The Sack

Once upon a time, in a land far, far away, there lived a sack of corn. It was a very special sack of corn, according to its owner - a farmer who had a doctorate in *Mathematics*, and knew about these things.

He did not know much about farming, however, and he owned just a goat and a wolf. The only reason he had the goat was because he had won it as a prize, though if truth be told, he had been hoping for a Ferrari. He would never admit that to the goat, of course, but their relationship had always been strained.

The wolf had been sold as a pup to the farmer, who believed he was buying a sheepdog to look after the goat. He was not a very good farmer, as has been mentioned. He did manage to teach the wolf some cool tricks, which we will elaborate upon later as they become necessary for the purpose of the narrative, but you can rest assured that none of them were in any way useful for herding sheep, and certainly not for herding a solitary goat. The wolf was terrified of the goat.

Our story begins as the farmer is being chased out of the village for having murdered the king's son. It was, of course, an accident, but the king was not as logical a person as the farmer, and he would not listen to reason nor a lecture on combinatorics.

In brief, a wandering gypsy had been offended by the king somehow—the gypsy was one of those people who are not happy unless they have something to be offended by—and she had placed a curse and some radioactive waste on one of the sacks of corn in the village. Of course, not knowing which sack of corn was tainted would have rendered them all unusable, and would have had a devastating effect on the village's economy, so the king decreed that someone must find the cursèd sack of corn as quickly as possible, before the sun rose and the stock markets opened. Our protagonist made the ever-foolish mistake of getting involved, and asked that all of the sacks of corn in the village be brought forth, along with a selection of children to taste them, because children are stupid and dispensable and will eat anything except broccoli.[1]

In all, there were two thousand sacks of corn in the village. In an ideal world—the kind with an unlimited supply of children to poison—the farmer

---

[1] Not you, dear reader. You are very special and you are universally loved. That is why someone bought you this book. You are not like other children - you eat your broccoli, don't you?

could have given a grain from a different sack to each of a couple of thousand children, and simply waited to see which one died, and then everyone who was in a position to complain would have lived happily ever after. This world is, however, not ideal, and due to the region's exceedingly ugly inhabitants and great advances in opthalmology, there were very few children to be found.

We must give the farmer the benefit of the doubt and assume that this paucity is the only reason he allowed the king's son to partake in his computations, for otherwise the farmer must have been very silly indeed, despite what his doctorate in *Mathematics* might suggest.[2]

We shall make some other assumptions, too, because mathematicians always do that. It's a way for them to make their jobs easier, and often gives them a get-out clause in the event that their calculations fail. They're sneaky like that:

Assumption 1. A poisoned child will die/mutate/otherwise suffer the ill-effects of the curse/radiation precisely at sun-up. We cannot simply keep feeding the greediest child grains of corn one at a time, expecting him or her to conviently kick the bucket as soon as they taste the grain from the poisoned/cursèd sack. Death is rarely convenient. (Except for the dying precisely at sun-up thing, which we shall attribute to magic or somesuch. Oh! Maybe they turn briefly into a vampire, and then permanently into dust.)

Assumption 2. The children are all of a standard constitution - we need not worry that one of the children is the invincible Rasputin[3] reincarnate, nor that one of the children is actually allergic to corn and might go into anaphylactic shock even if the grain that they eat is unpoisoned/uncursèd.

Armed with these assumptions and your mathematical prowess, what is the least number of children you would have needed to guarantee finding which was the poisoned sack of corn by sun-up, if you had been in the farmer's large and smelly shoes?

---

[2]There are some *very* silly mathematicians.

[3]The Empress of Russia's boyfriend, who, in 1916, was assassinated by being fed poisoned wine and cakes, shot three times, beaten with a club, and eventually tied up and thrown into a river, where he died of hypothermia.

1 Disco Balls

Brendan owns a small but surprisingly successful sex shop in a little town in Longford. One afternoon, after a rather heavy week's drinking interspersed with dodgy and ill-advised ebay shopping, he stumbles downstairs to find that he's received a package containing a dozen prosthetic testicles. They're pretty cool — you give them a little squeeze and they pulse a little and flash different colours, "for the perfect party in your pants".

However, Brendan, being the shrewd businessman that he is, realises that there probably wouldn't be much of a market in Longford for these so-called "Disco Balls" as they'd only frighten the sheep. So, with the usual buyer's remorse, he goes online to assess the damage, and is relieved to find that the prosthesticles seller has a favourable returns policy and excellent feedback. There is also a message in his inbox from the seller — warning him not to sell any of the Disco Balls he has received, as one of them has accidentally been filled with craic cocaine (more fun than regular cocaine) as opposed to silicone, and that if the prosthesticle were to burst, as is their wont, then the consequences would be most dire.

Brendan considers the situation briefly. He could return the entire package, or he could keep all of the prosthesticles and cut his losses and the cocaine, but his mother was from Cavan and so he decides to return the Disco Balls, minus the one containing the cocaine.

Although outwardly the prosthesticles all appear identical, Brendan reasons that the one containing the cocaine should be a different weight to the others — though he does not know whether cocaine or silicone is heavier. He checks the delivery date on the parcel, and the details of the returns policy, and his watch, and realises that he has very little time to get to the post office to make a return. Further, the only weighing scales he has are the balance weighing scales used, traditionally, to price the "Pick 'n Mix" anal beads by stacking the beads on one side of the scales against 1euro coins to pay for them on the other. Brendan reasons that he will only have time to make three weighings on the scales before having to dash to the post office.

How can he work out which prosthesticle contains the cocaine?