Campus Community Middle School

Summer Math Enrichment Program 2017

GRADE 6

Class of 2020 and Families:

Welcome to middle school mathematics! I realize that summer plans are being organized, camp spots are being reserved, and vacations are being planned. Still, research shows that the break from school and its structured academic activities often result in students being behind upon their return to school in fall. Months of work from the previous year can be lost during the summer. To add to this, the transition to middle school can be already be demanding and even difficult for some students. This summer program was designed with three goals in mind: (1) to help make the transition to middle school more seamless, (2) to allow briefly introduce students to grade-six content, and (3) to give students ample opportunity to practice as well as refine their "bridge skills" from elementary to middle school.

The sixth grade summer enrichment has three parts: (1) computation problems, (2) application activities, and (3) Khan Academy. Computation problems should be completed by hand (using calculators to check work if anything) and show all steps and processes. The application activities are a deeper thinking problems that require students to apply their math skills to real-world situations. Khan Academy is an online program that is aligned with grade-level standards and skills. Through Khan, students will have additional independent practice as well as continual feedback on the mastery of grade-level skills in the "Mission Foundations". Each student has been given a unique username as well as password. As Khan takes time, it is a good idea to start sooner rather than later. ***Please make sure your child uses the school-issued credentials when logging on and working throughout the summer.*** The overall goal of the program is to enhance your student's mathematical foundation and help ensure he or she will step confidently into middle school mathematics.

Summer projects should be completed by the first day of school. Though a lot of independent work is expected of your student this summer, please feel free to contact me whenever questions arise. I can be reached via email at rdsmith684@gmail.com or robin.smith@ccs.k12.de.us as well as via cell at (202) 276-2470. Please also join the "Rising 6th Grade" Remind group (see the attached Remind flier). Thank you for making Campus Community School your choice. I look forward to teaching your student in the fall! Have an amazing math-filled summer!

Mathematically Yours,

Robin D. Smith, MBA

6/7 Math Teacher

Part 1: Computation Problems

Whole Number Operations

DIRECTIONS: Without the use of a calculator, add, subtract, multiply, or divide. Show <u>all</u> steps.

1) 2846 + 1635

2) 24592 + 46268

3) 776 − 498

4) 1904 − 625

5) 776 x 98

6) 376 x 18

7) 493 x 67

8) 588 ÷84

9) 1620 ÷ 36

10) 770 ÷28

Order of Operations and Exponents

DIRECTIONS: Complete the following. Show <u>all</u> steps.

11) Write in exponential form.

$8 \times 8 \times 8 \times 8 \times 8$

12) Find the value.

2^6

DIRECTIONS: Simplify each expression by using the order of operations. Show <u>all</u> steps.

13) $3^2 + 6 - 2 \times 7$

14) $20 \div 5 \times 2 - (6 + 2) \times 7$

Prime Factorization

15) **Identify all the prime numbers from the list. Circle them. Below, explain why you made your selections.**

14   4   11   9   3   17   1

DIRECTIONS: Find the prime factorization of each number. Write your final answer answers in exponential form where applicable.

16) 60

17) 125

18) 42

Simplifying Fractions

DIRECTIONS: Write each fraction in simplest terms.

19) $\frac{15}{25}$

20) $\frac{35}{42}$

21) $4\frac{29}{29}$

Improper Fractions and Mixed Numbers

DIRECTIONS: Change the mixed numbers to improper fractions and the improper fractions to mixed numbers. Show your complete process.

22) $2\frac{4}{5}$

23) $6\frac{11}{17}$

24) $\frac{8}{3}$

25) $\frac{132}{11}$

Operations with Fractions

DIRECTIONS: Add, subtract, or multiply using the appropriate process required. Reduce your final answer to lowest terms.

26) $\frac{7}{16} + \frac{3}{16}$

27) $\frac{7}{10} + \frac{2}{10} - \frac{8}{10}$

28) $\frac{1}{2} + \frac{2}{3}$

29) $\frac{2}{3} - \frac{1}{6}$

30) $\frac{5}{6} + \frac{1}{4}$

31) $\frac{1}{2} - \frac{1}{5}$

32) $1\frac{1}{3} + 2\frac{1}{3}$

33) $2\frac{2}{3} - \frac{1}{3}$

34) $10 - 4\frac{5}{6}$

35) $5\frac{1}{4} + 3\frac{5}{8} + 2\frac{1}{2}$

36) $2\frac{1}{2} - 1\frac{3}{4}$

37) $\frac{5}{9} \text{ x } \frac{3}{10}$

38) $\frac{3}{16} \text{ x } 8$

39) $2\frac{1}{2} \text{ x } 3\frac{1}{5}$

Decimals to Fractions

DIRECTIONS: Write each decimal as a fraction. Reduce your final answer to lowest terms. Also, explain your strategy (or strategies) for turning decimals into fractions.

40) 0.8

41) 0.56

Decimal Operations

DIRECTIONS: Use an appropriate strategy to add, subtract, or multiply the following items. Show <u>all</u> steps.

42) 9.242 + 0.87

43) 35.87 – 10.2

44) 40.4 – 6.37

45) 0.7 x 0.4

46) 0.12 x 0.6

Ratios and Rates

DIRECTIONS: Write each ratio or rate as a fraction in simplest terms.

47) 30 feet to 60 feet

48) 51 males to 21 females

DIRECTIONS: Find each unit rate. (HINT: _____ per 1 unit of _____)

49) 1500 meters in 6 seconds

50) $36 for 4 pounds of shrimp

Part II: Application Activities

DIRECTIONS: Complete at least <u>**one**</u> application activity of your choice. Keep track of the components of your activity in a journal. Parental input is encouraged (particularly when strategizing, selecting, and getting required materials). However, students should be planning, thinking, and applying mathematics independently. The activity should be completed before the first day of school. Students should be prepared to not only share their experiences in great detail, but they should also be prepared to discuss the specific ways in which mathematics was used to complete the activity.

Activity 1: "Green Thumbs: Planning a Garden". Summer is a great time to plant and maintain a garden. Select your favorite type of garden (www.fullgardens.com has a comprehensive list of options) and make a plan of where and how to plant your garden of choice. Important things to consider are: the size of the garden; the layout of the garden; spacing of the plants; whether to start from plants or seeds; the number of flowers, herbs, or vegetables the garden can sustain. You are encouraged to make two scale drawings of the garden: one before planting and one that shows how your child expects it to look when it is completed. You will continue to use your math skills throughout the summer tracking the size of the plants and recording their growth data in a table to compare the growth rates. Other potential mathematical applications could be: determining how much fertilizer might be needed to nourish the plants and how fertilizer affects the yield of different plants. By the end of the summer, you should be able to compare the original scale drawing to the way the garden actually turned out. You should also be comfortable sharing what you learned and how mathematics was used throughout the activity.

Activity 2: "Maps and Trails and Routes – Oh My!". There are often many opportunities throughout the summer for you to read maps. The City of Dover's First State Park has an excellent historic district complete with a plethora of tour and park maps. Visiting centers in other areas in and outside of Delaware are another place to access maps. If your family is planning a trip that includes hiking or cycling along a trail, use a map of your route to calculate the total distance of the proposed trip. Next, look for alternative routes and find other distances using the trail map. Trail maps often include approximate times for a round trip to a particular destination on the map. If you select one of these routes, keep track of the total time the trip takes and compare this to the suggested time to your family's actual time. By the end of this activity, you should be comfortable discussing why any differences occurred and sharing all of the mathematical connections you experienced with your classmates.

Activity 3: "Busy, Busy, Busy: Weekly Summer Activities". Choose one of your favorite summer activities and estimate the number of hours during 5 weekdays that you participate in this activity. Next, write a fraction that shows the number of hours you participate in the activity over the total number of hours in 5 weekdays ($\frac{n}{120}$). Finally, use division to write your fractions as decimals. From here, you should be able to state the percent of the week you spend on your favorite summer activity. Extend this activity to also include the percent of weekdays spend sleeping or doing other activities. Be prepared to share this data as well as the related mathematical ideas with your peers.

Activity 4: "Summer Reading Challenge". Use the summer reading assignment and visit your local library or book store to select the books you will be reading this summer. Keep track of the minutes that you read each day for one week. At the end of the week, find the mean number of minutes you spent reading. Also, find the median number of minutes and the range of the number of minutes. If there is a mode, also find it. Be prepared to discuss whether the mean or median is a better representation of the average number of minutes spent reading and why. Use the chart in the appendix to record your data.

Part III: Khan Academy Mission Foundations

DIRECTIONS: Complete the grade 6 Mission Foundation skills using the practices, videos, a mastery challenges to practice grade-level skills. The following checklist can be used to track your progress.

Skill	Date Started	Date Mastered
Compare decimals through thousandths		
Multiplying decimals 2		
Dividing decimals: hundredths		
Add and subtract mixed numbers with unlike denominators		
Multiplying fractions		
Fractions as division		
Dividing unlike fractions by whole numbers		
Dividing whole numbers by unit fractions 2		
Powers of 10		
Volume 1		
Graph points		