

Problem-Based Learning Activities

Below are suggested summer tasks separated by grade level. Teachers will be reviewing the appropriate grade level problems when you return to school in September.

If you need assistance with the below problems, feel free to contact the district's math supervisor, Dr. Jeremy Cohen at jcohen@twpunionschools.org.

Have a wonderful summer!

All students entering 5th grade

Task

Below is a multiplication table for single digit numbers:

×	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9
2	2	4	6	8	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
4	4	8	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
8	8	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

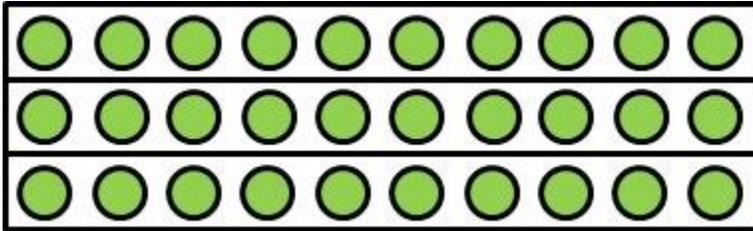
Use a different copy of the multiplication table for each of the questions below:

1. Color all boxes with multiples of 2 in the multiplication table. What pattern do you see in the colored boxes?
2. Color all boxes with multiples of 3 in the table. How does the pattern of multiples of 3 compare to the pattern of multiples of 2?
3. Color all boxes with multiples of 4 in the table. How is this different from the patterns in (a) and (b)? Why?

All students entering 6th grade

Task

1. Find all the factor pairs for 30. For each factor pair, draw a picture that shows both of the factors as well as the product. For example, $3 \times 10 = 30$ and this picture shows 3 groups of 10 circles for a total of 30 circles:

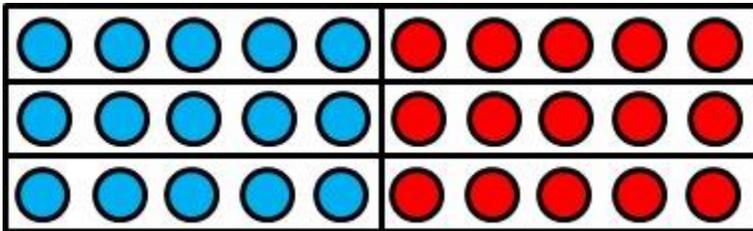


Make sure you have a picture for both ways of ordering the factors in each pair. For example, make sure you have a picture that represents $10 \times 3 = 30$ as well as one that represents $3 \times 10 = 30$. You can use the same picture if you can explain how it shows the product written in the other order.

2. We can also write 30 as a product of *three* factors. For example,

$$30 = 2 \times (3 \times 5)$$

If we think of this as 2 groups with (3 groups of 5 circles in each group), then we can draw a picture that shows this:



We can change the order of these three factors as well:

$$30 = 2 \times (5 \times 3)$$

$$30 = 3 \times (2 \times 5)$$

$$30 = 3 \times (5 \times 2)$$

$$30 = 5 \times (2 \times 3)$$

$$30 = 5 \times (3 \times 2)$$

Draw a picture for each one that reflects the order of the factors.

All students entering 7th Grade

Task

The 150 students at Jefferson School were asked if they prefer seeing the movie *Hunger Games* or *Divergent*. The data showed that 100 preferred *Hunger Games* and 50 preferred *Divergent*.

1. Look at the following statements and decide if each accurately reports the results of the survey and explain *how you know*.
 1. At Jefferson School, $\frac{1}{3}$ of the students prefer *Hunger Games*.
 2. Students prefer *Hunger Games* to *Divergent* in a ratio of 2 to 1.
 3. The ratio of students who prefer *Divergent* to students who prefer *Hunger Games* is 1 to 2.
 4. The number of students who prefer *Hunger Games* is 50 more than the number of students who prefer *Divergent*.
 5. The number of students who prefer *Hunger Games* is two times the number of students who prefer *Divergent*.

2. Compare statements (4) and (5) above. In what ways is the information given by these statements similar? In what ways is it different? Explain.

All students entering 8th Grade Pre-Algebra

Task 1

Chichén Itzá was a Mayan city in what is now Mexico. The picture below shows El Castillo, also known as the pyramid of Kukulcán, which is a pyramid located in the ruins of Chichén Itzá.



The temple at the top of the pyramid is approximately 24 meters above the ground, and there are 91 steps leading up to the temple. How high above the ground would you be if you were standing on the 50th step?

Task 2

5,000 people visited a book fair in the first week. The number of visitors increased by 10% in the second week. How many people visited the book fair in the second week?

All students entering 8th Grade Algebra/Honors Algebra

Task

You are a representative for a cell phone company and it is your job to promote different cell phone plans.

1. Your boss asks you to visually display (graph) three plans and compare them so you can point out the advantages of each plan to your customers.
 - Plan A costs a basic fee of \$29.95 per month and 10 cents per text message
 - Plan B costs a basic fee of \$90.20 per month and has unlimited text messages
 - Plan C costs a basic fee of \$49.95 per month and 5 cents per text message
 - All plans offer unlimited calling
 - Calling on nights and weekends are free
 - Long distance calls are included
2. A customer wants to know how to decide which plan will save her the most money. Determine which plan has the lowest cost given the number of text messages a customer is likely to send.