

Fun in the fairground

The fair has come to town.

Hoopla

You can buy 5 hoops for £1.25.

You win a prize by throwing a hoop over that prize, but it must also go over the base that the prize is standing on!

Ben spent some time watching people have a go at this stall and started to count how many goes they had and how many times someone won.

The table below shows his results.

Prize	Number of throws	Number of wins
Watch	320	1
£10 note	240	4
£1 coin	80	2

Hook a duck

This is a game where plastic ducks float around a central stall. They all have numbers stuck to their underside which cannot be seen until hooked up on a stick and presented to the stall holder.

In the game, if the number under the duck is a:
 1 – you win a lollipop 2 – you win a yo-yo
 5 – you win a cuddly toy

Each time a duck is hooked, it is replaced in the water.

Cindy, the stall holder, set up the stall one week with:

- 45 plastic ducks
- Only one of which had the number 5 underneath
- Nine had the number 2 underneath
- All the rest had a number 1 underneath

Cindy charged 40p for one stick, to hook up just one duck.

Use the information on Hook a duck to answer these questions.

- 6 What is the probability of winning:
 - a a cuddly toy?
 - b a yo-yo?
 - c a lollipop?
- 7 What is the probability of winning anything other than a lollipop?
- 8 Tom wanted his sister, Julie, to win a yo-yo.
 - a How many ducks should Julie hook to expect to have picked up at least one with a number 2 underneath?
 - b How much will it cost Tom to pay for the number of ducks hooked to expect Julie to win a yo-yo?
- 9 Before lunch on Sunday, Cindy took £100 from the stall.
 - a How many ducks had been hooked that morning?
 - b How many cuddly toys would you expect Cindy to have given away that morning?
 - c How many yo-yos would you expect Cindy to have given away that morning?
- 10 Cindy bought in the cuddly toys for £4 each and the yo-yos for 50p each. She gets the lollipops in a jar of 100 for £4. Cindy expects to take £250 on a Friday night.
 - a How many ducks will she expect to be hooked that night?
 - b How many lollipops will she expect to give away that evening?
 - c How many yo-yos will she expect to give away that evening?
 - d How many cuddly toys will she expect to give away that evening?
 - e What will be the value of all the prizes she expects to give away that night?

Use the information on Hoopla to answer these questions.

- 1 What income would these throws have made for the stall?
- 2 From the results shown, what is the probability of someone aiming for and winning a:
 - a £1 coin?
 - b £10 note?
 - c watch?
- 3 What would you say is the chance of someone winning a prize with:
 - a one hoop?
 - b five hoops?
- 4 After watching this, Ben decided to try for a £10 note. He bought 25 hoops and all his throws were aimed at the £10 note.
 - a How much did this cost him?
 - b What is his probability of winning a £10 note?
- 5 On a Saturday afternoon, the stall would expect about 500 people to buy a set of hoops. Assuming that the throws would have been aimed at the various prizes in the same proportion as Ben observed:
 - a how many of each prize would the stall expect to have to give away?
 - b how much income would be generated from the 500 people?
 - c if the watches cost £18, how much profit would the stall expect to make on a Saturday afternoon?

Answers