BBC BITESIZE

Hello. I'm Dr Alex Lathbridge and this is Bitesize Biology.

This is the first episode in a series on Inheritance, Variation and Evolution.

Or in other words, how you get things from your biological parents, how everyone is a little bit different, and how life forms have changed over billions of years.

We're starting at the beginning with reproduction. There are two types of reproduction you need to know about: sexual and asexual.

Now, I'm going to be using a few more specialised terms. You'll need to have a good idea of what meiosis and mitosis are. We did a whole episode on meiosis and mitosis in our series on The Cell, so if you need a little memory jogging, it might be a good idea to jump back to that episode on BBC Sounds before coming back here.

But if you're ready, let's get into it. First up is sexual reproduction, which involves two parents. When I say parents here, we're talking about your biological parents, not necessarily the people who bring you up.

The two biological parents, the mother and father, combine their genetic material, DNA, to make children, or – for your exam – offspring.

These offspring are genetically different from their parents and aren't clones of them. I said in the first series on The Cell that you might have your dad's chin? Well you might have his chin but you won't look identical to him.

This is all down to a process called meiosis, which is a special type of cell division just for sex cells. You'll need to remember some details here, so grab a pen and write this down.

Meiosis is a type of cell division that creates sex cells, known as gametes. Gametes in animals are sperm and ova, or eggs. Sexual reproduction happens in plants too. Their gametes are pollen and ova. Easy way to remember: pollen are plant sperm and ova are plant eggs.

Each gamete contains half the number of chromosomes that are found in a typical body cell. So remember, typical body cells in humans have 46 chromosomes, in 23 pairs (that's known as diploid) but in gametes there are half of this number so only 23 chromosomes. This is known as haploid. So you've got haploid and diploid.

Now gametes only need half this number of chromosomes because they are going to do something interesting. They're going to join forces with another gamete to get to the full 46, and this happens during a process called fertilisation.

In humans, fertilisation happens when the male sperm cell fuses with the female egg cell. This combines the genetic material of both parents to form offspring called a zygote.

When the parents' genetic material inside the gametes is combined, the zygote has the full number of chromosomes again, so that's 46 chromosomes in 23 pairs, which is known as diploid.

This process of combining the genetic material of two parents leads to genetic variation, it's why everyone looks different. The genetic material is randomly shuffled, which is why even if you have the same two biological parents, siblings don't look alike, unless you're identical twins. So you might get your dad's chin and your mum's nose, your sister might get your mum's chin and your dad's nose.
So that's sexual reproduction - now let's look at asexual reproduction.

What you need to understand is that asexual reproduction only involves one parent to create offspring. How?

Let's talk about potatoes (trust me here). Have you ever seen a potato that's past its best? They have little growths coming out of them, kind of looking like little shoots?

Well, if you sat there and watched this old potato, you'd notice that this little shoot would continue to grow. It would get bigger and bigger, and eventually a bud would form. From this little bud a new potato would grow.

No mention of gametes fusing together, nothing like that. This potato would be genetically identical to its parent.

It would be a clone of that old potato and that is an example of asexual reproduction. Asexual reproduction involves the process of mitosis, not meiosis, mitosis. And that's a type of cell division where cells create identical copies of the parent cells.

A good example of this are bacterial cells. In terms of plants, apart from potatoes, strawberries also reproduce asexually. And, you might not know this, so do jellyfish!

I'm Dr Alex Lathbridge and this is Bitesize Biology.

To find the rest of this series and more from our Bitesize podcasts, you can search Bitesize on the BBC Sounds app.