

# "Math is Cool" Championships – 2014-15

April 17, 2015

|                             |
|-----------------------------|
| Total Correct<br><b>KEY</b> |
|-----------------------------|

**STUDENT NAME:** \_\_\_\_\_ **School Name:** \_\_\_\_\_  
**Proctor Name:** \_\_\_\_\_ **Team #:** \_\_\_\_\_ **Room #:** \_\_\_\_\_

## 4th Grade Individual Contest – Score Sheet

|                    | Answer        | 1 or 0 | 1 or 0 |
|--------------------|---------------|--------|--------|
| 1                  | 6 [sides]     |        |        |
| 2                  | 4             |        |        |
| 3                  | 15            |        |        |
| 4                  | 27 [quarters] |        |        |
| 5                  | 21 [cats]     |        |        |
| 6                  | 9 [groups]    |        |        |
| 7                  | 108           |        |        |
| 8                  | 15 [girls]    |        |        |
| 9                  | 9             |        |        |
| 10                 | 2             |        |        |
| 11                 | 12            |        |        |
| 12                 | 40            |        |        |
| 13                 | 85 [%]        |        |        |
| 14                 | 84 [minutes]  |        |        |
| 15                 | [\$] 216      |        |        |
| <b>1-15 TOTAL:</b> |               |        |        |

## DO NOT WRITE IN SHADED REGIONS

|                     | Answer       | 1 or 0 | 1 or 0 |
|---------------------|--------------|--------|--------|
| 16                  | 3:07 PM      |        |        |
| 17                  | 60 [cu. in.] |        |        |
| 18                  | 240 [days]   |        |        |
| 19                  | 13 [inches]  |        |        |
| 20                  | [\$] 258     |        |        |
| 21                  | 53 [degrees] |        |        |
| 22                  | 1/2 or 3/6   |        |        |
| 23                  | 2 [badgers]  |        |        |
| 24                  | 64 [sq. cm]  |        |        |
| 25                  | [\$] 40      |        |        |
| 26                  | 7 [socks]    |        |        |
| 27                  | 1 un.        |        |        |
| 28                  | 61 [apples]  |        |        |
| 29                  | 31 [cubes]   |        |        |
| 30                  | 4 [students] |        |        |
| <b>16-30 TOTAL:</b> |              |        |        |

|                     | Answer                                                                   | 1 or 0 | 1 or 0 |
|---------------------|--------------------------------------------------------------------------|--------|--------|
| 31                  | 128 [days]                                                               |        |        |
| 32                  | 225 bugs                                                                 |        |        |
| 33                  | 14 [years]                                                               |        |        |
| 34                  | 11 [numbers]                                                             |        |        |
| 35                  | 2 [miles]                                                                |        |        |
| 36                  | 421 [coins]                                                              |        |        |
| 37                  | 6 [Odd days]                                                             |        |        |
| 38                  | [\$] 10                                                                  |        |        |
| 39                  | 18 [rectangles]                                                          |        |        |
| 40                  | $\frac{1}{165}$ or $\frac{3}{495}$ or $\frac{2}{330}$ or $\frac{6}{990}$ |        |        |
| <b>31-40 TOTAL:</b> |                                                                          |        |        |

4th Grade

# "Math is Cool" Championships – 2014-15

April 17, 2015

Total Correct

**STUDENT NAME:** \_\_\_\_\_ **School Name:** \_\_\_\_\_

**Proctor Name:** \_\_\_\_\_ **Team #:** \_\_\_\_\_ **Room #:** \_\_\_\_\_

## 4th Grade Individual Contest – Score Sheet

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

### DO NOT WRITE IN SHADED REGIONS

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

|                     | Answer | 1 or 0 | 1 or 0 |
|---------------------|--------|--------|--------|
| 31                  |        |        |        |
| 32                  |        |        |        |
| 33                  |        |        |        |
| 34                  |        |        |        |
| 35                  |        |        |        |
| 36                  |        |        |        |
| 37                  |        |        |        |
| 38                  |        |        |        |
| 39                  |        |        |        |
| 40                  |        |        |        |
| <b>31-40 TOTAL:</b> |        |        |        |

4th Grade

# “Math is Cool” Championships – 2014-15

Sponsored by:

April 17, 2015

4th Grade Mental Math Contest

**Follow along as your proctor reads these instructions to you. Your Mental Math score sheet is on the back.**

## **GENERAL INSTRUCTIONS applying to all tests:**

- *Good sportsmanship is expected throughout the competition by all involved. Bad sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise:*
  - *For problems dealing with money, a decimal answer should be given.*
  - *Express all rational, non-integer answers as reduced common fractions.*
- *For fifth and sixth grade, all fractions and ratios must be reduced.*
- *Counting or natural numbers refer to the numbers 1,2,3,4 and so on and do NOT include 0.*
- *Units are not necessary unless it is a problem that deals with time and, in that case, am or pm is needed. However, if you choose to use units, they must be correct.*
- *Leave all answers in terms of  $\pi$  where applicable.*
- *Do not round any answers unless stated otherwise.*
- *Record all answers on the colored cover sheets in the answer column only.*
- *Make sure all answer sheets have all the information filled out at the top of the 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 also be scored as a 0.*

## Mental Math – 30 sec per question

**8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score**

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

# “Math is Cool” Championships – 2014-15

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4th Grade – April 17, 2015

Mental Math Contest

## Mental Math – 30 sec per question

**8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score**

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

| # | Problem                                                                                                                           |
|---|-----------------------------------------------------------------------------------------------------------------------------------|
| 1 | What number added to eighteen gives a sum equal to twenty-four?                                                                   |
| 2 | What is the sum of 14 and 47?                                                                                                     |
| 3 | What is the degree measure of the largest possible interior angle of a triangle that is not obtuse?                               |
| 4 | Sally has four chickens and nine cows. How many legs do her animals have in all?                                                  |
| 5 | What is the range of the following set of numbers: 4, 9, 3, 1, and 6?                                                             |
| 6 | What is the sum of the number of edges on a cube plus the number of faces on a cube?                                              |
| 7 | As a common fraction, what is the probability of getting a composite number when rolling a standard cubical die?                  |
| 8 | What is the sum of the number of seconds in a minute, the number of centimeters in a meter, and the number of sides on a nonagon? |

# “Math is Cool” Championships – 2014-15

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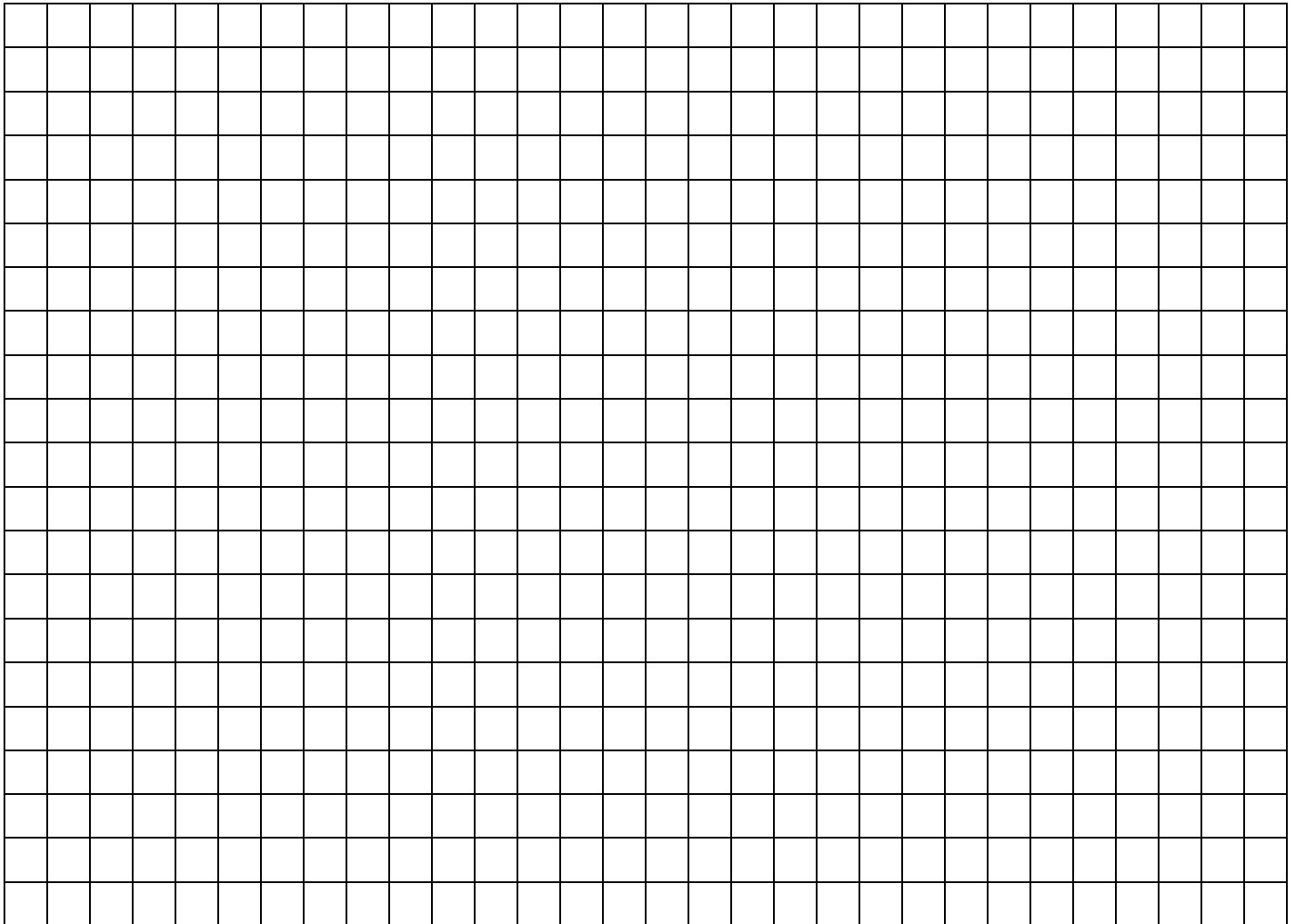
April 17, 2015

Individual Contest – 4th Grade

**Tear this cover sheet and scratch paper off and fill out the top of the colored answer sheet prior to the start of the test. The graph below is for your use, if needed.**

## **INDIVIDUAL TEST - 35 minutes**

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

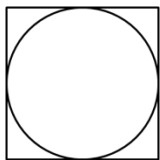
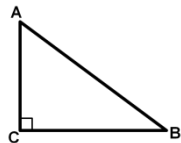
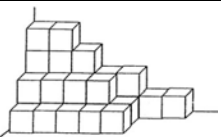


# “Math is Cool” Championships – 2014-15

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4th Grade – April 17, 2015  
Individual Contest

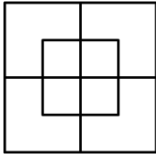
Record all answers on the colored cover sheet.

| Questions 1-30: 2 points each |                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                             | How many sides does a hexagon have?                                                                                                                                                                                 |
| 2                             | Which digit is in the ten-thousands place of the number 60,248,791 ?                                                                                                                                                |
| 3                             | What is the sum of $2 + 3 + 2 + 3 + 2 + 3$ ?                                                                                                                                                                        |
| 4                             | How many quarters do you need to have \$6.75 ?                                                                                                                                                                      |
| 5                             | Paula owns 15 cats and Roy owns 6 cats. How many cats do they have together?                                                                                                                                        |
| 6                             | At the Math Day event, students break up into groups of 3 to see the seminars and demonstrations. If there are 27 students, how many groups are there?                                                              |
| 7                             | What is the product of 9 and 12?                                                                                                                                                                                    |
| 8                             | The ratio of boys to girls in a class is 4:5. If there are 12 boys, how many girls are in the class?                                                                                                                |
| 9                             | Evaluate: $2 \times 6 \div 4 + 9 - 3$ ?                                                                                                                                                                             |
| 10                            | Find the arithmetic average of the following collection of numbers:<br>1, 2, 4, 2, and 1                                                                                                                            |
| 11                            | What is the greatest common factor of 36 and 60?                                                                                                                                                                    |
| 12                            | Five Rhinos were drawn in a computer aided drafting program. What is the total of the number of ears, noses, mouths, and feet contained in the image?                                                               |
| 13                            | Dan scored 78% on his Spanish test and Jun scored 92% on the same test. What is the average of the two students' scores?                                                                                            |
| 14                            | Mark practices his guitar for 25 minutes a day, while Joey practices his guitar for 37 minutes a day. In one week, how many more minutes does Joey practice his guitar than Mark?                                   |
| 15                            | The band One Direction is playing a concert in the town where Katie lives. She has to buy tickets for herself and three of her friends, and each ticket costs \$54. How much does she need to spend on the tickets? |
| 16                            | Taylor goes to a movie that starts at 1:00 PM. The movie runs for 127 minutes. At what time will the movie be done?                                                                                                 |
| 17                            | A uPhone is shaped like a small rectangular box and has dimensions of 10 inches long by 6 inches wide by 1 inch tall. What volume, in cubic inches, does a uPhone occupy?                                           |

|    |                                                                                                                                                                                                                                                                                                                                       |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18 | There are a total of 718 Pokemon. If Ash catches 3 new Pokemon every day, how many whole days will it take him to catch them all?                                                                                                                                                                                                     |
| 19 | A triangle has one side with length 3 inches and another with length 4 inches. The length of the third side is twice as long as the smallest side. What is the perimeter of the triangle?                                                                                                                                             |
| 20 | A Mii game system costs 2 times more than a Z-Box. A Z-Box costs 3 times more than a PloyStation. If a Ploystation costs \$43, how much does it cost to buy a Mii game system?                                                                                                                                                        |
| 21 | What is the measure, in degrees, of an angle that is complementary to a $37^\circ$ angle?                                                                                                                                                                                                                                             |
| 22 | When Samantha rolls a standard die, what is the probability that the top face shows a value less than 4? State your answer as a common fraction.                                                                                                                                                                                      |
| 23 | Four snakes are equal in value to 1 goose, and 5 geese are equal in value to 1 badger. How many badgers are equal in value to 40 snakes?                                                                                                                                                                                              |
| 24 | What is the area of a square, inside of which is inscribed a circle of radius 4 cm?                                                                                                                                                                                                                                                   |
|    |                                                                                                                                                                                                                                                    |
| 25 | Ana is climbing the North Mountain to find Elsa, but she stops at Oaken's Trading Post and Sauna for a cloak. The cloak costs \$50 but is 20% off during the "Big Summer Blowout." How much does the cloak cost now that it is on sale?                                                                                               |
| 26 | Sylvia is getting ready for zero hour at school, dressing in the dark while still half asleep. In her dresser drawer is an unsorted pile of socks that includes two pairs each of red, orange, yellow, green, blue, and violet colored socks. How many socks must she pull out of the drawer to be sure that she has a matching pair? |
| 27 | The ratio of two side lengths in right triangle ABC is $AC:AB = 3:5$ . How long is the shortest possible whole number length of side BC?                                                                                                                                                                                              |
|    |                                                                                                                                                                                                                                                  |
| 28 | If you pick 5 apples a day and you eat 3 apples every fourth day, how many apples will you have after 2 weeks?                                                                                                                                                                                                                        |
| 29 | How many cubes are in the stack shown in the figure? (Every cube is supported and there are no internal "holes.")                                                                                                                                                                                                                     |
|    |                                                                                                                                                                                                                                                  |
| 30 | Today is Global Youth Service Day. Out of Mrs. Madison's class of 28 students, 13 students volunteered to help clean up the park, 16 students helped with the food drive, and 3 students couldn't make it to either event. How many students participated in both volunteer activities?                                               |

Continued on the Next Page

## Challenge Questions: 3 points each

|    |                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 31 | Ansh has 8 shirts, 4 pair of pants, and 4 pairs of shoes. For how many days in a row can Ansh wear a different outfit, if an outfit consists of one shirt, one pair of pants, and one pair of shoes?                                                                                                                                                                                                                    |
| 32 | On every even-numbered day, a frog eats 10 bugs. The frog eats 5 bugs on every odd-numbered day. How many bugs does the frog eat in the month of June?                                                                                                                                                                                                                                                                  |
| 33 | James is 23 years older than Will. In 9 years James will be twice as old as Will. How many years old is Will now?                                                                                                                                                                                                                                                                                                       |
| 34 | Lukas writes down negative four, then adds one mentally and writes that sum. If he keeps to this pattern, how many numbers will he have written when he finishes writing the number 6?                                                                                                                                                                                                                                  |
| 35 | A father and son decided to run a mile together. The father's runs twice as fast as the son, so once the father finishes running a mile, he turns around and runs back towards the son. Upon reaching his son, the father turns around and runs back to the finish again. The father repeats running back and forth between the finish and his son until the son reaches the finish. How many miles did the father run? |
| 36 | When Phil sorts all of his gold coins into piles of 2, he has one left over. He has the same situation when he sorts all of his gold coins into piles of 3, 4, 5, 6, or 7. If Phil can make at least one pile of each type, what is the least number of coins that Phil could have?                                                                                                                                     |
| 37 | An "Odd Day" is celebrated whenever the two-digit representation of a date in month/day/year format consists of three consecutive, odd numbers in increasing order. For example, 03/05/07 was an Odd Day. How many Odd Days occur in the 21st century?                                                                                                                                                                  |
| 38 | Biff says, "Eho if you were to give me \$2, then we would both have the same amount." Eho responds, "Well, Biff, if you were to give me \$2, then I would have three times as much as you have remaining." How many dollars does Eho have now (before any money trades hands)?                                                                                                                                          |
| 39 | How many rectangles of any size are in the figure?<br>                                                                                                                                                                                                                                                                             |
| 40 | Bob has a bucket containing the letters in the word "PROBABILITY" on separate, identical tiles. What is the probability that, in three draws of one letter at a time, he randomly (without looking) pulls out the three letters that form his name? State your answer as a common fraction.                                                                                                                             |



# “Math is Cool” Championships – 2014-15

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4th Grade – April 17, 2015

Team Multiple Choice Contest

**USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #1 THROUGH #4.**

In a popular video game, specific materials have different values and take differing amounts of time to acquire by “mining” the terrain for the material, as shown in the table below.

| Material | Time required to mine one unit of the material with a standard pickaxe | Value per unit of material |
|----------|------------------------------------------------------------------------|----------------------------|
| Iron     | 4 minutes                                                              | 6                          |
| Wood     | 2 minutes                                                              | 3                          |
| Gravel   | 30 seconds                                                             | 2                          |
| Obsidian | 15 minutes                                                             | 8                          |
| Diamond  | 8 minutes                                                              | 12                         |

|          |                                                                                                                                                                                                                                                                                                             |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | It takes 2 wood units and 3 iron units to make an iron pickaxe. How many minutes will it take Steve the Spelunker to mine all of the materials required to make an iron pickaxe?<br>A) 129      B) 20      C) 18      D) 16      E) Answer Not Given                                                        |
| <b>2</b> | With an iron pickaxe Steve can mine materials twice as fast as with a standard pickaxe. How many minutes longer would it take for Steve to mine 12 obsidian and 10 diamond units using a standard pickaxe versus with an iron pickaxe?<br>A) 260      B) 130      C) 90      D) 65      E) Answer Not Given |
| <b>3</b> | Which material has the highest ratio of value to the time required to mine with a standard pickaxe, and is thus the most cost effective material to mine?<br>A) Gravel      B) Iron      C) Obsidian      D) Diamond      E) Answer Not Given                                                               |
| <b>4</b> | In a mine-off contest Steve has exactly 7 minutes to gather as many units of at least two different types of materials as he can. What is the greatest number of units that Steve can mine with his standard pickaxe in the contest?<br>A) 14      B) 13      C) 11      D) 7      E) Answer Not Given      |

**USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #5 THROUGH #6.**

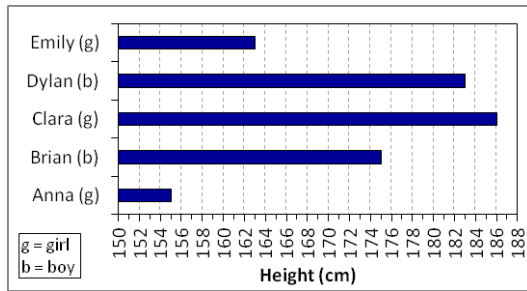
The ten students in Mr. Tonkyn’s math club helped at the food bank by handing out cans of clam chowder, which come six to a case.

|          |                                                                                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>5</b> | The students started their volunteer work at 9:00 AM and finished at 12:00 PM. In that time, how many degrees did the hour hand of the analog wall clock move?<br>A) 30      B) 60      C) 90      D) 120      E) Answer Not Given |
| <b>6</b> | The ten students handed out exactly 14 cases of clam chowder to 21 families. What was the average number of cans of clam chowder given to each family?<br>A) 1.5      B) 2      C) 3      D) 4      E) Answer Not Given            |

Continued on Back Side

**USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #7 THROUGH #10.**

Three girls and two boys are in the same club at Ecole Middle School. The chart below plots data for the heights of each student, in centimeters (cm).



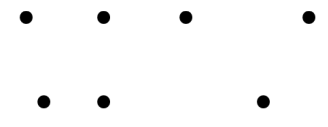
|           |                                                                                                                                                                                                                |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>7</b>  | <p>What is the range of the heights of the five students?</p> <p>A) 20      B) 23      C) 28      D) 32      E) Answer Not Given</p>                                                                           |
| <b>8</b>  | <p>Anna had a growth spurt and her height increased by 5%. How tall, to the nearest centimeter, is Anna after her growth spurt?</p> <p>A) 163      B) 162      C) 161      D) 160      E) Answer Not Given</p> |
| <b>9</b>  | <p>Two of the five students are chosen to be the co-presidents. What is the probability that both co-presidents are girls?</p> <p>A) 1/4      B) 2/10      C) 3/5      D) 3/10      E) Answer Not Given</p>    |
| <b>10</b> | <p>When Fritz joins the club, the average height of the six students becomes 174 cm. How many centimeters tall is Fritz?</p> <p>A) 185      B) 182      C) 177      D) 172      E) Answer Not Given</p>        |

# “Math is Cool” Championships – 2014-15

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4th Grade – April 17, 2015

Team Contest

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Tonight, Tyler is going to theatre to see a play that starts at 8:30 PM. It is now 6:44 PM. How many minutes is it until the play starts?                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2  | Sarah takes 1 hour and 30 minutes to make each friendship bracelet. If she spends a total of 18 hours making friendship bracelets, how many bracelets did she make for her friends?                                                                                                                                                                                                                                                                                                                                                              |
| 3  | Nick picks a counting number less than 20, and Nora tries to guess it. Nick gives Nora the hint that that 2 is a factor of his number. How many numbers are possible for Nick's number?                                                                                                                                                                                                                                                                                                                                                          |
| 4  | Charles is hosting a party, and baked 84 cookies to serve at the party. If a total of six guests arrived, and everyone shared the cookies equally, how many cookies did each person eat?                                                                                                                                                                                                                                                                                                                                                         |
| 5  | <p>Arrange the quantities A, B, C, and D in order of decreasing value. Your answer should consist of 4 letters in the proper order.</p> <p style="text-align: center;"><math>A = 9 \times 7</math>    <math>B = 98 - 32</math>    <math>C = 621 \div 9</math>    <math>D = 23 + 45</math></p>                                                                                                                                                                                                                                                    |
| 6  | Felicia spent half her money at the store. Then she went to a newspaper stand and spent one-fourth of her remaining money. If she has 6 dollars left, how many dollars did Felicia start with?                                                                                                                                                                                                                                                                                                                                                   |
| 7  | August 11 was the first day of school for Karen. How many days does she have to wait from the start of school until Christmas (December 25)?                                                                                                                                                                                                                                                                                                                                                                                                     |
| 8  | When six friends sit at a round table, Henry is immediately to Jackie's left, Katrina is immediately to Leo's left, Mary is immediately to Nate's right, and Henry and Mary sit next to each other. Which two friends sit next to Katrina?                                                                                                                                                                                                                                                                                                       |
| 9  | When showing Bryan a wrestling move, Connar dropped his calculator on a hard floor. Now, any digit entered comes up in the calculator as a complement of 9. That is, a 0 becomes a 9, a 1 becomes an 8, a 2 becomes a 7, and so on, with a 9 becoming a 0. Once entered, the calculator does the calculation normally on the numbers showing and displays the result correctly. If Connar pushes the buttons for 425 and another number to add them together, the calculator shows a sum of 789. What was the second number that Connar entered? |
| 10 | <p>If a line is drawn from each dot in the top row to each dot in the bottom row (see figure), what is the maximum number of line intersections at locations between these two rows?</p> <div style="text-align: right; margin-right: 50px;">  </div>                                                                                                                                                                                                       |

# “Math is Cool” Championships – 2014-15

Sponsored by:

4th Grade – April 17, 2015

## Relay Contest

**RELAYS** - 5 minutes per relay – 15% of team score

*There is no talking during this event and you must always be facing forward. Person #1 will be given an answer sheet(s) and will need to fill out the top. The proctor will hand out a strip of paper to each person. These need to be face down on your desk until it is time for the relay to start. Once the relay begins, everyone may turn over their strip of paper and begin working. You may write on the strip of paper to come up with your answer. However, when person #1 figures out his/her problem, he/she will record **just his/her final answer** on the answer sheet and pass only the answer sheet back to the person behind. This continues until person #4 puts an answer on the answer sheet and gives it to the proctor. A correct answer from person #1, #2 and #3 is worth 1 point each. A correct answer from person #4 is worth 2 points making each relay worth 5 points. You will see the expression **TNYWG** [Proctor: write this on the board] which means: “the number you will get”. This is where you put your teammate’s answer that they pass back to you, and then you should be able to solve your question. Once the relay begins, turn over your strip of paper and **make sure you have the right person number**. Remember, no talking and remain facing forward to avoid being disqualified!*

|          | <b>Practice Relay</b>                                                                                                                                                       | Answer           |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| Person 1 | What is $2 + 5$ ?                                                                                                                                                           | 7                |
| Person 2 | Given that TNYWG is the first multiple, what is the fourth multiple of TNYWG?                                                                                               | 28               |
| Person 3 | What is the remainder when TNYWG is divided by 5?                                                                                                                           | 3                |
| Person 4 | What is TNYWG times 9?                                                                                                                                                      | 27               |
|          | <b>Relay #1</b>                                                                                                                                                             | <b>Answer</b>    |
| Person 1 | What is the name for a polygon with 8 sides?                                                                                                                                | octagon          |
| Person 2 | What is the perimeter, in meters, of a TNYWG with sides each measuring 5 meters?                                                                                            | 40<br>[meters]   |
| Person 3 | Mrs. Jenkin had TNYWG balloons in her minivan, but 15% of them escaped when she opened the door. How many balloons does she have left?                                      | 34<br>[balloons] |
| Person 4 | July 4 <sup>th</sup> falls on a Saturday this year. What day of the week is it TNYWG days after July 4 <sup>th</sup> ?                                                      | Friday           |
|          | <b>Relay #2</b>                                                                                                                                                             | <b>Answer</b>    |
| Person 1 | What is the smallest prime factor of 77?                                                                                                                                    | 7                |
| Person 2 | A famous sequence starts with 1, 1, 2, 3, ... and subsequent values are equal to the sum of the two previous values. What is the TNYWG <sup>th</sup> term of this sequence? | 13               |
| Person 3 | What is TNYWG squared?                                                                                                                                                      | 169              |
| Person 4 | The sum of two numbers is TNYWG and their difference is 119. What is the smaller of the two numbers?                                                                        | 25               |

# “Math is Cool” Championships – 2014-15

Sponsored by:  
4th Grade – April 17, 2015

## COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

| #  | Problem                                                                                                                                            | Answer                           |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 1  | What is three squared times three squared?                                                                                                         | 81                               |
| 2  | What is the smallest prime number whose sum of digits is a square number?                                                                          | 13                               |
| 3  | How many meters are in a kilometer?                                                                                                                | 1000 [meters]                    |
| 4  | Omar is walking north when he suddenly stops and spins 270 degrees counterclockwise. What direction is Omar now facing?                            | East                             |
| 5  | The day before Joshua's birthday was Wednesday. What day will it be 19 days after Joshua's birthday?                                               | Tuesday                          |
| 6  | Eho is playing a word game with names. How many ways can he arrange the letters in the name Biff, spelled B-I-F-F?                                 | 12                               |
| 7  | Vincent can answer 6 science bowl questions for every one-hour practice session. How many questions can Vincent answer in three practice sessions? | 18 [questions]                   |
| 8  | What is the positive difference between ninety-six and fifty-nine?                                                                                 | 37                               |
| 9  | Kevin's minivan requires 5 gallons of gasoline to travel 120 miles. How many gallons of gasoline does he need to travel 360 miles?                 | 15 [gallons]                     |
| 10 | As a fraction, what is the probability of drawing a red queen from a standard 52-card deck?                                                        | $\frac{2}{52}$ or $\frac{1}{26}$ |

# “Math is Cool” Championships – 2014-15

Sponsored by:  
4th Grade – April 17, 2015

## COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

| #  | Problem                                                                                                                                              | Answer                          |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| 1  | What is the smallest whole number that I can subtract from 2015 to get an answer that is a multiple of four?                                         | 3                               |
| 2  | How many prime numbers between twenty and fifty have a seven as one of their digits?                                                                 | 2                               |
| 3  | How many dots are there on a standard cubical die?                                                                                                   | 21 [dots]                       |
| 4  | Only 30 students can be seated on a bus. If a school wants to send one-hundred twelve students to a math contest, how many buses do they need?       | 4 [buses]                       |
| 5  | In square inches, what is the area of a rectangle with side lengths of 5 and 21 inches?                                                              | 105 [sq in]                     |
| 6  | State your answer as a common fraction. If you flip a coin twice, what is the probability that you will not get heads either time?                   | one-fourth<br>(1/4)             |
| 7  | If Nick can make 3 quesadillas in a minute, how many quesadillas can Nick make in 13 minutes?                                                        | 39<br>[quesadillas]             |
| 8  | What is three-hundred forty-three minus three-hundred ninety-seven?                                                                                  | negative<br>fifty-four<br>(-54) |
| 9  | The sum of five different counting numbers is forty-two. What is the largest possible value of any of those five numbers?                            | 32                              |
| 10 | The normal water level at a small irrigation dam is 100 inches high. What would the water level be if it decreased by 20% due to drought conditions? | 80<br>[inches high]             |

# “Math is Cool” Championships – 2014-15

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## COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

| #  | Problem                                                                                                                                                  | Answer                    |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 1  | What is the quotient when two-hundred seventeen is divided by seven?                                                                                     | 31                        |
| 2  | The sum of three consecutive numbers is 150. What is the largest of the three numbers?                                                                   | 51                        |
| 3  | Miguel ran five miles at a rate of two miles per hour. How many <u>minutes</u> did he run?                                                               | 150 [minutes]             |
| 4  | After running, Miguel drank a quart and a half of milk. How many cups of milk did Miguel drink?                                                          | 6 [cups]                  |
| 5  | Subtract the fourth prime number from 25. What is the result?                                                                                            | 18                        |
| 6  | How many diagonals can be drawn in a pentagon?                                                                                                           | 5 [diagonals]             |
| 7  | On an ordinary 12-hour analog wall clock, how many times does the minute hand pass the number 3 in a day?                                                | 24 [times]                |
| 8  | What number is half way between eighty-seven and one-hundred twenty-one?                                                                                 | one-hundred four<br>(104) |
| 9  | A rectangle whose side lengths are counting numbers has a perimeter of 60 inches. What is the smallest possible area of the rectangle, in square inches? | 29 [sq. in.]              |
| 10 | What is the sum of the perfect cubes that are less than 50?                                                                                              | 36                        |

# “Math is Cool” Championships – 2014-15

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## COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

| #  | Problem                                                                                                                                            | Answer                                                              |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1  | John gives 4 apples to Steve. They both now have 20 apples. How many apples did Steve originally have?                                             | 16 [apples]                                                         |
| 2  | How many even counting numbers are there between 1 and 32, not including 1 or 32?                                                                  | 15 [numbers]                                                        |
| 3  | How many hours will it take me to bike one-hundred five miles at fifteen miles per hour?                                                           | 7 [hours]                                                           |
| 4  | Farmer Brown has 8 cows. After buying some more cows from a neighbor, he has 12 cows. What is the percent increase in the number of cows?          | 50 [percent]                                                        |
| 5  | The sum of two numbers is 46 and their difference is 18. What is the average of the two numbers?                                                   | 23                                                                  |
| 6  | Dale the car dealer bought 2 cars yesterday, and 8 the day before yesterday. How many cars will he have if he sells 3 cars today, and 4 tomorrow?  | 3 [cars]                                                            |
| 7  | If the degree measure of each angle of an acute triangle is a counting number, what is the smallest possible interior angle found in the triangle? | 2 [degrees]                                                         |
| 8  | If Viknesh owns forty-five pairs of shoes and each pair cost fifty-five dollars, what is the combined value of all of his shoes?                   | two-thousand<br>four-hundred<br>seventy-five<br>(2475)<br>[dollars] |
| 9  | How many feet are in 26 yards?                                                                                                                     | 78 [feet]                                                           |
| 10 | I am a two-digit counting number that is not divisible by 2, 3, or 4. But, I am divisible by 7 and I am less than 45. What number am I?            | 35                                                                  |



# “Math is Cool” Championships – 2014-15

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## COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

| #  | Problem                                                                                                                               | Answer       |
|----|---------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1  | Evaluate: two times three, plus five times three, plus three times three.                                                             | 30           |
| 2  | What is the median of the data set {1, 5, 2, 9, 4}?                                                                                   | 4            |
| 3  | Joan buys 13 dozen eggs, and then realizes that one-fourth of them are rotten. How many of the eggs are rotten?                       | 39 [eggs]    |
| 4  | What number goes in the blank in the following sequence? One, four, nine, BLANK, twenty-five.                                         | 16           |
| 5  | What is the degree measure of the smaller angle between the hour and minute hands on an ordinary 12-hour analog wall clock at one PM? | 30 [degrees] |
| 6  | What is the product of the second prime number and the third composite number?                                                        | 24           |
| 7  | How many logs has a woodchuck chucked after 7 minutes, if a woodchuck can chuck 2 logs per minute?                                    | 14 [logs]    |
| 8  | To the nearest whole number, convert nine-thirtieths (that is, nine over 30) to a percentage.                                         | 30 [percent] |
| 9  | What is the surface area, in square centimeters, of a cube with edges measuring 3 centimeters?                                        | 54 [sq. cm]  |
| 10 | How many distinct sums are possible when two standard, six-sided dice are thrown and the numbers on the top faces are added together? | 11 [sums]    |

# “Math is Cool” Championships – 2014-15

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## COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

| #  | Problem                                                                                                                                                                         | Answer                 |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 1  | What is the remainder when one-hundred five is divided by forty-nine?                                                                                                           | 7                      |
| 2  | What number is thirty percent of one-hundred fifty?                                                                                                                             | 45                     |
| 3  | What is the units digit when six to the power of 7 is evaluated?                                                                                                                | 6                      |
| 4  | What number is half of the sum of 23 and 53?                                                                                                                                    | 38                     |
| 5  | How many prime numbers are smaller than 30?                                                                                                                                     | 10 [prime numbers]     |
| 6  | How many ways can you make ten cents using any combination of pennies, nickels, and dimes?                                                                                      | 4 [ways]               |
| 7  | Minju can type out 3 pages of Spanish homework every hour. Andrew can type 2 pages of Spanish homework every hour. Working together, how many pages can they type in two hours? | 10 [pages]             |
| 8  | At what time after 11 AM will the minute and hour hands of an analog clock first be together?                                                                                   | 12:00 PM<br>or 12 PM   |
| 9  | How many counting numbers are factors of 40?                                                                                                                                    | 8 [numbers]            |
| 10 | Two red, two clear, and three yellow balls are in a bag. As a common fraction, what is the probability of pulling out a colorful ball?                                          | five-sevenths<br>(5/7) |

# "Math is Cool" Championships – 2014-15

Sponsored by:  
4th Grade – April 17, 2015

## COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

| # | Problem                                                                                                                                     | Answer            |
|---|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 1 | Chloe is counting backwards by fives. The first number she says is ninety-three. What is the fifth number that Chloe says?                  | 73                |
| 2 | What is the maximum number of points of intersection between a circle and a triangle?                                                       | 6 [intersections] |
| 3 | In the product of seven and thirteen, what is the tens digit?                                                                               | 9                 |
| 4 | Biff can jump four feet, 7 inches and Eho can jump three feet, three inches. How many INCHES further can Biff jump than Eho?                | 16 [inches]       |
| 5 | If fence posts are spaced every eight feet, how many fence post holes will Tex the cowhand have to dig for a 48 foot long stretch of fence? | 7 [holes]         |
| 6 | What is the greatest possible remainder when George's favorite number is divided by 22?                                                     | 21                |

Extra

Final Score:

**KEY**

(Out of 8)

# "Math is Cool" Championships -- 2014-15

School Name \_\_\_\_\_ Team # \_\_\_\_\_

Proctor Name \_\_\_\_\_ Room # \_\_\_\_\_

4th Grade

## Mental Math – 30 sec per question

**8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score**

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

|          | <b>Answer</b> | <b>1 or 0</b> | <b>1 or 0</b> |
|----------|---------------|---------------|---------------|
| <b>1</b> | 6             |               |               |
| <b>2</b> | 61            |               |               |
| <b>3</b> | 90 [degrees]  |               |               |
| <b>4</b> | 44 [legs]     |               |               |
| <b>5</b> | 8             |               |               |
| <b>6</b> | 18            |               |               |
| <b>7</b> | 2/6 or 1/3    |               |               |
| <b>8</b> | 169           |               |               |
|          |               |               |               |

**“Math is Cool” Championships – 2014-15**  
 4th Grade – April 17, 2015

School Name \_\_\_\_\_ Team # \_\_\_\_\_

Proctor Name \_\_\_\_\_ Room # \_\_\_\_\_

Final Score:

**KEY**

First Score

(out of 20)

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

**Correct responses are worth 2 points, incorrect responses are worth -1 point and no response is 0 points.**

**DO NOT WRITE IN SHADED REGIONS**

|    | Answer      | -1, 0 or 2 | -1, 0 or 2 |
|----|-------------|------------|------------|
| 1  | D           |            |            |
| 2  | B           |            |            |
| 3  | A           |            |            |
| 4  | C           |            |            |
| 5  | C           |            |            |
| 6  | D           |            |            |
| 7  | E (31 [cm]) |            |            |
| 8  | A           |            |            |
| 9  | D           |            |            |
| 10 | B           |            |            |
|    |             |            |            |

# “Math is Cool” Championships – 2014-15

4th Grade – April 17, 2015

Final Score:

KEY

First Score

(out of 10)

School Name \_\_\_\_\_ Team # \_\_\_\_\_

Proctor Name \_\_\_\_\_ Room # \_\_\_\_\_

## Team Contest – Score Sheet – 15 minutes – 30% of team score

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

**DO NOT WRITE IN SHADED REGIONS**

|    | Answer                     | 1 or 0 | 1 or 0 |
|----|----------------------------|--------|--------|
| 1  | 106 [minutes]              |        |        |
| 2  | 12 [bracelets]             |        |        |
| 3  | 9 [numbers]                |        |        |
| 4  | 12 [cookies]               |        |        |
| 5  | CDBA                       |        |        |
| 6  | [\$] 16                    |        |        |
| 7  | 136 [days]                 |        |        |
| 8  | Jackie, Leo (either order) |        |        |
| 9  | 784                        |        |        |
| 10 | 18 [intersections]         |        |        |
|    |                            |        |        |

# “Math is Cool” Championships -- 2014-15

4th Grade – April 17, 2015

**KEY**

## PRACTICE RELAY

| Answer for person<br># 1 | Answer for person<br># 2 | Answer for person<br># 3 | Answer for person<br># 4 |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7</b>                 | <b>28</b>                | <b>3</b>                 | <b>27</b>                |
| 1 or 0                   | 1 or 0                   | 1 or 0                   | 2 or 0                   |

## RELAY # 1

| Answer for person<br># 1 | Answer for person<br># 2 | Answer for person<br># 3 | Answer for person<br># 4 |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>octogon</b>           | <b>40 [m]</b>            | <b>34<br/>[balloons]</b> | <b>Friday</b>            |
| 1 or 0                   | 1 or 0                   | 1 or 0                   | 2 or 0                   |

## RELAY # 2

| Answer for person<br># 1 | Answer for person<br># 2 | Answer for person<br># 3 | Answer for person<br># 4 |
|--------------------------|--------------------------|--------------------------|--------------------------|
| <b>7</b>                 | <b>13</b>                | <b>169</b>               | <b>25</b>                |
| 1 or 0                   | 1 or 0                   | 1 or 0                   | 2 or 0                   |

Final Score:

(Out of 8)

# "Math is Cool" Championships -- 2014-15

Student Name \_\_\_\_\_

Team # \_\_\_\_\_

School Name \_\_\_\_\_ Proctor Name \_\_\_\_\_ Room # \_\_\_\_\_

4th Grade

## Mental Math – 30 sec per question

**8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score**

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

|          | <b>Answer</b> | <b>1 or 0</b> | <b>1 or 0</b> |
|----------|---------------|---------------|---------------|
| <b>1</b> |               |               |               |
| <b>2</b> |               |               |               |
| <b>3</b> |               |               |               |
| <b>4</b> |               |               |               |
| <b>5</b> |               |               |               |
| <b>6</b> |               |               |               |
| <b>7</b> |               |               |               |
| <b>8</b> |               |               |               |
|          |               |               |               |



# “Math is Cool” Championships – 2014-15

4th Grade – April 17, 2015

Final Score:

First Score

(out of 20)

School Name \_\_\_\_\_ Team # \_\_\_\_\_

Proctor Name \_\_\_\_\_ Room # \_\_\_\_\_

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

**Correct responses are worth 2 points, incorrect responses are worth -1 point and no response is 0 points.**

### DO NOT WRITE IN SHADED REGIONS

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

# "Math is Cool" Championships – 2014-15

4th Grade – April 17, 2015

Final Score:

First Score

(out of 10)

School Name \_\_\_\_\_ Team # \_\_\_\_\_

Proctor Name \_\_\_\_\_ Room # \_\_\_\_\_

## Team Contest – Score Sheet – 15 minutes – 30% of team score

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

### DO NOT WRITE IN SHADED REGIONS

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