"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

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:*
  - *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 5th 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., √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.*

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).

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

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			
4th Grade	**TOTAL:**		

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

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.

4th Grade

	Answer	
1	20 [nights]	Gustavo reads twelve pages of his book every night. If his book has two hundred forty pages, how many nights will it take him to read his book?
2	18	What is the next term in the sequence that begins: Three, four, six, nine, thirteen, and so on?
3	56 [cents	If Olivia has one dollar and twenty-nine cents, and Arjun has seventy-three cents, how much more money, in cents does Olivia have than Arjun?
4	121	What is the smallest perfect square greater than one hundred?
5	16 [inches]	What is the perimeter in inches of a rectangle with side lengths of three point two inches and four point eight inches?
6	60 [%]	Parth has twenty marbles. Five of the marbles are red, three of the marbles are green, and the rest are blue. What percentage of the marbles are blue?
7	12	How many ways are there to rearrange the letters A, B, C and D from left to right, if A and B refuse to be next to each other?
8	84[points]	Kylie's average score on three tests is ninety points. What is her new average score in points if on her fourth test she scores a sixty-six?

"Math Is Cool" Masters — 2022-23

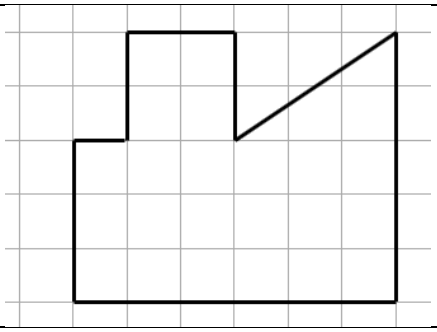
4th Grade — May 6th 2023

Individual Contest

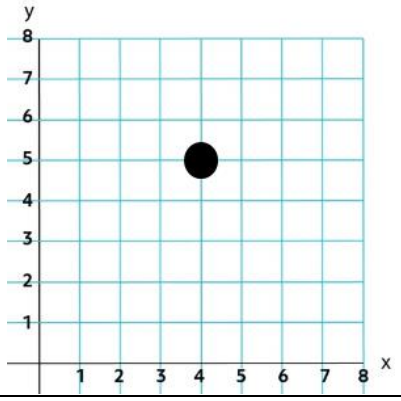
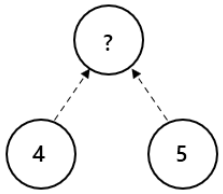
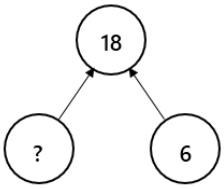
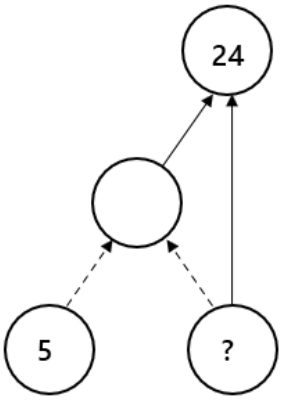
Record all answers on the colored cover sheet. 35 minutes, 40 problems, ~92% of individual score.
No talking during this individual test. A 5-minute time warning will be given.

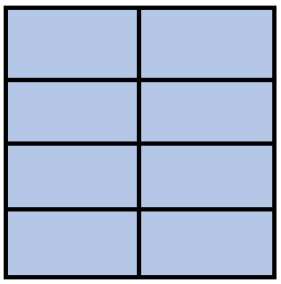
	Questions 1-30: 2 points each
1	Evaluate: 18 + 2 × 5
2	Find the value of the expression x ÷ 3 when x = 12.
3	Dheeraj has made 6 cups of lemonade. How many more cups of lemonade does he need to make to have one gallon of lemonade?
4	Aurora has twice as many candies as Brooklyn, and one-third as many candies as Cierra. If Brooklyn has one candy, how many candies does Cierra have?
5	How many sixths are there in $4\frac{1}{6}$?
6	The following table shows the number of students in each 5th grade class at Vitsa Elementary School. If one student is chosen at random, what is the probability, in percent, that they are in Ms. Devine's class?
7	What is the next number in the sequence that begins with: 1, 1, 2, 4, 7, 11, 16, …
8	Find the area of this shape in square units. Each square on the grid is 1 unit by 1 unit.
9	Write this number as an integer: Three hundred thousand sixty-one
10	What is the remainder when 479 is divided by 6?
11	Find the range of the following data set: {7, 6, 2, 9, 1, 5, 5}

Teacher	Number of Students
Ms. Devine	20
Mrs. Maxson	21
Mr. Melville	18
Mr. Medrano	21



Continued on next page.

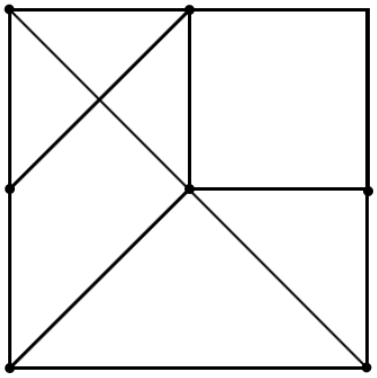
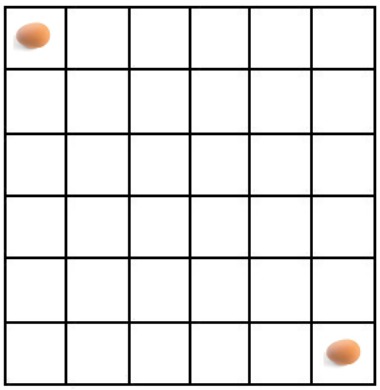
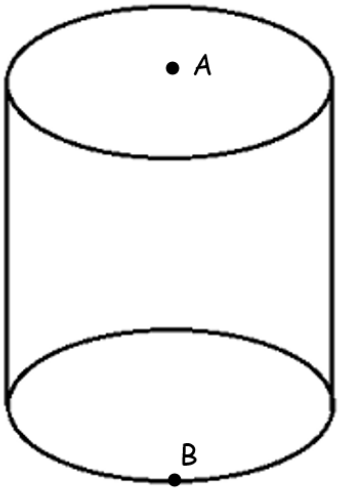
12	Ziquan is buying tickets for the fair. He needs to buy two tickets and each ticket costs $8. If he pays with a twenty-dollar bill, how much change, in dollars, will he get back?
13	What is the x-coordinate of the grid point on the coordinate plane that is covered by the circle? 
14	A rectangle with integer side lengths has an area of 28 square units. If both the length and width of the rectangle are an even number of units, what is the perimeter of the rectangle, in units?
15	Mei has six coins (pennies, nickels, dimes, or quarters) and has at least one of each type of coin. What is the positive difference, in cents, between the most amount of money she could have and the least amount of money she could have?
16	Bogdan is running a 1 kilometer race. He has already completed $\frac{3}{4}$ of the race course. How many more meters does he have to run?
17	On his past five tests, Eric has earned 87, 99, 82, 79 and 91 points. On her past five tests, Samantha has earned 90, 88, 91, 97, and 72 points. What is the positive difference between Eric's and Samantha's median scores?
18	In a circle puzzle like the ones shown here, dashed arrows mean to add and solid arrows mean to multiply. For example, the unknown value in the first puzzle is 9, because 4 + 5 = 9. The unknown value in the second puzzle is 3, because 3 x 6 = 18.   In this circle puzzle to the right, what is the unknown number indicated with a question mark? All numbers in the puzzle are positive integers. 
19	How many of the first 100 counting numbers (starting with 1, 2, 3, …) contain the digit 7?
20	The Taterade beverage company recently downsized their bottled energy drink from 25 ounces to 20 ounces. What was the percent decrease in the drink size? Answer as a positive integer.
Continued on next page.	

21	On a spelling test, students are asked to spell the word BUG. Each student uses all the correct letters exactly one time, but all of the students spell the word wrong, and each student has a different spelling! What is the maximum number of students that could be in the class?
22	Trinity is 3 years older than Juho. Six years ago, the sum of their ages was 25 years. How many years old is Trinity currently?
23	Julia and Maxim are each thinking of a number. Julia's number is prime and has two digits. Maxim's number is one greater than a perfect square and does not contain the digit 1. What number could they both be thinking of?
24	It is currently 9:54 PM, where 9+5+4 = 18. How many minutes will it be until the sum of the digits of the time is 18 again?
25	A square with an area of 144 cm^2 is divided into 8 congruent (equal) rectangles, as shown. What is the perimeter of one of these rectangles, in centimeters? 
26	Two fair ten-sided dice with sides numbered 1-10 are rolled. What is the probability, as a percent, that the sum of the numbers rolled is 16?
27	What is the sum of the first six positive multiples of 11?
28	What is the smallest positive integer that has a remainder of 1 when divided by 7, a remainder of 5 when divided by 8, and a remainder of 2 when divided by 9?
29	Alex can ride her bike at a constant speed of 12 miles per hour. She bikes for ten minutes then stops and rests for five minutes. If this pattern continues, how long in minutes will it take her to bike 8 miles?
30	Jackson and Josue play a game where the winner gains 2 points, the loser loses 1 point, and there are no ties. If Jackson won exactly 15 games, and Josue had a final score of 33 points, what was Jackson's final score?

Challenge Questions: 3 points each

31	Find the next term in the following sequence: 0, 2, 7, 16, 30, …
32	If the mean of the following set is 6, what is the value of x? {4, x, 10, 10, 6, 7, 9, x}
33	Six books of different heights are to be arranged on a bookshelf from left to right. How many ways can the books be arranged if the tallest book cannot be in the last (furthest right) spot?
34	The sum of four two-digit numbers is 221. None of the digits are 0 and no two of the digits are the same. Which of the digits 1 through 9 does not appear in one of the two-digit numbers?

Continued on next page.

35	Biff and Eho are running around a track that is a quarter of a mile long at a constant speed. They start at the same spot but run in opposite directions. If Biff runs twice as fast as Eho, and they meet after 1 minute and 15 seconds, what is Biff's speed, in miles per hour?
36	The following square has been split into seven distinct regions. All lines go through the square's vertices, side midpoints, or the center of the square. How many different ways are there to color in two or more distinct regions of the square such that 3/8 of the square will be colored? 
37	A farmer is placing eggs in a 6 x 6 crate such that each row, column and the two diagonals has no more than two eggs and such that each space has only one egg. Two eggs have already been placed, as shown below. What is the maximum number of eggs that can be placed in the crate, including the two that are already there? 
38	Itzel has 2023 cubes that have a side length of one inch. She then makes the largest possible rectangular prism with a height of one inch and a square base. With the remaining squares, she makes the largest possible rectangular prism with a height of two inches and a square base. She continues making rectangular prisms with square bases and increasing the height by one each time until she does not have enough cubes to make the next prism. What is the volume of the last rectangular prism she makes?
39	The cylinder shown here has a volume of 2400π cubic units, and the area of the base is 100π square units. Point A is the center of one of the bases and point B is on the circumference of the opposite base. In units, what is the shortest straight-line distance between A and B, which may go through the interior of the cylinder? 
40	A factor of 6! is chosen at random. What is the probability in percent that the factor chosen is odd?

"Math Is Cool" Masters – 2022-23

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	28
2	4
3	10 [cups]
4	6 [candies]
5	25 [sixths]
6	25 [%]
7	22
8	25 [square units]
9	300061
10	5
11	8 [= range]
12	4 [dollars]
13	[x =] 4
14	32 [units]
15	48 [cents]

	Answer
16	250 [meters]
17	3 [points]
18	3
19	19 [numbers]
20	20 [%]
21	5 [students]
22	20 [years]
23	37
24	425 [minutes]
25	18 [cm]
26	5 [%]
27	231
28	29
29	55 [minutes]
30	6 [points]

	Answer
31	50
32	[x =] 1
33	600 [ways]
34	4
35	8 [mph]
36	12 [ways]
37	12 [eggs]
38	12 [cubic inches]
39	26 [units]
40	20 [%]

4th Grade

May 6th 2023

"Math Is Cool" Masters – 2022-23

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:			

4th Grade

May 6th 2023

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

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Team Multiple Choice Contest

USE THE FOLLOWING MAP AND KEY TO SOLVE PROBLEMS #1 THROUGH #4.

Consider the following two-by-two arrays of consecutive integers. For example, Array #1 consists of the numbers 1, 2, 3, 4 starting at the upper-left corner and moving across the two rows. Each following array has an upper-left number one higher than the previous array. The pattern continues with additional arrays.

Array #1

1	2
3	4

Array #2

2	3
4	5

Array #3

3	4
5	6

...

...

1 What is the product of all four numbers contained in Array #4?

A) 22 B) 360 C) 780 D) 840 E) Answer not given.

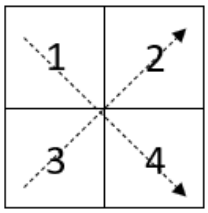
2 What is the positive difference between the sum of the four numbers contained in Array #5 and the sum of the four numbers contained in Array #1?

A) 10 B) 16 C) 26 D) 30 E) Answer not given.

3 The sum of each diagonal in Array #1 is equal to 5, since 1 + 4 = 5 and 2 + 3 = 5. What is the sum of each diagonal in Array #10?

A) 21 B) 22 C) 23 D) 24
E) Answer not given.

Array #1



4 Consider a different set of two-by-two arrays, each of which contains the first four positive consecutive multiples of the integers, starting with 2. Array #1 contains the multiples of 2: 2, 4, 6, 8, starting at upper-left and moving across the two rows. Array #2 contains the multiples of 3: 3, 6, 9, 12. The pattern continues infinitely. In this pattern, what is the largest product that can be made by multiplying the two numbers on either diagonal of Array #5?

A) 30 B) 150 C) 144 D) 216 E) Answer not given.

Continued on Next Page

USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #5 THROUGH #7.

The table shown here displays the approximate number of pandas that live in the wild in China from the years 1970 through 2020. The panda estimates are found by researchers conducting a "panda census" every few years.

Year	No. of wild pandas
1970	2670
1975	2170
1980	1640
1985	1100
1990	?
1995	1360
2000	1400
2005	1630
2010	1770
2015	1780
2020	1860

5 In 1990, there were 310 fewer pandas than in 1980. How many pandas were there in 1990?

A) 790 B) 940 C) 1330 D) 1410 E) Answer not given.

6 The panda population is projected to increase by 5% between 2020 and 2025. What is the projected number of pandas in 2025?

A) 1953 B) 2163 C) 2240 D) 2790 E) Answer not given.

7 The panda population decreased at a fairly constant rate from 1970 to 1985. On average, the panda population was decreased by how many pandas per year over that time period? Round your answer to the nearest whole panda.

A) 100 B) 105 C) 115 D) 117 E) 118

Continued on Next Page

	USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #8 THROUGH #10. There are 14 identical objects that are going to be placed into different groups (sets). Unless otherwise specified, assume that the order of the groups does not make a difference. For example, placing 12 objects into Set 1 and two objects into Set 2 is the same as placing two objects into Set 1 and 12 objects into Set 2. It is possible to have an "empty set" which contains zero objects.
8	In how many different ways can the 14 identical objects be placed into two different groups (sets)? A) 5 B) 8 C) 10 D) 14 E) Answer not given.
9	Suppose that the 14 identical objects are Oreo cookies that are being divided between two friends, Zahir and Parth. In this case, the order of the groups matters, because Parth will be very unhappy for example if Zahir gets all 14 Oreos. In how many different ways can the 14 Oreos be distributed between the two friends? A) 8 B) 12 C) 15 D) 28 E) Answer not given.
10	In how many different ways can 14 identical objects be placed into three different groups (sets)? Assume that order does not matter. A) 24 B) 28 C) 30 D) 48 E) Answer not given.

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Key

Team Multiple Choice Contest – Answer Key

4th Grade

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

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

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4th Grade — May 6th 2023

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.

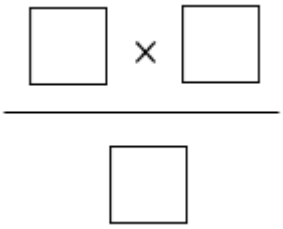
STUDENTS: DO NOT WRITE IN SHADED REGIONS

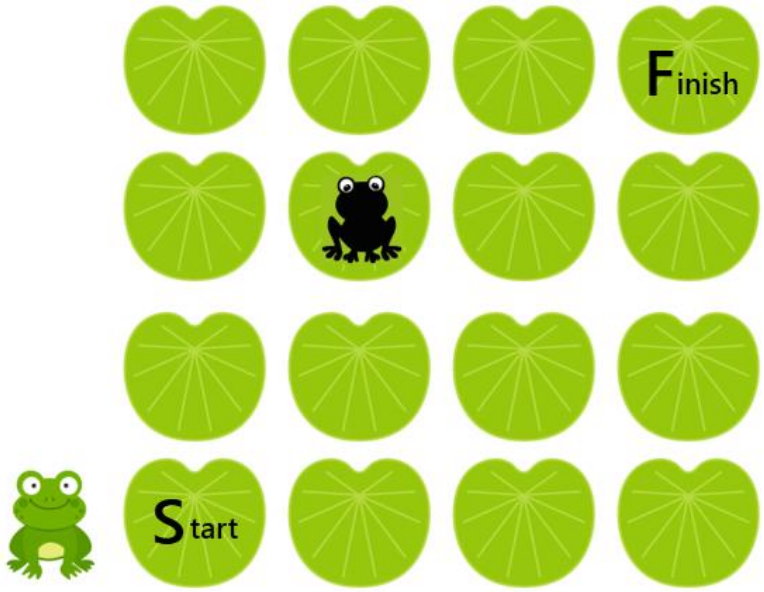
		Scorer 2	Scorer 1
Answer		-1, 0, or 2	-1, 0, or 2
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
4th Grade	**TOTAL:**		

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Team Contest

1	How many integers are there between 12 and 39 inclusive (including 12 and 39)?
2	Make the largest quotient possible by choosing three of the four numbers shown below. One number goes in each box, and you can use each number at most one time. What is the quotient? 4, 12, 8, 6 
3	A plane travels at 500 miles per hour. If the distance between Seattle and New York is 3000 miles, how many hours will it take for the plane to travel between the two locations?
4	How many positive integers less than 60 are divisible by 4?
5	What is the sum of the first 10 numbers in the following arithmetic sequence? 1, 4, 7, 10, …
6	At Parker's Pie Shop, a slice of pie is one eighth of a full pie and costs $3. If a full pie costs 25% less than eight slices of pie, how much, in dollars, does a full pie cost?
7	A cylinder has a circumference of 6 centimeters and a height of 24 centimeters. A string is wrapped around the cylinder beginning at a point on the edge of the bottom base of the cylinder and ending at a point on the edge of the top base directly above the point where it begins. The string is evenly spaced as it wraps around the cylinder exactly three times. In centimeters, what is the length of the string?
	Continued on next page.

8	Lily the frog loves leaping across lily pads. Her pond has sixteen lily pads as shown below. From any lily pad, she can jump up or to the right to any adjacent lily pad (not diagonally). Except she cannot jump to the one lily pad currently occupied by Florence, because Florence refuses to move. How many ways are there for Lily to get to the lily pad labelled **Finish** from the lily pad labelled **Start** using the fewest leaps possible? 
9	Andrei, Bo, Claire and Devon went on an Easter egg hunt. They found red, purple, yellow and green colored eggs. The number of purple eggs that they found was three more than the number of green eggs. The number of red eggs was twice the number of green eggs. The number of yellow eggs was two more than the number of red eggs. Andrei found as many eggs as Bo did. Claire found three eggs more than Andrei did. Devon found four eggs more than Bo did. Claire, whose favorite color is red, gathered only red eggs. None of the others gathered red eggs. How many total eggs did they find?
10	If three 6-sided dice are rolled, what is the probability in percent that either all three numbers are odd or all three numbers are even?

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4th Grade — May 6th 2023

Key

Team Contest – Answer Key

4th Grade

	Answer
1	28 [integers]
2	4 [= quotient]
3	6 [hours]
4	14 [positive integers]
5	145
6	[$] 18
7	30 [centimeters]
8	11 [ways]
9	35 [eggs]
10	25 [%]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

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.

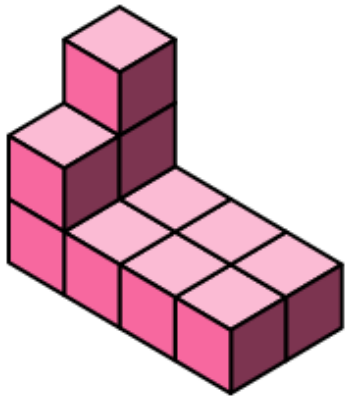
STUDENTS: DO NOT WRITE IN SHADED REGIONS

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

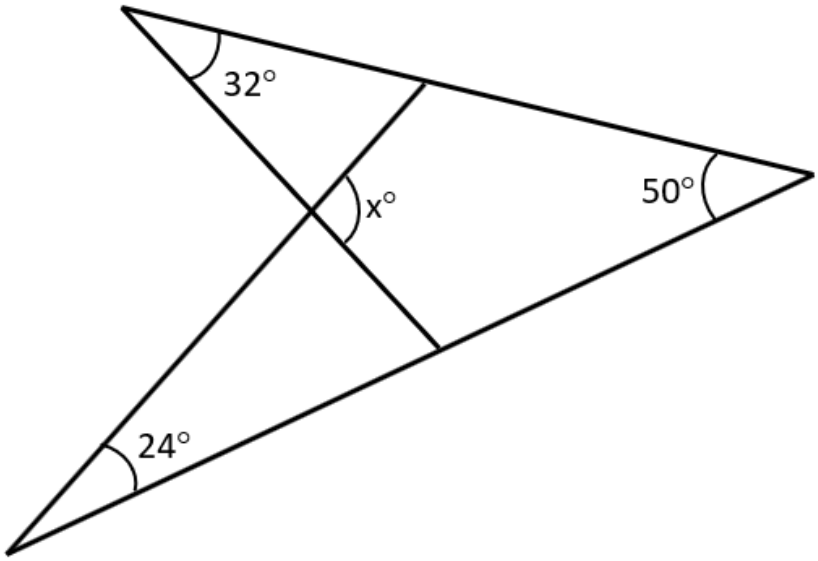
"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Linda Moore Triple Jump

1	The following figure is made of unit cubes, some of which are stacked. What is the volume of the entire figure, in cubic units? 
2	If I have ten quarters, seven dimes, five nickels, and four pennies, what is the least number of additional nickels I need to pay for something that costs $3.94?
3	If it is currently 3:42 PM, how many minutes will it be until 6:19 PM on the same day?
4	For what digit A is the following number evenly divisible by 9? 42A968
5	At a certain math competition, the 5th grade trophy is 5% taller than the 4th grade trophy, and the 6th grade trophy is 20% taller than the 5th grade trophy. What percent taller is the 6th grade trophy than the 4th grade trophy?
6	Biff and Eho each roll a fair six-sided die numbered one through six, and then multiply together the number that each of them got. If the product of the two numbers is even, Biff wins. If the product is odd, Eho wins. As a percentage, what is the probability that Biff will win the game?
7	The angles of a triangle are in a 1:3:8 ratio. What is the measure, in degrees, of the largest angle?
8	A set of seven distinct positive integers has a unique mode of 7, a median of 5, and a mean of 5. What is the largest possible integer in the set?
9	What is the sum of the first digits of the first 2023 counting numbers? For example, the first (left-most) digit in the number 587 is 5.

Continued on next page.

10	In the following figure, what is the measure of angle x, in degrees? 

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

Linda Moore Triple Jump – Answer Key

4th Grade

	Answer
1	11 [cubic units]
2	9 [nickels]
3	157 [minutes]
4	[A =] 7
5	26 [%]
6	75 [%]
7	120 [degrees]
8	10
9	6043
10	106 [°]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Final Score *(out of 10)*

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			
4th Grade	**TOTAL:**		

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Final Score *(out of 10)*

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			
4th Grade	**TOTAL:**		

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Final Score *(out of 10)*

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			
4th Grade	**TOTAL:**		

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

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" Masters — 2022-23

4th Grade — May 6th 2023

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" Masters — 2022-23

4th Grade — May 6th 2023

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	Gustavo reads twelve pages of his book every night. If his book has two hundred forty pages, how many nights will it take him to read his book?	20 [nights]
2	What is the next term in the sequence that begins: Three, four, six, nine, thirteen, and so on?	18
3	If Olivia has one dollar and twenty-nine cents, and Arjun has seventy-three cents, how much more money, in cents does Olivia have than Arjun?	56 [cents
4	What is the smallest perfect square greater than one hundred?	121
5	What is the perimeter in inches of a rectangle with side lengths of three point two inches and four point eight inches?	
6	Parth has twenty marbles. Five of the marbles are red, three of the marbles are green, and the rest are blue. What percentage of the marbles are blue?	60 [%]
7	How many ways are there to rearrange the letters A, B, C and D from left to right, if A and B refuse to be next to each other?	
8	Kylie's average score on three tests is ninety points. What is her new average score in points if on her fourth test she scores a sixty-six?	84[points]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

College Bowl Round #1

#	Problem	Answer
1	In the number four hundred thirty five thousand two hundred and six, what digit from zero to nine is in the ten-thousands place?	3
2	The interior angles of a polygon have a sum of 360 degrees. How many sides does this polygon have?	4 [sides]
3	A logging company cut down twenty four thousand five hundred and thirty-two trees on the south side of Mount Eho and six thousand forty-three trees on the north side of Mount Eho. How many total trees did they cut down?	30575 [trees]
4	What is the next term in the following sequence: One, negative four, nine, negative sixteen, twenty-five, and so on.	-36
5	If sixteen minus x equals two, what is the value of two times x?	28 [= 2x]
6	Eighty-five percent out of two thousand eight hundred reviews of the Super Mario Brothers Movie were positive. How many of the reviews were positive?	2380 [reviews]
7	If an integer is randomly chosen from one to twenty-five inclusive, what is the probability in percent that it is prime?	36 [%]
8	Jose has the following data: X, six, ten, twelve, three, seven and ten If the median of the data is nine, what is the value of x?	9 [= x]
9	As an integer, what is the value of three halves plus six fourths plus ten minus four?	9
10	Lyla is making a banner for her little brother's birthday party. She tapes together pieces of construction paper until the banner is two yards long. Each piece of paper is nine inches long. How many pieces of paper does she need?	8 [pieces of paper]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

COLLEGE BOWL ROUND #2

#	Problem	Answer
1	Ten raised to what power equals one hundred thousand?	5
2	Find the sum of the eighth and ninth terms of the arithmetic sequence that begins with: two, five, eight, eleven and so on.	49
3	Using only pennies, nickels and quarters, what is the least amount of coins needed to make eighty-eight cents?	8 [coins]
4	Two cards are selected one at a time with replacement from a standard 52-card deck. What is the probability in percent that the cards are from different suits, where the suits are hearts, diamonds, clubs and spades?	75 [%]
5	What is the smallest positive five-digit integer that is divisible both by eight and nine?	10008
6	How many distinct sets of three positive integers have a mean of six, a median of seven, and no mode?	3 [sets]
7	A number begins with the following digits and the pattern continues infinitely: One two three four one two three four one two three four and so on. What is the two thousand and twenty third digit in the number?	3
8	What is the length of a rectangle in units if the perimeter is 84 units and the width is 13 units?	29 [units]
9	What is the product of one point six and fifty?	80
10	In an obtuse triangle, how many of the interior angles measure more than ninety degrees?	1 [angle]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

COLLEGE BOWL ROUND #3

#	Problem	Answer
1	If one interior angle of a rhombus measures forty-three degrees, what is the sum in degrees of the measures of the other three interior angles?	317 [degrees]
2	If an integer is chosen at random from one to ten, including one and ten, what is the probability in percent that the integer contains the digit one?	20 [%]
3	A wheel spins one hundred times in two minutes and thirty seconds. At this rate, how many times does the wheel spin in fifteen minutes?	600 [spins]
4	Four high school students are sitting in a car. If there are four different seats, including the driver's seat, and Kirby must drive the car, in how many ways can the four students sit in the car?	6 [ways]
5	What is the mean of the first ten positive odd integers?	10 [= mean]
6	There are fourteen dogs at Dylan's Doggie Daycare. Twelve of them are females and the rest are males. Eight of them are white. What is the smallest possible number of white female dogs?	6 [dogs]
7	Jovanni is sorting marbles into boxes. He put 36 marbles in the first box, 43 marbles in the second box, 50 marbles in the third box, and 57 marbles in the fourth box. If this pattern continues, how many marbles will Jovanni put in the sixth box?	71 [marbles]
8	Five kilograms and forty-five grams is equal to how many grams?	5045 [g]
9	How much more volume in cubic inches does a cube with side lengths of six inches have compared to a cube with side lengths of three inches?	189 [cubic inches]
10	The decimal number zero point six two is equal to what percentage?	62 [%]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

COLLEGE BOWL ROUND #4

#	Problem	Answer
1	What whole number divided by 100 equals thirty-five point one six?	3516
2	What is the next number in the sequence that begins: One hundred twenty-eight, sixty-four, thirty-two and so on.	16
3	On a number line, how many units apart are the numbers thirty-five and negative nine?	44 [units]
4	Working together, two hoses can fill a swimming pool with water in four hours. One hose alone can fill the pool in twelve hours. How many hours would it take the other hose alone to fill the pool with water?	6 [hours]
5	In how many ways can the number four be written as the sum of two or more not necessarily different positive integers, if the order of the integers does not matter?	4 [ways]
6	A square's side length is the same number of units as the diameter of a circle. If the area of the circle is two thousand five hundred times pi square units, how many units is the side length of the square?	100 [units]
7	The range of the following set of positive integers is 15. What is the value of x? Fourteen, two, x, twelve, nine, three	17
8	What is the least common denominator of the fractions one third and three fourths?	12
9	How many edges does a cube have?	12 [edges]
10	Mr. Houser kept data on how many books each of his students read last week. Two students read zero books, eight students read one book, four students read two books and nine students read three books. How many students read more than one book last week?	13 [students]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

College Bowl Round #5

#	Problem	Answer
1	Two hundred eighty-seven minutes equals four hours and how many minutes?	47 [minutes]
2	How many interior angles does an octagon have?	8 [interior angles]
3	The Math Is Cool students in Wenatchee voted on their favorite prize. A total of one hundred eighty-eight students voted for either fidget spinners or beanies. Three times as many students voted for fidget spinners as voted for beanies. How many students voted for fidget spinners?	141 [students]
4	What is the maximum number of pieces of pizza that can be created by making three straight cuts across a round pizza? Pieces may not be moved or stacked, and they do not have to be the same size or shape.	7 [pieces]
5	A positive integer from one to one hundred, including one and one hundred, is selected at random. What is the probability in percent that the number is divisible by five?	20 [%]
6	Two friends are playing marbles. Max says to Ruby, if you give me one of your marbles, we would each have the same number of marbles. Ruby says, if you give me one of your marbles, I would have five times as many marbles as you. How many marbles does Ruby currently have?	4 [marbles]
7	What two-digit positive integer is one more than a perfect square and one less than a perfect cube?	26
8	What number plus nine hundred and fifteen equals three thousand seven hundred twenty-three?	2808
9	What is the volume in cubic inches of a rectangular prism with side lengths of seven point six inches, ten inches and two inches?	152 [cubic inches]
10	What is the greatest common factor of sixteen, twelve and twenty?	4

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

COLLEGE BOWL ROUND #6

#	Problem	Answer
1	How many numbers in the following set are prime? One, two, seven, twenty-one, twenty-seven, thirty-one, thirty-nine	3 [numbers]
2	What is the median of the following set of numbers? Seventy-five, seventy-seven, sixty-four, sixty-six, eighty-four	75
3	How many more sides does an octagon have than a triangle?	5 [more sides]
4	The sum of three positive integers is seventy-two. The integers are in the ratios of three to four to five. What is the smallest of the three integers?	18
5	Out of all of the different arrangements that can be made using the digits one, two three and four, what percentage of them start with a digit that is prime?	50 [%]
6	The mean of the following set of numbers is 12: A, B, thirteen, and fifteen What is A plus B?	20 [= A + B]
7	One of a right triangle's angles measures thirty-two degrees. What is the measure in degrees of the other acute angle of the triangle?	58 [degrees]
8	What is two thousand two hundred seventy-one rounded to the nearest hundred?	2300
9	Ms. Carlson is taking her class to a field trip at the science museum. They have three hours to spend at the museum and want to divide their time equally among the ten exhibits. How many minutes should they spend at each exhibit?	18 [minutes]
10	If there are twenty-two testing rooms at a math competition, and each room has exactly four teams and each team has exactly four students, how many total students are at the math competition?	352 [students]

"Math Is Cool" Masters — 2022-23

4th Grade — May 6th 2023

Key

COLLEGE BOWL – EXTRA QUESTIONS

#	Problem	Answer
1	My brother spent ten dollars on comic books and candy bars. He bought seven items. If comic books cost two dollars each and candy bars cost one dollar each, how many comic books did he buy?	3 [comic books]
2	How many multiples of one hundred are between one and two thousand twenty-three?	20 [multiples]
3	Find the value of five squared minus four squared plus three squared minus two squared plus one squared.	15
4	How many units greater is the perimeter of a square with side length 37 units than the perimeter of a square with area one hundred square units?	108 [units]
5	Six hundred and twelve inches is equal to how many yards?	17 [yards]
6	Ellie is delivering three thousand three hundred boxes of Girl Scout cookies to three neighborhoods. One neighborhood has two hundred fifty houses, the second has five hundred houses, and the third has three hundred fifty houses. If each house gets the same number of boxes of cookies, how many boxes does each house get?	3 [boxes]

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 Relay 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, Relay, 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.
- You will score the Relays.
- 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. The Relay will require the desks arranged in columns (front to back). 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 (AND PERHAPS GRADED BY YOU). 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. While students are taking the Team Test, get the Relay tests ready.
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 2022 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