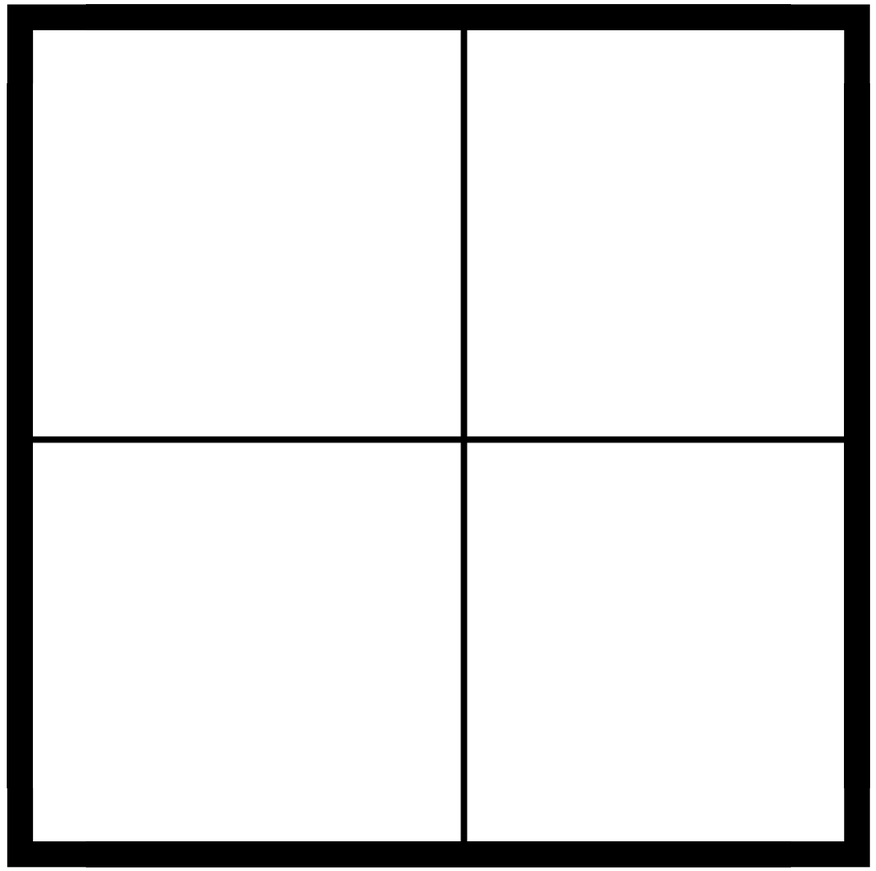
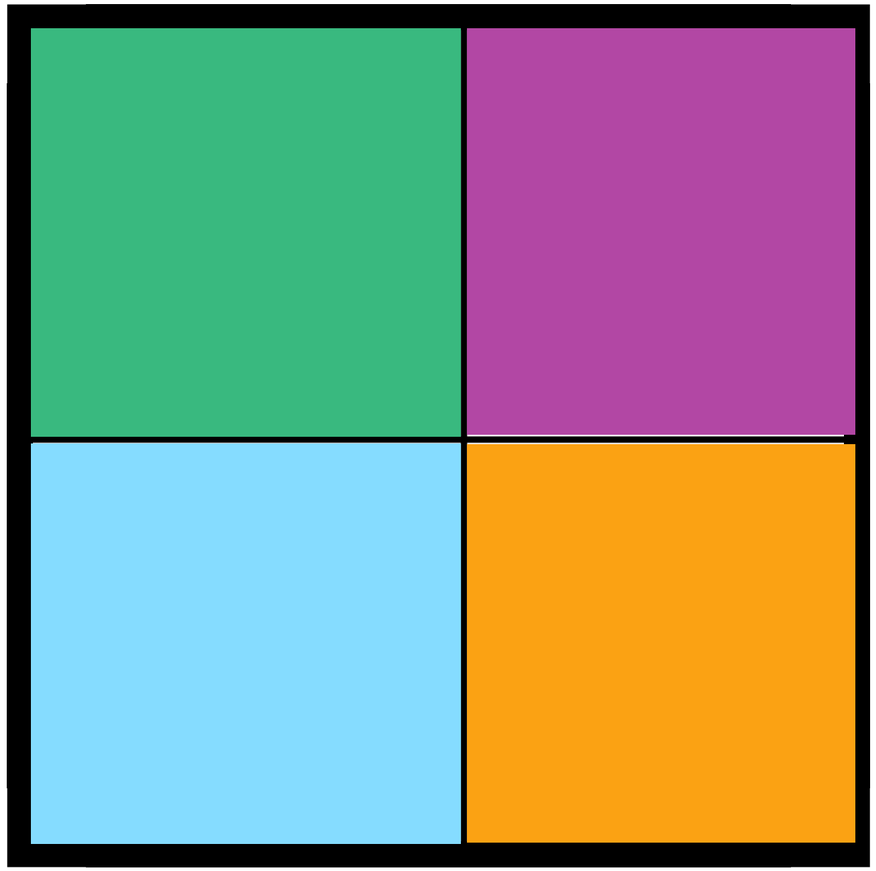
maths
beyond the curriculum

THE FOUR COLOUR THEOREM

MATHS MEETS COMPUTERS



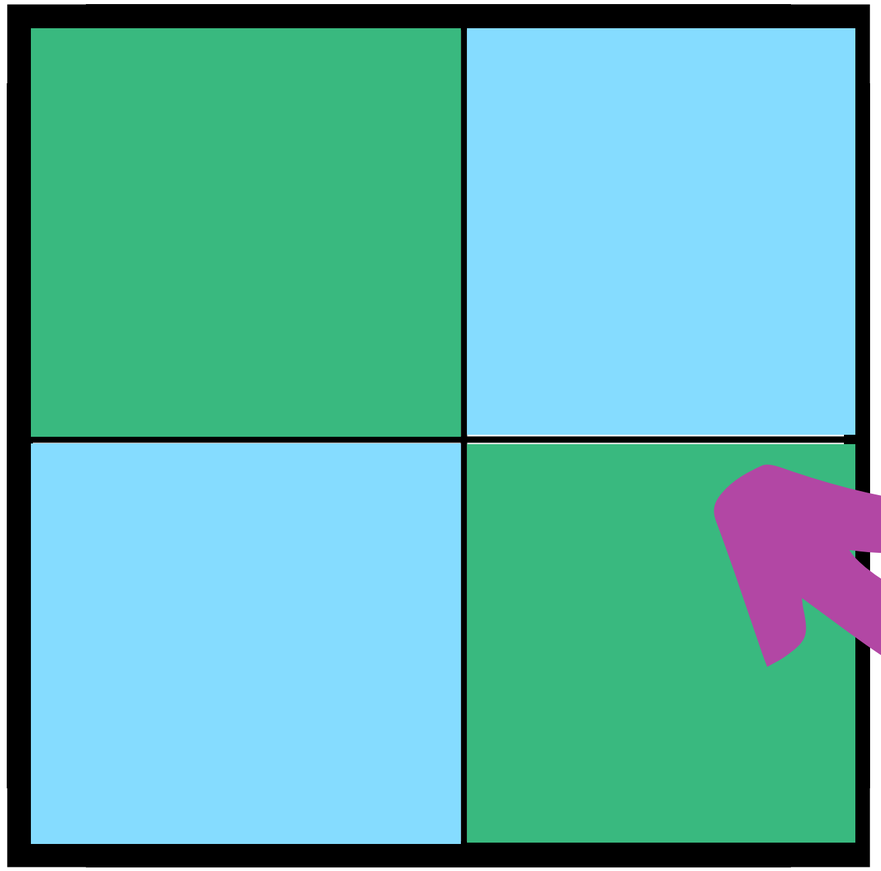
I can colour each small square so that no two colours are touching



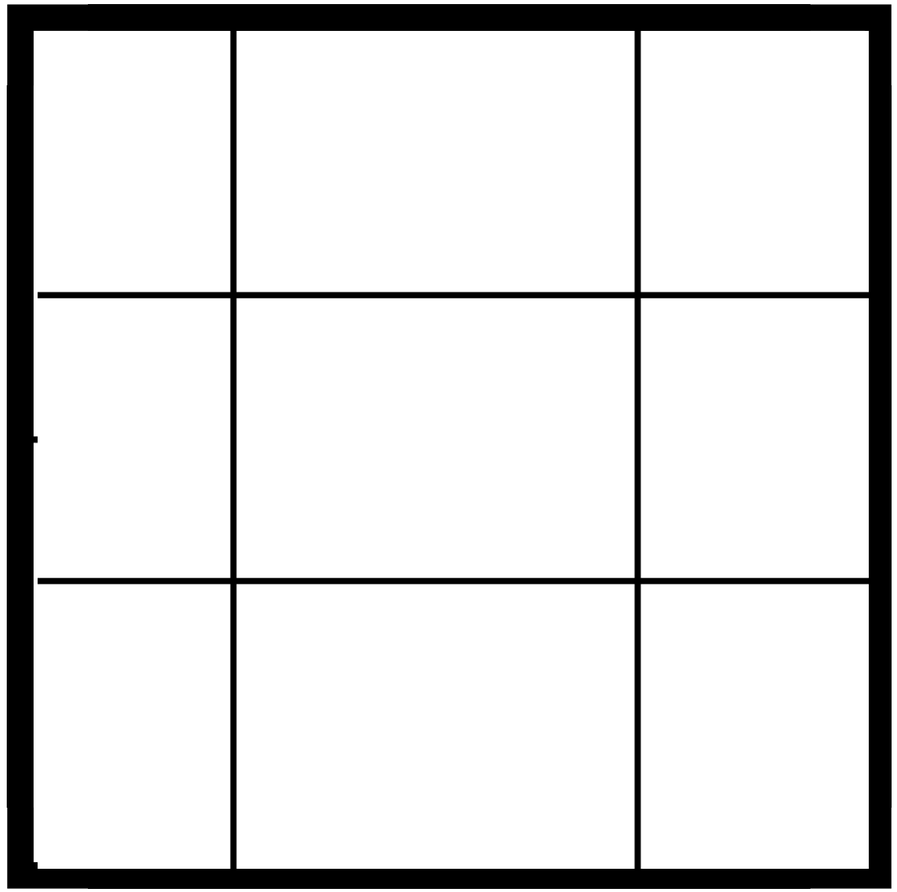
I can colour each small square so that no two colours are touching

Can I do it in fewer colours?

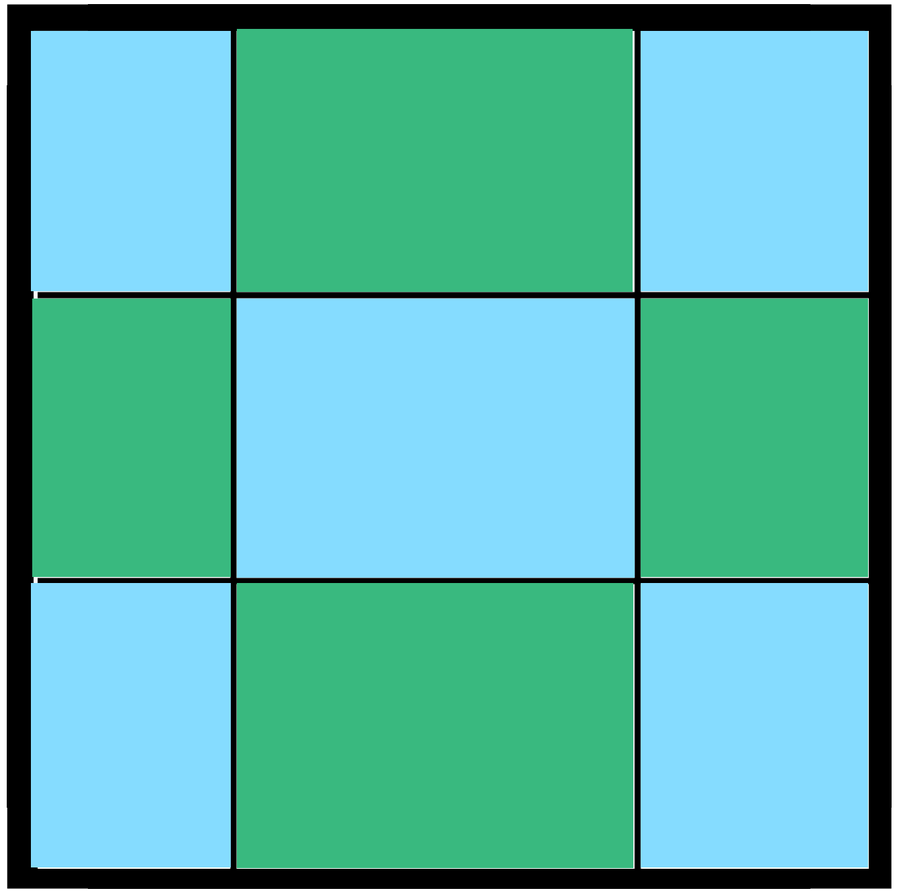
JSPaint Link



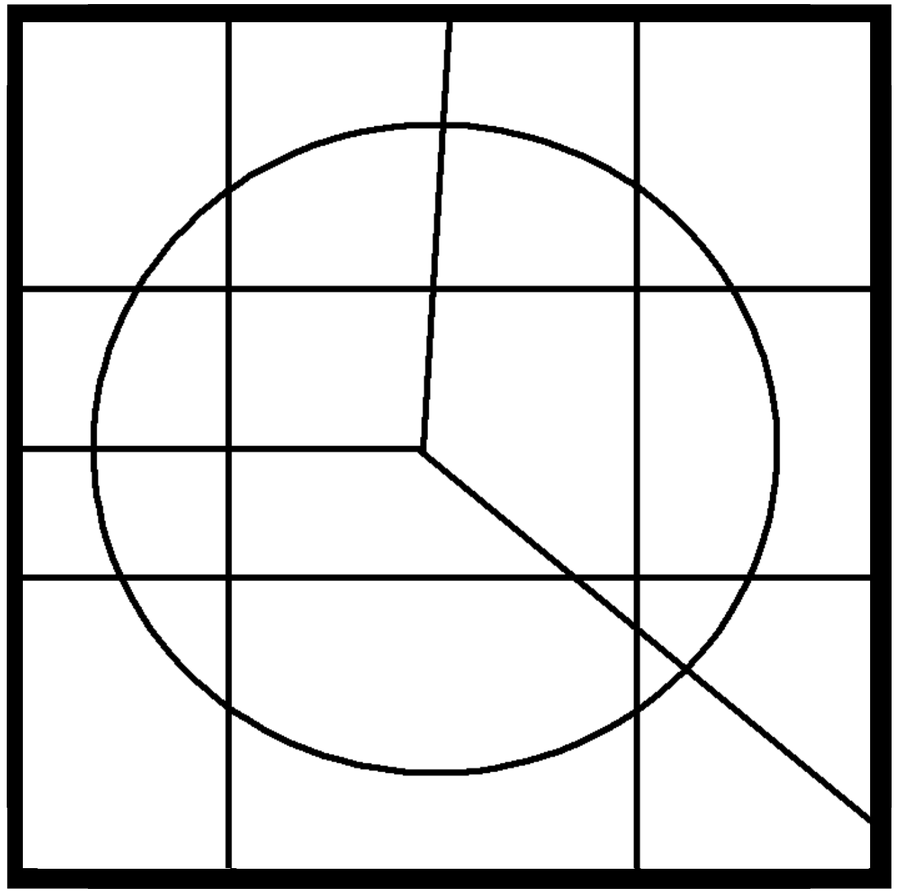
These same colours are not touching as they don't share an edge



How many colours do I need here?



Still only two colours! What sort of design needs more than two colours?



Can I do this in two colours? What about three? or four?

Image Link

JSPaint Link

Francis Guthrie in 1852 was colouring a map of England when he ***postulated*** that he could colour it in just four colours where no colours shared an edge

Can you?

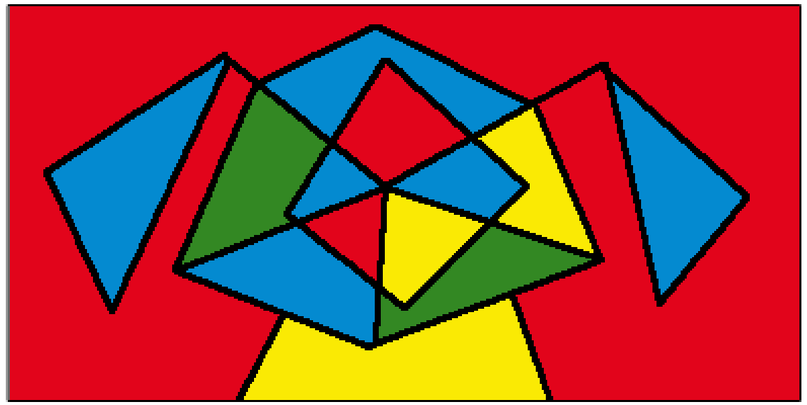
postulate: *to claim something as true*

Try digitally with these links

Mathigon

Transum

postulate: to claim something as true

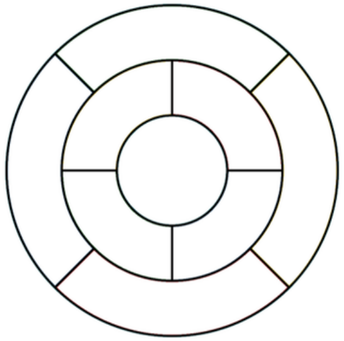


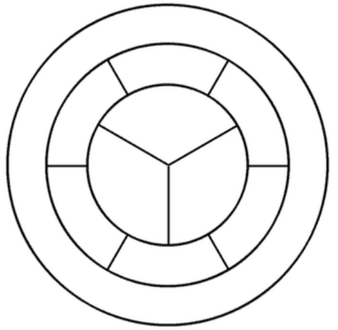
Over 100 years after this was suggested it was finally **proven**. Though many mathematicians had tried to prove it, it was finally solved with the help of a **super computer** in 1976, when Kenneth Appel and Wolfgang Haken finally showed four colours are all you need for ANY standard map.

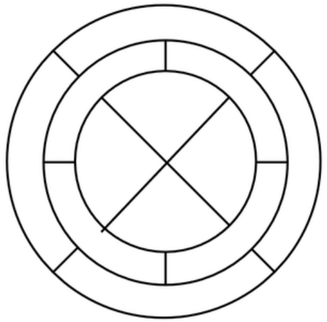
It was the first time a computer was used for a proof - they are now used all the time in mathematics

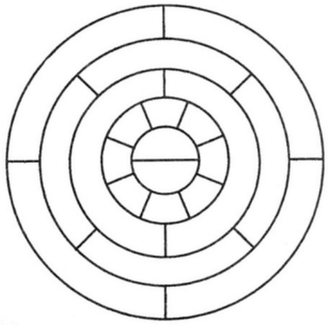
Follow Up Activity One

Use only four colours to fill these 'maps' in



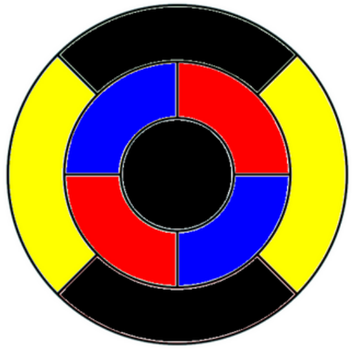


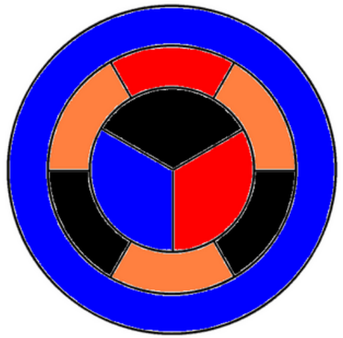


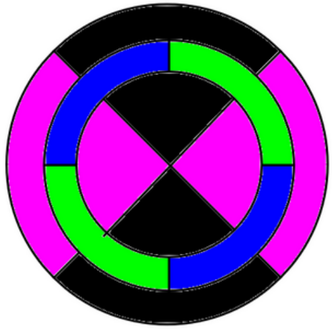


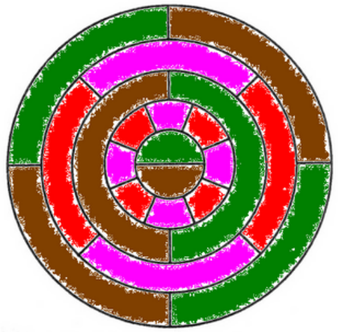
Courtesy of Don Steward Median blog

Follow Up Activity One
Possible Answers





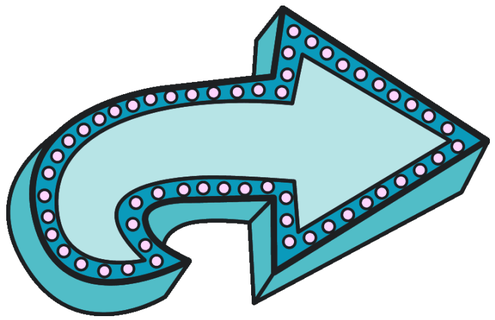




Courtesy of Don Steward Median blog

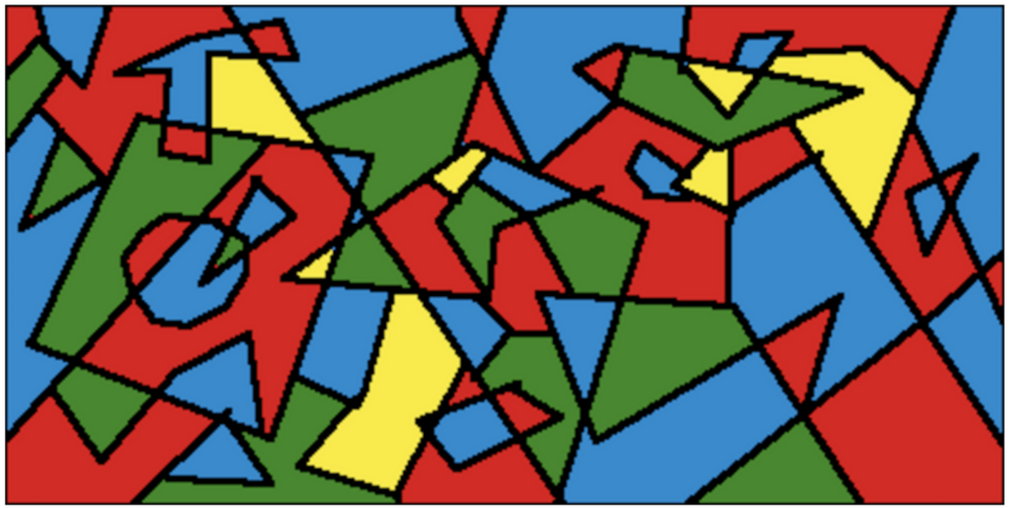
Follow Up Activity Two

Check out this tool which solves any 'map'



Four color theorem - map solver

April 11, 2016



Final Summary

Write one paragraph that explains what the four colour theorem is with a small example

In 20 words or less write down why mathematicians had to use a computer to solve the four colour theorem