

Cuisinaire Strips

# Introduction

Numbers are most often introduced by counting. But the use of "Cuisinaire rods" (and K. Stern's rods) introduces addition of numbers as *addition of lengths*, emphasizing a geometric interpretation of numbers. This approach tends to postpone naming the numbers and often serves as a preparation to a more formal approach.

We use *Cuisinaire strips* in a similar way, but with some differences.

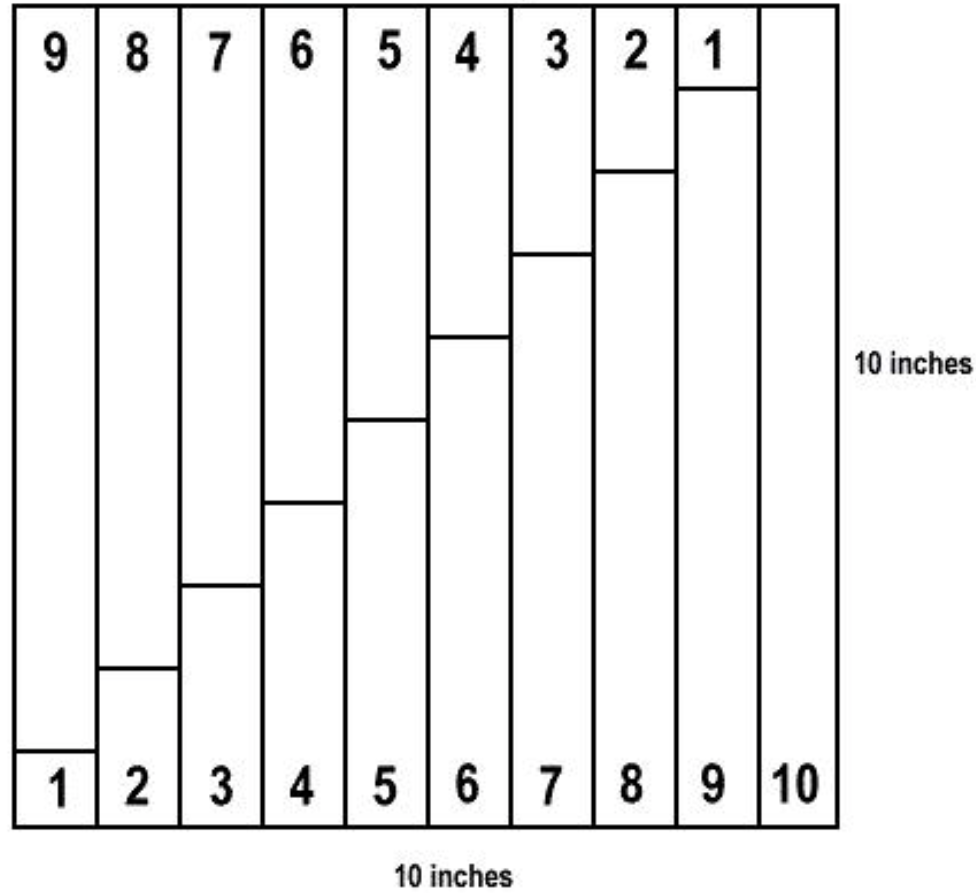
- The standard terminology for addition of numbers is used from the very beginning.
- The length of the strips is measured and expressed in standard units (here we use inches).
- Making a kit is an essential introduction to other activities.

So let's make a kit and do some activities!

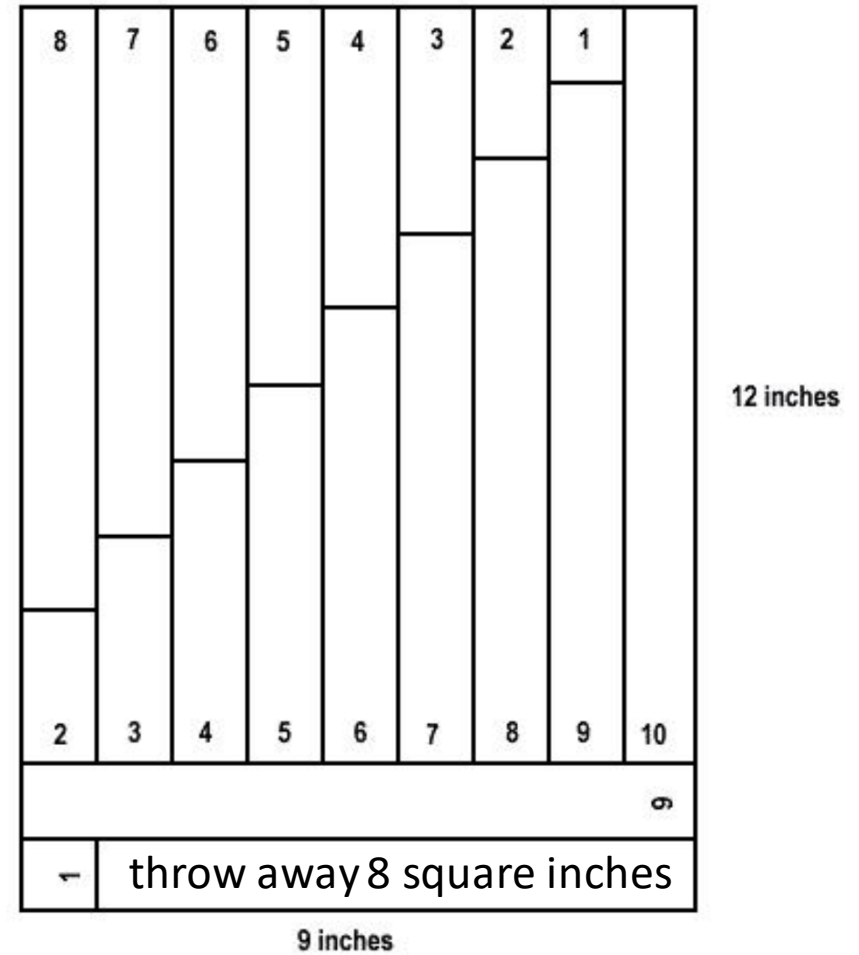
## Supplies needed to make a set of Cuisinaire strips

- one 12 inch by 9 inch piece of construction paper or one 10 inch by 10 inch sheet of poster board
- ruler
- scissors
- large manila envelope to keep the strips in

This illustration is for use with posterboard.

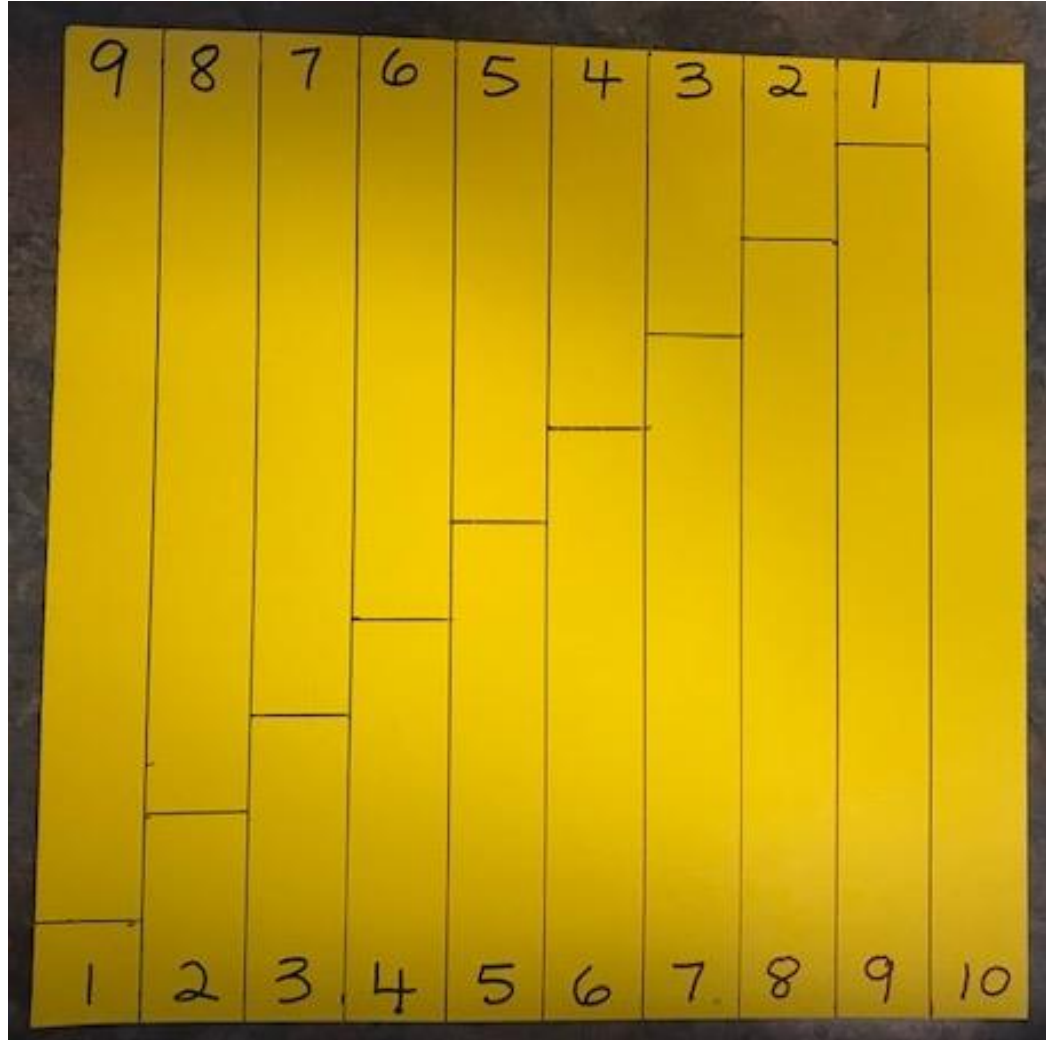


This illustration is for standard construction paper.

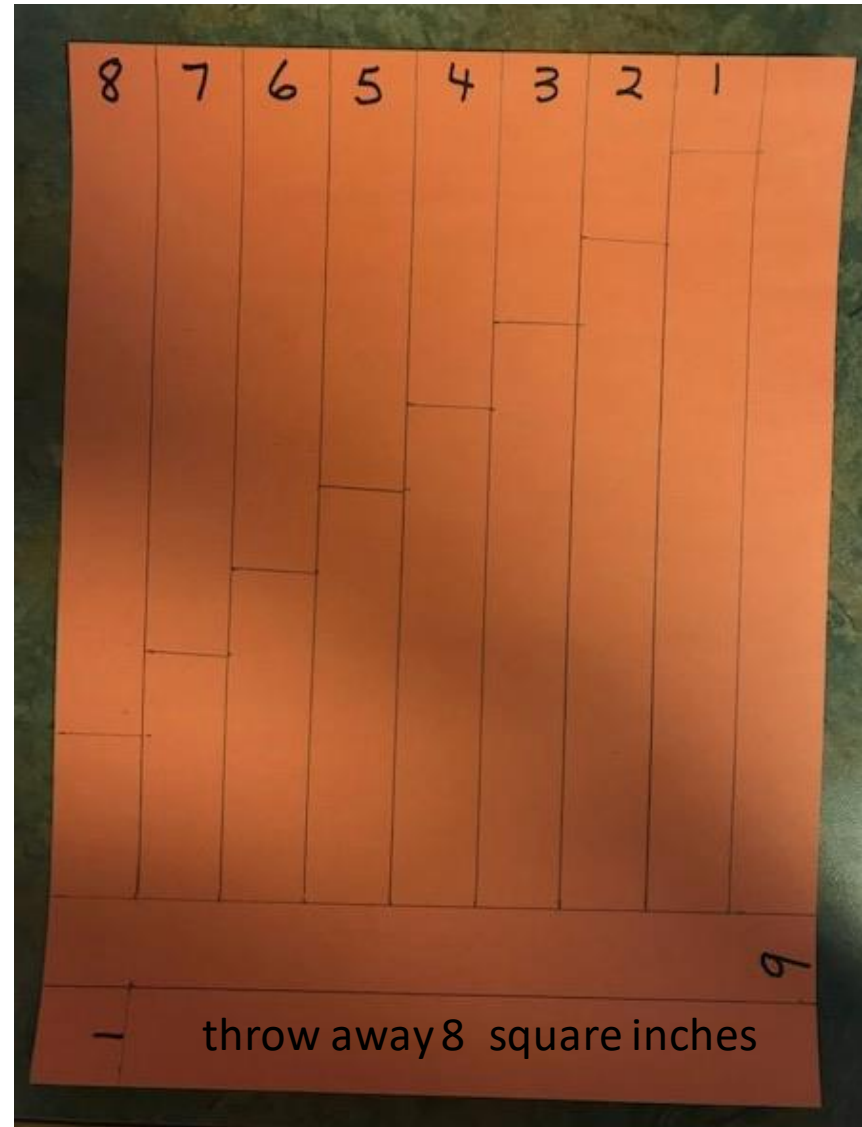


The teacher shows the students the pattern, and explains what they need to do. Students draw the pattern; write the numbers; and cut out the strips. They should write their names on the envelope and close it. It is best if children sitting next to each other use different colors of poster board (or construction paper), so their strips don't get mixed up.

# Some actual samples

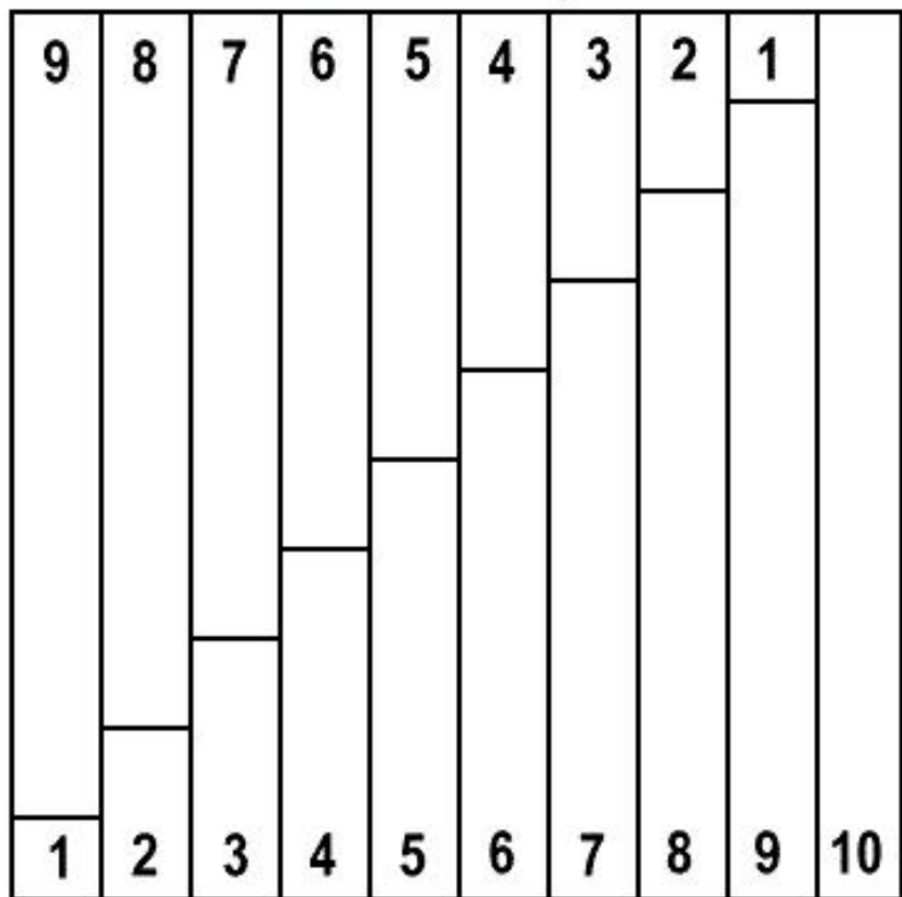


poster board



construction paper  
(throw away 8 square inches of bottom row)

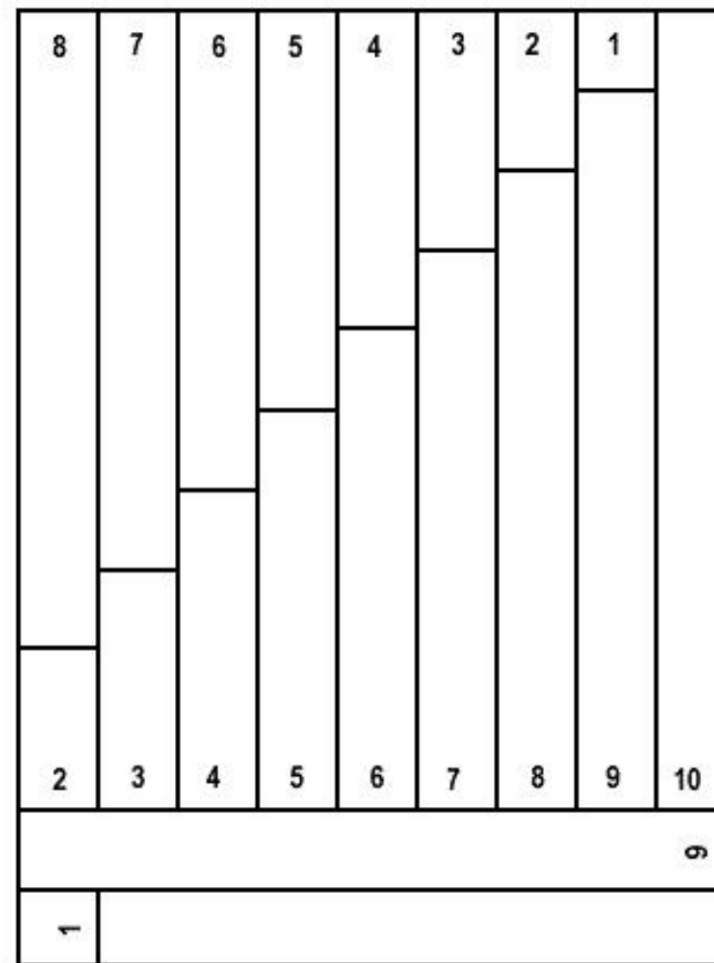
This illustration is for use with posterboard.



10 inches

10 inches

This illustration is for standard construction paper.



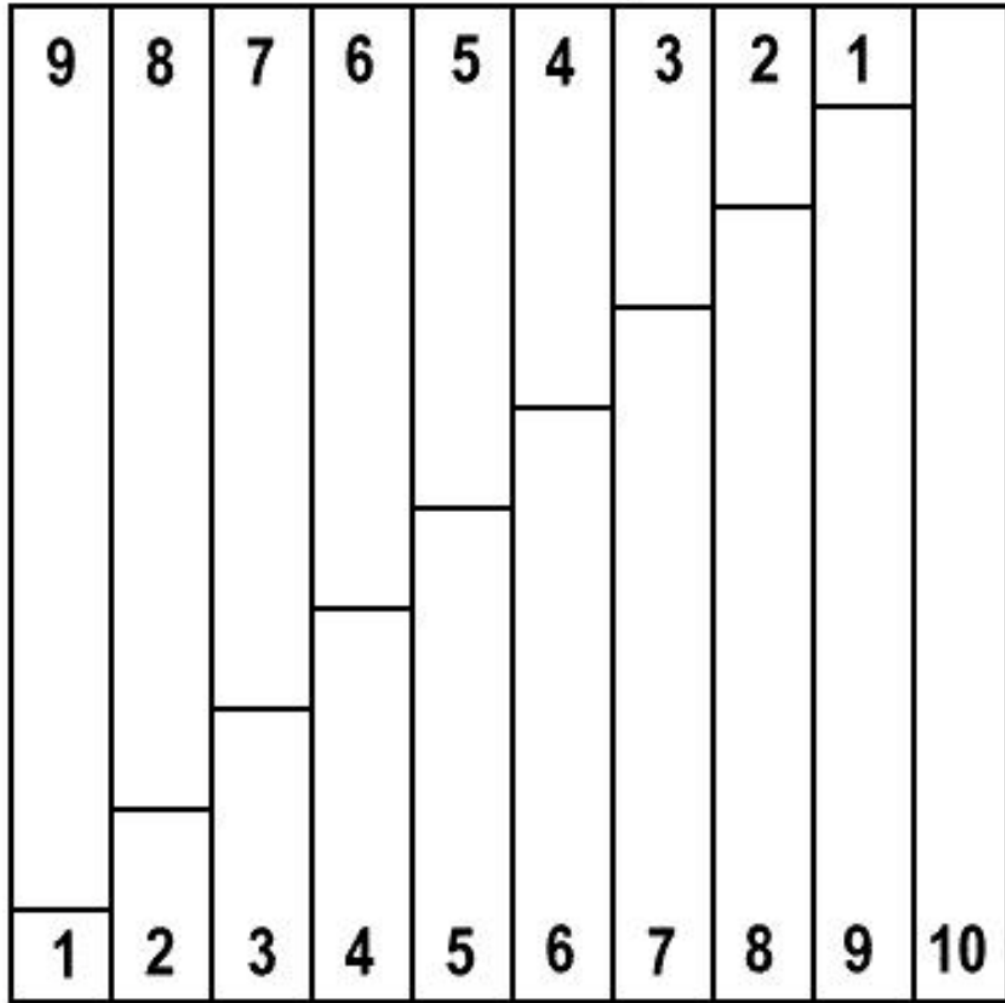
12 inches

9 inches

**Remark** The strips must **not** be divided into one inch squares. The numbers describe the length of each strip measured in inches. Students should confirm this by measuring each strip with a ruler.

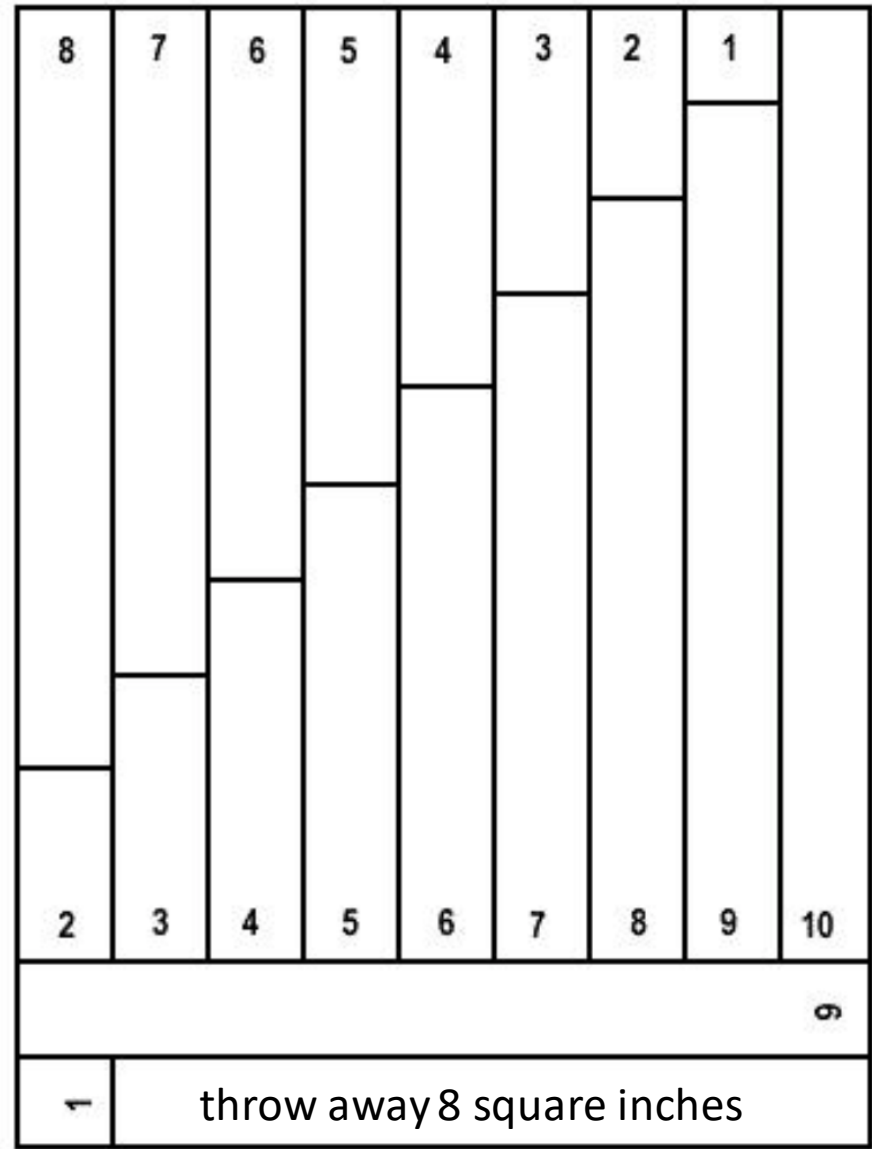
**Remark** If this task is too difficult, at least part of it must be done by the students (cutting and measuring the strips and writing the numbers on them).

This illustration is for use with posterboard.



10 inches

This illustration is for standard construction paper.



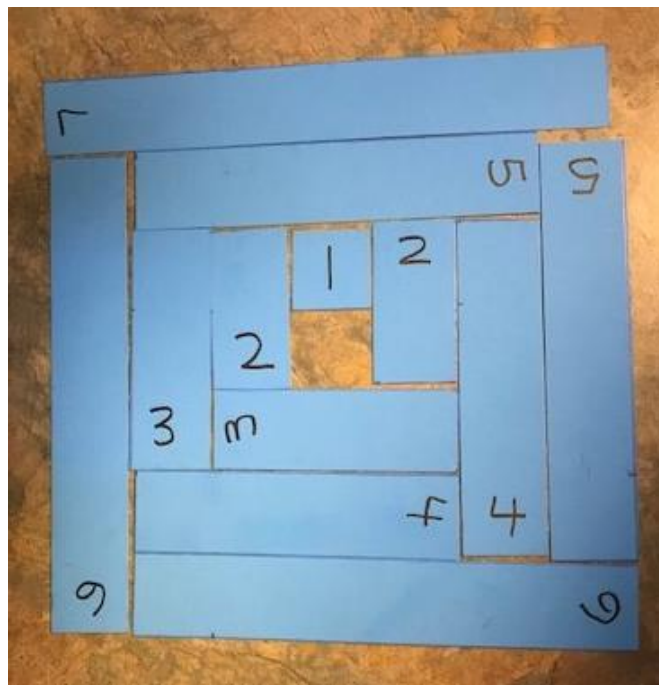
12 inches

9 inches

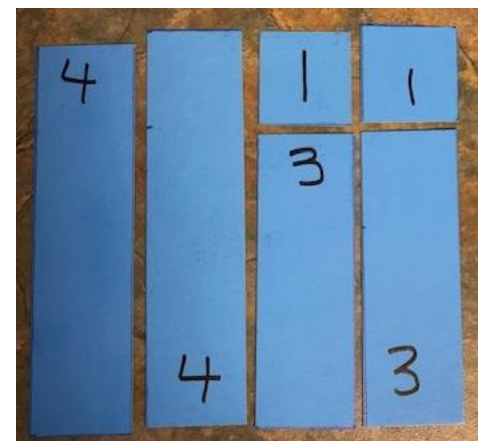
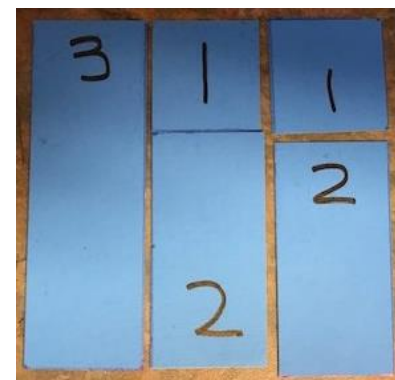
## 2. Puzzle problems

- Arrange the nineteen strips you have into a square. (That is easy!)
- Make some rectangles and some more squares.
- What other shapes can you make?

7 by 7 square  
with a hole  
in the middle



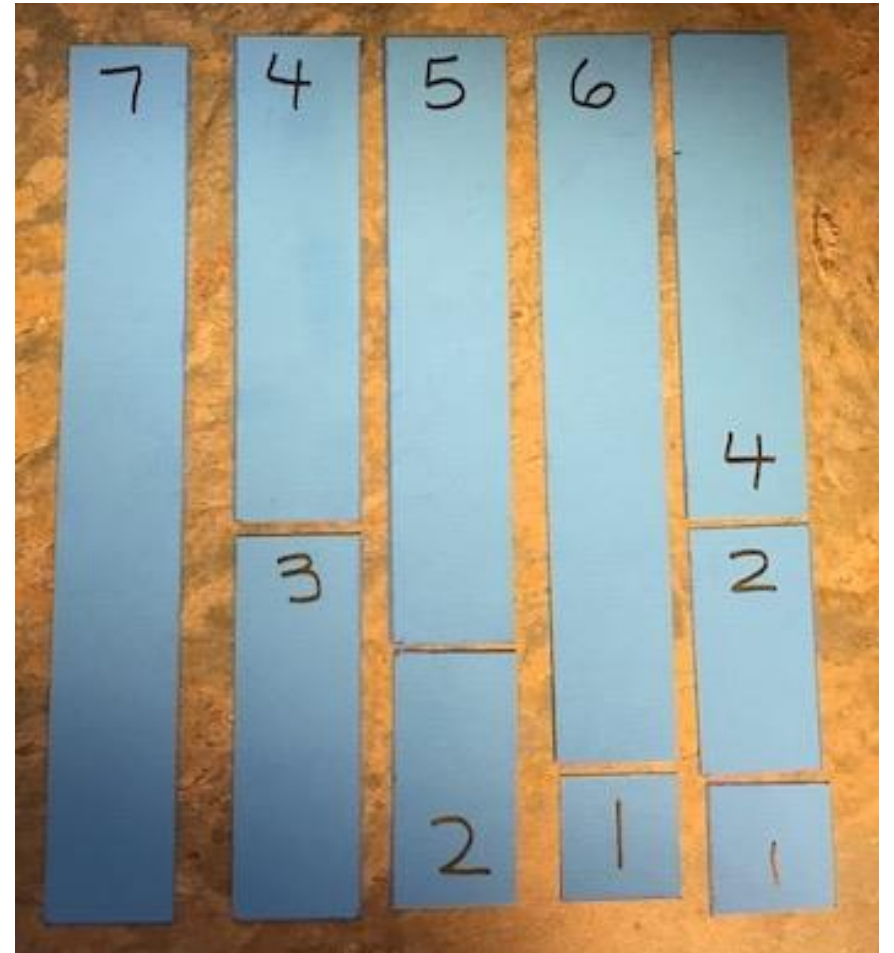
some  
squares—  
can you  
make more?





### 3. Basic addition problems

- The total length of two strips may be equal to the length of a third one.
- In how many ways can you make a length of 10 inches from two strips? Here the order does not count, so we have 5 ways,  $1 + 9, \dots$ , and  $5 + 5$ .
- How many ways can we make a length of 9, 8, ... inches?
- How to make a length of 10, 9, 8, ... from three strips?

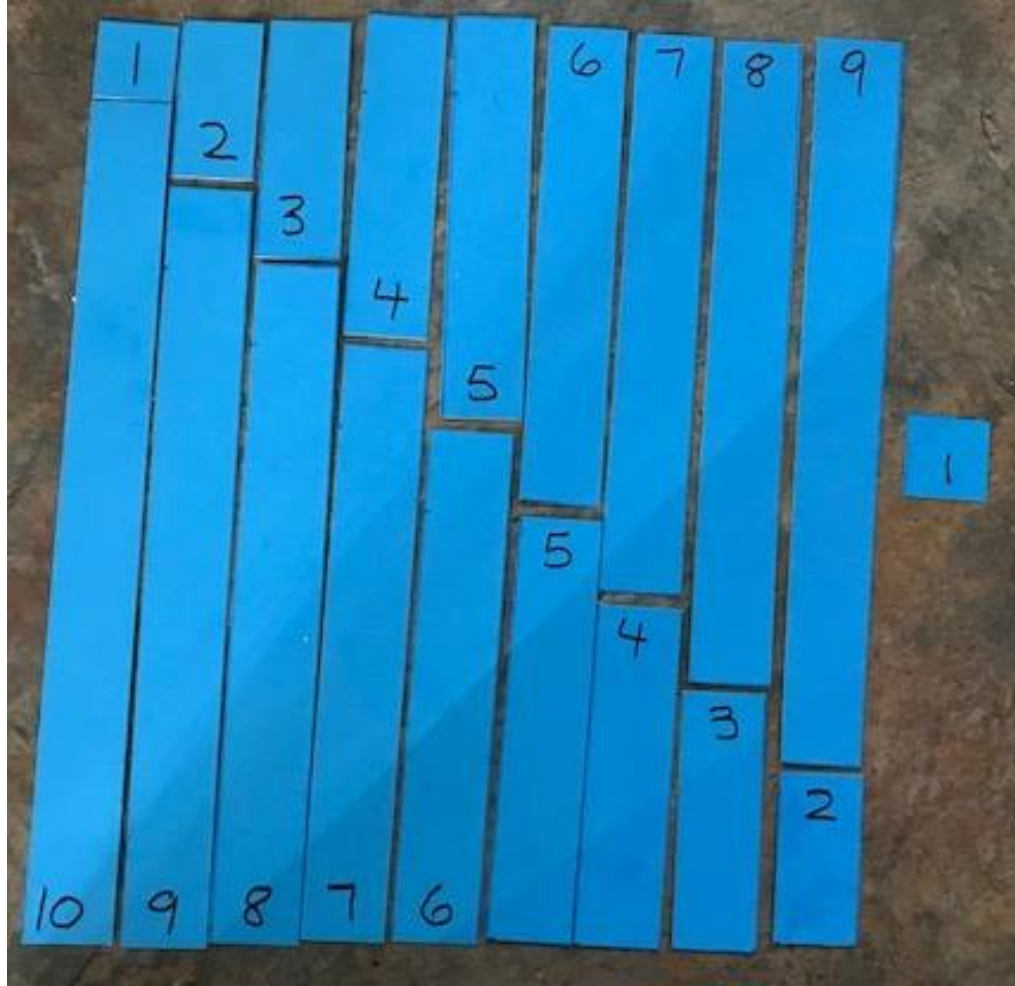


Some ways to make 7

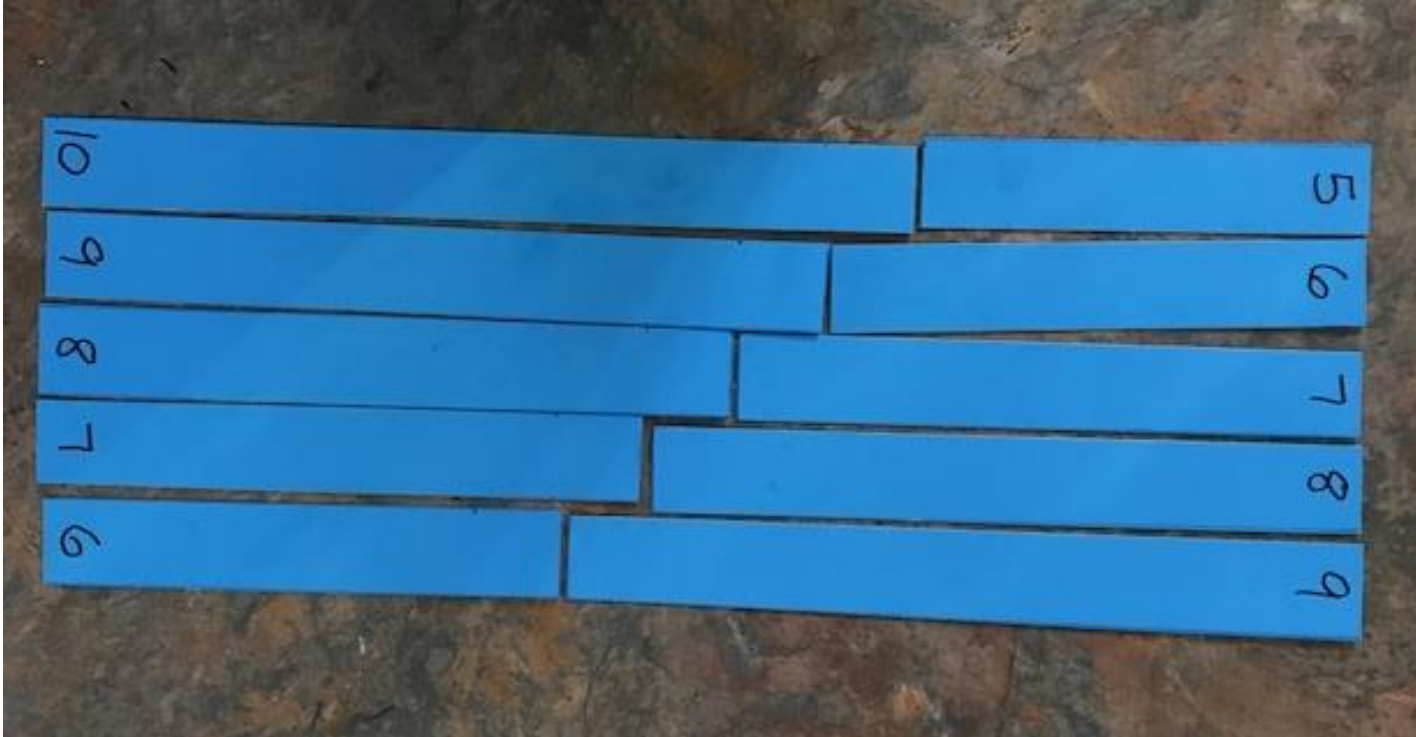
$$4 + 3 \quad 6 + 1$$

$$5 + 2 \quad 4 + 2 + 1$$

Can you find more?



Making eleven in nine ways, with one left over  
(What is the multiplication problem?)  
(Notice that  $9 + 2 = 2 + 9$ ....)



Some ways to make 15 with  
2 strips.

(Notice that  $9 + 6 = 6 + 9$ .)

## Extra credit problem

In how many ways can you make 15 with 3 strips?

In counting, let's say that

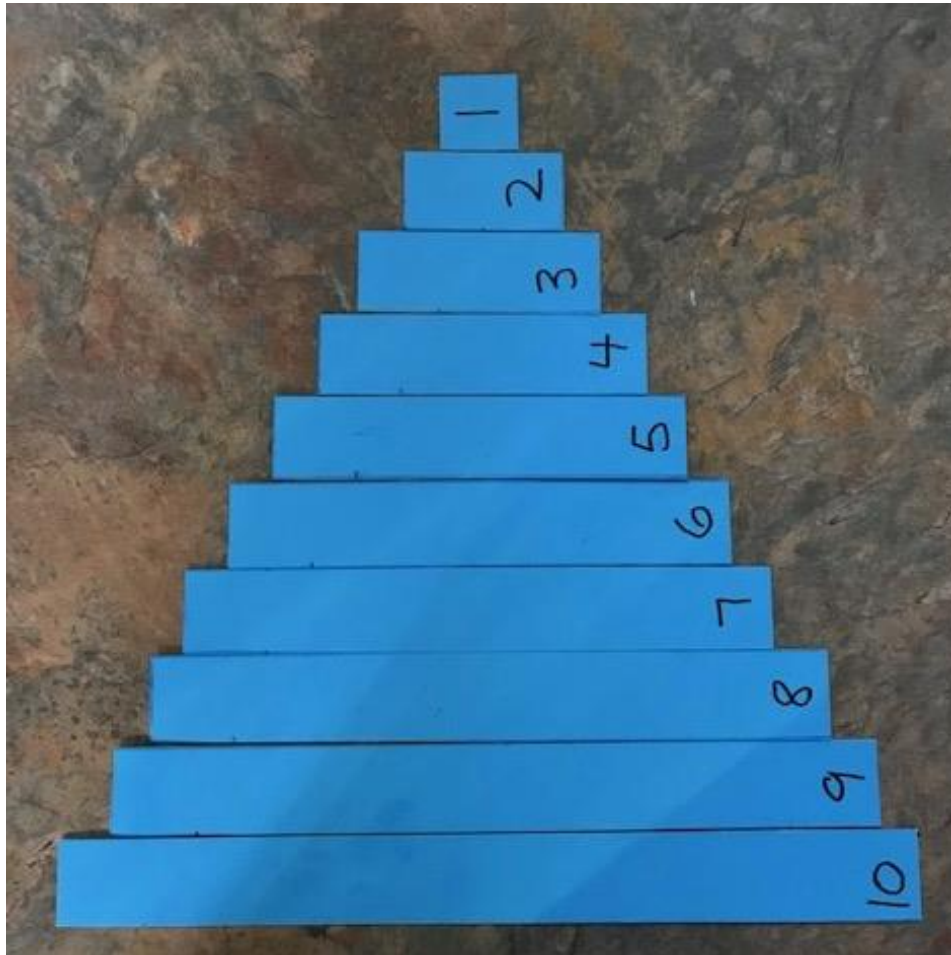
$10 + 4 + 1$  is the same as

$10 + 1 + 4$ , for example. (So we count it just once.)

I counted 14 different ways.

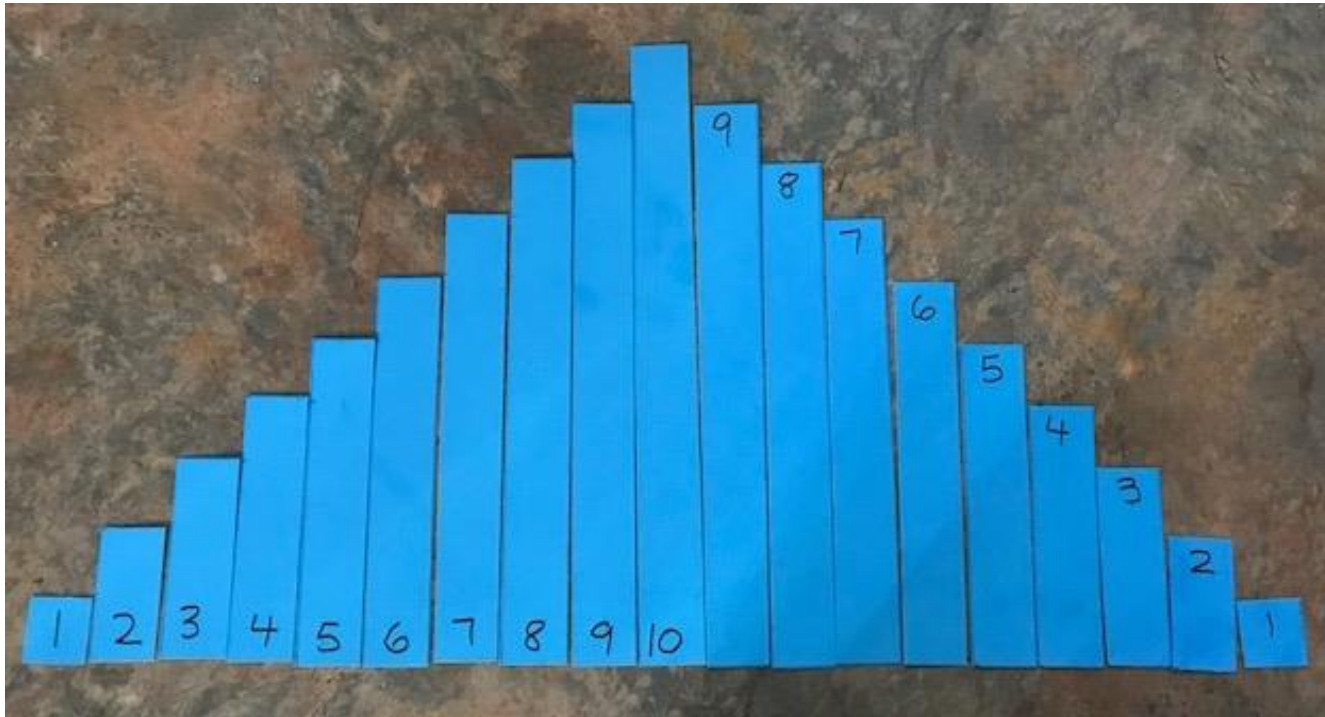
Did I make an error? Can you find them all?

In order to get extra credit, please list at least 14 ways. If you find more, list them as well.



A pyramid!

What is  $1 + 2 + 3 + 4 + \dots + 9 + 10$ ?



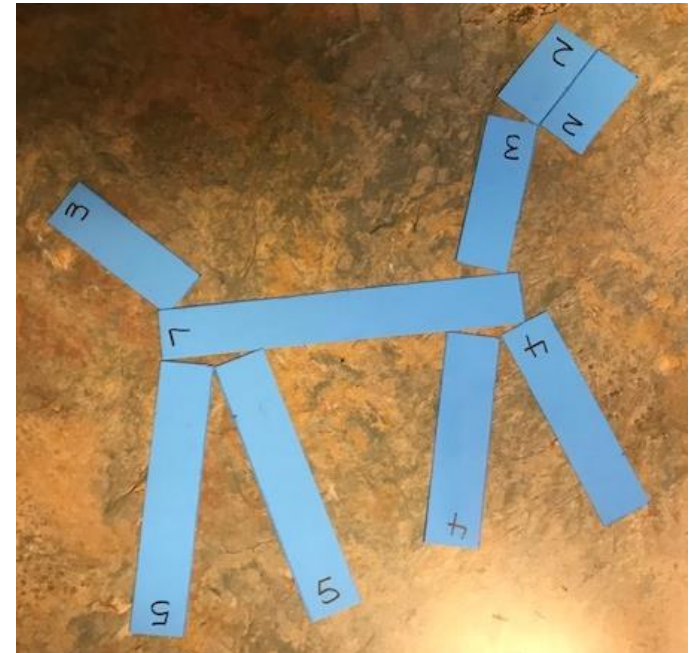
All the marbles (AKA strips)!  
What is the sum?



## 4. More addition problems

- Which combination of strips give the same length, for example, 14 inches?
- What is the total length of the strips, 3 inches, 5 inches and 7 inches? If you are not sure, measure it with a ruler.
- Can you solve some of these problems in you head, with your eyes closed?
- If you lined up all your strips, what would be the total length?

a stick horse  
How many  
square inches?



And of course....

YAY



!



Now it's your turn! Make up some problems, some diagrams, some configurations, some designs.

What do you think your students can learn from using these strips?

And don't forget the extra credit problem:

In how many ways can you make 15 with 3 strips?

In counting, let's say that

$10 + 4 + 1$  is the same as

$10 + 1 + 4$ , for example (so we count it just once).

I counted 14 different ways.

Did I make an error? Can you find them all?

In order to get extra credit, please list at least 14 ways. If you find more, list them as well.

END!