Greater Cleveland Council of Teachers of Mathematics
5th and 6th Grade Problem Solving Tournament - 2018

5th Grade Problem Solving, Round 1

1.	Dan and Olson are brothers. Olson is 3 years older than Dan, and they are both less than 100 years old. If Dan's age is a multiple of 10 and Olson's age is a multiple of 7 this year, how old is Olson this year?	
2.	Our class brought in cookies for Teacher Appreciation Day. My teacher said she was really hungry and ate ¼ of the cookies. Our principal ate ⅔ of what was left. At the end of the day, our class was told only 2 cookies were left. How many cookies did we bring in for Teacher Appreciation Day?	
3.	One floor of an office building is 14 feet. The 102nd floor of an office building is 1,428 feet above the ground. How many yards above the ground is the 105th floor?	
4.	Jamie is making chocolate chip pancakes. The recipe calls for 2 ¾ cup flour, 1 ⅝ cup pancake mix, and ½ cup chocolate chips. She decides to double the recipe to make two batches at once. How much more flour is needed than pancake mix? Write in simplest form.	

Team Number _____ **Score _____ / 40**

5th Grade Problem Solving, Round 1 Answers

1.	Dan and Olson are brothers. Olson is 3 years older than Dan, and they are both more than 10 years old and less than 100 years old. If Dan's age is a multiple of 10 and Olson's age is a multiple of 7 this year, how old is Olson this year?	**63 years old**
2.	Our class brought in cookies for Teacher Appreciation Day. My teacher said she was really hungry and ate ¼ of the cookies. Our principal ate ⅔ of what was left. At the end of the day, our class was told only 2 cookies were left. How many cookies did we bring in for Teacher Appreciation Day?	**8 cookies**
3.	One floor of an office building is 14 feet. The 102nd floor of an office building is 1,428 feet above the ground. How many yards above the ground is the 105th floor?	**490 yards**
4.	Jamie is making chocolate chip pancakes. The recipe calls for 2 ¾ cup flour, 1 ⅝ cup pancake mix, and ½ cup chocolate chips. She decides to double the recipe to make two batches at once. How much more flour is needed than milk? Write in simplest form.	**1 ⅝ more cups of flour**

Team Number _____ **Score _____ / 40**

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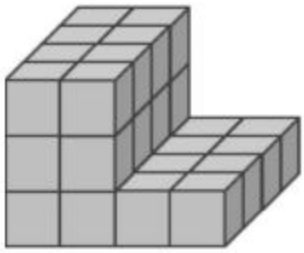
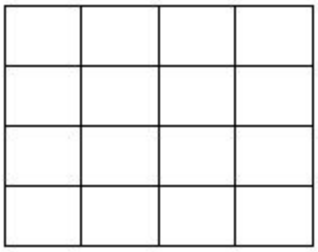
5th Grade Problem Solving, Round 2

1.	Bobby is helping buy meats, for grilling, for the school picnic. He bought 10 pounds of sausage at $1.69 per pound, 100 pounds of hamburgers at $1.99 pound, 1,000 pounds of hot dogs at $2.09 per pound, and 100 pounds of chicken at $3.69 per pound. Which of the items he bought cost the most?	
2.	The principal is buying iPads for the classroom. She can buy 15 iPads for $3180 at Best Buy. She can buy 7 iPads for $1505 at the Apple Store. Which store has the better buy?	
3.	What is the volume of this solid, if each cube measures 2cm x 2cm x 2cm? 	
4.	How many squares can you count in the figure below? 	

Team Number _____ **Score _____ / 40**

Greater Cleveland Council of Teachers of Mathematics
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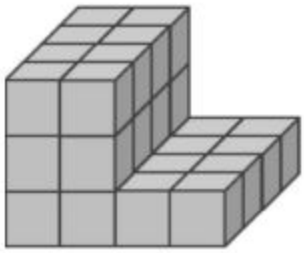
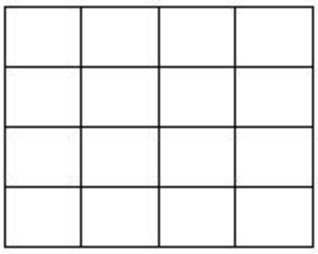
5th Grade Problem Solving, Round 2 Answers

1.	Bobby is helping buy meats, for grilling, for the school picnic. He bought 10 pounds of sausage at $1.69 per pound, 100 pounds of hamburgers at $1.99 pound, 1,000 pounds of hot dogs at $2.09 per pound, and 100 pounds of chicken at $3.69 per pound. Which of the items he bought cost the most?	**Hot dogs**
2.	The principal is buying iPads for the classroom. She can buy 15 iPads for $3180 at Best Buy. She can buy 7 iPads for $1505 at the Apple Store. Which store has the better buy?	**Best Buy**
3.	What is the volume of this solid, if each cube measures 2cm x 2cm x 2cm? 	**256 cm cubed**
4.	How many squares can you count in the figure below? 	**30 squares**

Team Number _____ **Score _____ / 40**

Greater Cleveland Council of Teachers of Mathematics
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6th Grade Problem Solving, Round 1

1.	Five spoons and 2 glasses weigh as much as 3 plates. One plate weighs as much as 1 spoon and 1 glass. How many spoons weigh as much as 1 glass?	
2.	Mr. Allen and Mr. Baxter are both exercising. They are both walking east on Main Street, but did not start at the same time. Mr. Allen walks one block in one minute and Mr. Baxter walks 3 blocks in 2 minutes. At 1:30, Mr. Allen is 4 blocks ahead of Mr. Baxter. At what time will Mr. Baxter catch up to Mr. Allen?	
3.	Bottle A is empty, but can hold 12 pints of water. Bottle B is half full of water. When the contents of Bottle B are poured into the empty Bottle A, Bottle A then becomes 3/4 full of water. How many pints of water does Bottle B hold when full?	
4.	Ed received a big bonus at year end. He gave ½ of it to his wife. He gave ⅓ of what was left to his son. He gave the remaining $240 to the cancer society. How much bonus did Ed receive?	

Team Number _____ **Score _____ / 40**

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6th Grade Problem Solving, Round 1 Answers

1.	Five spoons and 2 glasses weigh as much as 3 plates. One plate weighs as much as 1 spoon and 1 glass. How many spoons weigh as much as 1 glass?	**2 spoons**
2.	Mr. Allen and Mr. Baxter are both exercising. They are both walking east on Main Street, but did not start at the same time. Mr. Allen walks one block in one minute and Mr. Baxter walks 3 blocks in 2 minutes. At 1:30, Mr. Allen is 4 blocks ahead of Mr. Baxter. Wt what time will Mr. Baxter catch up to Mr. Allen?	**1:38**
3.	Bottle A is empty, but can hold 12 pints of water. Bottle B is half full of water. When the contents of Bottle B are poured into the empty Bottle A, Bottle A then becomes 3/4 full of water. How many pints of water does Bottle B hold when full?	**18 pints**
4.	Ed received a big bonus at year end. He gave ½ of it to his wife. He gave ⅓ of what was left to his son. He gave the remaining $240 to the cancer society. How much bonus did Ed receive?	**$720**

Team Number _____ **Score _____ / 40**

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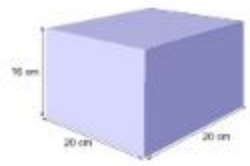
6th Grade Problem Solving, Round 2

1.	Annie has a bag of marbles. Whether she breaks the marbles into groups of 2, groups of 3, or groups of 5, she always ends up with one marble left over. What is the least number of marbles Annie can have?	
2.	Ross bought some square tiles with side length of 1 foot. He used 91 of them to tile his rectangular bathroom floor. He didn't have to cut any tiles, the tiles fit perfectly. Assuming all sides of the floor are greater than 1 foot, what is the perimeter of Ross' bathroom floor?	
3.	There are three jerseys with numbers 1, 2, and 3. John, Tom, and Jerry are each wearing one of the jerseys. They are standing in a row. John is somewhere to the left of Tom. The person who is wearing the number 2 jersey is somewhere to the left of the person who is wearing the number 1 jersey. Jerry is somewhere to the right of the perso who is wearing the number 3 jersey. The person who is wearing the number 1 jersey is somewhere to the right of Jerry. Which number is John wearing?	
4.	 Kristen has a fish tank that is a rectangular prism,measuring 20 cm x 20cm x 16 cm. If she fills it 3/4 full of water, what is the volume of the water in the tank?	

Team Number _____ **Score _____ / 40**

Greater Cleveland Council of Teachers of Mathematics
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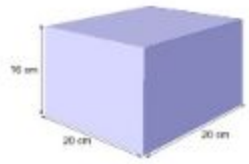
6th Grade Problem Solving, Round 2 Answers

1.	Annie has a bag of marbles. Whether she breaks the marbles into groups of 2, groups of 3, or groups of 5, she always ends up with one marble left over. What is the least number of marbles Annie can have?	**31 marbles**
2.	Ross bought some square tiles with side length of 1 foot. He used 91 of them to tile his rectangular bathroom floor. He didn't have to cut any tiles, the tiles fit perfectly. Assuming all sides of the floor are greater than 1 foot, what is the perimeter of Ross' bathroom floor?	**40 feet**
3.	There are three jerseys with numbers 1, 2, and 3. John, Tom, and Jerry are each wearing one of the jerseys. They are standing in a row. John is somewhere to the left of Tom. The person who is wearing the number 2 jersey is somewhere to the left of the person who is wearing the number 1 jersey. Jerry is somewhere to the right of the person who is wearing the number 3 jersey. The person who is wearing the number 1 jersey is somewhere to the right of Jerry. Which number is John wearing?	**John is wearing #3 jersey**
4.	 Kristen has a fish tank that is a rectangular prism, measuring 20 cm x 20cm x 16 cm. If she fills it 3/4 full of water, what is the volume of the water in the tank?	**4800 cm cubed**

Team Number _____ **Score _____ / 40**

2018 GCCTM 5th / 6th Grade Team Construction Activity

60 points possible

1. Orient the paper horizontally so the longer side is at the bottom. Draw a diagonal from the bottom left corner to the top right corner.

2. Draw and label point A on the diagonal 4 cm. from the bottom corner of the paper.

3. Draw and label point B 16.5 cm directly above point A. Draw line segment AB parallel to the left edge of the paper.

4. Using segment AB as a side, draw and label rectangle ABCD so that it is 6 cm. by 16.5 cm.

5. Measuring on the diagonal, draw and label point E 3 cm. to the right of segment CD, and point F 6.5 cm. to the right of point E.

6. Label the intersection of segments CD and AE as point G. What type of right triangle is formed by points A, D, and G? Write it in the triangle.

7. Draw and label point H 5.5 cm. above point F so that segment FH is parallel to segment AB.

8. Draw and label point I above point E the same distance from the top of the page as point H. Connect points I and E, so that segment IE is parallel to segment FH. Connect points H and I.

9. Name the polygon formed by EFHI and write it inside the figure.

10. Estimate the area of polygon EFHI in centimeters and write it inside the figure.

Team Number _____

2018 5th/6th Grade ~ Team Construction Activity ~ Scoring Rubric

Graders: Please work through the construction activity in order to understand the scoring rubric. Extra working marks are perfectly acceptable. One scoring suggestion for the Construction Activity is to assign one individual to grade certain requirements, and then pass it to another individual to grade the next requirements, and so on.

Each of the requirements below must be executed completely and correctly in order to earn the available points. Incorrect or incomplete attempts earn 0 points, ***unless the scorers at the site choose to award partial credit on a consistent basis.***

1. Paper is oriented correctly and a diagonal is drawn from bottom left corner to top right corner. (because most students will be using 12" rulers, allow a little leeway in the diagonal meeting both vertices) _____**/ 6**
2. Point A is on the diagonal and is 4 cm from the bottom corner of the paper. _____**/ 6**
3. Point B is 16.5 cm directly above point A and AB is drawn parallel to edge of paper. _____**/ 6**
4. A 6 cm by 16.5 cm rectangle is drawn and vertices are labeled. _____**/ 6**
5. Points E and F are on the diagonal, E is 3 cm to the right of CD and F is 6.5 cm to the right of point E. _____**/ 6**
6. Point G is labeled at the intersection of CD and AE and Scalene is written inside triangle ADG. _____**/ 6**
7. Point H is 5.5 cm above point F and FH is parallel to AB. _____**/ 6**
8. Point I is above point E, PArallel to FH, and equal distance from the top of the page as point H. HI is drawn. _____**/ 6**
9. Polygon EFIH is named Trapezoid(or right trapezoid) inside the figure. _____**/ 6**
10. Area of the polygon is written inside the figure and is between 35 and $40\ cm^2$

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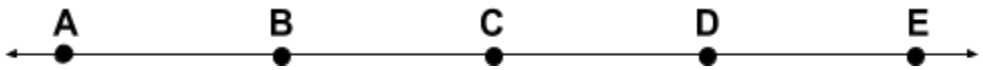
Team Number _____ **Score _____ / 60**

5th and 6th Grade Nimble Number Line

Read each question aloud only. You may read each question no more than two times. Do not project the questions. You may project the number line diagram, but it is already included on the student answer sheet. Students will work as a team during this event. Only one student is permitted to hold a pencil and write down each answer for the team. Calculators are not used during this event.



1.	If A = 0 and E = 3, what is the value of D?	D = 2 ¼ or 9/4
2.	If A = 24 and E = 80, what is the value of C?	C = 52
3.	If A = 24 and E = 80, what is the value of B?	B = 38
4.	If A = 5.5 and B = 6, name all points that have whole number values.	B, D (must have both)
5.	If B = ⅛ and C = 3/12 what is the value of E?	E = 5/12
6.	If B = 4/9 and D = 5/9, what is the value of C?	C = 9/18 or 1/2
7.	If B = 4/9 and D = 5/9, what is the value of A?	A = 7/18
8.	If A = 420 and B = 545, what is the value of D?	D = 795
9.	If B =1 ⅓ and C = 1 ⅔, name all the points that have whole number values.	A, D (must have both)
10.	If C = 0 and D = 12, what is the value of A?	A = -24

Team Number _____ **Score_____/10**

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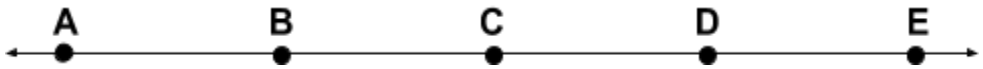
5th and 6th Grade Mental Math



Refer to the number line diagram to mentally reason with the following questions. *All points labeled on the number line are equidistant.*

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

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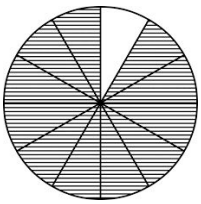
Team Number _____ **Score_____/10**

5th Grade Pile of 10

1.	150 tenths plus 1700 hundredths equals how many thousandths?	
2.	Sue Ellen is sewing trim on pillows. It takes 18 inches of ribbon to trim each pillow. If she has 12 yards of ribbon, what is the most number of pillows she can trim?	
3.	Ken and Sean have the same number of tennis balls. If Ken gives Sean 16 tennis balls, how many more tennis balls will Sean have than Ken?	
4.	Solve the number riddle: If you multiply me by 7, then subtract 7 from the product, you will have 70. What number am I?	
5.	Gary's lemon cookie recipe calls for ⅘ of a cup of sugar. How much sugar would Gary use to make ½ of a batch of cookies?	
6.	Let n stand for a number. Evaluate the expression for n=4. 2 plus 5 times a number	
7.	There are 165 children taking swimming lessons at the pool. If 10 children will be assigned to each instructor, how many instructors need to be hired?	
8.	Seven fancy bottles cost $3.57. The cost of each bottle is the same. What is the cost of each bottle?	
9.	 What fraction of the shape is not shaded?	
10.	The perimeter of a rectangular piece of metal is 24 centimeters. It is 4 ½ centimeters wide. How long is it?	

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Team Number _____ **_____/40**

Greater Cleveland Council of Teachers of Mathematics
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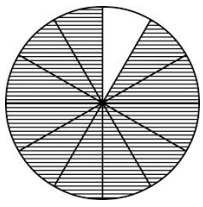
5th Grade Pile of 10 Answers

1.	150 tenths plus 1700 hundredths equals how many thousandths?	**32,000**
2.	Sue Ellen is sewing trip on pillows. It takes 18 inches of ribbon to trim each pillow. If she has 12 yards of ribbon, what is the most number of pillows she can trim?	**24 pillows**
3.	Ken and Sean have the same number of tennis balls. If Ken gives Sean 16 tennis balls, how many more tennis balls will Sean have than Ken?	**32 more tennis balls**
4.	Solve the number riddle: If you multiply me by 7, then subtract 7 from the product, you will have 70. What number am I?	**11**
5.	Gary's lemon cookie recipe calls for ⅖ of a cup of sugar. How much sugar would Gary use to make ½ of a batch of cookies?	**2/10= ⅕ cup**
6.	Let n stand for a number. Evaluate the expression for n=4. 2 plus 5 times a number	**22**
7.	There are 165 children taking swimming lessons at the pool. If 10 children will be assigned to each instructor, how many instructors need to be hired?	**17 instructors**
8.	Seven fancy bottles cost $3.57. The cost of each bottle is the same. What is the cost of each bottle?	**$0.51**
9.	 What fraction of the shape is not shaded?	**1/12**
10.	The perimeter of a rectangular piece of metal is 24 centimeters. It is 4 ½ centimeters wide. How long is it?	**7 ½ cm or 7.5 cm**

Team Number _____ **_____/40**

Greater Cleveland Council of Teachers of Mathematics
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6th Grade Pile of 10

1.	How many thousands are in one billion?	
2.	150 tenths plus 1700 hundredths equals how many thousandths?	
3.	This year 20 more students rode the school bus than last year. If this is a 10% increase, how many rode the school bus last year?	
4.	Two-thirds is what fractional part of 12?	
5.	Sue Ellen is sewing trim on pillows. It takes 18 inches of ribbon to trim each pillow. If she has 12 yards of ribbon, what is the most number of pillows she can trim?	
6.	A rectangle has a length that is twice its width and a perimeter of 30 meters. Find the area of the rectangle.	
7.	What number is as much greater than 30 as it is less than 84?	
8.	Janene has saved $164 to spend while on vacation. She spends 25% of that money on a ticket to an amusement park. How much does Janene have left to spend?	
9.	A shipping crate is shaped like a rectangular prism. It is 5 ½ feet long by 3 feet wide and 2 ¼ feet high. What is the volume of the crate?	
10.	Twenty-four guests came to the party. This was ⅘ of those who were invited. How many guests were invited?	

Team Number _____ **_____/40**

Greater Cleveland Council of Teachers of Mathematics
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6th Grade Pile of 10 Answers

1.	How many thousands are in one billion?	**1 million**
2.	150 tenths plus 1700 hundredths equals how many thousandths?	**32,000**
3.	This year 20 more students rode the school bus than last year. If this is a 10% increase, how many rode the school bus last year?	**200 students**
4.	Two-thirds is what fractional part of 12?	**1/18 or equivalent**
5.	Sue Ellen is sewing trim on pillows. It takes 18 inches of ribbon to trim each pillow. If she has 12 yards of ribbon, what is the most number of pillows she can trim?	**24 pillows**
6.	A rectangle has a length that is twice its width and a perimeter of 30 meters. Find the area of the rectangle.	**50 square meters**
7.	What number is as much greater than 30 as it is less than 84?	**57**
8.	Janene has saved $164 to spend while on vacation. She spends 25% of that money on a ticket to an amusement park. How much does Janene have left to spend?	**$123**
9.	A shipping crate is shaped like a rectangular prism. It is 5 ½ feet long by 3 feet wide and 2 ¼ feet high. What is the volume of the crate?	**37 ⅛ cubic feet or 37.125 cubic feet**
10.	Twenty-four guests came to the party. This was ⅘ of those who were invited. How many guests were invited?	**30 guests**

Team Number _____ **_____/40**