Summer Maths 2019
Students Entering 6th Grade

Dear Rising 6th Grade Students and Families,

Congratulations on a phenomenal year in 5th grade mathematics!!! We are proud of **each** student and celebrate the great maths thinking and growth we experienced this year.

The 6th Grade Maths Team has identified the following skills as the most critical for students as they start 6th grade. Students should work through this packet with the goal that they are proficient in these skills in September. I would also recommend using ***Khan Academy*** and ***IXL.com*** as a resource for clearing up misconceptions or additional practice.

This assignment will be your first graded Maths assignment!!!! Please, try to spread the work out on separate days—each page should take no more than 20 minutes, and some should take a lot less time. Clearly, your work on this packet should not just be a list of answers, but should show your work so we can see how you are thinking.

This packet is due on the Thursday, September 5, 2019

Next year, we will do a lot of work with fractions, decimals, and percents. Be on the look-out this summer for ways in which you use them in real life. Here are some ways that you might practice this summer:

- **Cook with your family**- recipes often use fractional measurements. How would you double or "half" the recipe?

- **Shop for bargains.** Notice the "sale" signs, and what they mean. If I have a "20% off" coupon, what will be the sale price?

- **Work with money**- estimate the price of your groceries, make change, figure out the best deal by using unit price.

- **Figure out the tip**—if your family is at a restaurant, figure out how to determine the amount to leave for a tip.

If you have a chance, find some maths puzzles and games to play online!

- https://ed.ted.com/search?utf8=%E2%9C%93&qs=Dan+Finkel
  Dan Finkel's excellent TEDed puzzles includes various riddles and puzzles presented in a fun way.

- sites.google.com/psbma.org/mathisfun/home
  The Lawrence Maths Specialists have organized a great website with lots of puzzles, practice, and resources.

- illuminations.nctm.org/content.aspx?id=3855
  NCTM Illuminations has some free games that you can download to a mobile device.

- bedtimemath.org
  A daily, "real-life" story, and then has different levels of maths-related questions.

- brilliant.org and brilliant.org/daily-problems/
  Brilliant is a website and associated community that features problems and courses in mathematics, physics, quantitative finance, and computer science.

- twitter.com/mathinthenews?lang=en
  A new math question related to current events every school day.

- youcubed.org/students/
  A free online course for students from Youcubed.

- mathbits.com/caching/MathCacheDirectionsOpen.html
  As copied from their website: "*In the spirit of geocaching, we have created activities called "MathCaching" which use the internet to find hidden boxes to reveal clues to the continuation of the games. Your success at "MathCaching" is dependent upon your skills at solving mathematical problems.*"

Thank you for your partnership around maths education at Heath!

Have a great summer!

All the best,
Mrs. Bourmpoula
she/her/hers
valia_bourmpoula@psbma.org
bit.ly/MathsHeathBourmpoula (*under construction*)

Math or Maths?

You may wonder why our youcubed posters say mathS and not math. There are many countries in the world, including the UK where Jo is from, that say maths not math. Also, maths was made into a plural noun because it is short for mathematicS - and the s on the end is important. It captures all the different forms of mathematicS and ways of being mathematical - e.g. drawing, communicating, generalizing, visualizing, connecting. The singular word math sounds more narrow and people in the US often say "do the math" when they mean "do a calculation!" Maths is so much more than calculating so we like the word mathS!

youcubed®

Refresher Worksheet 1
Multiplication of Whole Numbers

Key Concept and Vocabulary

factors product

$3 \cdot 4 = 12$

Visual Model

A rectangle that is 3 units by 4 units has an area of 12 square units.

Area $= 3 \times 4$

$= 12$ square units

Skill Examples

1. $6 \cdot 7 = 42$
2. $0 \times 5 = 0$
3. $8 \cdot 1 = 8$
4. $(9)(12) = 108$
5. $15 \times 20 = 300$

Application Example

6. Find the area of a rectangular lot that is 20 yards wide and 35 yards long.

Area = (length)(width)

$= 35 \cdot 20$

$= 700 \text{ yd}^2$

∴ The area is 700 square yards.

Please, find the following products and show your work in a clear and organised way.

1) 12 x 95 = _____	**2)** 980 x 79 = _____

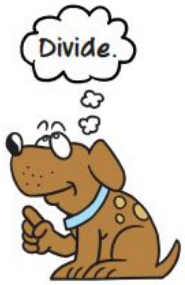
3) 48 x 61 = _____	**4)** 519 x 71 = _____
5) 157 x 92 = _____	**6)** 510 x 94 = _____
7) 1,054 x 42 = _____	**8)** 2,469 x 22 = _____

Refresher Worksheet 2
Division of Whole Numbers

Key Concept and Vocabulary

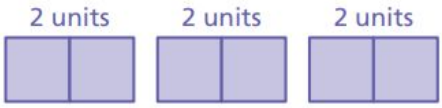
dividend → 10 ÷ 2 = 5 ← quotient

divisor



Visual Model

If you divide 6 units into 3 equal parts, each part will have 2 units.



$6 \div 3 = 2$

Skill Examples

1. $42 \div 6 = 7$

2. $\frac{65}{13} = 65 \div 13 = 5$

3.
$$\begin{array}{r} 13 \\ 15\overline{)195} \\ \underline{15} \\ 45 \\ \underline{45} \\ 0 \end{array}$$

∴ $195 \div 15 = 13$

Application Example

4. Six people find a treasure worth $12,300. If each person receives an equal share, how much does each person get?

$\$12{,}300 \div 6 = \$2050$

∴ Each person gets $2050.

Please, find the following quotients and show your work in a clear and organised way.

1) 1,575 ÷ 63 = _____	**2)** 832 ÷ 52 = _____

3) 658 ÷ 14 = _____	**4)** 2,952 ÷ 72 = _____
5) 1,104 ÷ 23 = _____	**6)** 3,220 ÷ 16 = _____
7) 7,200 ÷ 9 = _____	**8)** 78,182 ÷ 97 = _____

Refresher Worksheet 3
Understanding Decimals

Please, complete the chart. Fill in the whole number tenths, hundredths and thousandths columns with the correct number. Use zeros as placeholders where necessary.

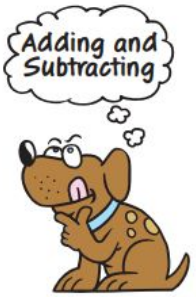
Number	**Whole number**	**Tenths** *(x 10^{-1})*	**Hundredths** *(x 10^{-2})*	**Thousandths** *(x 10^{-3})*
3.751				
4.891				
1.608				
10.540				
9.618				
2.198				
0.208				
0.005				
1.7				
2.398				
6.0				
107.673				

Refresher Worksheet 4
Adding and Subtracting Decimal Numbers

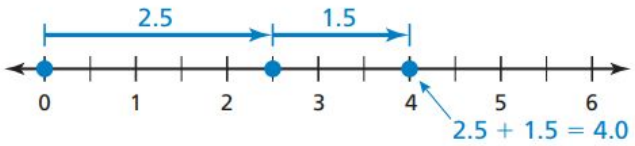
Key Concept and Vocabulary

$$\begin{array}{r} 5.7 \\ +\ 3.36 \\ \hline 9.06 \end{array} \qquad \begin{array}{r} 12.72 \\ -\ 3.84 \\ \hline 8.88 \end{array}$$

Align on decimal point.



Visual Model



Skill Examples

1. $\begin{array}{r} 134.12 \\ +\ 25.485 \\ \hline 159.605 \end{array}$

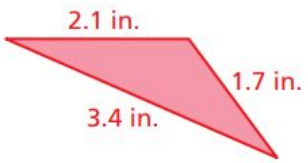
2. $\begin{array}{r} 0.135 \\ +\ 0.14 \\ \hline 0.275 \end{array}$

3. $\begin{array}{r} 32.000 \\ -\ 9.451 \\ \hline 22.549 \end{array}$

4. $\begin{array}{r} 1.405 \\ -\ 0.55 \\ \hline 0.855 \end{array}$

Application Example

5. Find the perimeter of the triangle.



$2.1 + 1.7 + 3.4 = 7.2$

∴ The perimeter is 7.2 inches.

Please, find the following sums or differences. Show your work in a clear and organised way.

1) 32.5 + 82.4 = _____	**2)** 71.8 – 20.2 = _____

3) 144.97 + 837.66 = _____	**4)** 248.23 – 80.89 = _____
5) 206.619 + 93.11 = _____	**6)** 419.6 – 146.48 = _____
7) 3.45 + 5.6 – 2.309 = _____	**8)** 10.0 – (4.57 + 2.35) = _____

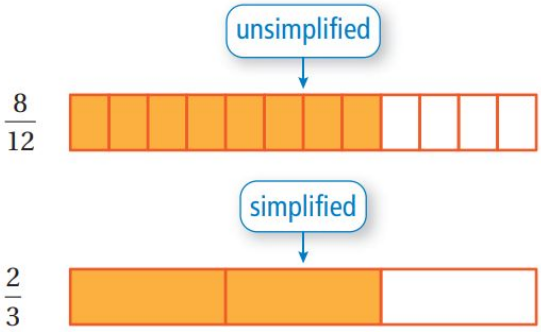
Refresher Worksheet 5
Irreducible Form Fractions

Key Concept and Vocabulary

$$\frac{8}{12} = \frac{2 \cdot \cancel{4}}{3 \cdot \cancel{4}} = \frac{2}{3}$$

Divide numerator and denominator by common factor.

Visual Model



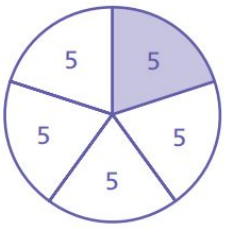
Skill Examples

1. $\frac{2}{4} = \frac{1 \cdot \cancel{2}}{2 \cdot \cancel{2}} = \frac{1}{2}$
2. $\frac{3}{6} = \frac{1 \cdot \cancel{3}}{2 \cdot \cancel{3}} = \frac{1}{2}$
3. $\frac{15}{20} = \frac{3 \cdot \cancel{5}}{4 \cdot \cancel{5}} = \frac{3}{4}$
4. $\frac{80}{100} = \frac{4 \cdot \cancel{20}}{5 \cdot \cancel{20}} = \frac{4}{5}$

Application Example

5. Five of the 25 students in your class have a Facebook account. Write this fraction in simplifed form.

$$\frac{5}{25} = \frac{1 \cdot \cancel{5}}{5 \cdot \cancel{5}} = \frac{1}{5}$$



∴ One-fifth of your class has a Facebook account.

Please, find the irreducible form of each fraction. Show your work.

1) $\frac{16}{18} =$ _____	**2)** $\frac{10}{12} =$ _____
3) $\frac{15}{45} =$ _____	**4)** $\frac{21}{35} =$ _____

Refresher Worksheet 6
Improper Fractions and Mixed Numbers

Key Concept and Vocabulary

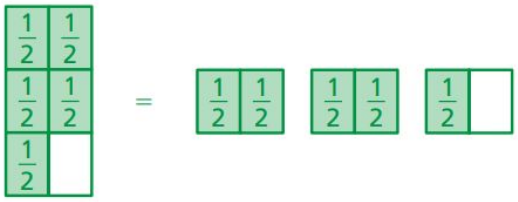
$\frac{5}{2} = 2\frac{1}{2}$

improper fraction

mixed number

Visual Model

$\frac{5}{2}$ = $2\frac{1}{2}$



Skill Examples

1. $\frac{7}{3} = 2\frac{1}{3}$
2. $\frac{8}{4} = 2$
3. $2\frac{1}{4} = \frac{8}{4} + \frac{1}{4} = \frac{9}{4}$
4. $3\frac{3}{5} = \frac{15}{5} + \frac{3}{5} = \frac{18}{5}$

Application Example

5. During a month, you used 13 half-hours of phone time. How many hours did you use?

13 halves → $\frac{13}{2} = 6\frac{1}{2}$ ← 6 and one-half

∴ You used $6\frac{1}{2}$ hours.

Please, write <u>the improper fraction as a mixed number</u> or <u>the mixed number as an improper fraction</u>. Show your work.

1) $\frac{19}{4} =$ _____	**2)** $3\frac{2}{5} =$ _____
3) $2\frac{2}{3} =$ _____	**4)** $\frac{28}{3} =$ _____

Refresher Worksheet 7
Adding and Subtracting Fractions

If the denominators are **not** the same, then you have to use **equivalent fractions** which do have a common denominator . To do this, you need to find the **least common multiple** (LCM) of the two denominators.

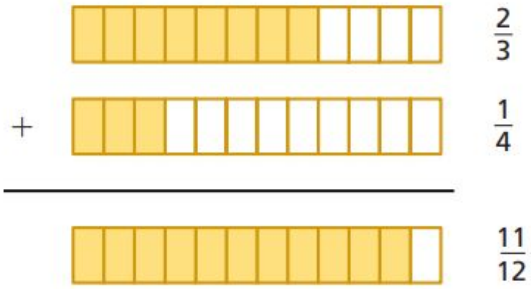
Add $\frac{2}{3}$ and $\frac{4}{6}$

LCM (3,6) = 6

$\frac{2}{3} + \frac{4}{6} = \frac{4+4}{6} = \frac{8}{6} = \frac{4 \times 2}{3 \times 2} = \frac{4}{3}$

$\frac{2}{3} + \frac{4}{6} = \frac{4}{3}$

Visual Model



Skill Examples

1. $\frac{1}{5} + \frac{2}{3} = \frac{1 \cdot 3 + 5 \cdot 2}{5 \cdot 3} = \frac{13}{15}$
2. $\frac{1}{2} + \frac{1}{4} = \frac{1 \cdot 4 + 2 \cdot 1}{2 \cdot 4} = \frac{6}{8} = \frac{3}{4}$
3. $\frac{1}{3} - \frac{1}{4} = \frac{1 \cdot 4 - 3 \cdot 1}{3 \cdot 4} = \frac{1}{12}$
4. $\frac{3}{7} - \frac{2}{5} = \frac{3 \cdot 5 - 7 \cdot 2}{7 \cdot 5} = \frac{1}{35}$

Application Example

5. You ride your bike $\frac{3}{8}$ mile to the store. Then you ride $\frac{1}{6}$ mile to school. How far do you ride altogether?

$\frac{3}{8} + \frac{1}{6} = \frac{3 \cdot 6 + 8 \cdot 1}{8 \cdot 6} = \frac{26}{48} = \frac{13}{24}$

∴ You ride $\frac{13}{24}$ mile.

Please, find the following sums or differences. Show your work in a clear and organised way.

1)

$\frac{3}{5} + \frac{2}{7} =$ _____

2)

$\frac{11}{15} + \frac{7}{15} =$ _____

3)

$\frac{1}{3} + \frac{1}{6} =$ _____

4)

$\frac{3}{10} + \frac{1}{4} =$ _____

5)

$\frac{1}{2} + \frac{2}{5} =$ _____

6)

$\frac{1}{8} + \frac{1}{9} =$ _____

7)

$\frac{5}{9} + \frac{4}{9} =$ _____

8)

$\frac{2}{3} + \frac{3}{4} + \frac{1}{6} =$ _____

9)

$\frac{11}{12} - \frac{1}{3} =$ _____

10)

$\frac{4}{5} - \frac{1}{10} =$ _____

11)

$\frac{3}{5} - \frac{1}{6} =$ _____

12)

$\frac{7}{8} - \frac{1}{3} =$ _____

13)

$\frac{5}{9} - \frac{2}{5} =$ _____

14)

$\frac{1}{5} - \frac{1}{6} =$ _____

What's My Number? *Riddles*
Use the clues to find each number.

1)

- If divided by 10, the remainder is 2
- If divided by 4, the remainder is 0
- It is less than 50
- The sum of the digits is 5

What's My Number? _____

2)

- If divided by 3, the remainder is 1
- If divided by 100, the remainder is 0
- It has three digits
- It has less than 400

What's My Number? _____

3)

- If divided by 25, the remainder is 0
- If divided by 8, the remainder is 5
- It is more than 500
- It is less than 600

What's My Number? _____

4)

- If divided by 3, the remainder is 0
- If divided by 53, the remainder is 0
- It is more than 300
- It is less than 500

What's My Number? _____

Entering 6th Grade Maths Calendar

(please, write your solutions on the following page)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Mr. Brook's class received 168 postcards from pen pals. If each of the 24 students received the same number of postcards, how many did each receive?	Add 34.95 + 23.90 What number is in the tenths place?	What is the numerator of $\frac{6}{8}$ in lowest terms?	It takes Mark 3 minutes to make 1 ½ inches of a bracelet. If he works at the same speed, how many minutes will it take him to make a 3-inch bracelet?	3 friends share the cost of a video game. If the game costs $74.79 including tax, what is the best estimate to the nearest dollar of the amount each friend will pay?	Howard has a blue, a white and a black shirt. He also has a black, a red and a white tie. How many different shirt and tie combinations can he make?	How many more even number days are there in July than in February?
Bill and Carol buy a pizza that is cut into 8 equal slices. If Bill eats $\frac{1}{8}$, and Carol eats $\frac{1}{4}$ of the pizza, how many eighths of pizza are left?	Stacy has 79 strawberries to put in 5 baskets. If she puts the same number of strawberries in each basket, how many strawberries will be left over?	I bought 60 lollipops. I kept 3 and gave the rest to my 3 friends. They divided the lollipops equally among themselves. How many lollipops did each friend get?	Glen glued 4 white cubes in a stack. After the glue dried, he painted the cubes red. How many faces of the four cubes are red?	One side of an equilateral triangle is 9cm. What is the perimeter?	The number of sides in a hexagon plus the number of sides in a heptagon plus the number of sides in a triangle totals how many?	(12 x 5 + 2) ÷ 2 = _____ Make up 3 more number equations using at least 2 operations (+ - x ÷) to get the same answer.
One side of a regular heptagon measures 3.5cm. What is its perimeter?	The perimeter of a square is 52cm. What is the length of each side?	Sally sold 2 out of 12 tickets to the concert. To the nearest whole percent, what percent of the tickets did she sell?	3,477 + **B** – 3,500 What value does **B** stand for?	Barry bought a roll of ribbon to make bows for his gift boxes. There are 132 inches of ribbon on the roll. How many feet of ribbon was that?	If you tripled the number of sides on a pentagon, it would be a polygon with how many sides?	Ted used a rule to make this list of numbers: 1, 2, 5, 10, 17, _____. If he continues which number should he write next?
2,978 + x = 3,000 What value does *x* stand for?	2,022 – 1,998 = y What value does *y* stand for?	The largest multiple of 4 that is less than 30 is _____?	Eight hours after 6:00am is what time?	If 4 mint chocolates cost $1.00, how many mint chocolates can you get for $5.00?	1.75, 3.5, 7, _____, 28. In the above pattern, what number belongs between the 7 and 28?	(a + b) x 3 = 33 If a = 1, then b = _____
Six nickels is what percent of $1.00?	How many edges does a cube have?	The largest prime number less than 30 is _____?	Student's Name: Parent's or Guardian's Signature:			