



# MATHS WI NAE BORDERS

This mini-competition is inspired by the annual 'Mathématiques sans Frontières' contest. 'Maths wi nae Borders' can be entered by *any* class in Scotland. The five tasks should be completed in less than two hours. Entries should be submitted online and must be received by 23/10/23.

To enter

- Head to [www.mathsweek.scot/schools/challenges](http://www.mathsweek.scot/schools/challenges)
- Select Maths Wi Nae Borders
- Fill out the form
- Upload your files to the form following the instructions
- Await your certificates and keep your fingers crossed you win!

Some advice from the markers, based on previous competitions:

- Partial solutions and attempts can gain marks.
- Neat and careful work is important
- Remember that we are looking for entries from an entire class (so as a class pick your best solution to each of the five problems).
- Many entries will include correct answers so consider how to make your entry stand out (an excellent answer might include a description of how you approached the question, any extra formulae or strategies you came across or any observations that you think are Mathematically interesting).

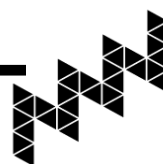
**Next year,  
Bonnie will  
be 5 years  
old.**



**Two days  
ago she  
was 2 years  
old.**

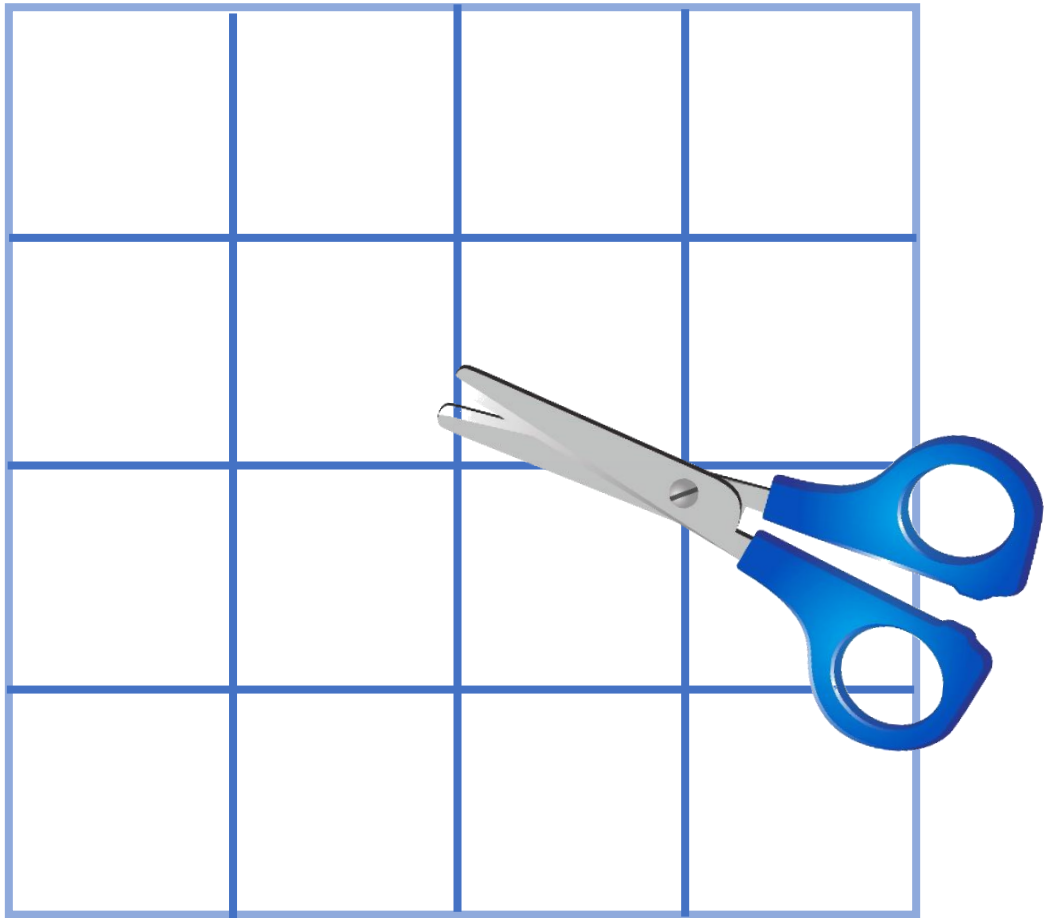


**When is  
Bonnie's  
birthday?**

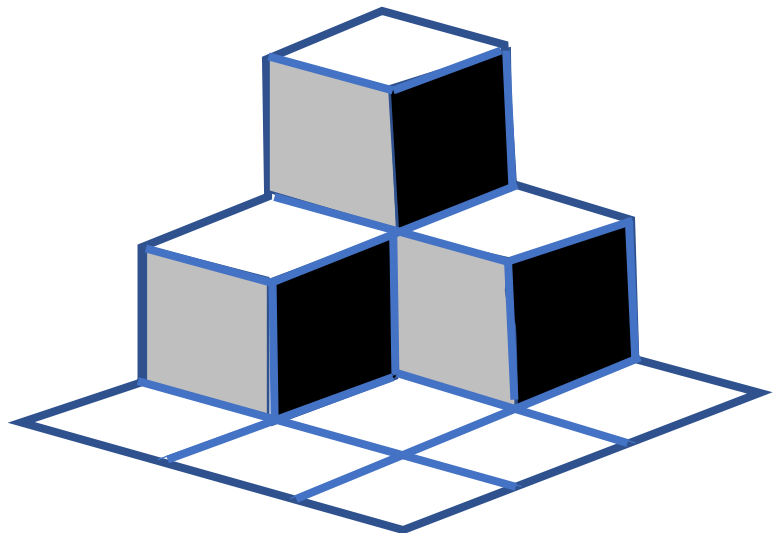


②

Take a sheet of 16 squares.



By cutting along the edges of eight squares and keeping the paper in a single piece, form this shape.



Explain clearly how you managed this.

③

Hannah, Sam and George huv twa hunner and eighty twa colourin pincils aw the gaiter in their bags.

Even though Sam hus the maist pincils, he is the wan wi the fewest rid pincils (it's actually the square root o the nummer of aw his pincils).

But Hannah, who hus the fewest pincils, is the wan wi the maist rid wans (exactly wan sivinth o aw her pincils).

How mony rid pincils dis George huv?  
Explain yer answer!



Give your answer  
to this question in  
Gaelic  
or Scots  
using a minimum  
of 30 words.



Tha 282 peansailean dathte uile-gu-leir aig Hannah, Sam agus Seòras.

Ged a tha an àireamh bu mhotha de pheansailean aig Sam, tha an àireamh bu lugha de pheansailean dearg aige ('s ann a tha iad am freumh ceàrnagach den pheansailean uile-gu-leir aig Sam).

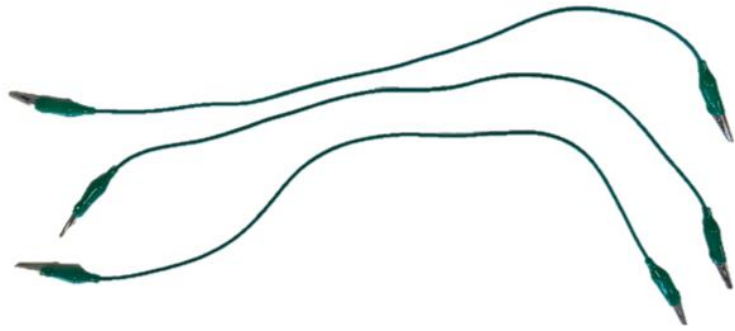
Ged a bheil an àireamh bu lugha de pheansailean aig Hannah, tha an àireamh bu mhotha de pheansailean dearg aice (aon seachdamh de pheansailean uile-gu-leir a th' aice).

Cia mheud peansail aig a bheil Seòras?  
Minich do fhreagairt.

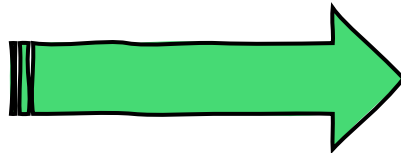


4

Fraser has 3 green cables.



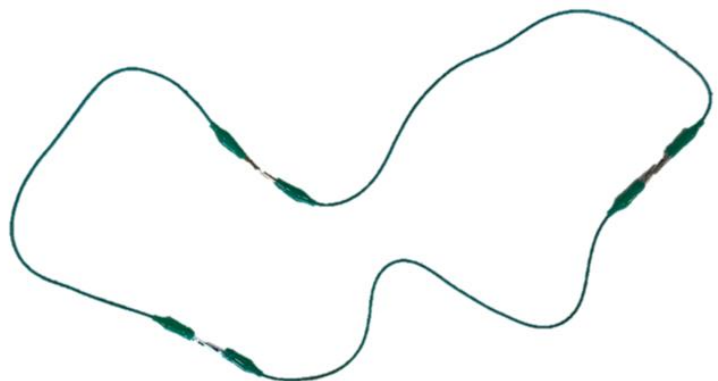
He folds them in the centre and then clenches his fist, allowing the ends to hang down:



Now he doesn't know which end is connected to which.

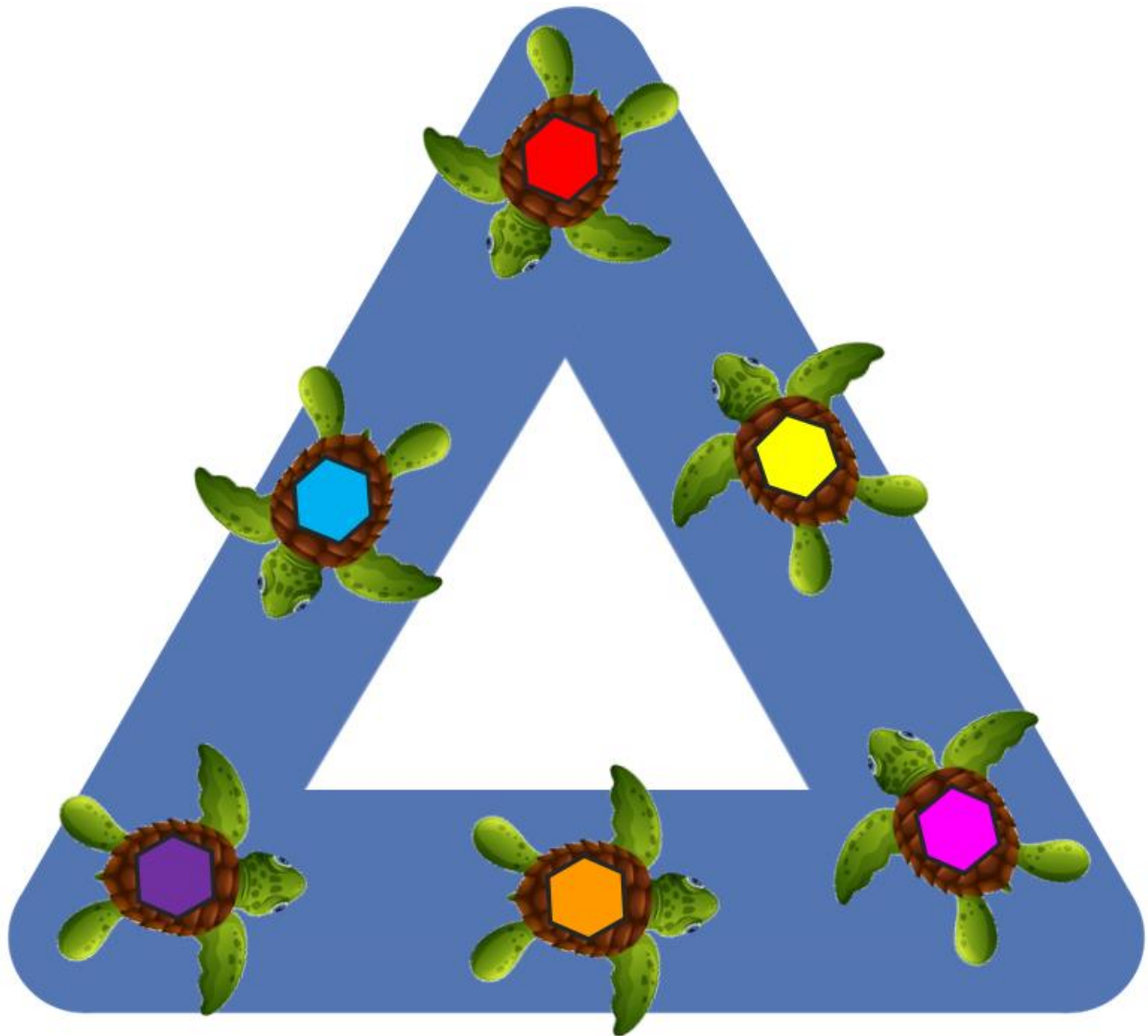
1. First, he connects two of the six ends.
2. Then he connects two of the remaining four ends.
3. Lastly, he connects the two final ends.

What is the probability that, when he opens his fist, he'll be left with all three cables forming one single circuit like this?



5

Six racing turtles train on a triangular swimming pool.



Your challenge is to assign every turtle with a different prime number so that the three numbers on each side of their swimming pool adds up to the same total!

Oh, and you will get more points if your three sides have the lowest possible total!