"Math Is Cool" Championships — 2023-24

7/8th Grade — February 2024

Sponsored by:

GENERAL INSTRUCTIONS applying to all tests:

- *Good sportsmanship is expected throughout the competition by <u>all</u> involved (competitors and observers). Display of poor sportsmanship will result in disqualification.*
- *Competitors may not use calculators or any other aids on any portion of this contest.*
- *Unless stated otherwise:*
  - *All answers are integers, and any non-integer answers will be "coded" as integers.*
  - *All fractions and ratios must be reduced to simplest form, all radicals must be simplified, and all denominators must be rationalized.*
  - *Do not round or approximate answers. Leave answers in terms of π or other irrational quantities (e.g., √2), where applicable.*
- *Units are not necessary as part of your answer, However, if you choose to use units, they must be correct.*
- *Record all answers on the colored cover sheets in the answer column only.*
- ***Be sure that the student name, school, team number, etc. has been filled out at the top of each answer sheet.***
- *Tests will be scored as a 0 if answers are not recorded correctly on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will be scored as a 0.*

FINAL SCORES AND AWARDS

Individual awards are determined by both the Mental Math and Individual Test scores. Individual ties are broken based on the following, in this order: total scaled individual points, total number of correct answers on the Individual Test, Mental Math raw score, number of correct answers from Individual Test #31-40, number of correct answers from Individual Test #16-30, highest numbered question answered correctly on the Individual Test working backwards from #40.

Team (School) awards are based on the highest score from amongst each of the school's "teams of 4 students" in each event and is calculated as 2·(Sum of highest 3 Mental Math scores) + 2·(Multiple Choice) + 6·(Team) + 1·(Triple Jump) + 1·(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 the events, starting with Mental Math.

MENTAL MATH TEST - 30 sec./quest., 8 problems, ~8%/25% of individ./team scores

The proctor will read each question twice. You may not do any writing or talking while arriving at a solution. Record only your answer on your answer sheet. You may not change, cross out, erase, or write over an answer once you have written it down. The maximum wait time is 30 seconds after completion of the second reading of the question. Correct answers receive 1 point.

INDIVIDUAL TEST - 35 minutes, 40 problems, ~92% of individual score

When you are prompted to begin, tear off the colored answer sheet and begin testing. No talking during this individual test. You will be given a 5 minute time warning. Correct answers receive 2 points for problems 1-30 and 3 points for 31-40 (in the scaled score).

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Final Score *(out of 8)*

Room #	School Name	Student Name	Team #

Mental Math – ~25% of team score & ~8% of individual score

All students in the room will concurrently be asked the same eight questions in this individual test. 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 or her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before the next question is read. You may continue to work on a problem (in your head) while the next question is being read. The raw score is 1 point per correct answer.*

STUDENT: DO NOT WRITE IN SHADED REGIONS (or anywhere else, other than the answer box)

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
7/8th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2023-24

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Key

Mental Math Contest – Answer Key

30 seconds per question – ~25% of team score & ~8% of individual score

SCORERS — Write-overs, Cross-outs, and Erasures Must be Marked Incorrect (0)
Bracketed items […] in the answer key are optional.

7/8th Grade

	Answer	
1	40	What is eight plus nine plus twenty-three?
2	3 [integers]	How many of the single-digit integers one through nine are spelled with three letters in English?
3	360	What is forty percent of nine hundred?
4	22 [days]	How many days are in three and one-seventh weeks?
5	11	The first three numbers in a geometric series are two hundred ninety-seven, ninety-nine, and thirty-three. What is the fourth number in the series?
6	9779	What is the largest four-digit palindrome in which the hundreds and tens digits are prime numbers and the ones and thousands digits are composite numbers?
7	11	A set of three integers has a mean of thirty-five. What integer can be added to the set so that the mean of the four integers is now twenty-nine?
8	152 [cubes]	A six-by-six-by-six cube has two-by-two-by-two cubes removed from each of its corners. How many one-by-one-by-one cubes can the remaining portion be divided into?

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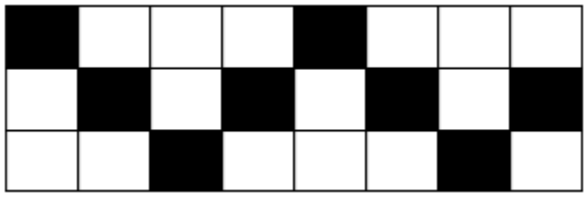
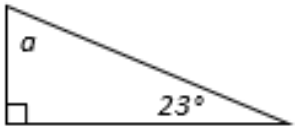
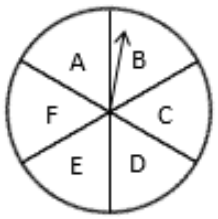
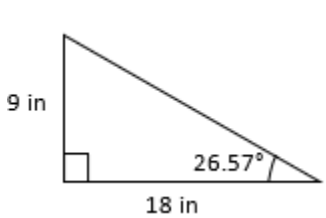
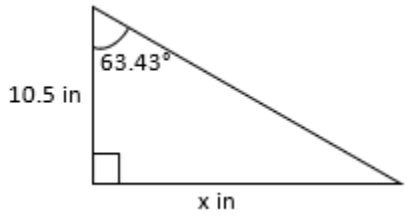
Individual Contest

Record all answers on the colored cover sheet. 35 minutes, 40 problems, ~92% of individual score.
No talking during this individual test. A 5-minute time warning will be given.

	Questions 1-30: 2 points each
1	Evaluate: 20 + 200 + 2000 – 2
2	How many inches are in 4.5 feet?
3	A car drives at an average rate of 60 miles per hour for 9 hours. How far in miles does the car drive?
4	Solve for x: 22x + 50 = 424
5	How many shaded squares are in the figure, which is composed of unit squares? 
6	Four friends take turns rolling a pair of dice. Ayush rolls first. Benjamin does not roll last. Chenrui rolls before Benjamin and Dhriti. Who rolls last? Answer as an integer only: 1 = Ayush, 2 = Benjamin, 3 = Chenrui, or 4 = Dhriti.
7	A rectangle has an area of 336 square meters and a length of 28 meters. In meters, what is the width of the rectangle?
8	A palindrome is a number that reads the same forwards as backwards, like 1221. What is the largest 3-digit palindrome in which the tens digit is different from the ones digit?
9	What percent of 20 is 17?
10	The first three terms of an arithmetic sequence are 15, 37, 59, . . . What is the tenth term in the sequence?
11	During each 5-day work week, Tina works from home four days and drives to the office on the fifth day. Assuming the day she drives to work is chosen at random, the probability during any given week that she will drive on Tuesday is a reduced common fraction A/B. What is A + B?
12	What is the median of the data set? 22/7, 256, $\frac{1+\sqrt{4}}{2}$, 2, 1
13	Evaluate: $4 \cdot 11 \cdot 5 \cdot 9$
14	Solve for x: $9 = \frac{2x}{3} - 5$

Continued on next page.

15	The ratio of donkeys to horses on a farm is 3:4. If the total number of donkeys plus the total number of horses on the farm equals 63, how many horses are on the farm?
16	If it takes ten people ten minutes to build ten card houses, each working at the same rate, how long in minutes does it take one person to build one card house?
17	The mean of all positive one-digit perfect squares is a reduced common fraction A/B. What is A + B?
18	What is the value of angle a in degrees? 
19	As a reduced common fraction, the probability of drawing a red 8 from a standard deck of cards is A/B. What is A + B?
20	What number must be added to the data set to make the mean of the new data set equal to 50? 30, 100, 40
21	A circular spinner is divided into 6 congruent sectors, each of which is labeled as shown. As a reduced common fraction, the probability of spinning two vowels in a row is P/Q. What is the value of P + Q? 
22	A book has pages 5 through 267 and every page is numbered. How many times does the digit 8 appear in the page numbers of this book?
23	Evaluate the expression: $\frac{(15-9)-11^2}{55-13\cdot 6}$ = ?
24	What is the sum of a + b + c in the following equation? $(7x - 15)(5x + 8) = ax^2 + bx + c$
25	What is the value of x in the diagram?  
26	Let A = 35% of 90 and let B = the number that is 35% less than 90. What is the value of B – A?
27	Six friends each picked a different integral number of plums from a tree. Ben picked 12 more than Juana, who picked the fewest. Fang picked 12 fewer than Mohamed, who picked the most. Clarissa picked half as many as Adeniyi, who picked more than Fang. Clarissa also picked fewer than Ben, who picked 30 plums. What is the lowest possible number of plums that Mohamed could have picked?

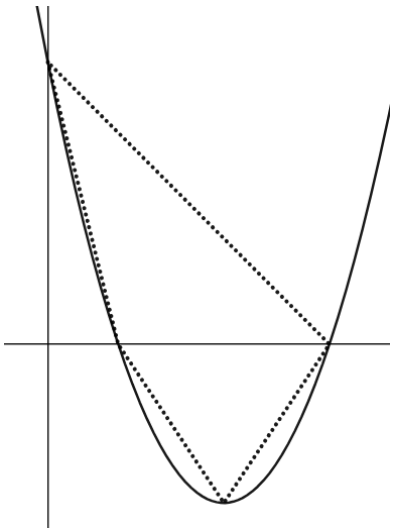
Continued on next page.

28	If A = 30/x, then what is the sum of the positive integer values of x, such that A is an integer?
29	A unit of land equal to 4840 square yards is called an acre. How many square feet are in 1 acre?
30	The first three terms of a geometric sequence are 12500/288, 2500/144, 500/72, . . . In this sequence, the first term whose value is less than 1, as a reduced common fraction is A/B. What is the value of A + B?

Challenge Questions: 3 points each

31	Solve for x: $\frac{1}{1+\frac{1}{1+\frac{1}{x}}} = \frac{8}{15}$
32	In a survey of 90 people, each person indicates whether they like or do not like hot dogs and whether they like or do not like hamburgers. The results include that 54 people like hot dogs, 63 people like hamburgers, and 39 people like both hot dogs and hamburgers. As a reduced common fraction, the probability that a person in the survey likes neither hot dogs nor hamburgers is A/B. What is A + B?
33	There are three distinct ordered pairs of integers (a_1, b_1), (a_2, b_2) and (a_3, b_3) that are solutions to the following equation. What is the combined sum of $a_1 + a_2 + a_3 + b_1 + b_2 + b_3$? $\sqrt{320} = a\sqrt{b}$
34	A cylindrical container of ice cream has a radius of 12 centimeters and a height of 15 centimeters. How many spherical scoops of ice cream can be formed from the contents of the container if the radius of each sphere is 3 centimeters? The ice cream can be 'smushed' and reformed into spheres.
35	Let A equal the product of a positive single-digit prime number, a two-digit integer that is equal to a power of 3, and a two-digit composite number. As a reduced common fraction, the quotient of the largest possible value of A divided by the smallest possible value of A equals P/Q. What is P + Q?
36	How many ways are there to arrange the letters in the word COOKIE, if no two adjacent letters are the same?
37	Sienna rides her bike on the Burke-Gilman trail for 12 miles from the University of Washington to Bothell with the wind and back again against the wind in a total of 2.5 hours. Her average speed when there is no wind is 10 miles per hour. Assuming the wind speed remains constant throughout the ride, and in miles per hour, what is the wind speed?
38	Three 6-member data sets are represented by A, B, and C. The mean of data set A, the median of data set B, and the unique mode of data set C are each 25. The 18 members of the three sets consist of two 25s in set C and an additional 16 distinct positive one- or two-digit integer values. As a reduced common fraction, the largest possible mean of these 16 distinct integers is P/Q. What is P + Q?

Continued on next page.

39	The vertex, the two x-intercepts and the y-intercept of the parabola whose equation is $f(x) = 2x^2 - 5x + 2$ are connected with segments to form a quadrilateral, as shown below. As a reduced common fraction, the area of this quadrilateral is A/B units^2. What is $A + B$? 
40	Find the number of integer grid points (x, y) in the region between the graphs of $y = x^2 + 1$ and $y = 100$, including those lying on $y = x^2 + 1$ and $y = 100$. For example, (2, 12) is one integer grid point that lies between the two graphs.

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KEY

Individual Contest – Answer Key

SCORERS: Bracketed […] items in answer key are optional. Just mark the score as 0 or 1 and add up those values to reflect total correct.
First Scorer – use the right-hand columns so 2nd scorer can do a blind scoring.

	Answer
1	2218
2	54 [inches]
3	540 [miles]
4	[x =] 17
5	8 [squares]
6	4
7	12 [meters]
8	989
9	85 [%]
10	213
11	[A + B =] 6
12	2
13	1980
14	[x =] 21
15	36 [horses]

	Answer
16	10 [minutes]
17	[A + B =] 17
18	[a =] 67 [°]
19	[A + B =] 27
20	30
21	[P + Q =] 10
22	46 [times]
23	5
24	-104
25	[x =] 21 [in]
26	[B – A =] 27
27	39 [plums]
28	72
29	43560 [ft^2]
30	[A + B =] 13

	Answer
31	[x =] 7
32	[A + B =] 17
33	119
34	60 [scoops]
35	[P + Q =] 2099
36	240 [ways]
37	2 [mph]
38	[P + Q =] 105
39	[A + B =] 107
40	1330 [points]

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Total Correct (all columns)

Room # _____ SCHOOL NAME _____ STUDENT NAME _____ Team # _____

Individual Contest – Score Sheet

STUDENTS: 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:			

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Scorers: Just score as 0 or 1 and add up those values (i.e., just work with number correct).

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Team Multiple Choice Contest

USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #1 THROUGH #3.

In a survey of 10826 adults in the United States given in September 2023, people responded to the following question: "Within the next 10 years, how likely do you think it is that artificial intelligence (AI) will enable people to have conversations with other species of animals?"

The five answer choices are shown in the table below. The percent of the whole survey population along with the percent of 4 different age groups to respond with each answer choice are shown as well.

	All	18 – 29 years old	30 – 44 years old	45 – 64 years old	65+ years old
Very likely	13%	22%	19%	7%	4%
Somewhat likely	24%	33%	28%	20%	16%
Not very likely	24%	21%	20%	25%	30%
Not likely at all	20%	10%	17%	24%	28%
Not sure	19%	14%	16%	24%	22%

1. Based on the survey, which age group is most likely to think that AI will make it possible to have conversations with animals of other species?

   A) All B) 18 – 29 C) 30 – 44 D) 45 – 64 E) 65+

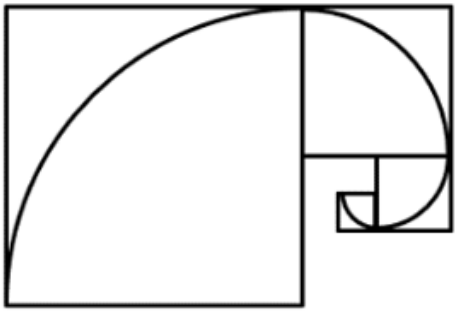
2. Based on the survey, about how many persons responded that it is "Very likely" that AI will make it possible to have conversations with animals of other species?

   A) 141 B) 1400 C) 1407 D) 14000 E) 14074

3. If 50% of the respondents were in the 18 – 29 age group, then based on the survey what is the approximate difference in the number of respondents who responded with "Very likely" or "Somewhat likely" versus those who responded with "Not very likely" or "Not likely at all"?

   A) 130 B) 1191 C) 1245 D) 1299 E) 2598

Continued on Next Page

	USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #4 THROUGH #6. A sock drawer has 32 socks in it that all feel identical and are randomly mixed together. Altogether, there are 3 pairs of white socks, 5 pairs of brown socks, 4 pairs of black socks, 2 pairs of green socks, 1 pair of polka dot socks and 1 pair of striped socks.
4	If you close your eyes and pull socks one by one from the drawer, how many socks must you pull to ensure that you have at least one pair that match? A) 6 B) 7 C) 8 D) 10 E) 15
5	If two socks are randomly pulled from the drawer without replacement, what is the probability that they are both brown socks? A) 45/496 B) 45/248 C) 45/124 D) 5/248 E) 5/124
6	If two socks are randomly pulled from the drawer without replacement, what is the probability that they will not be a matching pair? A) 47/248 B) 95/496 C) 25/31 D) 87/496 E) 49/248
	USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #7 THROUGH #10. In the figure shown there are four squares. The perimeter of the smallest square is 8 centimeters and is half of the perimeter of the next smallest square, whose perimeter is half the perimeter of the next smallest square, and so on. Each square also has a quarter-circle inscribed in it. 
7	What is the perimeter of the second-largest square? A) 12 cm B) 16 cm C) 20 cm D) 24 cm E) 32 cm
8	What is the circumference of the quarter-circle inscribed in the smallest square? A) $\pi/4$ cm B) $\pi/2$ cm C) 2 cm D) π cm E) $3\pi/2$ cm
9	Let A equal the combined area of the four quarter-circles in the diagram and let B equal the combined area of the region inside the squares but not including the four quarter-circles. What is the ratio A/B? A) 4 B) $\pi/(4-\pi)$ C) $\pi/(2-\pi)$ D) 1/340 E) Answer not given
10	If the figure above consisted of only the smallest square, the square has a perimeter of 8 centimeters. If the figure consisted of only the two smallest squares, then the outer perimeter of the two squares (solid lines) can be determined in centimeters.  If the figure given above is expanded, following the same pattern, to include a total of 8 squares, what will the outer perimeter of the diagram be? A) 576 cm B) 586 cm C) 764 cm D) 1532 cm E) 3068 cm

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Key

Team Multiple Choice Contest – Answer Key

7/8th Grade

Correct responses are worth 2 points, incorrect responses are worth -1 point, and absence of a response is worth 0 points.

	Answer
1	B
2	C
3	D
4	B
5	A
6	C
7	E
8	D
9	B
10	D

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Final Score *(out of 20)*

Room # _____ **School Name** _____ **Team #** _____

Team Multiple Choice Contest – 15 minutes – ~20% of team score

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

Correct responses are worth 2 points, incorrect responses are worth -1 point, and absence of a response is worth 0 points.

STUDENTS: DO NOT WRITE IN SHADED REGIONS

		Scorer 2	Scorer 1
Answer		-1, 0, or 2	-1, 0, or 2
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
7/8th Grade	**TOTAL:**		

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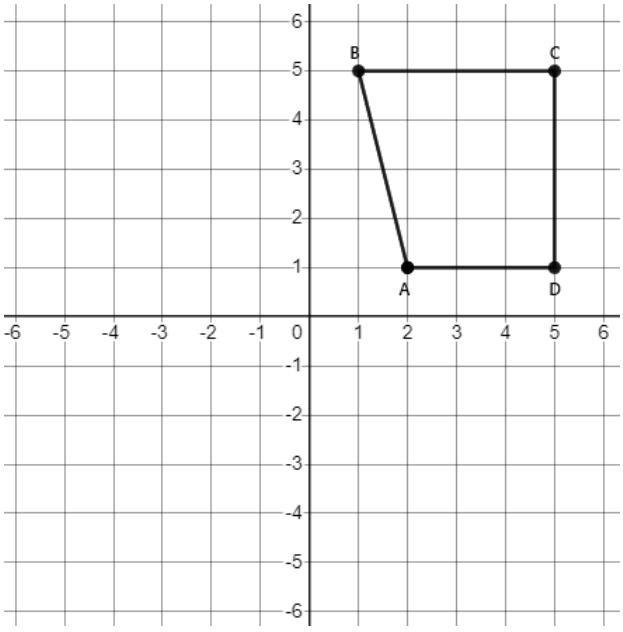
Team Contest

1	What is the largest factor of 91, other than 91?
2	Let A, B, and C represent three distinct single-digit integers. If A > C > B, then what is the largest possible value of B?
3	When rolling two standard 6-sided dice, as a reduced common fraction, the probability of rolling two numbers whose product is 12 is A/B. What is A + B?
4	Tula has four pennies, three nickels, two dimes, and one quarter. How many different cent-values can any two of these coins have? For example, two pennies have a cent-value of 2 cents.
5	Athena bowls a score of 132, Blaze bowls a score of 164, and Cody bowls a score of 143. What score does Delaney need to bowl in order for the group to have a mean score of 150?
6	Armelle can wax a pair of skis in 10 minutes. Ansel takes 50% longer to wax the same-size pair of skis. How many minutes would it take them working together to wax 5 of the same-size pairs of skis?
7	A concert ticket is purchased at 90% of its advertised price. It is then resold at 108% of its advertised price. What percent of the purchase price is the resale price?
8	On the graph shown below, reflect B over the y-axis to get B', reflect D over the x-axis to get D', and rotate C 180° about the origin to get C'. In square units, what is the area of quadrilateral AB'C'D'? 

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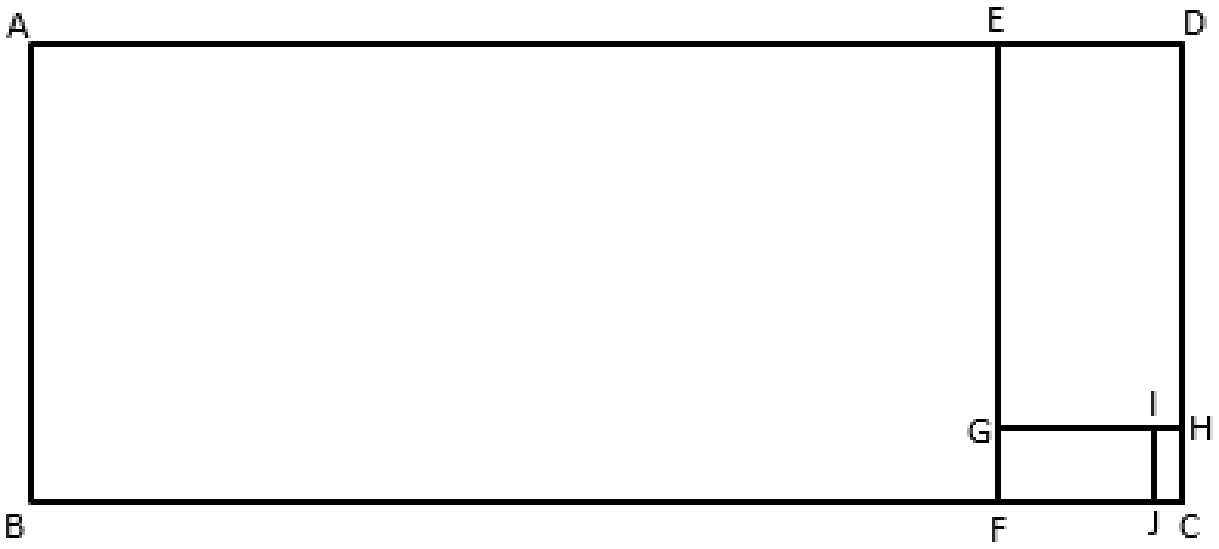
9	In the figure below rectangles ABCD, DEFC, GFCH, and HIJC are all similar, HI = 32 mm, and IJ = 80 mm. What is the length of AE in centimeters? 
10	A sequence consists of 2024 terms. Each term after the first term is 1 greater than the previous term. The sum of the 2024 terms is 33,396. Determine the sum of the terms in the odd-numbered positions in the sequence. For example, starting with the first term plus the 3rd term and so on, and ending with the second-to-last term.

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Key

Team Contest – Answer Key

7/8th Grade

	Answer
1	13
2	[B =] 7
3	[A + B =] 10
4	9 [values]
5	161
6	30 [minutes]
7	120 [%]
8	39 [units^2]
9	105 [cm]
10	16192

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Final Score *(out of 10)*

Room # _____ **School Name** _____ **Team #** _____

Team Contest – 15 minutes – ~30% of team score

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

STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
7/8th Grade	**TOTAL:**		

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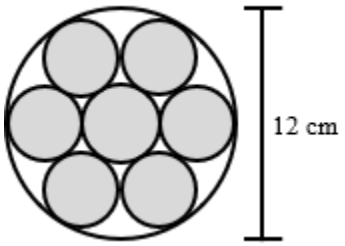
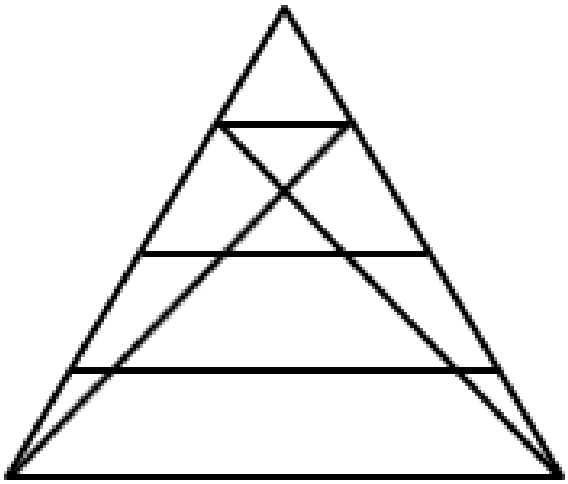
Linda Moore Triple Jump

1	One ton is equal to 2000 pounds. How many pounds are in $3\frac{3}{4}$ tons?
2	Josias takes 10 minutes to build one sandcastle. Ezra can build 6 sandcastles in 72 minutes. Working together, how many sandcastles can Josias and Ezra build in one hour?
3	What is the sum of the terms in the arithmetic sequence: 12, 18, 24, . . . , 66, 72, 78?
4	Evaluate the expression if x = -8 and y = 4: $$\frac{3x^2 + 2xy - 5y^2}{-x}$$
5	What is the largest 3-digit number such that all of the digits are different and the number is divisible by each of the digits?
6	Kenji erases some integers from the following list: 5, 9, 2, 3, 7, 4, 6, 5, 6, 4, 10, 7, 2, 5. When he is done, the range of the remaining list is 3. What is the least possible number of integers that Kenji could have erased?
7	Jiya and Gordon are away at college. They visit home on random weekends. The probability that Jiya will visit on any given weekend is 15%. The probability that Gordon will visit is 40%. As a percent, what is the probability on any given weekend that neither will visit?
8	The figure consists of one large circle with diameter 12 centimeters and 7 smaller congruent circles that are externally tangent to each other and internally tangent to the large circle. Let the area of the unshaded region inside the large circle, but not including any of the 7 smaller circles be A. Let the area of the seven shaded circles be B. As a decimal, the ratio of B/A equals C.D, where C and D are single digit integers. What is C + D? 

Continued on next page.

9	How many triangles of any size are in the figure below? 
10	Isa is making and selling trail mix for a fund raiser. He makes three different mixtures, each containing cashews, chocolate chips, and raisins, each of which costs a certain number of dollars per kilogram. Each of the three mixtures is sold at a price of $18 per kilogram. If the cashews, chocolate chips and raisins are combined in a ratio of 1:1:1 by weight, Isa makes a dollar profit of 20% over the cost. If the cashews, chocolate chips and raisins are combined in a ratio of 3:2:1 respectively by weight, the profit is 8%. If the cashews, chocolate chips and raisins are combined in a ratio of 1:4:2 by weight, the profit is 26%. What is the cost of the chocolate chips in dollars per kilogram?

"Math Is Cool" Championships — 2023-24

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Key

Linda Moore Triple Jump – Answer Key

7/8th Grade

	Answer
1	7500 [lbs]
2	11 [sandcastles]
3	540
4	6
5	936
6	5 [integers]
7	51 [%]
8	[C + D =] 8
9	24 [triangles]
10	15 [$/kg]

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Final Score *(out of 30)*

Room # _____ **School Name** _____ **Team #** _____

Linda Moore Triple Jump – 15 minutes – ~15% of team score

When you are prompted to begin, tear off the three colored answer sheets and give a copy of the test to each of your team members and begin testing. Record all answers on this colored answer sheet. This Submittal #1 will be collected after 5 minutes.

SUBMITTAL #1

STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
7/8th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2023-24

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Room #	School Name	Team #

Linda Moore Triple Jump – 15 minutes – ~15% of team score

This Submittal #2 will be collected after 10 minutes.

SUBMITTAL #2

STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
7/8th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2023-24

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Room #	School Name	Team #

Linda Moore Triple Jump – 15 minutes – ~15% of team score

This Submittal #3 will be collected after 15 minutes.

SUBMITTAL #3

STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
7/8th Grade	**TOTAL:**		

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Room # _____ **School Name** _____ **Team #** _____

Total Score for Each Round

College Bowl #1 (10 Possible)	College Bowl #2 (10 Possible)	College Bowl #3 (10 Possible)

DO NOT USE TALLY MARKS ON THIS SHEET. WRITE THE TOTAL SCORE FOR EACH ROUND.

"Math Is Cool" Championships — 2023-24

7/8th Grade — February 2024

Room # _____ **School Name** _____ **Team #** _____

Total Score for Each Round

College Bowl #1 (10 Possible)	College Bowl #2 (10 Possible)	College Bowl #3 (10 Possible)

DO NOT USE TALLY MARKS ON THIS SHEET. WRITE THE TOTAL SCORE FOR EACH ROUND.

"Math Is Cool" Championships — 2023-24

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Proctor Copy

Mental Math Contest

MENTAL MATH – 30 seconds per question – ~25% of team score & ~8% of individual score

All students in the room will concurrently be asked the same eight questions in this individual test. 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 or her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before the next question is read. You may continue to work on a problem (in your head) while the next question is being read. The raw score is 1 point per correct answer.*

1	What is eight plus nine plus twenty-three?	
2	How many of the single-digit integers one through nine are spelled with three letters in English?	3 [integers]
3	What is forty percent of nine hundred?	360
4	How many days are in three and one-seventh weeks?	22 [days]
5	The first three numbers in a geometric series are two hundred ninety-seven, ninety-nine, and thirty-three. What is the fourth number in the series?	
6	What is the largest four-digit palindrome in which the hundreds and tens digits are prime numbers and the ones and thousands digits are composite numbers?	9779
7	A set of three integers has a mean of thirty-five. What integer can be added to the set so that the mean of the four integers is now twenty-nine?	11
8	A six-by-six-by-six cube has two-by-two-by-two cubes removed from each of its corners. How many one-by-one-by-one cubes can the remaining portion be divided into?	152 [cubes]

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Key

COLLEGE BOWL ROUND #1

#	Problem	Answer
1	What is the product of seventy-six times sixty-four?	4864
2	Twenty is X percent of twenty-five and Y percent of forty. What is X minus Y?	[X – Y =] 30
3	Twin primes are two prime numbers that differ by two. What is the sum of the two prime numbers in the smallest twin primes greater than twelve?	36
4	The letters A, B, C, D, E, and F are randomly assigned to make a six-letter arrangement. As a reduced common fraction, the probability that the last letter in the arrangement is D is P over Q. What is P plus Q?	[P + Q =] 7
5	Charlene is currently three times Sameer's age. In four years, she will be twice Sameers's age. In years, how old is Sameer now?	4 [years old]
6	The first two terms of a series are four-fifths and fifteen. Beginning with the third term, each successive term is the product of the two previous terms. What is the fifth term?	2160
7	Anaya runs an eighteen-mile race at an average rate of nine miles per hour. Brenda runs the same race averaging ten miles per hour but starts ten minutes after Anaya. How many minutes will it take Brenda to catch Anaya?	90 [minutes]
8	When you multiply any two distinct digits one through five together, how many different two-digit products are possible?	4 [products]
9	How many millimeters are equivalent to one-fourth of a meter?	250 [mm]
10	In square centimeters, what is the area of a square whose perimeter is fifty-six centimeters?	196 [cm^2]

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Key

COLLEGE BOWL ROUND #2

#	Problem	Answer
1	One cantaloupe weighs the same as eight apples. One apple weighs the same as twenty-nine blueberries. How many blueberries weigh the same as one cantaloupe?	232 [blueberries]
2	Solve the following equation for X: negative nineteen plus five X equals eighty-six	[x =] 21
3	How many three-inch-by-three-inch squares can a twenty-four-inch-by-forty-two-inch rectangle be divided into?	112 [squares]
4	The mean of three different positive integers is twenty-six. What is the largest possible positive difference between the largest and the smallest integers?	74
5	An eight-sided die with sides numbered one through eight and a twelve-sided die with sides numbered one through twelve are rolled. As a reduced common fraction, the probability that the sum of the numbers showing is nineteen is A over B. What is A plus B?	[A + B =] 49
6	My number is a positive, even three-digit integer. The sum of the ones and tens digits equals the hundreds digit. The hundreds digit is three times the ones digit. What is my number?	642
7	A sequence of fractions begins with one half. Each successive term is a new fraction in which the numerator and denominator of the previous term both increase by one. What is the sum of the numerator and denominator of the seventh term?	15
8	What is the product of the first five positive odd integers?	945
9	What is the largest even three-digit palindrome?	898
10	Ken can make twenty-four sub sandwiches in an hour. Barbie can make sub sandwiches at one and a half times the rate of Ken. How many sandwiches can Barbie make in two hours?	72 [sandwiches]

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Key

COLLEGE BOWL ROUND #3

#	Problem	Answer
1	A jar has thirteen red marbles and fifteen white marbles. As a reduced common fraction, the probability of drawing a white marble from the jar is A over B. What is A plus B?	[A + B =] 43
2	The first three terms of a geometric sequence are one, three, and nine. What is the sum of the next two terms?	108
3	What is the median of all positive two-digit multiples of eighteen?	54
4	Aman takes twelve hours to read a book. Aziz reads at a rate that is three-fourths the rate of Aman. How many hours does it take Aziz to read the same book?	16 [hours]
5	Two hundred percent of P equals ten percent of Q. What is Q divided by P?	20
6	In the interval from ten to twenty-nine inclusive, as a reduced common fraction, the ratio of prime numbers to composite numbers is A over B. What is A plus B?	[A + B =] 10
7	Consider circle A of radius R. Circle B has an area that is three times the area of circle A. The radius of circle B is R times the square root of X. What is the value of X?	[X =] 3
8	How many inches are in thirteen point five feet?	162 [inches]
9	In a set of three distinct positive integers, A, B, and C, the largest integer is A, which is a two-digit integer, and the smallest integer is B, which is a one-digit integer. What is the smallest possible value of C?	2
10	What is the sum of the three largest even two-digit integers?	288

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Key

COLLEGE BOWL ROUND #4

#	Problem	Answer
1	Blanca takes ten minutes to walk from home to school. If school is one-third of a mile from home, what is her average walking speed in miles per hour?	2 [mph]
2	A jar has two green marbles and some blue marbles in it. As a reduced common fraction, the probability of drawing a green marble is one over seven. How many blue marbles are in the jar?	12 [blue marbles]
3	Amad is three years older than Barry and seven years older than Cristina. How many years older than Cristina is Barry?	4 [years]
4	What is the sum of the positive integer factors of one hundred and eighty-seven?	216
5	Brooklyn takes forty-five minutes to mow the lawn. Cooper takes one and a half hours to mow the same lawn. What is the ratio of Brooklyn's lawn-mowing rate to Coopers's lawn-mowing rate?	2 or twice
6	How many positive three-digit multiples of ninety-five are there?	9 [multiples]
7	A set of three distinct integers have a range of forty-five. The largest integer is ten times the smallest integer. The smallest integer is one-third the middle integer. What is the sum of the three integers?	70
8	As a reduced common fraction, one-half of six-sevenths is A over B. What is A plus B?	[A + B =] 10
9	An angle measures eighty-two degrees. In degrees, what is the measure of twice its supplementary angle?	196 [°]
10	If five N plus ten D equals one hundred and seventy-five and D equals two N, what is the value of N?	[N =] 7

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Key

COLLEGE BOWL ROUND #5

#	Problem	Answer
1	As a reduced common fraction, the probability of rolling an eleven on a standard twenty-sided die with sides numbered one through twenty is A over B. What is A plus B?	21
2	A two-gallon container of fertilizer costs thirty-five dollars and four cents. In cents, what is the price per quart?	438 [cents]
3	What is the mean of the counting numbers six through twelve, inclusive?	9
4	Penelope can build five sandcastles in three hours. How many sandcastles can she build in one hour and twelve minutes?	2 [sandcastles]
5	At the county fair people can win a prize by guessing the weight of a pig. No one who guessed was correct, but the three closest guesses were two hundred seventy, two hundred eighty, and two hundred ninety-five pounds. One of the guesses was off by five, one was off by ten, and one was off by twenty. In pounds, what does the pig weigh?	290 [pounds]
6	Three boys and three girls form a line, with the first person being closest to the doorway. How many different ways can they line up relative to the doorway if they must alternate boy-girl, boy-girl, boy-girl, or girl-boy, girl-boy, girl-boy?	72 [ways]
7	What is one hundred and one times nine hundred and nine?	91809
8	What is the least common multiple of sixteen and forty?	80
9	A series of numbers starts with one, three, six, ten, and so on. What is sum of the next two numbers in the series?	36
10	Raj rides his bike at an average rate of ten miles per hour. How many miles does he ride in eighteen minutes?	3 [miles]

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Key

COLLEGE BOWL ROUND #6

#	Problem	Answer
1	What is one thousand divided by ten, divided by twenty?	5
2	Solve the following equation for X: five times the quantity X plus nine equals one hundred and forty	[x =] 19
3	Seventy-two pencils cost nine dollars. How many cents do eighteen pencils cost?	225 [cents]
4	A data set consists of fifteen distinct integers and the largest number in the set is twenty-three. What is the largest possible median of the set?	16
5	What is the ninth term in the arithmetic sequence whose first term is eight and whose third term is twenty?	56
6	Let A equal a two-digit integer and B equal a three-digit integer. The greatest common factor of A and B is eleven. What is the largest possible value of A plus B?	1078
7	Two cubes have a combined volume of one hundred and fifty-two cubic centimeters, and the dimensions of both cubes are integers. As a reduced common fraction, the ratio of the smaller cube's side length to the larger cube's side length is A over B. What is A plus B?	[A + B =] 8
8	What is the median of the five numbers in the following data set? zero point five, ten, negative one, three, and eight	3
9	A bag of M and Ms has six red, three green, five brown, two yellow, and four blue M and Ms. As a reduced common fraction, the probability of randomly drawing a red M and M from the bag is A over B. What is A plus B?	[A + B =] 13
10	In how many ways can two positive integers be multiplied together to make thirty-two? The order in which the integers are multiplied does not matter.	3 [ways]

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Key

COLLEGE BOWL EXTRA

#	Problem	Answer
1	What is nine hundred and ninety-nine divided by twenty-seven?	37
2	A train leaves the station at eight AM traveling at an average rate of forty-five miles per hour. How many miles will the train have traveled at nine-forty AM that same morning?	75 [miles]
3	What is the mean of the following data set? zero, twenty, negative five, three, and seven	5
4	How many ways are there to make fifty cents with quarters and/or dimes?	2 [ways]
5	The first four cards to be drawn from a standard deck without replacement are the Ace of Spades, the Ace of Clubs, the Jack of Hearts, and the Jack of Diamonds. As a reduced common fraction, the probability that the next card is a Jack or an Ace is A over B. What is A plus B?	[A + B =] 13
6	What number is two hundred and fifty percent of two hundred and fifty?	625
7	Triangle ABC is drawn on a coordinate plane. The coordinates of vertex A are zero comma ten, the coordinates of vertex B are four comma zero, and the coordinates of vertex C are four comma twelve. In square units, what is the area of triangle ABC?	24 [units^2]
8	Solve the following equation for X: three hundred fifty-two equals seven X minus five	[x =] 51

Proctoring Overview

You will receive a room packet envelope with the schedule and College Bowl rotations on the front. Each room packet includes:

1) the proctor instructions and the general instructions that you will be reading,
2) the proctor question/answers packet (this needs to be carefully controlled), and
3) sets of Mental Math, Individual, Multiple Choice, Team, and Triple Jump test materials.

(If not in the room packet, the proctor supervisor will provide blank scratch paper.)

When you receive the room packet, count to ensure that you have the correct number of tests for each event (16 Mental Math & Individual, 4 of each of the team events).

Key Points

- Act professional; focus on what you are doing.
- Your job is to proctor the students; that is, you administer tests, give time warnings, & monitor students for proper test taking behavior to ensure competition integrity and avoid issues like failing to put answers on the answer sheet.
- The proctor packet has Mental Math and College Bowl questions/answers. Keep the packet secure! Avoid opportunities for competitors to see the tests or answers.
- Student/school names and team numbers are critical on the answer sheets. Make sure that students fill out such identifying information.
- Keep track of time, and provide appropriate time warnings. Keep to the schedule as close as possible. Wait between events, if needed.
- Read & know the rules—competitors & spectators will, and they will call you on it.
- On questions that you read, read smoothly, enunciate clearly, and don't read too fast.
- If unsure of how to deal with an issue/question/concern, flag down the proctor supervisor and ask.
- Be respectful of your classroom — leave it tidy and arranged exactly as you found it. We don't want any displeased teachers!!
- Use the quick-reference guide on the next page for room setup and key information.

Schedule

Each of the 6 events includes about 5 minutes at the start for reading instructions or rearranging the room.

3:30 - 4:00	Coaches register (Library)	6:15 - 6:40	Proctors get dinner in proctor room
4:05 - 4:15	Orientation (Gym)	6:45 - 6:55	College Bowl #1
4:15 - 4:20	Students go to testing rooms	6:55 - 7:05	College Bowl #2
4:20 - 4:35	Mental Math	7:05 - 7:15	College Bowl #3
4:35 - 5:15	Individual Test	7:15 - 7:25	College Bowl #4
5:15 - 5:35	Team M.C. Test	7:25 - 7:35	College Bowl #5
5:35 - 5:55	Team Test	7:35 - 7:45	College Bowl #6
5:55 - 6:15	Triple Jump	8:00 - 8:30	Awards Ceremony (Gym)

1. Mental Math

Configuration: Students at individual desks spread out in the classroom. Alternating desks, students not next to teammates.

Scheduled Time: 4:20-4:35 PM (read instructions & test)

Duration: 30 seconds per question maximum (beginning after the 2nd reading)

Give Time warning at: 5 seconds

Number of questions: 8 (all students do the same questions)

Proctor Actions: Read each question twice, reading clearly and not too fast. Start the 30 second clock after the 2nd reading.

Key Points: Start by reading "General Instructions" then Mental Math instructions. Make sure everyone writes their name, school & team number on the answer sheet. No talking allowed. Except for the answer, no is writing allowed. Collect answer sheets and organize by team number, then alphabetically by first name of competitor, & staple sheets for the same team together.

2. Individual Test

Configuration: Students at individual desks; same arrangement as for Mental Math.

Scheduled Time: 4:35 PM (read instructions), 4:40-5:15 (test)

Duration: 35 minutes

Give Time warning at: 5 minutes & 30 seconds

Number of questions: 40

Proctor Actions: Ensure appropriate test-taking behavior. Prep for next event (or furtively read College Bowl questions to yourself).

Key Points: Read "Individual Test" instructions. Make sure everyone writes their name, team number, school, proctor name, & room number down on the answer sheet. Collect answer sheets, organize by team, then alphabetically by first name of competitor, and staple sheets for same team together.

3. Team Multiple Choice Test

Configuration: Groups of 4 desks, with the groups spread out in the classroom.

Scheduled Time: 5:15 PM (read instructions), 5:20-5:35 PM (test)

Duration: 15 minutes

Give Time warning at: 5 minutes & 30 seconds

Number of questions: 10

Proctor Actions: Ensure appropriate test-taking behavior. Prepare for next event.

Key Points: Read Mult. Choice instructions. Students can talk quietly & work together.

4. Team Test

Configuration: Groups of 4 desks spread out in the classroom (same as Team Mult. Choice).

Scheduled Time: 5:35 PM (read instructions), 5:40-5:55 PM (test)

Duration: 15 minutes

Give Time warning at: 5 minutes & 30 seconds

Number of questions: 10

Proctor Actions: Ensure appropriate test-taking behavior. Prepare for next event.

Key Points: Read Team Test instructions. Need to have school & team number on answer sheet. Students can talk quietly & work together.

5. Triple Jump

Configuration: Groups of 4 desks spread out in the classroom.

Scheduled Time: 5:55 PM (read instructions), 6:00-6:15 PM (test)

Duration: 15 minutes

Give Time warning at: 30 seconds and 5 seconds before each of three submittals.

Number of questions: 10

Proctor Actions: Ensure appropriate test-taking behavior. Collect Submittals #1, #2 and #3 at 5, 10 and 15 minutes.

Key Points: Read Triple Jump instructions. Need to have school & team number on answer sheets. There are THREE answer sheets and submittals. Students can talk quietly & work together

6. College Bowl

Configuration: Row of 9 desks (side by side) at the front of the room (CBA device on center desk).

Scheduled Time: 6:45 PM (read instructions), 6:50-7:45 PM (test)

Duration: 45 seconds per question (30 seconds per question if there is only one team, who will be only going against the clock)

Give Time warning at: 5 seconds

Number of questions: 10 per round, 6 rounds total

Proctor Actions: Read each question twice, reading clearly and not too fast. Start 45 (or 30) second clock after the 2nd full reading. Mark tally on white board as questions are answered and transfer the numeric total to the score sheets.

Key Points: Event is collaborative, talking is allowed. For a wrong answer, just say, "That is incorrect." (no verbal/visual clues that could be interpreted by the other team to arrive at an answer).

Summary of MIC Proctoring

(for proctors to read to themselves)

Pass out materials (answer sheet/test packets, scratch paper) for the current event to individuals or teams (as appropriate) so they can fill in the name, school, and team number information (very important!). Tell students to not lift the cover sheet or turn over the paper until you give the signal to start. Read the general instructions as the first item at the beginning of the competition (before Mental Math). Read the event-specific instructions just prior to each event and ask if there are any relevant questions. After reading the instructions, you can signal students to begin. Make sure one proctor is watching the time and giving appropriate time warnings (e.g., "five minutes remaining"). At the end of the event, tell competitors to stop work. Collect, sort, & staple the answer sheets (as appropriate) and keep them secure until handed off to a runner.

For the Mental Math/Individual tests, arrange students scattered throughout the classroom with **no student next to another student from their own school**. For the team tests, students will be in groups of 4 desks. College Bowl will require a line of 9 desks side-by-side across the front of the classroom.

For College Bowl, place the College Bowl apparatus (CBA) on a central desk in the line of desks at the front (4 desks on either side of the central one). One proctor will likely need to hold the CBA in place during the College Bowl rounds. Turn the apparatus on by depressing the button or flipping the dip switch. Students may try out the CBA prior to the 1st question. Note: while one light is blinking, the other light is locked out. There is no need to "reset" the device, just let the light finish blinking and it is ready to go.

Do not read the answer for College Bowl when you read the question (they are both on the same page). In College Bowl, if an incorrect answer is given, simply say "That is incorrect" and do not give any other cues about the answer (e.g., don't say "sorry, you were close" or exhibit interpretable body language). If both teams fail to supply a correct answer, announce what the correct answer was.

If there is an irregularity (i.e., lack of honesty, poor sportsmanship), make a note of the circumstances, flag the answer sheet, and report the issue to the proctor supervisor.

At the end of the day, return the desks to their original arrangement, recycle any unwanted test materials & used scratch paper, erase any marks you made on the whiteboard, and generally make sure the classroom is tidied up. Return the CBA, the room packet envelope, the proctor instructions, the contest rules packet, the proctor packet of questions, extra scratch paper, and unused test material to the proctor supervisor.

Detailed Instructions for Proctors

Grades 4-8

NO CALCULATORS ALLOWED ON ANY TESTS!

1. Check to make sure you have everything in your packet.
   - A. ***Mental Math:***
     1. 16 - colored Mental Math answer sheets
     2. Mental Math questions with answers (in the Proctor Packet)
   - B. ***Individual Test:*** 16 individual tests, with colored answer sheets attached
   - C. ***Team Multiple Choice Test:*** 4 team multiple choice packets (stapled), each containing 4 tests plus one colored answer sheet on top
   - D. ***Team Test:*** 4 team test packets (stapled), each containing 4 tests plus one colored answer sheet on top
   - E. ***Triple Jump:***
     4 team test packets (stapled), each containing 4 tests plus three colored answer sheets on top (one per submittal).
   - F. **College Bowl:**
     1. 4 - College Bowl score sheets
     2. College Bowl questions – 6 rounds (in the Proctor Packet)
   - G. Scratch paper (to be handed out as needed, but try not to waste it)
   - H. Electronic College Bowl Apparatus (CBA; usually distributed at dinner break)

   ALL *COLORED* ANSWER SHEETS WILL BE COLLECTED BY YOU AND WILL BE TAKEN TO THE SCORING ROOM (by RUNNERS) AS SOON AS THEY ARE FILLED OUT BY COMPETITORS. COMPETITORS CAN KEEP ALL OF THE WHITE SHEETS, IF THEY WOULD LIKE (OTHEWISE COLLECT THEM FOR RECYCLE).

   If you are missing anything, you can go get it before the opening ceremony. After the opening ceremony, contact the proctor supervisor/scoring room.

2. Take a photo or draw a picture on the whiteboard of how the classroom is laid out (so that it can be returned to its original configuration following the competition). Then set up the classroom desks for the first event (Mental Math).

Respect the teacher whose room you are using. Do not touch their computer or other items. Do not erase anything on their board. Leave the room tidy & in the exact original layout.

Mental Math

3. Arrange desks in a configuration suitable for individual testing (rows/grid of desks all facing forward, students in separated/alternating desks).

4. Put the Mental Math answer sheets face up on the desks such that students are spread out. Wait for students to arrive. You can fill out the proctor name and room

number (and perhaps team numbers) on all blank answer sheets, if you like. Read over the questions so you will be prepared to read them out loud.

5. After students sit down, check to make sure that no one from the same team is seated next to each other (i.e., "Team xxx, raise your hands."). Ask them to move, if needed.

6. **Check to make sure that students put their full name, school name, team number, and room number on their answer sheet and that the information is legible**.

7. Read the "GENERAL INSTRUCTIONS" (in the Proctor Packet) to the students. Then, read the "MENTAL MATH" instructions (in the Proctor Packet) to the students.

8. Begin the testing. Read each of the eight Mental Math questions to all of the students in the room, per the instructions.

9. At the conclusion of Mental Math, collect the answer sheets. Organize the answer sheets by team number, then alphabetically by first name of competitor. Staple each team's set of four answer sheets together. Promptly hand the packets of answer sheets to your runner for conveyance to the scoring room.

Individual Test

10. The seating configuration will remain unchanged (no swapping seats).

11. Hand out Individual Test packets with the colored blank answer sheet facing up. **Check to make sure that students put their full name, school name, team number, and room number on their answer sheet and that the information is legible**.

12. Read the "INDIVIDUAL TEST" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.

13. While students are taking the Individual Test, monitor the students for proper test-taking behavior and watch the time to provide 5-minute and 30-second warnings. Make sure students are writing answers on the answer sheet (not the test question pages). During this time you can also get the Individual Multiple Choice tests ready, read through the rules of subsequent events, and (carefully/secretively) look ahead to review the College Bowl questions (i.e., to avoid stumbling over the wording when it comes time to read the questions aloud). You will have observers in the room watching the College Bowl rounds, so make sure you understand the rules, how timing works, etc.

14. At the conclusion of Individual Test, collect the answer sheets. Organize the answer sheets by team number, then alphabetically by first name of competitor. Staple each team's set of four answer sheets together. Promptly hand the packets of answer sheets to your runner for conveyance to the scoring room. Students may keep or recycle their test question packets.

Team Multiple Choice

15. Change the room set-up to groups of 4 desks together so students can work as a team.
16. Hand out the tests and have teams fill out the top portion of the answer sheet. **Check answer sheets to make sure they are filled out correctly (school, team #, etc.).**
17. Read the "TEAM MULTIPLE CHOICE" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.
18. Monitor the students for proper test-taking behavior (talking is allowed), watch the time, and provide 5-minute and 30-second warnings. While students are taking the Team Multiple Choice test, get the Team Tests ready.
19. At the conclusion of the test, collect the answer sheets & hand them off to the runner.

Team Test

20. Keep the same seating arrangement in groups of four. Hand out the Team Test packets and have teams fill out the information at the top of the colored answer sheet. **Check the answer sheets to make sure they are filled out correctly (school, team #, etc.).**
21. Read the "TEAM TEST" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.
22. Monitor the students for proper test-taking behavior (talking is allowed), watch the time, and provide 5-minute and 30-second warnings.
23. At the conclusion of the test, collect the answer sheets & hand them off to the runner.

Triple Jump

24. Keep the same seating arrangement in groups of four. Hand out the Triple Jump Test packets and have teams fill out the information at the top of EACH OF THE THREE colored answer sheet. **Check the answer sheets to make sure they are filled out correctly (school, team #, etc.).**
25. Read the "Triple Jump TEST" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.
26. An Answer Sheet must be submitted every 5 minutes (labeled: Submittal #1, Submittal #2, Submittal #3). Give time warning at 30 seconds and 5 seconds prior to each submittal. Collect the submittals promptly at 5 minutes, 10 minutes and 15 minutes.
27. At the conclusion of the test, staple the three answer sheets for each team together in order: Submittal #1 (top), #2, #3 (bottom) & hand them off to the runner.

28. At the conclusion of the Triple Jump, release the students for their break. If there is anything left (i.e., answer sheets) that should have been taken to the scoring room, give those to the runner or have a proctor take it to the scoring room now.

29. Set up your room for the College Bowl rounds and tidy up the room before you go to break. Set up a line of 9 desks side by side facing the front of the room. One team will be on each side (doesn't matter which) and the College Bowl apparatus will be stuck down on the desk in the middle. Another row of 8 desks should be set up in the middle of the room for the two teams not competing in a round. Other desks should be moved to the back of the room in an orderly fashion for the spectators.

30. Take your packet of College Bowl questions with you during break to keep them secure! Do not leave them in the room!

Dinner Break

31. AT BREAK — Eat dinner in the proctor room. Pick up your College Bowl apparatus (CBA) at this time. If you haven't already, you may want to read over the College Bowl questions to make sure you will be able to pronounce everything properly. Return to your room in time to place the CBA in position.

College Bowl Rounds

32. Place the CBA on the middle desk of the line at the front of the room (you may want to moisten the suction cups with a film of water). One proctor may need to hold the device down (and do timing). Do not press the button to "reset" the CBA (it's an on/off switch).

33. You will have the same teams that were previously in the room for the duration of all College Bowl rounds — if you have an extra/different team, they are in the wrong room and can be disqualified if they hear the questions! Help get them to the correct room.

34. Fill out the score sheets for each team in your room with their school name and team number. Call up the first 2 teams according to the sequence on the room envelope.

35. You will be reading Round #1 questions to two teams while the other two teams (and any spectators) wait in the back of the room out of line of sight of the competitors. Refer to the College Bowl schedule (on your room envelope) to see which two teams compete in each round. If a round only has one team, they will be competing against the clock and thus will have 30 seconds to answer, not 45 seconds. Record the final scores for each team on their score sheets (which you hold on to) after each round. Rounds 2-6 work the same way. Refer to the schedule to make sure the correct teams are competing at the correct time. Don't get ahead of schedule (or behind, for that matter!). If you finish a round early, please wait until the appointed time to start the next round. If you have any problems (including anyone questioning the rules or a decision made by a proctor) contact the proctor supervisor.

36. Who is keeping score? Who is keeping track of the time? YOU ARE !!!
37. Read the "COLLEGE BOWL" instructions (in the Proctor Packet) to all the students (just one time), then begin the testing for each round at the appointed times.
38. If you mis-read a question, replace it with one of the extra questions.
39. If a parent/coach/student protests an answer, make a note of the situation (the test, the problem number, who answered, what their answer was, etc.) and kindly state that the coach should bring up the issue with the contest director. Proceed as normal, scoring the question based on the answer key.
40. At the conclusion of all College Bowl rounds, get the score sheets promptly to the scoring room (either yourself or via a runner).
41. Release your group to the awards ceremony no earlier than 7:45 PM to avoid causing a disruption to other rooms. Have students help re-set the room.
42. At the end of the day, return the desks to their original arrangement, collect all scratch paper, erase any marks you made on the whiteboard, and generally make sure the classroom is tidied up. Return the College Bowl apparatus, proctoring envelope, and residual material to the proctor supervisor.

General Instructions

- Good sportsmanship is expected throughout the competition by all involved (competitors and observers). Display of poor sportsmanship will result in disqualification.
- Competitors may not use calculators or any other aids on any portion of this contest.
- Unless stated otherwise: Note: for 2023 tests, all answers are integers.
  - Express all rational, non-integer answers as common fractions, except in problems dealing with money, where you should give the answer as a decimal rounded to the nearest cent.
  - For fifth grade and up, all fractions and ratios must be reduced to simplest form, all radicals must be simplified, and all denominators must be rationalized.
  - Do not round or approximate answers. Leave answers in terms of π or other irrational quantities (e.g., $\sqrt{2}$), where applicable.
- Units are not necessary as part of your answer, unless it is a problem that deals with time, in which case, AM or PM is required. However, if you choose to use units, they must be correct.
- Record all answers on the colored cover sheets in the answer column only.
- **Be sure that the student name, school, team number, etc. has been filled out at the top of each answer sheet.**
- Tests will be scored as a 0 if answers are not recorded correctly on the answer sheets.
- Blank answer sheets and answer sheets with no name will be scored as a 0.

Mental Math Instructions

All students in the room will concurrently be asked the same eight questions in this individual test. 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 or her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before the next question is read. You may continue to work on a problem (in your head) while the next question is being read. The raw score is 1 point per correct answer.

Individual Test Instructions

You will have 35 minutes to work on the Individual test, which consists of 40 questions. 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 first 30 questions are worth two points each and questions 31-40 are worth 3 points each. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute warning.

Team Multiple Choice Instructions

You will have 15 minutes to answer 10 multiple choice questions as a team. This test is the only test where you will be penalized for incorrect responses. You will receive two points for a correct letter response, zero points for leaving it blank, and minus one point for an incorrect response. When you are prompted to begin, tear off the colored answer sheet, pass out a copy of the test to each team member, and begin testing. **ONLY a letter response should be listed as an answer on this answer sheet.**

Team Test Instructions

You will have 15 minutes to answer 10 questions as a team. When you are prompted to begin, tear off the colored answer sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as a 1 or 0. Record all answers on this colored answer sheet.

Triple Jump Instructions

You will have 15 minutes to answer 10 questions as a team. However, you will submit a set of answers every 5 minutes. Notice that your answer sheets are labeled Submittal #1 (to be submitted after 5 minutes), Submittal #2 (to be submitted after 10 minutes) and Submittal #3 (to be submitted after 15 minutes). Each problem is scored as a 1 or 0 on each of the three submittals, for a total of 30 points. Answers that are written on one submittal sheet do NOT carry over to the next submittal sheet – they need to be entered again. You may change your answer for a question from one submittal to the next, if you feel that your previous answer was incorrect.

College Bowl Instructions

Read these to the competitors before the first round:

To maintain the integrity of the competition, spectators must stay in this room during a round of College Bowl questions. Once all readings for a round have been completed, you may leave.

All competitors must be facing the front of the room in one row. Teams not competing in the current round need to be behind the front row and in front of the spectators. All spectators need to be behind the competitors at the back of the room.

A maximum of ten questions per round will be scored. It is OK for both teams to score the same number of points! The proctor will record the points earned on each team's score sheet, which is retained by the proctor.

You may use scratch paper and pencil. You may talk with your team members while arriving at a solution.

An Electronic College Bowl Apparatus (CBA) will be used to identify the team who is first to have an answer.

During these rounds, each question will be read twice and a maximum time of 45 seconds after the second reading of the question is completed will be allowed for a team to answer. If a team buzzes in after the second reading and gives an incorrect response, the other team has the remainder of the 45 seconds to respond. A team is allowed only one attempt at buzzing in and answering per question. You may interrupt (buzz in) while a question is being read, however, if you do, the proctor will stop reading, and an immediate response is needed. If the correct response is given, the proctor will proceed to the next question. Otherwise, the question will be re-read for the other team, making sure it has two full readings. If an immediate response is not given after a team buzzes in, their lack of an answer in a timely manner is considered incorrect. In the event that only one team is competing in a round (i.e., one team is absent), the team competing will have a maximum of 30 seconds after the completion of the second reading in which to buzz in. The proctor will give a 5-second time warning.

Wait to be acknowledged by the proctor before giving an answer. This avoids the situation of blurting out an answer when the other team buzzed in first.

If two students from the same team answer at the same time with different answers, the answer will be considered incorrect.

If a problem arises with one of the questions, an extra question will be asked to replace that question.

If the round finishes early, you need to stay in the room for the remaining time.

Mental Math Questions

Relay Answers

College Bowl Questions/Answers