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**'Red Balloons, Blue Balloons' printed from http://nrich.maths.org/**

Katie and Will have some balloons, some are red and some are blue.



First, Katie blew up a red one. After her first puff her balloon had a circumference of 24 cm.

Her second puff added ½ as much again to that.

Her third puff increased it by 1/3.

Her fourth puff increased it by 1/4 and her fifth puff by 1/5.

Her sixth puff increased it by 1/6

and at the beginning of her seventh puff it went



Next, Will blew up a blue balloon. After his first puff his balloon had a circumference of 14 cm.

And, just like Katie's, his second puff added ½

as much again to that and his third puff increased it by 1/3.

His fourth puff increased it by ¼ and so on.

His balloon burst at exactly the same size as Katie's at the beginning of a puff.

How many puffs had Will done before his balloon burst?

**Why do this problem?**

[This problem](http://nrich.maths.org/public/viewer.php?obj_id=1040&part=index) would be a good one when doing calculations with fractions. It also requires logical thinking and organising of results. Different strategies and approaches can be taken: knowledge of addition, or multiples, or an understanding of fractions can be used to arrive at a solution.

**Key questions**

What do you think is a good way to start?

How big was Katie's balloon after the second (third, fourth etc.) puff?

How big was Will's balloon after the second (third, fourth etc.) puff?

**Possible extension**

Learners could make up a similar problem of their own for a friend to try.

**Possible support**

Breaking the problem down step by step will help learners reach a solution. It might be useful to have each subsequent piece of information written on a separate card so that they can be given to children when ready, rather than presenting all the information at once.

**Solution**

|  |  |  |
| --- | --- | --- |
| **Puff number** | **Circumference of Katie’s balloon in cm** | **Circumference of Will’s balloon in cm** |
| 1 | 24 | 14 |
| 2 | 36 | 21 |
| 3 | 48 | 28 |
| 4 | 60 | 35 |
| 5 | 72 | 42 |
| 6 | 84 | 49 |
| 7 | **BANG!** | 56 |
| 8 |  | 63 |
| 9 |  | 70 |
| 10 |  | 77 |
| 11 |  | 84 |
| 12 |  | **BANG!** |

So Will’s balloon will burst at the beginning of his 12th puff.