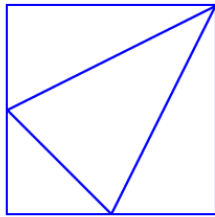


Further Challenges Nrich

If you are looking to further your learning, try one of these NRICH problem solving challenges. These will not be marked via google classroom, but you are welcome to explore and complete these at home. 😊

### Fraction Fascination

Age 7 to 11 ★★★



I drew this picture by drawing a line from the top right corner of a square to the midpoint of each of the opposite sides. Then I joined these two midpoints with another line.

Can you see four triangles in the square?

What fraction of the area of the square is each of these triangles?

Then I drew another picture:

### NRICH Fraction Fascination:

<https://nrich.maths.org/5061>

### Keep it Simple

Age 11 to 14 ★

**Unit fractions (fractions which have numerators of 1) can be written as the sum of two different unit fractions.**

For example

$$\frac{1}{2} = \frac{1}{3} + \frac{1}{6}$$

Charlie thought he'd spotted a rule and made up some more examples.

$$\frac{1}{2} = \frac{1}{10} + \frac{1}{20}$$

$$\frac{1}{3} = \frac{1}{4} + \frac{1}{12}$$

$$\frac{1}{3} = \frac{1}{7} + \frac{1}{21}$$

$$\frac{1}{4} = \frac{1}{5} + \frac{1}{20}$$

Are all his examples correct?

What do you notice about the sums that are correct?

Find some other correct examples..

How would you explain to Charlie how to generate lots of correct examples?

### NRICH Keep it Simple:

<https://nrich.maths.org/keepitsimple>

## NRICH: Egyptian Fractions

<https://nrich.maths.org/1173>

### Egyptian Fractions

Age 11 to 14 ★★

The ancient Egyptians didn't write fractions with a numerator greater than 1 - they wouldn't, for example, write  $\frac{2}{7}$ ,  $\frac{5}{9}$ ,  $\frac{123}{467}$ .....

Instead they wrote fractions like these as a sum of **different** unit fractions.

There are several NRICH problems based on Egyptian fractions. You can start by exploring unit fractions at [Keep it Simple](#)

In this problem we are going to start by considering how the Egyptians might have written fractions with a numerator of 2 (i.e. of the form  $\frac{2}{n}$ ).

For example

$$\frac{2}{3} = \frac{1}{3} + \frac{1}{3} \text{ (but since these are the same, this wasn't allowed.)}$$

or

$$\frac{2}{3} = \frac{1}{3} + \frac{1}{4} + \frac{1}{12}$$

or

$$\frac{2}{3} = \frac{1}{3} + \frac{1}{5} + \frac{1}{20} + \frac{1}{12}$$

or

$$\frac{2}{3} = \frac{1}{3} + \frac{1}{6} + \frac{1}{30} + \frac{1}{20} + \frac{1}{12}$$

or

$$\frac{2}{3} = \frac{1}{4} + \frac{1}{12} + \frac{1}{7} + \frac{1}{42} + \frac{1}{31} + \frac{1}{930} + \frac{1}{21} + \frac{1}{420} + \frac{1}{13} + \frac{1}{156}$$

and so on, and so on!!

You might want to check that these are correct.

(If you can't see how these have been generated, take a look at [Keep it Simple](#) )