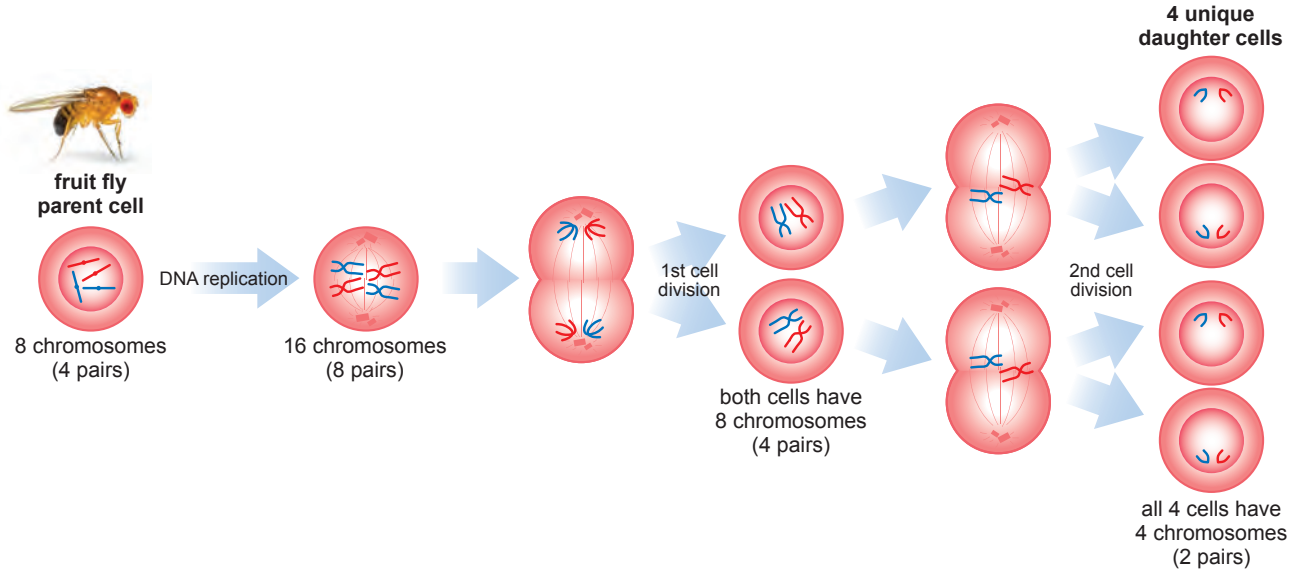
Meiosis and Mitosis

When a baby is made, it has the correct amount of **genetic information** and is unique in its appearance and features. It also develops from just one cell (the **zygote**). This is just plainly amazing! How can something so complex and complicated as a human be produced from one single tiny cell? Well, the answer is actually two different processes: **mitosis** and **meiosis**.

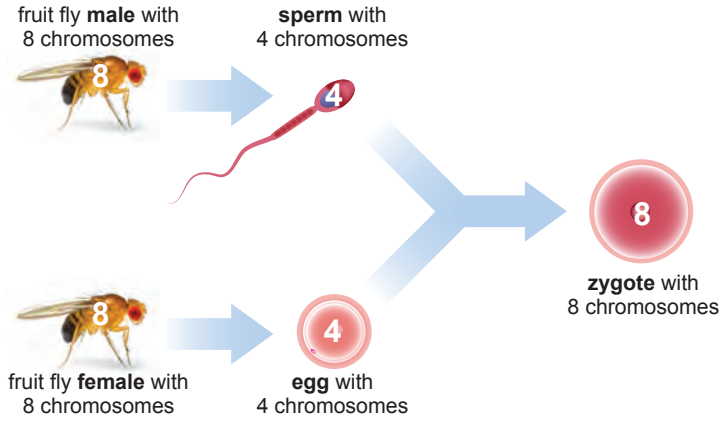
Meiosis occurs in the **reproductive** (**sex**) **organs**, the ovaries, testicles and anthers. It is a type of **cell division** which means that cells divide or split to produce more cells. In order to reproduce sexually, the **gametes** (sex cells) have to combine during the process of **fertilisation** to make the **zygote** (the first cell of the living thing). So here's the amazing and tricky bit...

Let's take the tiny, insignificant fruit fly for example. Fruit flies have 8 chromosomes in their normal body cells (**somatic cells**). This number of chromosomes makes them a normal functioning fruit fly. If we combined two normal fruit fly cells together we would expect to make a cell that contained 16 chromosomes – not right! This would result in an undeveloped **foetus** and death. To stop this and in order to get the right number of chromosomes in the offspring meiosis has to occur.

Meiosis



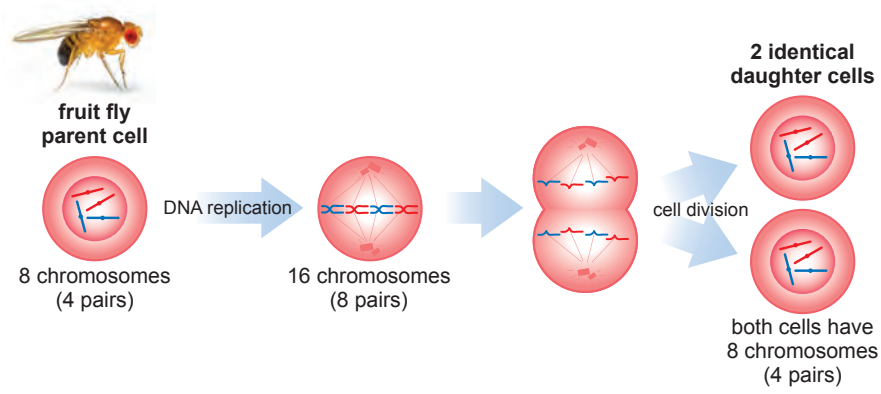
Meiosis



Each of the four cells made has half the chromosomes (4) of the original cell, these new 'daughter cells' become **gametes**. In this case it is a male fruit fly so they become sperm. The same process occurs in the female fruit fly except she makes eggs instead. So now when we fuse two of the cells made from meiosis, we get the right number of chromosomes (8) in the zygote.

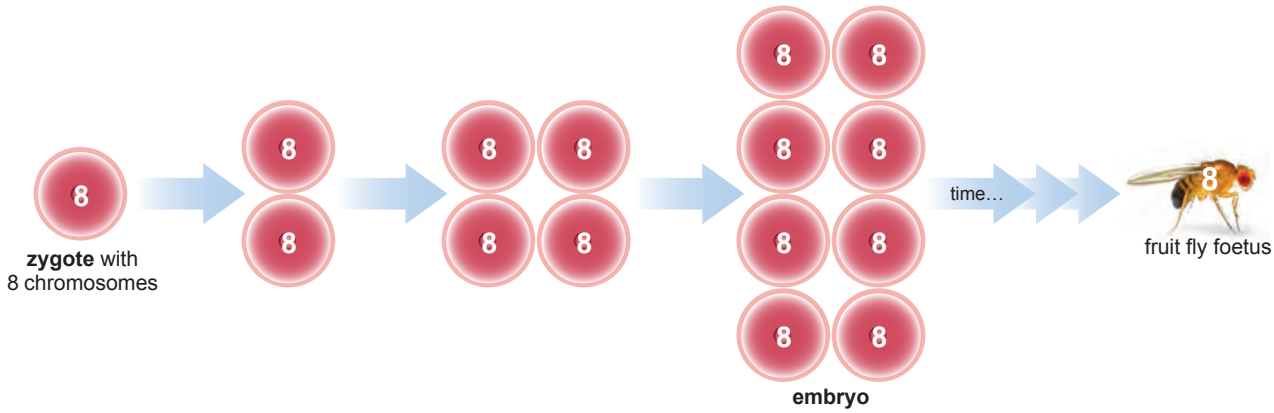
We now have one cell. This has to become an entire fruit fly which is made up of thousands of individual cells - this happens through the wonder of **mitosis**. Mitosis is also **cell division** but it produces cells that are identical to the parent cell. This means it is used in the growth and repair of damaged cells. Mitosis ensures that each cell made performs the right functions as they are identical to the original cell. Let's look at the fruit fly again ...

Mitosis



Two identical cells are made that function in the same way as the parent cell. Once a **zygote** is made, **mitosis** occurs to produce more and more cells, forming the **embryo** and then the **foetus**. Once born, the baby continues to carry out **mitosis** at a fast rate and grow bigger and bigger.

Mitosis



In order for sexual reproduction to occur, both mitosis and meiosis have to occur – meiosis to make the sex cells that produces the zygote and mitosis to produce the embryo, foetus and baby. If we were to reproduce asexually then only mitosis occurs because no gametes are involved.