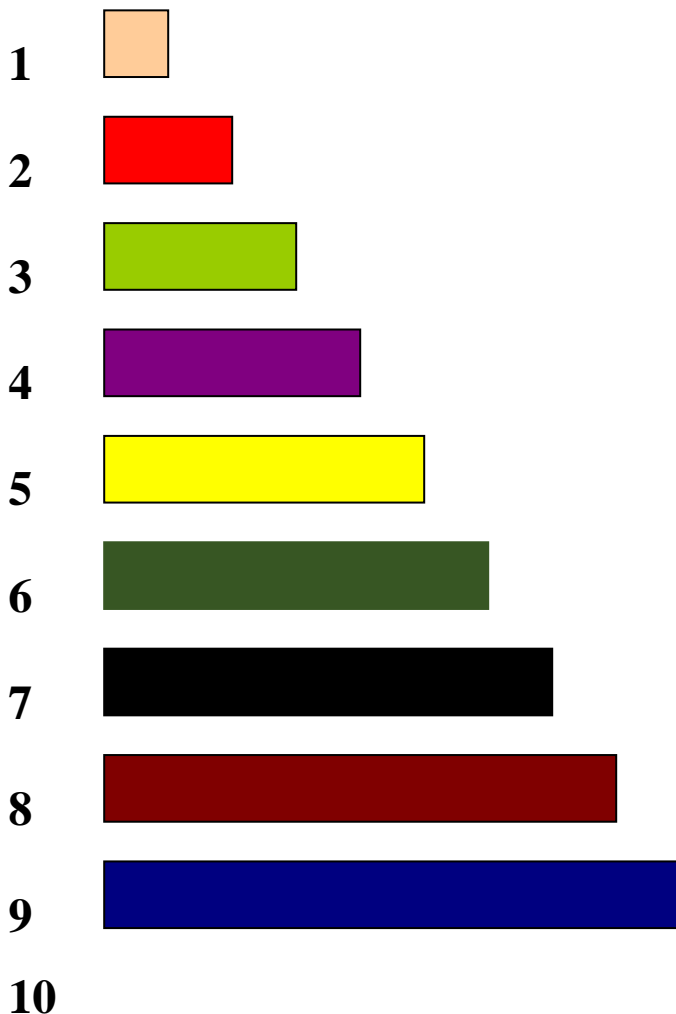


Rod Trains

Level E

A rod train can be made with different-sized rods, by putting the rods end to end. Rod trains can be just one rod, several rods of equal size, or several rods of differing sizes. The order of the rods matters. For example, a rod train made up of a two-unit rod on the left side then a four-unit rod on the right is a different rod train from one that has a four-unit rod on the left side and a two-unit rod on the right.

You have a rod of every natural number length. For example, you have a rod with a length of one unit, a rod with a length of two units, etc. You have an infinite number of rods in each size.



Determine the number of rod train combinations needed for a train of length **n**. Justify mathematically how you got your answer.

Cuisenaire Rods

