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

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

Numbers and Digits

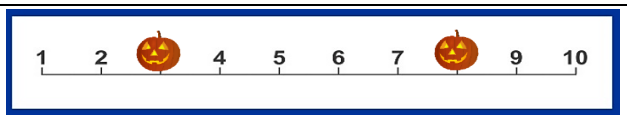
Welcome to Math Challenge #3. In this challenge, we are working on the building blocks of digits and numbers. We will start by exploring the number line, a handy tool that paints a clear picture of how numbers sit in a row. Additionally, we will dissect digits—the individual symbols that team up to form numbers—unveiling the magic behind their representation.

A **number** is a count or measurement that is really an idea in our minds. We write or talk about numbers using numerals such as "3" or three. A **digit** is a symbol in a numerical system. While a number can represent a number word or combination of digits, a digit is a symbol in a numeral representation of a number.

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.

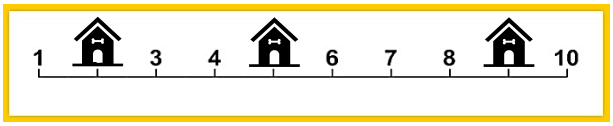
Answer

1. Some numbers are missing from the number line below. Identify the numbers that are covered by the pumpkins.

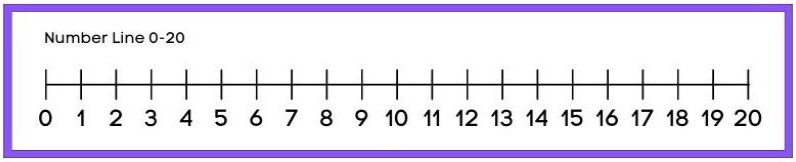


2. Elijah wrote the numbers from 1 to 15 in order without spaces: 12345678910….
What is the 15th digit that Elijah wrote?

3. A sum is the result of adding two or more numbers. What is the sum of the numbers covered by the dog houses?



4. Jerome's secret number is exactly in the middle of the numbers 7 and 15. Find Jerome's secret number.



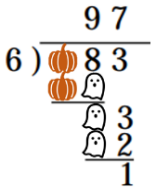
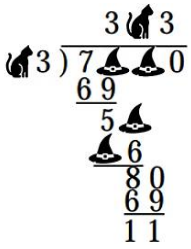
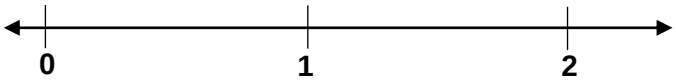
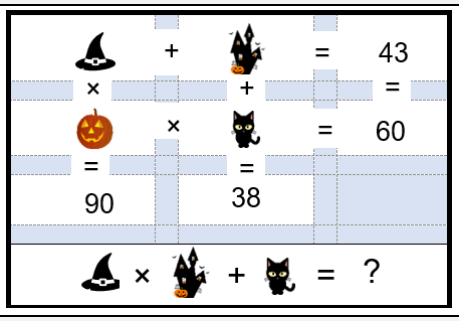
5. 3 6 6

Hameed creates a list of three different 3-digit numbers using the following cards as digits in the number. What is the result when he subtracts the smallest number from the largest number on the list?

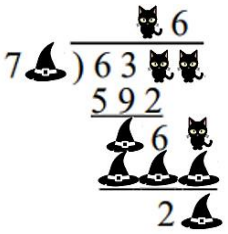
6. 1 2 3 4 5 6 7 8 9

a. Using the above cards at most once each, place a card in each box to make the **largest** sum. What is that sum? ☐☐ + ☐☐ *a.*

b. Using the above cards at most once each, place a card in each box to make the **smallest** sum. What is that sum? ☐☐ + ☐☐ *b.*

7.	Sonia lists six different 3-digit numbers using only the digits 5 and 7. Each digit is used at least once in each number. What is the result when she subtracts the smallest number from the largest number on the list?	
8.	Alex uses a combination master lock for his treasure box. He uses digits: 8, 8, 7, and 3. Use the clues to figure out the code that opens the master lock. • 7 is not at the first or last digit. • The first and last digit are different. • 3 is the digit in the ones place. • The two 8's are not next to each other.	
9.	Ursula uses the digits 1, 2, 3, 4, 5, and 6 to make two three-digit numbers. Each digit is used once. The numbers are then subtracted. What is the greatest possible difference?	
10	Given the following two division problems, and that a symbol represents the same digit in each occurrence, what does each of the four symbols represent? a.  b. 	
11.	A, B, C, and D are four numbers to be graphed on the number line below. A > 0.5; C and A are equally distant from 1; B is halfway between 0 and 0.5; A + B = 0.80; 1 < D < C. In what order will the points lie on the number line from left to right?  0 1 2	
12.	How many unique three-digit area codes (with no repeating digits) can be made using the digits 2, 5, 7, and 9?	
13.	The three-digit number NM8 is 386 more than the two-digit number NM. What is the value of the two-digit number NM?	
14.	Each of the following icons stands for a two-digit number, except for the pumpkin. What number is the question mark?	

15. Replace each icon with the same digit to solve this division problem.



= ____

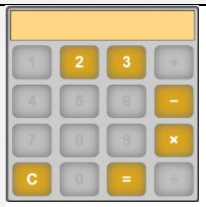
= ____

16. Rowena made up a number riddle with these clues:

- She is thinking of a 5-digit odd number and the sum of all its digits is 20, and all digits are distinct.
- The digits in the hundreds place and in the tens place are consecutive numbers and the hundreds digit is less than the tens digit.
- When you multiply the digits in the tens and hundreds places, you get the digits for the thousands and ten-thousands places.
- Her number is larger than 300×100.

What is Rowena's number?

17. The pages of a book are consecutively numbered from 1 through 384. How many times does the digit '8' appear in this numbering?

18. 

You are given a broken calculator. The only working digits are 2 and 3. Other working keys are the minus key (–), the multiplication key (×), the equal key (=), and the reset key (C).
Use only the working keys to make the totals from 1 to 20. The number three and five have already been done as examples.

1 =		**11 =**	
2 =		**12 =**	
3 =	3	**13 =**	
4 =		**14 =**	
5 =	33–22–3–3 or 3×3–2×2	**15 =**	
6 =		**16 =**	
7 =		**17 =**	
8 =		**18 =**	
9 =		**19 =**	
10 =		**20 =**	

Solution is available on November 3, 2023
www.mathinaction.org