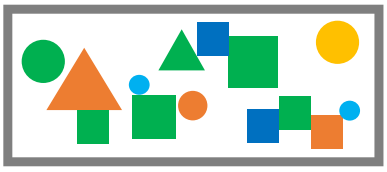
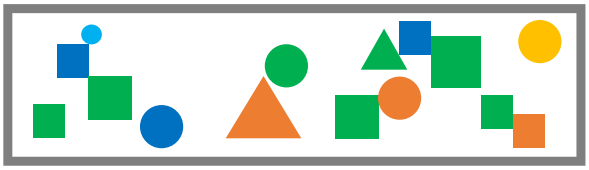
First Name: _____ **Last Name:** _____ **Grade:** _____

Teacher: _____ **Parent's email:** _____

Comparing Numbers

Kinder & First Grade: solve <u>at least</u> 3 problems.
Second & Third Grade: solve <u>at least</u> 7 problems.
Fourth Grade and above: solve <u>at least</u> 12 problems.

		Answer
1.	 Number of squares: 7 Number of circles: 5 7 – 5 = 2	*2 [more squares]*
2.	Jeanine read 2+4 or 6 books, Liza read 2+5 or 7 books, and Roy read 3+3 or 6 books. Liza read the most number of books.	*Liza*
3.	 Logan marked 8 squares; Nicole marked 7 triangles and circles. Logan marked 1 more shape than Nicole.	*Logan, by 1*
4.	Renata found 6+6 or 12 shells.	*12 [shells]*
5.	Laura has 4+4+4 or 12 fish; James has 10 fish. Laura has 2 more fish.	*Laura*
6.	Melissa: 2+4+6+8+10 = 30 pieces of candy Timothy: 1+4+7+10+13 = 35 pieces of candy Timothy's bag has 35 – 30 or 5 more pieces of candy than Melissa's.	*5 [pieces of candy]*
7.	If we count by 7's, we have the following numbers that are more than 20 but less than 60: 21, 28, 35, 42, 49, 56. Next year, these numbers will be: 22, 29, 36, 43, 50, 57. When we count by 5, we will say 50. So, Sangeeta must be 49 years old now.	*49 [years old]*
8.	Off by a number and deviate by a number means that the number could be either smaller or larger. One way to solve this is by keeping everything organized. We can create a table.	*134*

	-11	+11	-3	+3	-7	+7	-10	+10
127	116	138	124	130	120	**134**	117	137
137	126	148	**134**	140	130	144	127	147
124	113	135	121	127	117	131	114	**134**
145	**134**	156	142	148	138	152	135	155

Examine the columns and compare the values. The only number that doesn't change between each of the two columns is 134. So that is the answer.

We can check our answers: 145 – 11 = 134, 137 – 3 = 134, 127 + 7 = 134, and 124 + 10 = 134. ✓

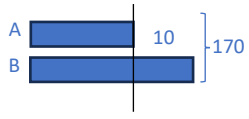
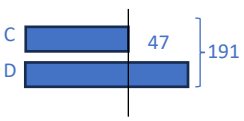
9.	First run: Zoe ran 8.5 yards to get the ball and 8.5 yards to bring back the ball = 17 yards. Second run: Zoe ran 17 yards + 17 yards = 34 yards Third run: Zoe ran (17 – 3) yards + (17 – 3) yards = 28 yards Total distance = 17+ 34 + 28 = 79 yards.	*79 [yards]*

10.	What is **the greatest whole number** that can be placed in each blank space to make the number sentences true? a. **4 × ___ < 35** 8 b. **60 × ___< 250** 4 c. **7 × ___ < 500** 71 d. **50 + ___ × 2 < 70** 9 e. **81 × 5 – ___> 360** 44 f. **6 × ___ + 5 < 41** 5	*a. 8* *b. 4* *c. 71* *d. 9* *e. 44* *f. 5*

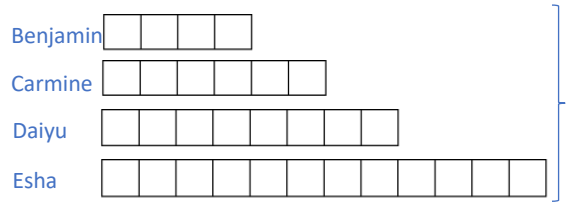
11.	a. **Partition 34** The first two numbers are the same and are multiples of five. The third number is less than five. Solution: 15+15+4 b. **Partition 34** The numbers form a sequence. Each number is five more than the previous number. Solution: 1+6+11+16 c. **Partition 55** The second number is twice the first. The third number is twice the second. The fourth number is the same as the third. Solution: 5+10+20+20 d. **Partition 55** The numbers form a sequence. Each number is four more than the previous number. Solution: 3+7+11+15+19	*a. 15+15 + 4* *b. 1 + 6 + 11 + 16* *c. 5 + 10 + 20 + 20* *d. 3+7+11+15+19*

12.	1 meter = 100 cm, 1 cm = 10 mm. King Penguin, Mute Swan, Wandering Albatross, Andrean Condor, Marabou Stork, Emu, Southern Cassowary, Dalmatian Pelican, Ostrich.	*King Penguin, Mute Swan, Wandering Albatross, Andrean Condor, Marabou Stork, Emu, Southern Cassowary, Dalmatian Pelican, Ostrich*

Birds	Average Heights (in cm)
Andrean Condor	110
Emu	153
King Penguin	92
Mute Swan	100
Ostrich	210
Southern Cassowary	155
Wandering Albatross	107
Dalmatian Pelican	175
Marabou Stork	150

13.	a. If A is 10 less than B, find the value of A and B. **A + B = 170** **A = ?** **B = ?** We can solve this by drawing a model:  A = (170 – 10)/2 = 80 B = 80 + 10 = 90 Check: A+B = 80 + 90 = 170 and 80 is 10 less than 90. ✓ b. If D is 47 more than C, find the value of C and D. **C + D = 191** **C = ?** **D = ?**  C = (191 – 47)/2 = 72 D = 72 + 47 = 119 Check: A+B = 72+ 119 = 191 and 119 is 47 more than 72. ✓	*A = 80* *B = 90* *C = 72* *D = 119*

14. We can solve this by drawing a model:



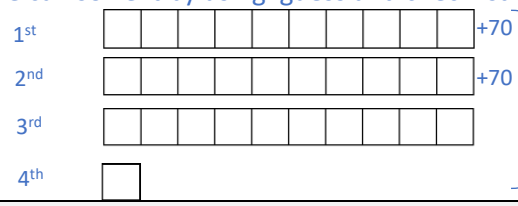
Esha ate an even number of cookies; the amount is also divisible by 3. Daiyu must have eaten an even number of cookies and ate less than Esha. Then, the number of cookies Esha ate is divisible by 4. We can check on Esha having 12 cookies and calculate the rest.

Carmine = half of 12 = 6 Daiyu = 2/3 of 12 = 8 Benjamin = half of 8 = 4

Check that the total is 30. ✓

Benjamin = 4, Carmine = 6, Daiyu = 8, Esha = 12.

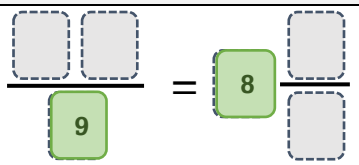
15. We can solve it by using 'guess and check' strategy or we can draw a model.



233 - 2×70 = 93 corresponds to 31 units
1 unit: 93/31 = 3
1st and 2nd number each is 10×3 + 70 = 100
3rd number 10×3= 30
4th number 3

100, 100, 30, 3

16. a.



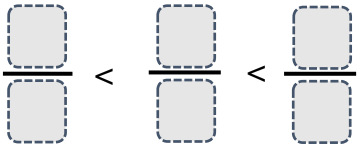
1 2 3 4 5 6 7

What is the equation? 75/9 = 8 1/3

Digits 8 and 9 are already used. If we divide something by 9 and get 8 whole, it means that we were dividing a number between 72 and 81. And a fraction in a mixed number has numerator less than 9.
We can use each digit at most once. 9 = 3×3, which means in the answer we'll have 3 in denominator.
Now the only way these clues work, when $\frac{75}{9} = 8\frac{1}{3}$

a. 75/9 = 8 1/3

b.



4 5 6 7 8 9

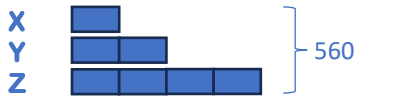
Fractions that are greater than ½ and less than 1:

$\frac{4}{5}$	$\frac{4}{6}, \frac{5}{6}$	$\frac{4}{7}, \frac{5}{7}, \frac{6}{7}$	$\frac{5}{8}, \frac{6}{8}, \frac{7}{8}$	$\frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}$

With 4/5 we can create 3 distinct inequalities, with 4/6 three distinct inequalities, and 4/7 three distinct inequalities. There are no more options to create a fraction more than ½ and less than 1 with 4 in the numerator. Thus, 9 such inequalities are possible.
Creating compound inequality, using each digit at most once will give us:
4/6 < 5/7 < 8/9 or 4/5 < 6/7 < 8/9 or 4/7 < 5/8 < 6/9 or 4/7 < 5/6 < 8/9 or
5/9 < 4/7 < 6/8 or 5/9 < 4/6 < 7/8 or 5/8 < 4/6 < 7/9 or 6/8 < 7/9 < 4/5 or
6/9 < 4/5 < 7/8

b. 9

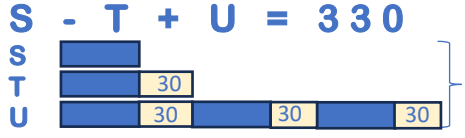
17. a. If Y is twice as big as X and Z is twice as big as Y, find the value of X, Y, and Z.



560 ÷ 7 = 80
X = 80
Y = 2 × 80 = 160
Z = 2 × 160 = 320

a. X = 80
Y = 160
Z = 320

b. If T is 30 more than S and U is three times T, find the value of S, T, and U.



S – T + U = 3 rectangles + (30 + 30) = 330
3 rectangles = 330 – 60
3 rectangles = 270
1 rectangle = 270 ÷ 3 = 90
S = 90; T = 90 + 30 = 120; U = 120 × 3 = 360

b. S =90
T = 120
U = 360

18.	The best approach is to find all the prime factors of all the products given.