

# Problem Posing

## Asking “What-If-Not?” with Patterns, Functions, and Geometry

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### Sources:

Brown, Stephen I. and Walter, Marion I. The Art of Problem Posing (3<sup>rd</sup> edition). New Jersey: Lawrence Erlbaum Associates, Inc., 2005.

Brown, Stephen I. and Walter, Marion I. Problem Posing: Reflections and Applications. New Jersey: Lawrence Erlbaum Associates, Inc., 1993.

### Trains of Length 10

How many trains of length 10 can you make with Cuisenaire rods *without* using length 1 rods?

If you use identical rods in a different order, it is considered a separate train. A 2-6-2 train is different from a 2-2-6 train.

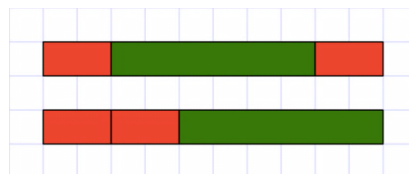


Image made at <http://nrich.maths.org/4348>

### Sequence

Given the sequence 1, 5, 9, 13, 17, 21, 25, 29, 33, ... What is the fifteenth term?

### Biking Home

Tommy lives out in the country. A straight road passes his house, with lots of open grassy field on either side. He is allowed to ride his bike anywhere as long as he can get home in ONE hour or less from the time his parents call him on this cell phone. He can ride fast on the road (10 mph) and less fast in the grassy area (6 mph). Show and explain where Tommy can be and still be able to get home within an hour.

### A Quadratic Function

Determine all of the quadratic functions  $f(x) = ax^2 + bx + c$  that satisfy the relationship  $f(f(1)) = f(f(2)) = f(f(3))$ .

### More about our work:

*Implementing the Mathematical Practice Standards* ([mathpractices.edc.org](http://mathpractices.edc.org))

- Professional development through dialogues that illustrate mathematical thinking

*Assessing Secondary Teachers' Algebraic Habits of Mind* ([mhomresearch.edc.org](http://mhomresearch.edc.org))

- Researching ways teachers use structure and language in doing and teaching math



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