0:00:00.000,0:00:07.120

Here's two questions nobody's ever asked

me. Why is sex so important and why is it

0:00:07.120,0:00:16.510

so popular. The answer from a biological

perspective is that sex, the coming

0:00:16.510,0:00:24.070

together of gametes from parents is so

popular because of the variation that

0:00:24.070,0:00:33.870

the process produces. Think of it. You and

everyone barring you identical twins are

0:00:33.870,0:00:34.989

unique.

0:00:34.989,0:00:40.710

Not just in the seven billion people on

the planet but in the history of the

0:00:40.710,0:00:50.399

world. And sex ensures that. Every time I

human makes gametes they turn out

0:00:50.399,0:00:55.730

differently now what are gametes? These are

the products that made you the sperm and

0:00:55.730,0:00:59.649

egg that came together. Each of them in

humans

0:00:59.649,0:01:06.150

23 chromosomes. One of each of the pairs.

They came together and you were once a

0:01:06.150,0:01:13.540

fertilized egg. You grew by the process

of mitosis, just plain cell division, into

0:01:13.540,0:01:21.220

the thirty odd billion cells that make

you up now. And at puberty you started

0:01:21.220,0:01:27.619

producing sperm or eggs depending on

your sex obviously and you will continue

0:01:27.619,0:01:39.299

to make them. So what is it about this

process of making gamittes that is so

0:01:39.299,0:01:46.530

popular with plants and animals and

fungi everything you see around you

0:01:46.530,0:01:55.369

everyday uses this process. And it's

basically identical in yeast and you and

0:01:55.369,0:02:05.560

seaweed and oak trees. The two parts of

the process of meiosis that two division

0:02:05.560,0:02:12.670

process, that makes these gametes. Is

first of all the miraculous coming

0:02:12.670,0:02:13.460

together

0:02:13.460,0:02:19.950

of those chromosome pairs and pairing

so perfectly along their length. That's

0:02:19.950,0:02:25.230

called synapses. And once those

chromosomes have found their pair

0:02:25.230,0:02:33.120

they're going to exchange material. In

what a random but regular way. What's

0:02:33.120,0:02:38.480

that mean. It means the point of crossing

over of those chromosomes the place

0:02:38.480,0:02:44.690

where they exchanged bits is always

different but the number of times it

0:02:44.690,0:02:53.980

occurs is pretty regular. So you get a

mixing of these pairs. The second part

0:02:53.980,0:03:01.740

is that it's really unlikely, like one in

eight million, that the 23 chromosomes

0:03:01.740,0:03:07.780

that came from your dad and the 23 from

your mom are split in that way into the

0:03:07.780,0:03:12.800

gametes that you make. It's called

independent assortment and it means

0:03:12.800,0:03:22.450

that every pair has a 50 50 chance of

ending up in one gamete or the other. So

0:03:22.450,0:03:27.360

when you combine these two things the

crossing over and the independent

0:03:27.360,0:03:33.980

assortment it means this. Tt means that

you will never make a gamete that's the

0:03:33.980,0:03:43.520

same as the gametes that made you. The

process ensures that. Why do we need this

0:03:43.520,0:03:50.310

variation well. We don't but our species

does. Remember evolution acts upon variation

0:03:50.310,0:03:56.990

in the population we don't want to be

all the same genetic information we’re

0:03:56.990,0:04:05.300

vulnerable then. But by making each

individual this new mixture of traites it

0:04:05.300,0:04:11.160

ensures that the population has the

variation at least for humans so far to

0:04:11.160,0:04:14.940

withstand the differing environments

that we've encountered over our

0:04:14.940,0:04:20.630

evolutionary history. And that's why sex

is so popular and so important