eight.	196
4	What is the degree measure of one base angle of an isosceles triangle whose vertex angle is 56 degrees?	62 [degrees]
5	When the product of eighty thousand and five hundred thousand is expressed in scientific notation, what will be the exponent of the ten?	10
6	Of the three fractions, one-eighth, one-ninth, and two-seventeenths, find the difference between the largest and the smallest. Express your answer as a reduced fraction.	1/72
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, 10 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 two types of syrup?	1680 [sundaes]
9	What is the perimeter in inches of a square whose area is zero point two five square inches? If your answer is not a whole number, give it as a decimal.	2 [inches]
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, the machine produces 53 when the number X is entered. What is X?	[X=] 17

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COLLEGE KNOWLEDGE BOWL ROUND #5 - SET 5

#	Problem	Answer
1	What is the sum of the even counting numbers between 1 and 11?	30
2	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]
3	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]
4	Marcy is trying to run a marsupial menagerie. Every day, three wombats escape from her wombat pen, and she never catches or replaces any of them. If there are 87 wombats at the start of July first, on what date will the last wombat escape from the pen?	July 29th
5	A rectangular garden bed measures 7 feet by 8 feet. If there are an average of 27 plants per square **yard** in this bed, how many total plants are there in it?	168 [flowers]
6	A rhombus has a perimeter of 76 inches. What is its side length, in inches?	19 [inches]
7	If 180 students take a test and only 35 percent of them pass, how many students fail?	117 [students]
8	I am thinking of a certain counting number. There are twelve multiples of four that are less than my number but greater than zero. What is the sum of all possible values of my number?	202
9	On an analog wall clock, how many degrees will the minute hand move between 2:30 PM and 5:40 PM the same day?	1140 [degrees]
10	Two numbers have a difference of 6 and a product of 315. What is the sum of the two numbers?	36
	Brian, Tony, and Jimmy are brothers. Brian is three years older than Tony and seven years older than Jimmy. The sum of their ages ten years ago was 38 years. How many years old is Tony now?	23 [years]

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COLLEGE KNOWLEDGE BOWL ROUND #6 - SET 6

#	Problem	Answer
1	What is the greatest common factor of 48 and 84?	12
2	The product of two consecutive **even** counting numbers is 48. What is the sum of these two numbers?	14
3	The product of three consecutive **even** counting numbers is 480. What is the sum of these two numbers?	24
4	Moritz bikes for four miles at eight miles per hour, then another four miles at ten miles per hour. How many minutes did the entire trip take?	54 [minutes]
5	Lola's test scores from her past six math tests are 90, 50, 81, 92, 78, and X. If her average test score is exactly 79, what is X?	[X=] 83
6	I am thinking of a 4-digit counting number. All its digits are different, and their sum is fifteen. Either the ones digit or the tens digit is 4, and either the hundreds digit or the thousands digit is 6. What is the difference between the largest and smallest numbers I could be thinking of?	3906
7	In a regular hexagon, how many of the diagonals are **not** lines of symmetry?	6 [diagonals]
8	Harry, Ron and Hermione are walking around Hogwarts. They walk 3 miles at 2 miles per hour, and then stop at Black Lake for 20 minutes. When they realize they are late for class, they run the 3 miles back at a rate of 9 miles per hour. How many **minutes** did their trip take?	130 [minutes]
9	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]
10	Let X represent a two-digit counting number divisible by 10. The sum of the prime numbers between **X** and **X plus 20** is 199. What is X?	[X=] 30

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COLLEGE KNOWLEDGE BOWL ROUND - EXTRA

#	Problem	Answer
1	What is negative one, raised to the eleventh power?	negative 1
2	What is the positive difference between the least common multiple and the greatest common factor of 14 and 21?	35
3	What is the volume in cubic units of a cylinder with a circumference 10 pi units and a height of 22 units?	550 pi [cubic units]

Final Score:

KEY

First Score

(out of 8)

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6th 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	12		
2	64 [sq. inches]		
3	9 [vertices]		
4	CAB		
5	42 [fish]		
6	12 [wolves]		
7	36 [ways]		
8	35		

"Math is Cool" Masters – 2012-13

6th 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	A		
3	B		
4	B		
5	D		
6	B		
7	D		
8	A		
9	A		
10	C		

"Math is Cool" Masters – 2012-13

6th 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	$18\frac{1}{3}$ [years]		
2	DCBA		
3	32		
4	38 [inches]		
5	[$] 3.50		
6	[$]1.75		
7	18, 20, 22 [trips] (any order)		
8	[N=] 4		
9	[step] 9 or 9^{th} [step]		
10	0.104		

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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
112	**504 [km]**	**10,584 [dots]**	**1568**
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
204	**22 [numbers]**	**121**	**15 [primes]**
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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6th 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

6th 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

6th 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			

"Math is Cool" Masters – 2012-13

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

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

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

6th Grade Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	BAEDC		
2	624 [monkeys]		
3	1/26		
4	[$]1.86		
5	85		
6	12:58 [PM]		
7	=		
8	4,686,900 [yds]		
9	43		
10	79		
11	12 [hours]		
12	Saturday or Sat.		
13	16		
14	16 [carrots]		
15	457		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	29 [times]		
17	11 [zeros]		
18	9		
19	22 [coins]		
20	110 [degrees]		
21	100 [feet]		
22	1/6 [sq. ft.]		
23	8.4 [%]		
24	9 [ways]		
25	13 [bills]		
26	4:30 & 7:30 [AM]		
27	26		
28	23.08 [sq inches]		
29	4,375,000,000 [decomposers]		
30	529 [minutes]		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	6 [smoothies]		
32	16 [regions]		
33	22π [cubic cm]		
34	11 [digits]		
35	1/15		
36	235		
37	54 [rocks]		
38	398		
39	159		
40	18		
31-40 TOTAL:			

6th 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 #: _____

6th 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:			

6th Grade