

EXAMPLE How many different two-digit numbers can be made using only the digits 2, 4, 6, and 8?

We can write the numbers in order.

We organize the numbers in the 20's, 40's, 60's, and 80's as shown below.

22	42	62	82
24	44	64	84
26	46	66	86
28	48	68	88

So, there are a total of $4+4+4+4 = \mathbf{16}$ numbers.

If you make a list to solve a problem, keep the list organized.



PRACTICE Solve each problem below.

40. There are four 2-digit numbers that use only 6's and 7's. List them in order from least to greatest below.

_____, _____, _____, _____

41. There are eight numbers less than 1,000 that use only 1's and 0's as digits. Complete the list of these numbers in order below.

 0 , _____, _____, _____, _____, _____, _____, 111

42. How many numbers between 200 and 400 use only 2's and 3's as digits?

42. _____

PROBLEM SOLVING

Organizing Numbers

In the problems on this page, you are **arranging** digits.



PRACTICE | Solve each problem below.

- 43.** There are four ways to arrange the digits 5, 5, 5, and 7 to make a four-digit number. List them in order from least to greatest below.

_____, _____, _____, _____

- 44.** There are six ways to arrange the digits 2, 3, and 4 to make a three-digit number. List them in order from least to greatest below.

_____, _____, _____, _____, _____, _____

- 45.** There are six ways to arrange the digits 0, 0, 1 and 2 to make a four-digit number. List them in order from least to greatest below.

_____, _____, _____, _____, _____, _____

- 46.** How many different four-digit numbers can you make by arranging the digits 1, 1, 9, and 9?

46. _____

EXAMPLE

How many ways can we add 1's, 2's, and 3's to get a sum of 5 if we don't care about the order of the numbers? For example, $2+3$ and $3+2$ are counted as the same.

We can organize our work by the largest number in the sum.

If 3 is the largest number in the sum, there are two ways to get a sum of 5.

$$3+2$$

$$3+1+1$$

If 2 is the largest number, there are two ways.

$$2+2+1$$

$$2+1+1+1$$

If 1 is the largest number, there is just one way.

$$1+1+1+1+1$$

All together, there are **5** ways.

PRACTICE

Solve the problem below. In this section, we don't care about the order of the numbers we're adding. For example, $4+5$ and $5+4$ are counted as the same.

47. There are four ways to get a sum of 7 using 1's and 2's. Write all four ways on the lines below.

PRACTICE

Solve each problem below. For the problems in this section, we don't care about the order of the numbers. For example, $4+5$ and $5+4$ are counted as the same.

- 48.** There are four ways to get a sum of 8 using 2's, 3's, and 4's. Write all four ways on the lines below.

- 49.** How many ways are there to get a sum of 10 using 1's and 3's?

49. _____

- 50.** How many ways are there to get a sum of 8 using 1's, 3's, and 5's?

50. _____

- 51.** How many ways are there to get a sum of 6 using
★ 1's, 2's, and 3's?

51. _____