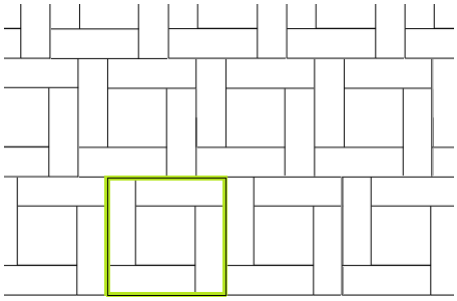
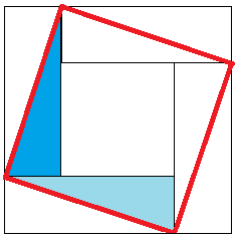
Pythagoras' Theorem

(Note: the text below is probably unnecessary: look at the pictures, and you will see the proof of Pythagoras' Theorem, without further explanation!)

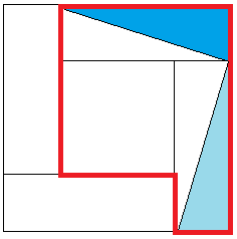
To prove Pythagoras' Theorem, we'll play with a tiled floor with a pattern like this:



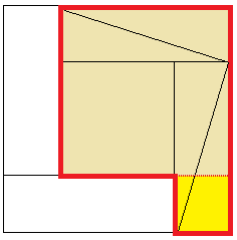
Notice we have a repeated central square surrounded by rectangles (whose dimensions we shall call $a \times b$).



We can divide the four non-square (rectangular) pieces into triangles; when we do, we see a larger "rotated" central square (whose dimensions we shall call c^2).



Then we rearrange the triangles: imagine the dark blue triangle rotating 90° and the light blue triangle rotating 90°, making the top region (outlined in red above) transform into a new region (also outlined in red). Notice the area of the region outlined in red has not changed.



Now regroup ("recolour") this figure: we have two squares (again outlined in red), whose areas are a^2 and b^2.
Notice that the blue triangles are right-angled triangles, with sides a, b, c (c being the hypotenuse), and so the red outlined area initially (in the first diagram) is a square with area c^2, and after merely moving tiles around we arrive (in the bottom diagram) a red outlined area which is $a^2 + b^2$. So these areas must be equal. Thus Pythagoras' Theorem!

In short: