Last One Standing

Imagine a school assembly with 250 students. Everyone stands up and flips a coin. People with tails sit down. People with heads flip again.

Do you think anyone will get 6 heads in a row?
How many heads in a row do you expect the last one standing to have flipped?
Can you explain your reasoning?

There is an animation for you to explore what happens when different sizes of school assembly gather and carry out the experiment at http://nrich.maths.org/7220 .

How many people would you need to have in a school assembly for you to expect there to be someone still standing after ten flips?

Here are some related questions you might like to consider:

- Imagine that if you buy one ticket, the probability of winning the lottery jackpot is approximately 1 in 14 million. If there are usually two jackpot winners every week, how many tickets do you think are sold each week?

- On October 7th 2010, a woman gave birth to her third child. Her first two children were also born on October 7th, in 2005 and 2007. So all three children in the family have the same birthday. The odds of this happening were incorrectly reported in the newspapers as being 1 in 48 million. Can you work out the correct probability?

  There are more than a million families in the UK with three children. Would you expect there to be other families with three children who share a birthday?

- The television performer Derren Brown once filmed himself flipping ten heads in a row for a programme about horse racing and unlikely events. He used a fair coin, and kept filming until he got ten in a row. How long do you think it took him?