

Animal Survival

A large herd of zebras is grazing in a vast, open savanna landscape. The zebras are scattered across the field, some facing left and some right. The grass is a mix of green and yellow, indicating a dry season. In the background, there are low, rolling hills or mountains under a clear blue sky with a few wispy white clouds. The overall scene is bright and sunny.

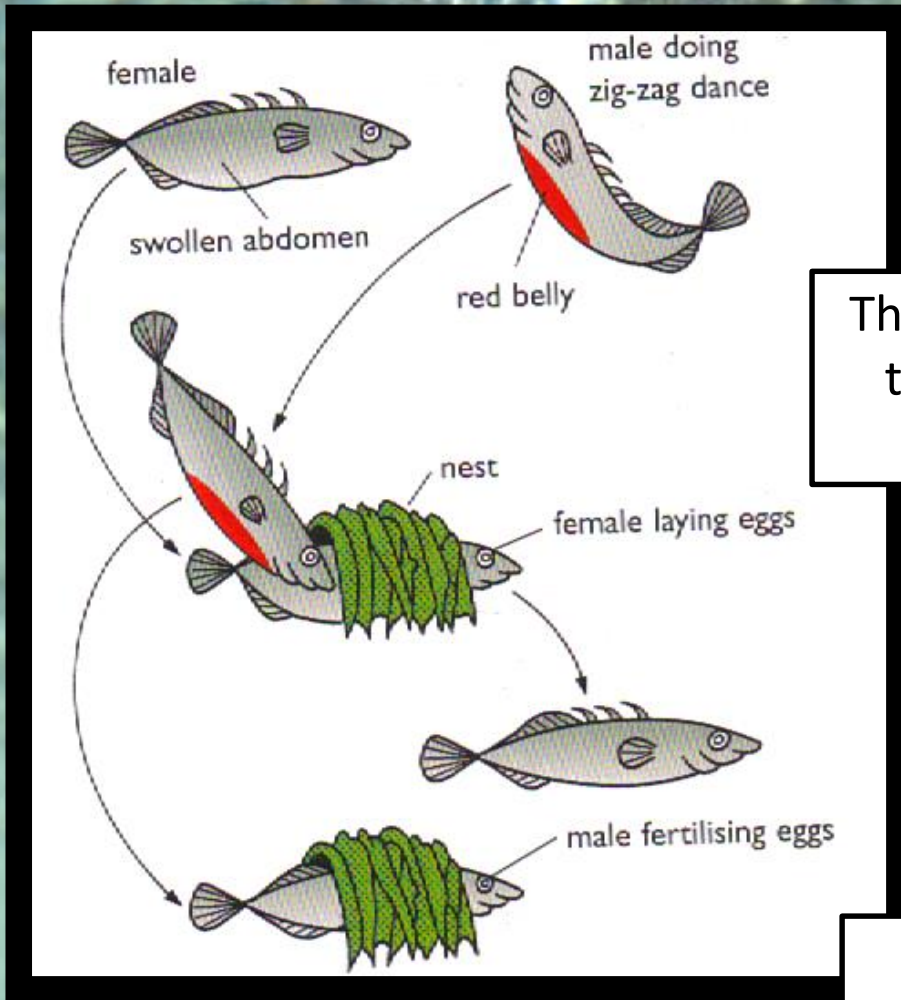
Chapter 7: Reproduction

Survival of a species

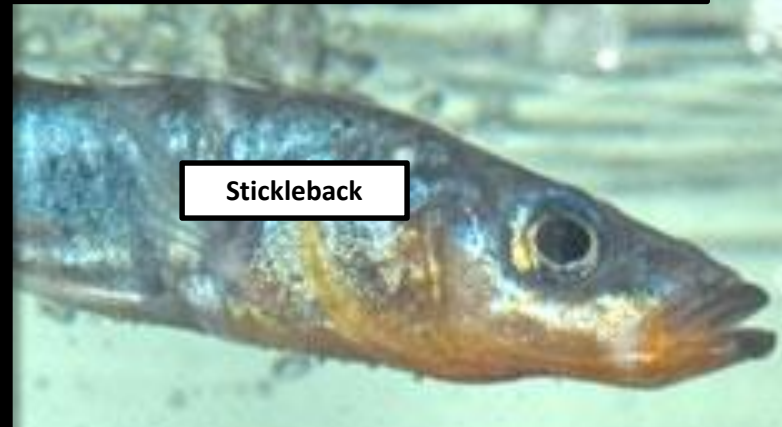


Living organisms eventually die, so in order for a species to survive it must produce sufficient young to replace those that are lost through old age, predation and disease.

Reproduction in fish (external fertilisation)



The female lays her eggs first and the male follow depositing his sperm adjacent to the eggs.



Stickleback

The sperm swim through the water to the eggs attracted by a chemical given off by them

Fish Eggs

A microscopic view of several fish eggs. The eggs are spherical and have a thin, flexible outer covering. Inside each egg, a large, clear, spherical yolk is visible, which serves as the food source for the developing embryo. The yolk is surrounded by a layer of cytoplasm and a nucleus. The background is a dark, slightly blueish-grey color.

Yolk

In fish, eggs are protected by flexible coverings and that the embryos obtain food from enclosed yolk.



Fish produce a large number of eggs because . . .

- External fertilisation is inefficient and wasteful

- The chance of a sperm meeting an egg is relatively low

- Those eggs that do become fertilised receive little or no parental care

A large school of yellow tangs (Zebrasoma flavescens) swimming in clear blue water. The fish are characterized by their yellow heads, black and white vertical stripes, and yellow tails. They are swimming in various directions, creating a sense of movement and depth.

Care of Young

Young fish emerge from the eggs able to look after themselves without help from their parents.

After its yolk runs out a young fish begins to catch its own food and develops into an adult fish

External Fertilization

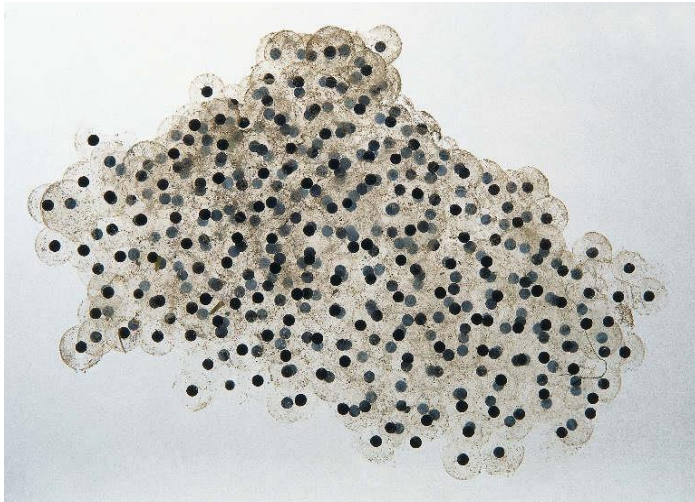
Outside the animals in the surrounding environment (external fertilisation)



An advantage of external fertilization is that it results in the production of a large number of offspring



What are the advantages of external fertilisation?



Advantages

Lots of eggs being produced and more offspring

Disadvantages

The eggs and young can be eaten by other animals

They have to find food and protect themselves

Internal

Inside the female (internal fertilisation)

An advantage of internal fertilisation is that the foetus gets all of the nutrients it needs



What are the advantages of internal fertilisation?



Protect the baby

Supply of food and nutrients

Disadvantages

If the mother has any diseases or toxic substances in her blood it could pass to the baby

Only have a few offspring at a time



Mammals produce far fewer eggs because . . .

- Internal fertilisation is more efficient

- There is a greater chance of sperm cells fertilising the egg

- The eggs are well protected being inside the mother

Care of young in mammals



At birth, the young of mammals are dependent on the adult for care and protection.

Number of young vs. parental care

The more young an animal has the less parental care is involved e.g. fish.

And the less young produced the more parental care is involved e.g. mammals



Sperm

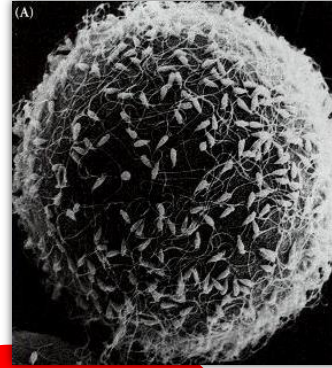
Produced in Testes:
•Small
•Has tail
•No food



Gametes

Egg

Produced the Ovaries:
•Large
•own food
•No tail



Reproduction

Fertilisation

Fertilisation occurs when the sperm and egg fuse together combining their genetic material.



Number of young vs. parental care

The fewer offspring the greater the parental care

Gametes

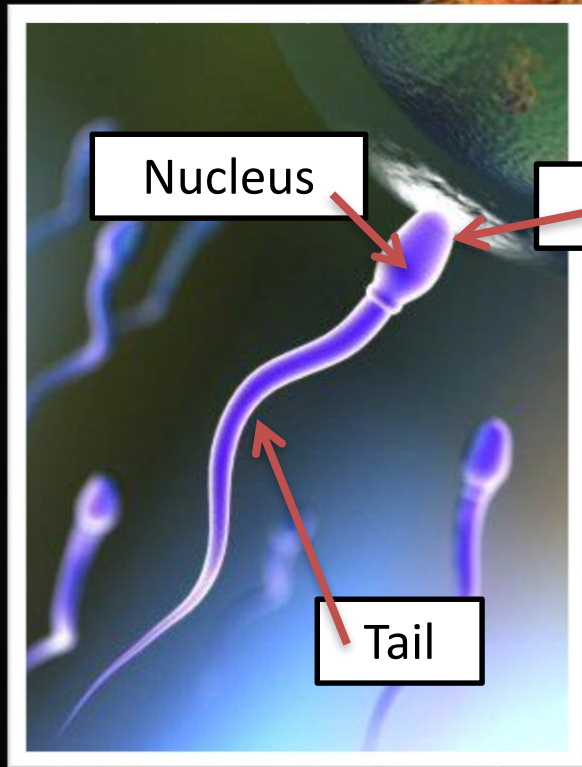
Reproduction occurs via gametes or sex cells.

Female gametes are called eggs

and male gametes are called sperm.

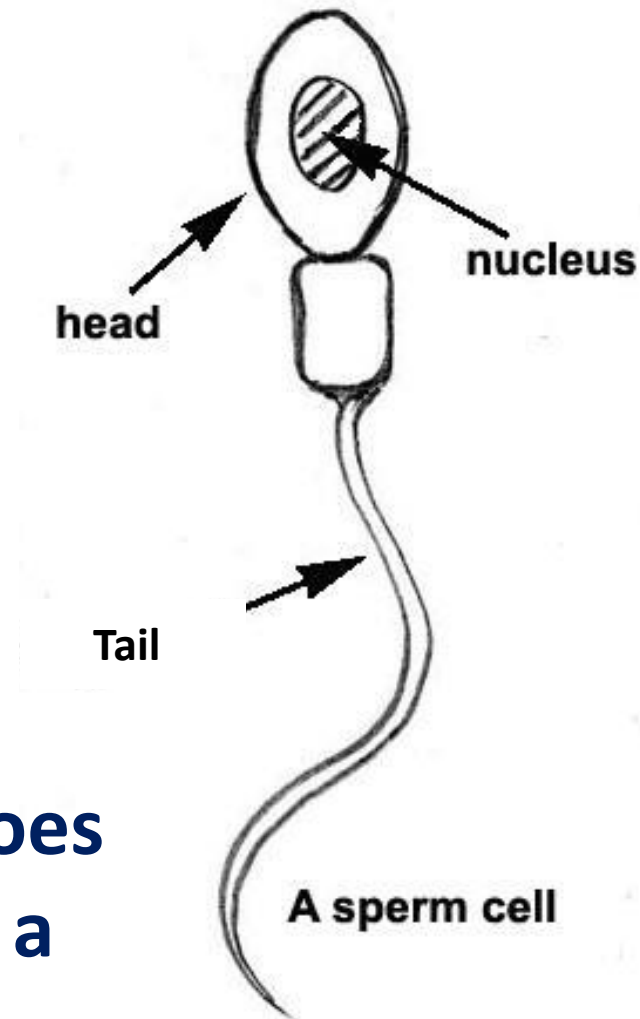


Sperm



The male produces large amounts of sperm. Sperm is produced in the Testes, it is small, it has a tail and it doesn't carry any food

The Sperm cell



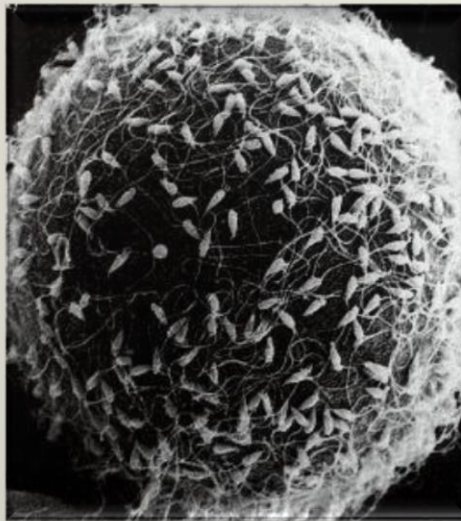
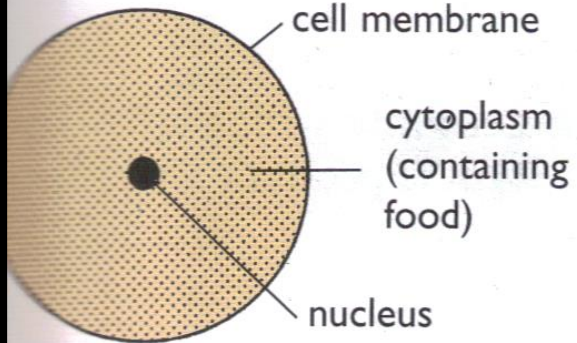
**Why does
it have a
tail?**

The Sperm cell

**Explain
how a
sperm
cell is
adapted
for its
function**

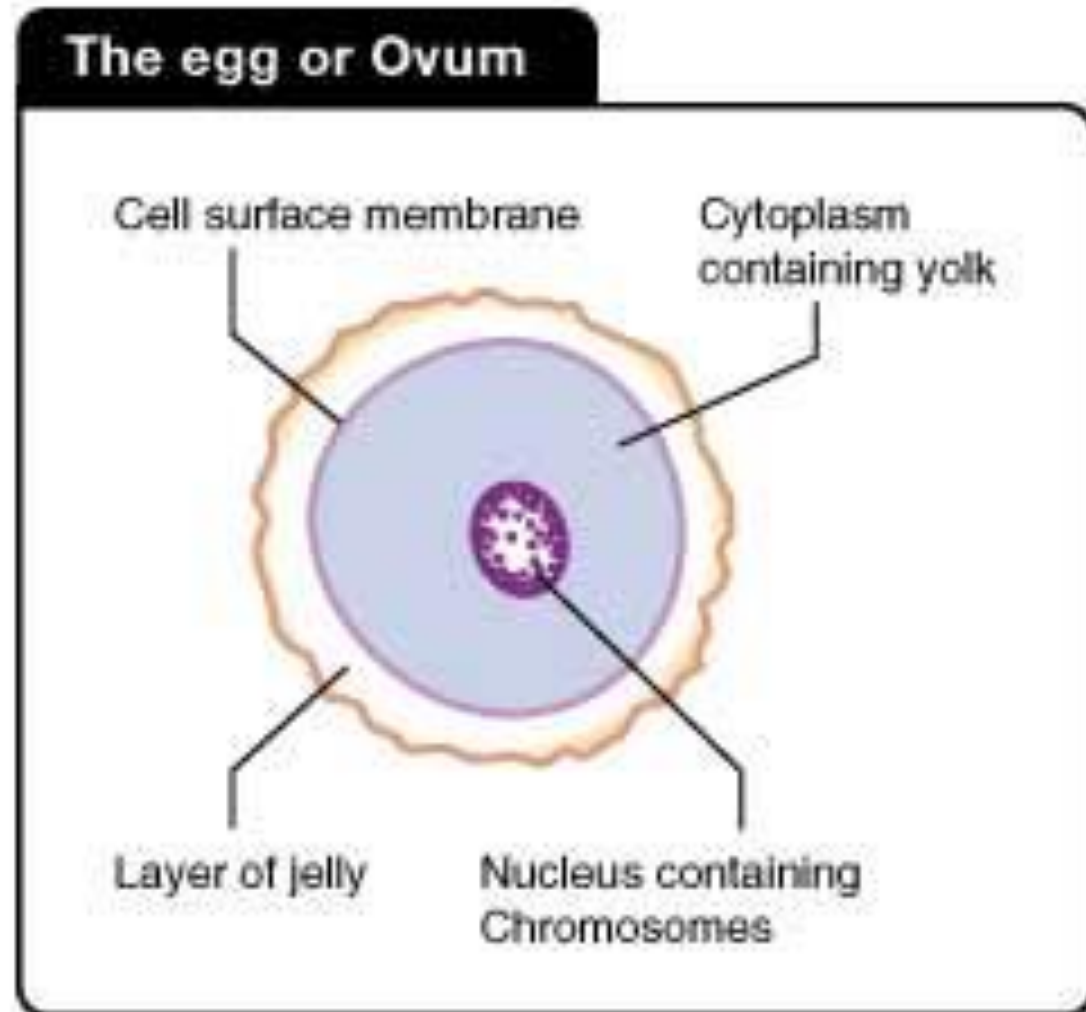


Eggs



Females produce a smaller number of eggs. Eggs are produced in the Ovaries. Eggs are large, they have their own food and they do not have a tail.

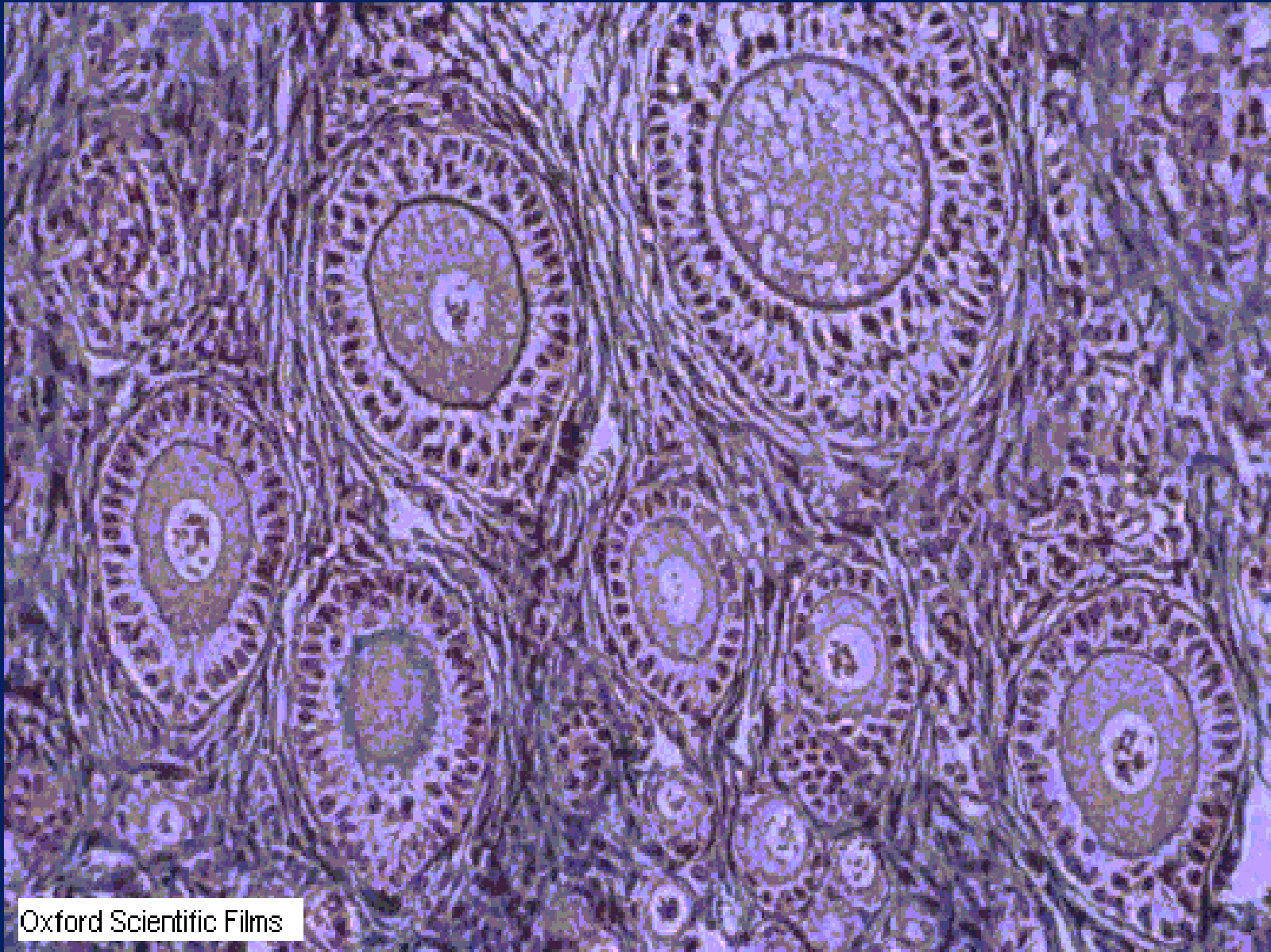
What is an ovum?



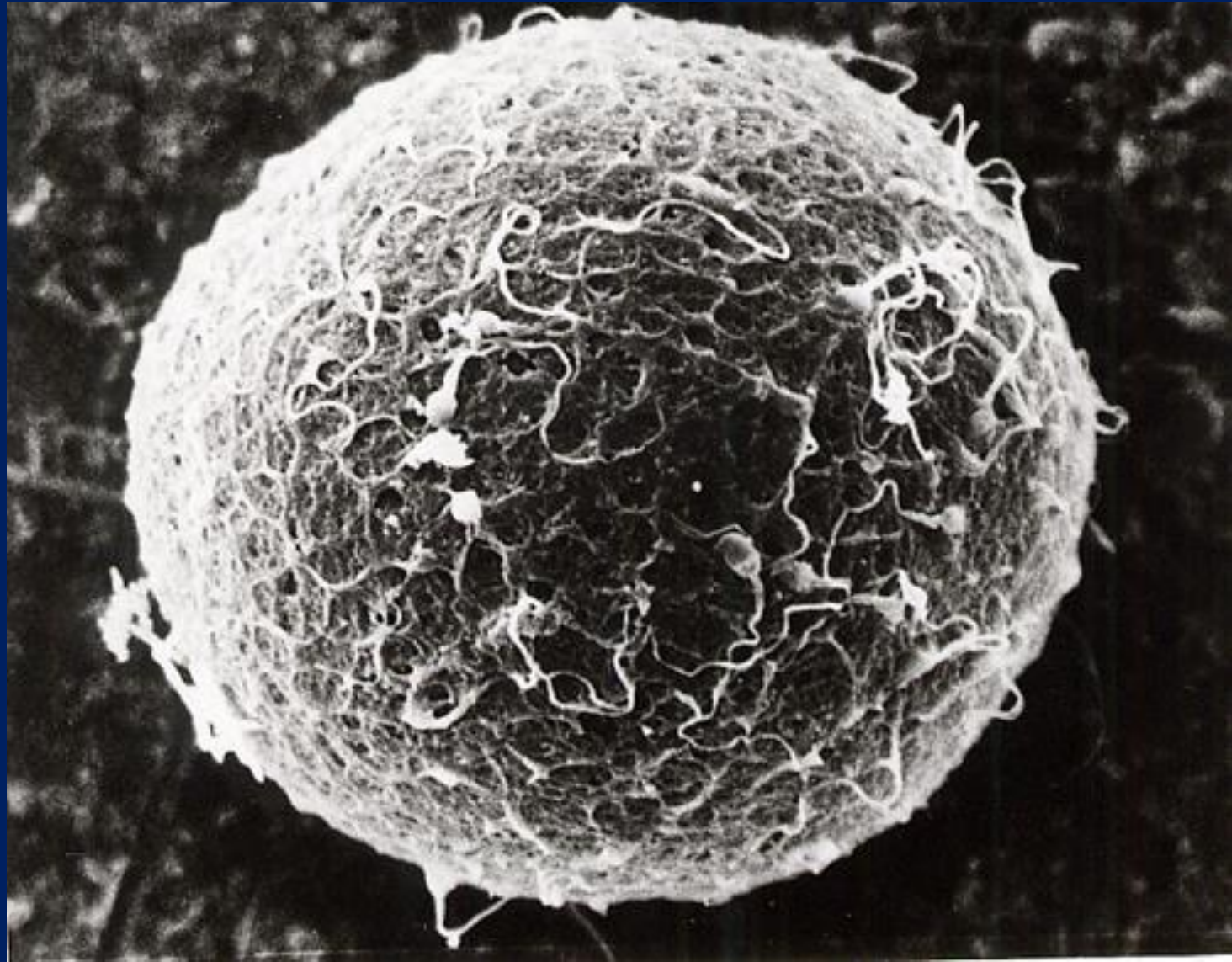
What is an ovum?



What is an ovum?



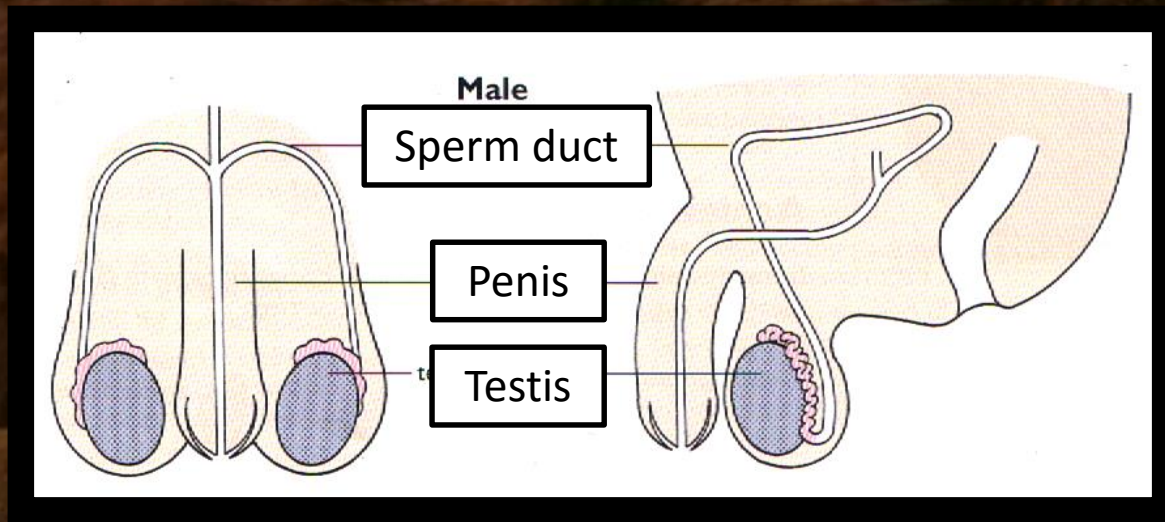
Egg Cell



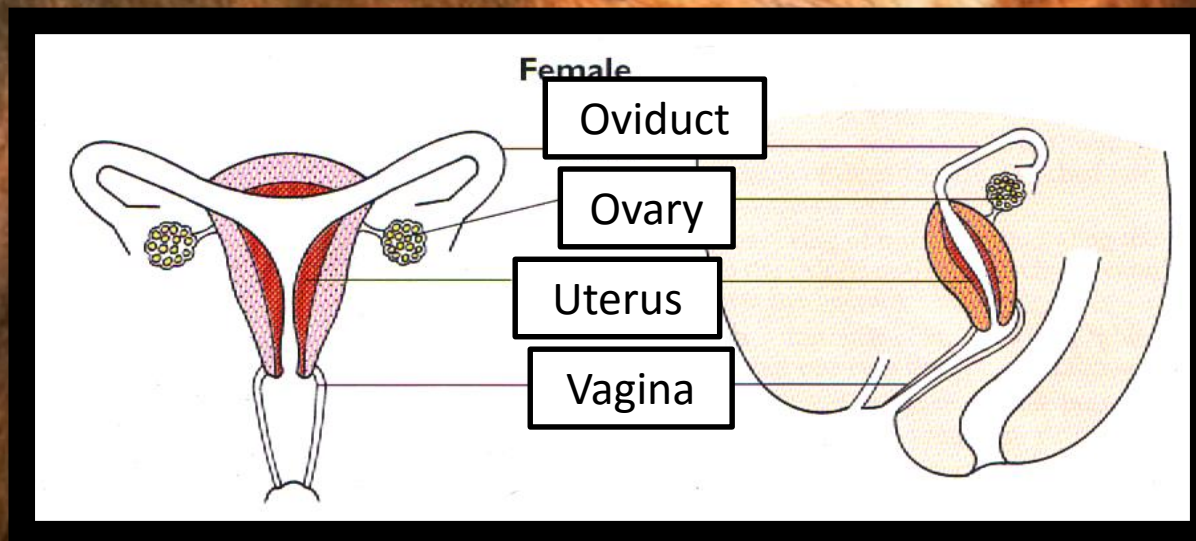
A photograph of two raccoons sitting on a log. The raccoon in the foreground is looking directly at the camera, while the one behind it is slightly out of focus. The background is a soft, green, out-of-focus natural setting.

Reproduction in mammals (internal fertilisation)

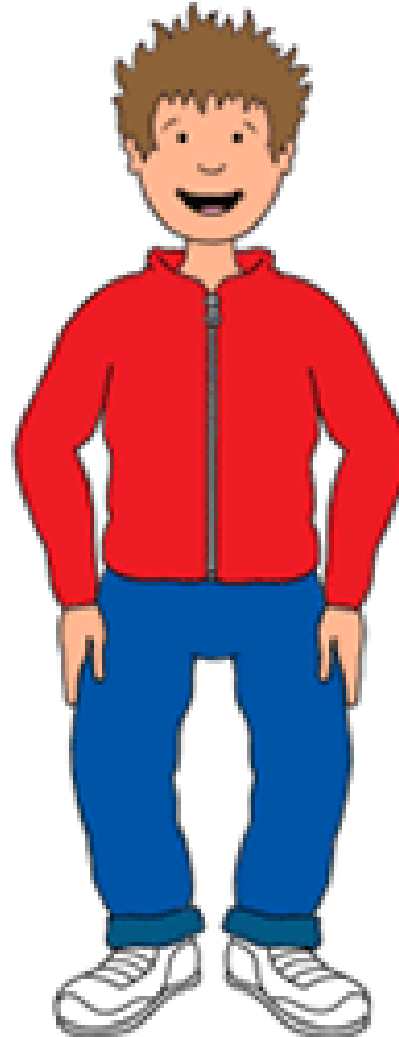
In mammals and most land animals there is no water medium for the sperm to swim through so sperm is deposited into the body of the female



Reproductive organs of a mammal

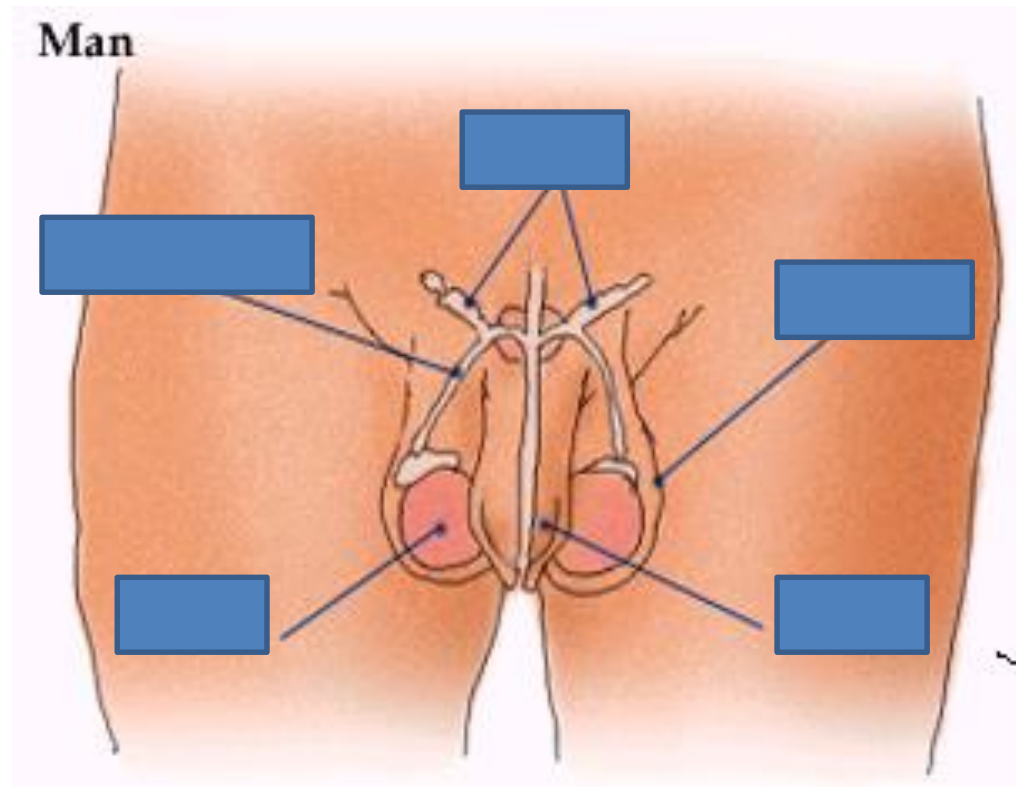


Today we will learn about the male reproductive system

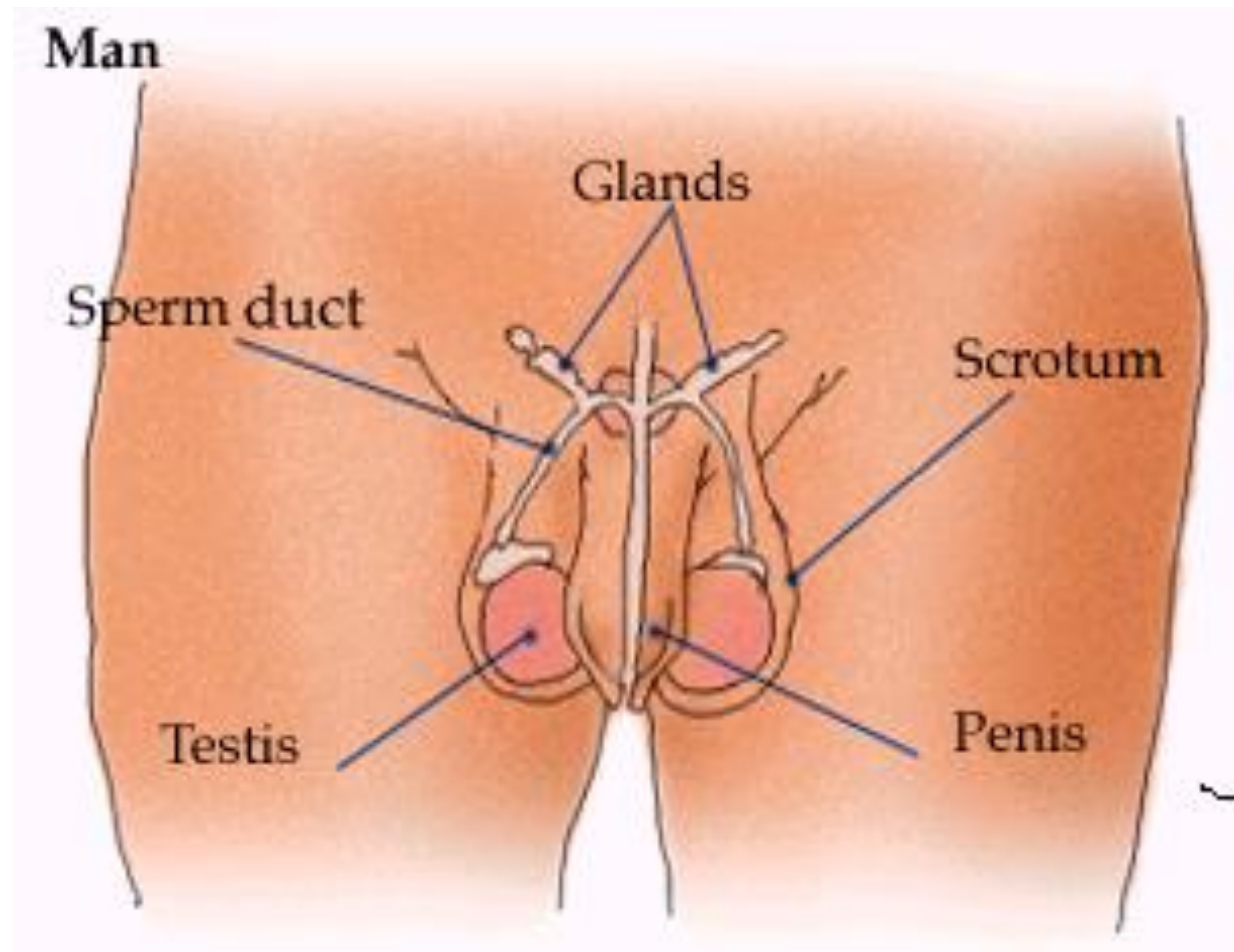


The male reproductive system

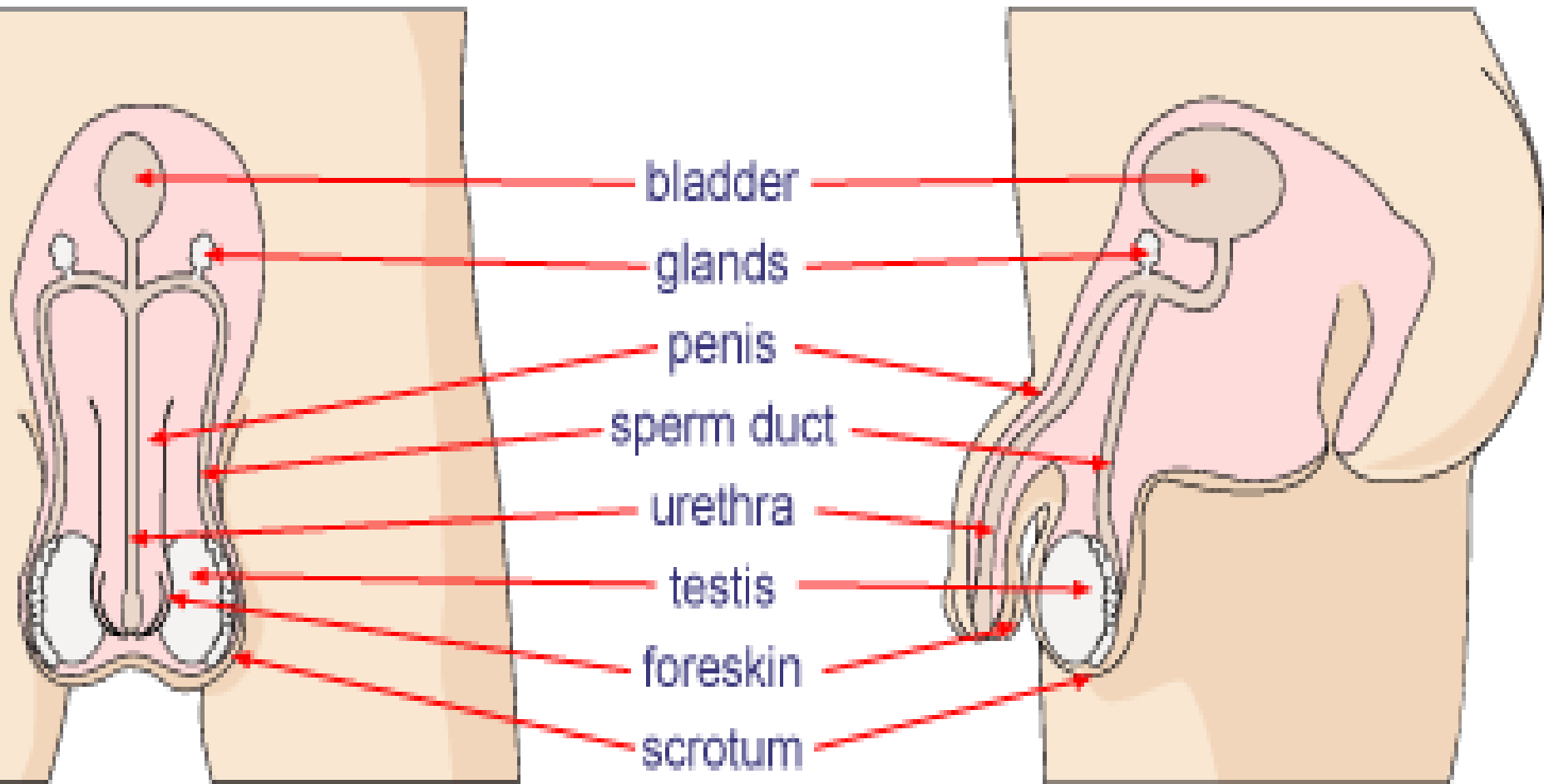
What do we know?
Can you identify anything on the diagram?



The male reproductive system

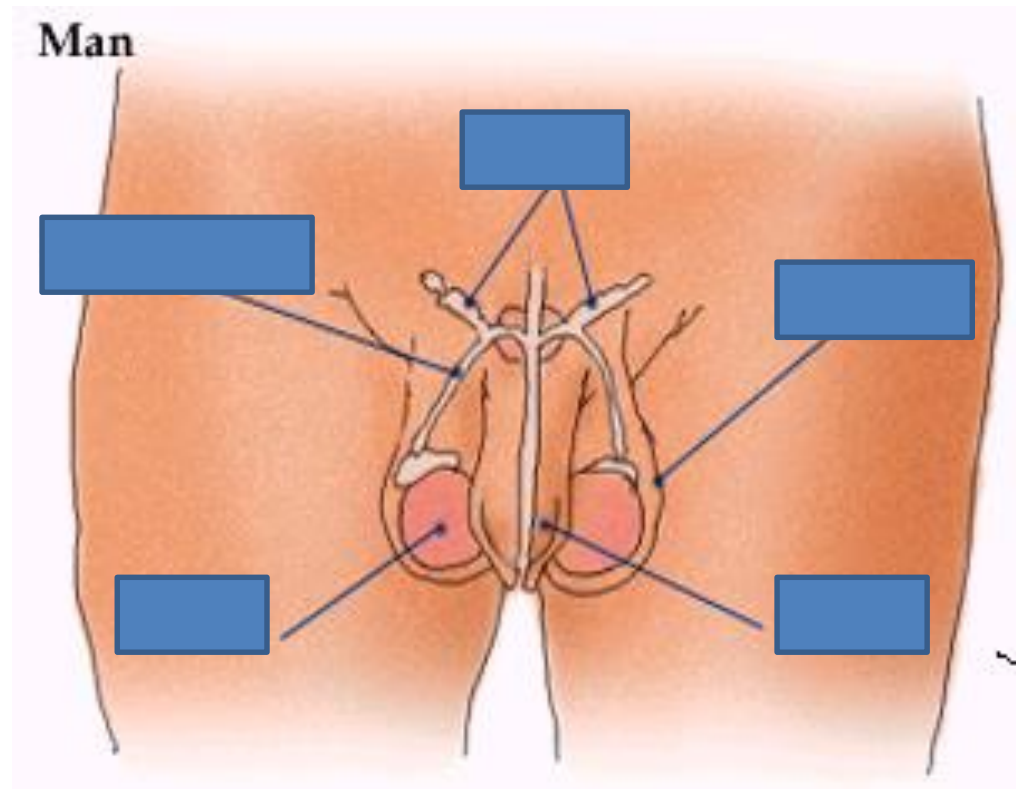


The male reproductive system

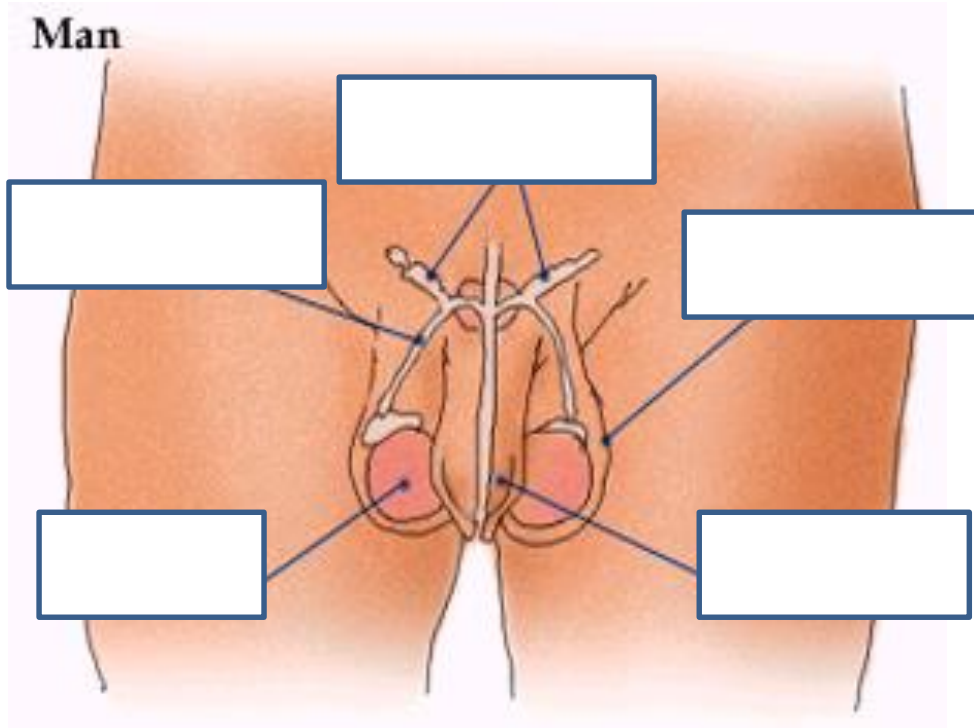


The male reproductive system

Label the diagram



The male reproductive system



Part	Function
Penis	
Urethra	
Sperm duct	
Testicles	
Gland	
Foreskin	

Outcomes:

Use key words to label the male reproductive system

Describe the function of each part of the male reproductive system

Explain how the sperm cell is adapted for its function

What does each part do?

Write down the function of each part on your diagram. Use the descriptions on the board to help you.

These secrete a liquid to add to the sperm. The sperm and liquid together is called semen.

This joins to the sperm duct. Semen and urine leave the penis through this.

This skin surrounds the testicles.

The sperm is produced here

The sperm travels up this tube from the testicles.

Today we will learn about the female reproductive system



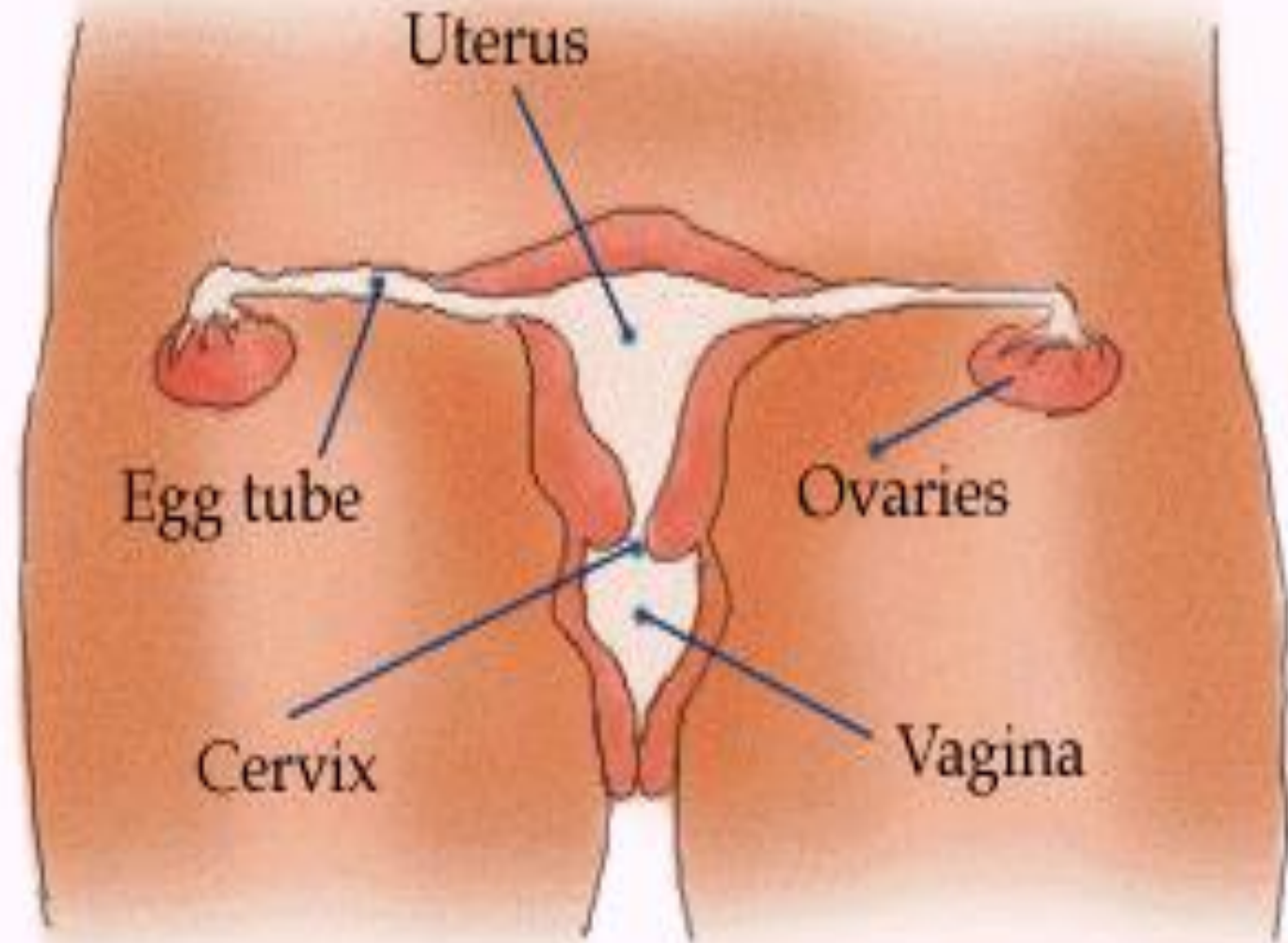
The female reproductive organ

**What do we know?
Can you identify anything on the diagram?**



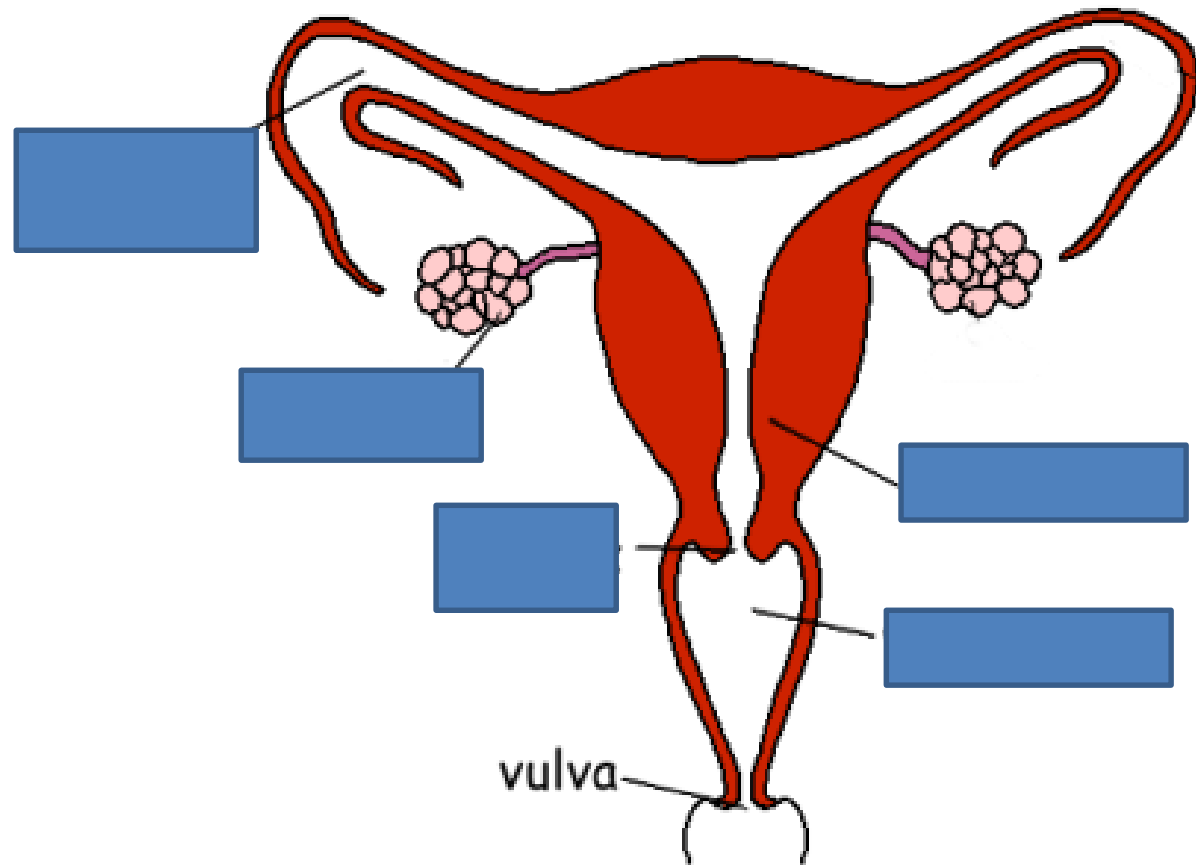
The female reproductive organ

Woman

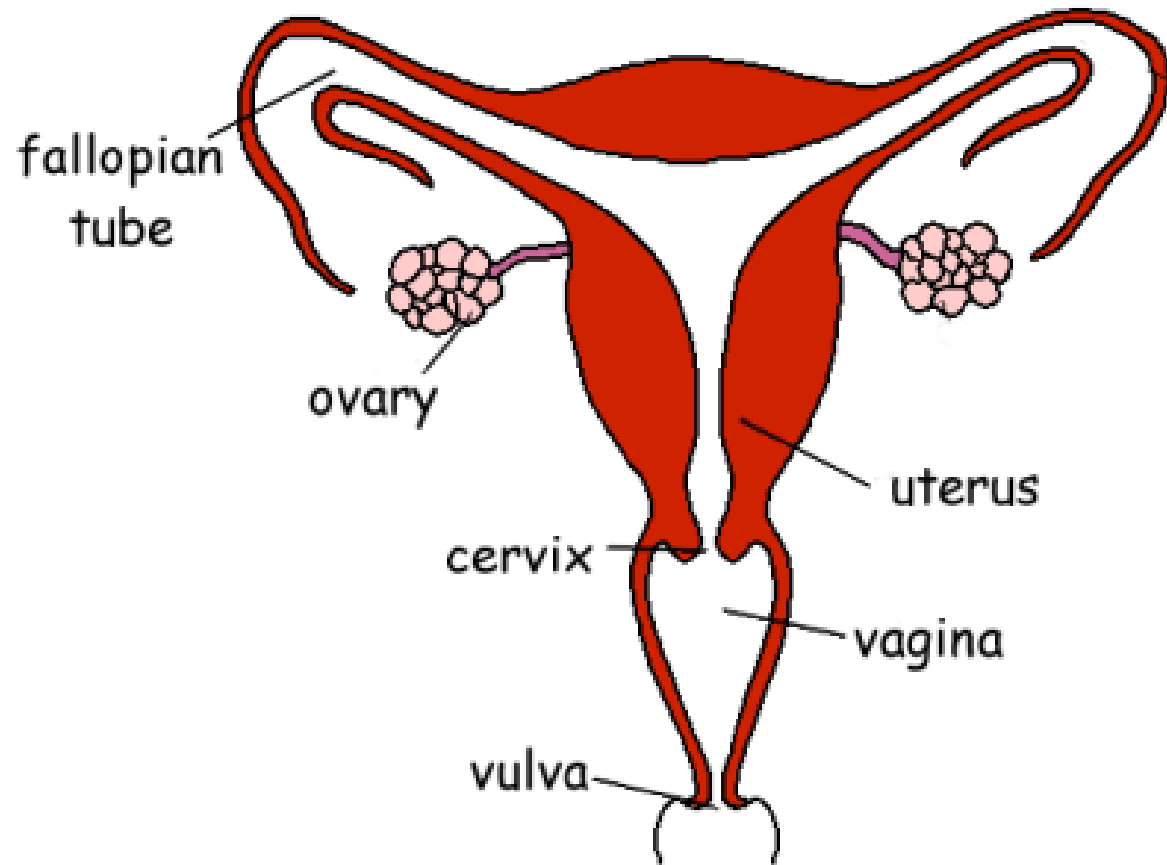


The female reproductive organ

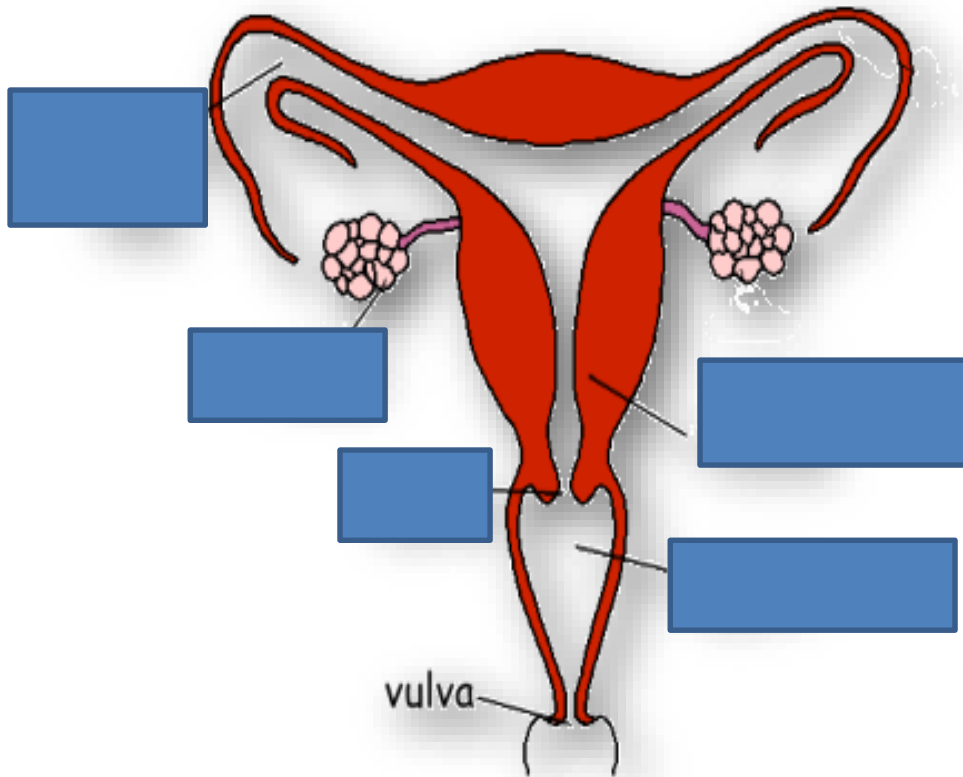
Label the diagram of the reproductive organs



What does each part do?



The female reproductive system



Part	Function
Ovary	
Fallopian Tube	
Womb/ Uterus	
Cervix	
Vagina	

Outcomes:

Use key words to label the female reproductive system

Describe the function of each part of the female reproductive system

Explain how the female egg cell is adapted for its function

What does each part do?

Write down the function of each part on your diagram. Use the descriptions on the board to help you.

This holds the foetus in place if the egg has been fertilised. It is a muscle that closes the top of the vagina.

This is where the fertilised egg would implant and develop into a foetus.

This is the tube that the egg travels down to get to the womb. Fertilisation usually happens here.

These release the egg cells

This is a muscular tube that opens to the outside of the body.

Mammal Reproduction

Sperm transmitted from penis to vagina swims up uterus into oviducts

Copulation

Young mammals need a lot of parental care

- Greater chance of sperm meets egg

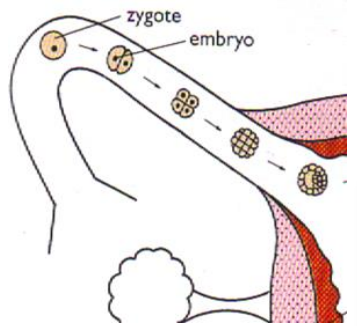
- Eggs protected inside mother

- Internal fertilisation is more efficient

Produce fewer eggs

Because no water medium for the sperm to swim through

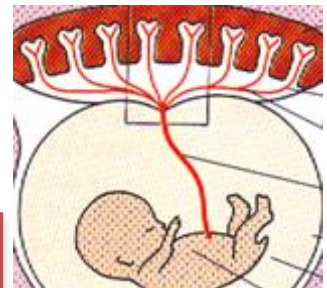
Internal Fertilisation



Fertilisation

Reproductive organs

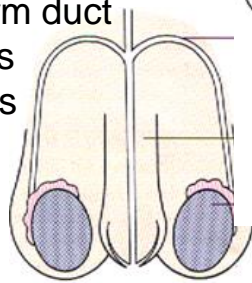
Placenta



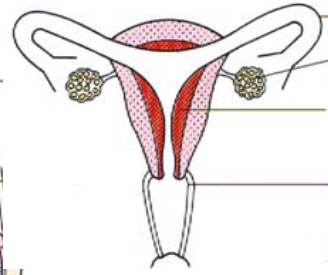
The placenta is an organ which allows substances to move from the mother's blood to babies' blood

Provides nourishment, gas exchange and excretion for the foetus

- Sperm duct
- Penis
- Testis

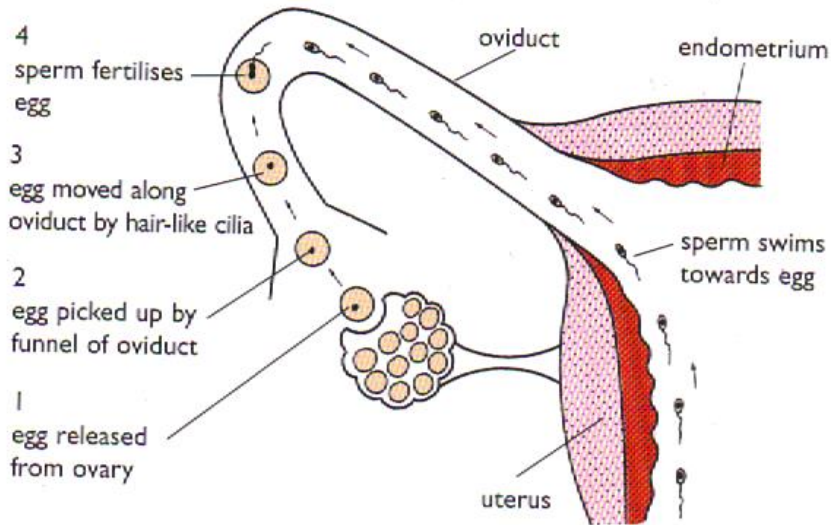
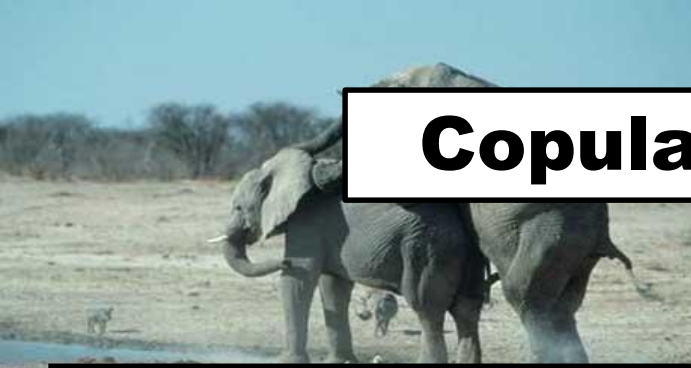


- Oviduct
- Ovary
- Uterus
- Vagina



The fertilised egg passes down the oviduct and becomes attached to the wall of the uterus.

Copulation



During copulation the penis is inserted into the vagina.

Sperm is released from the penis and they swim up the uterus and into the oviducts

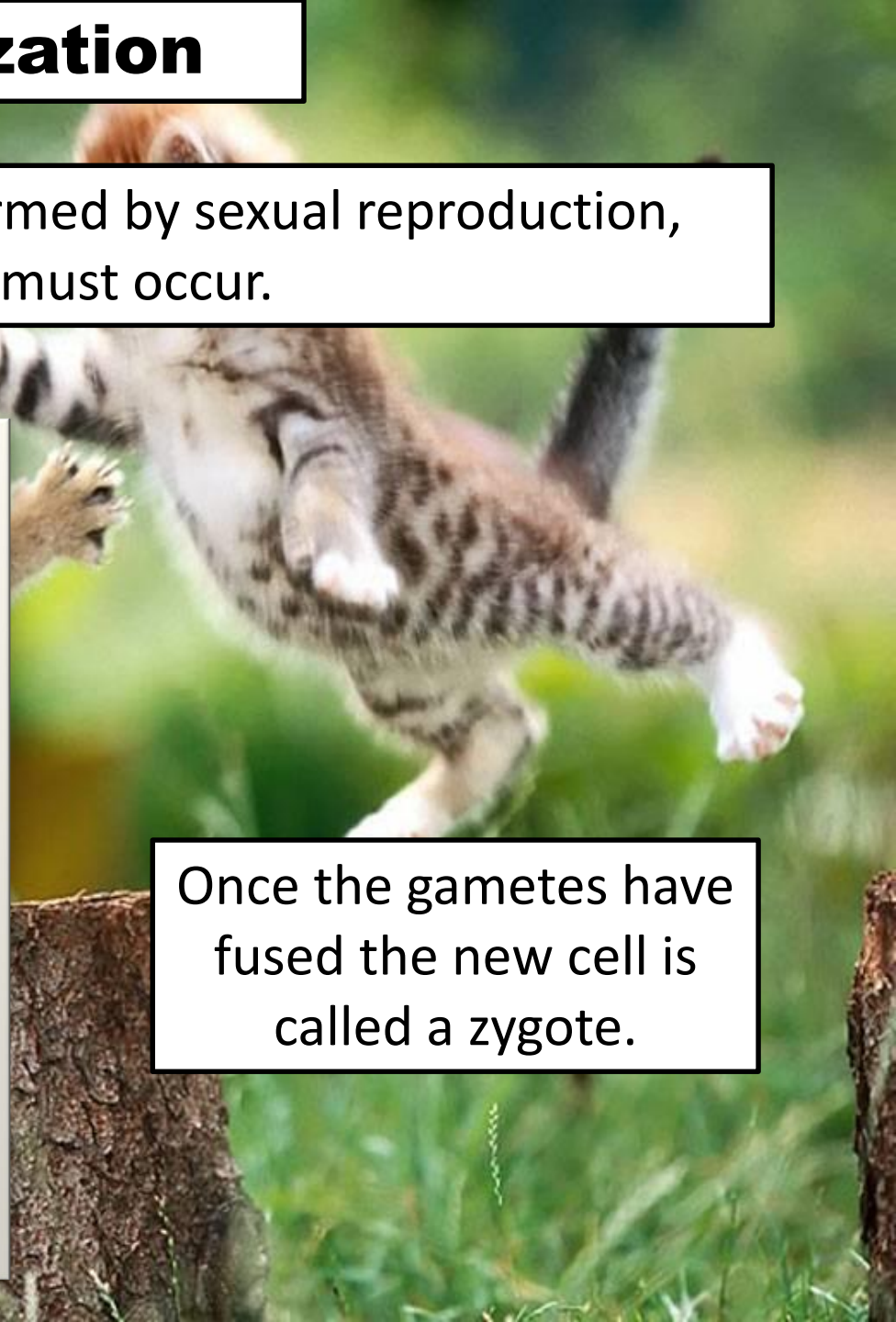


Fertilization

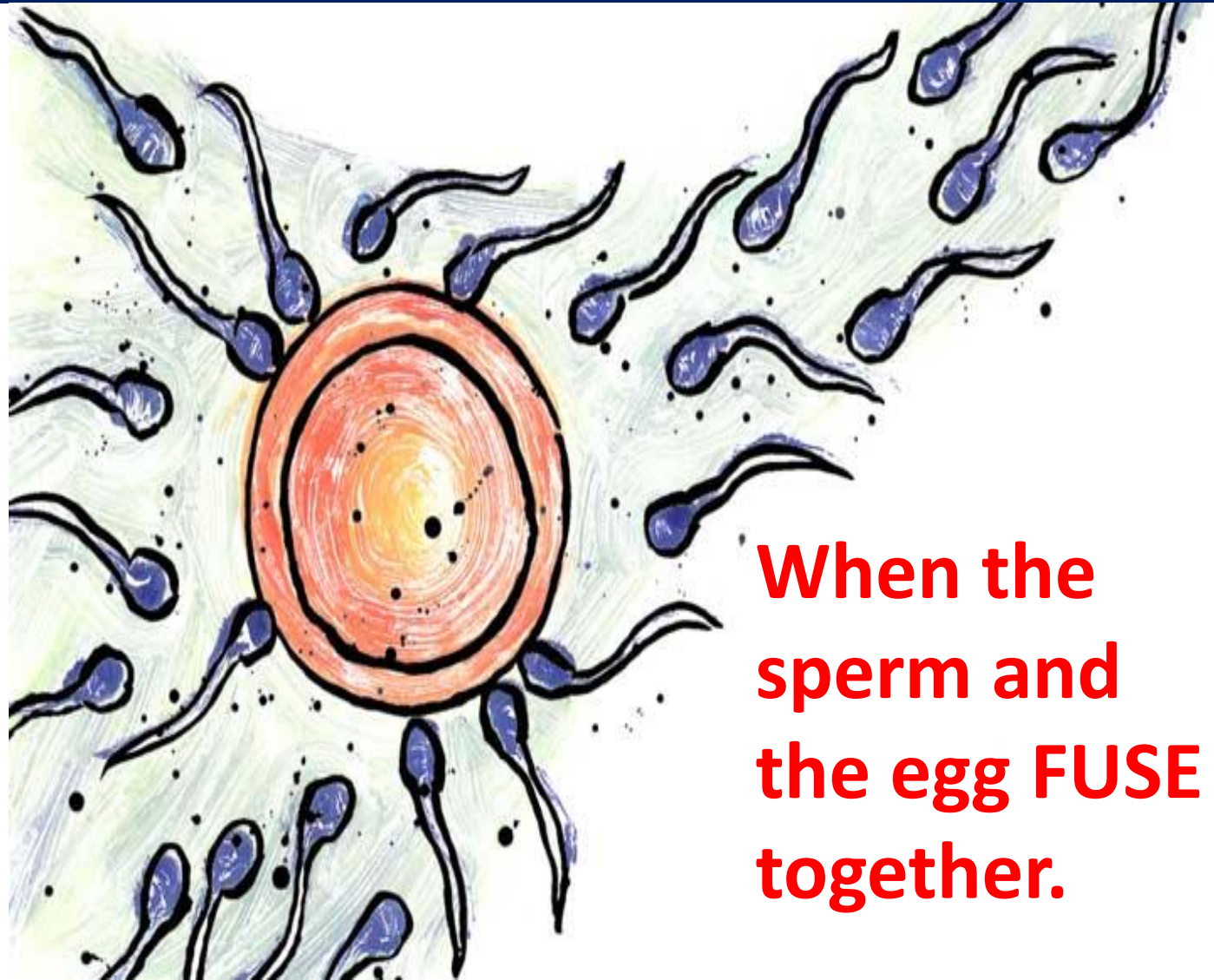
For a new individual to be formed by sexual reproduction, fertilisation must occur.



Once the gametes have fused the new cell is called a zygote.

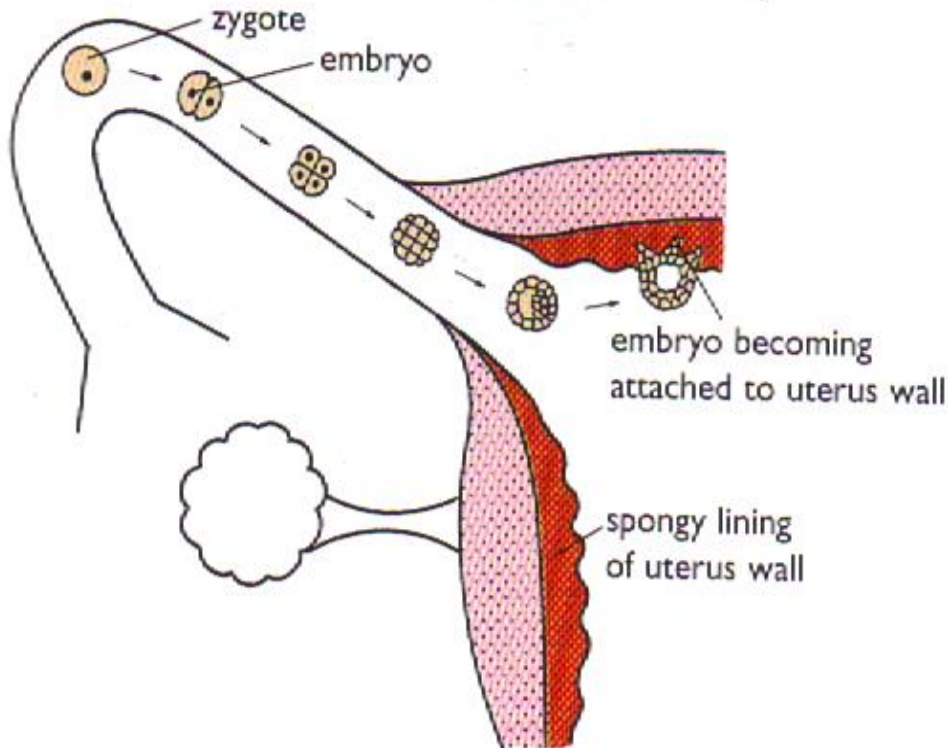


What is fertilisation?



**When the
sperm and
the egg FUSE
together.**

Fertilisation

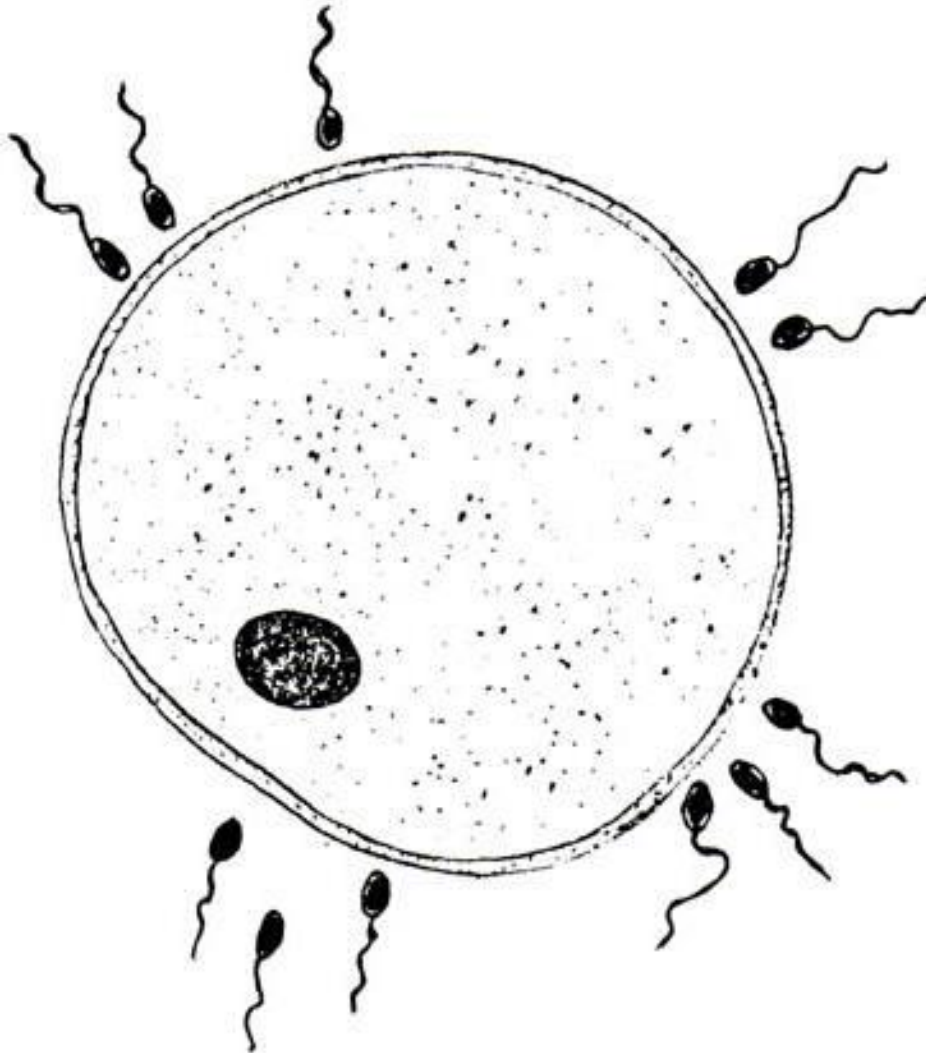


The fertilised egg passes down the oviduct and becomes attached to the wall of the uterus.

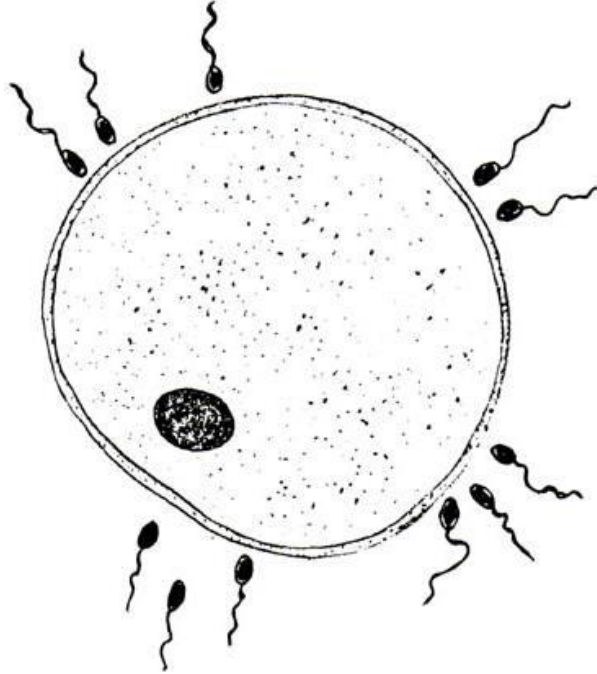
It develops in fluid of the amniotic sac and obtains food from the maternal circulation (mothers' blood)

Sperm and the egg

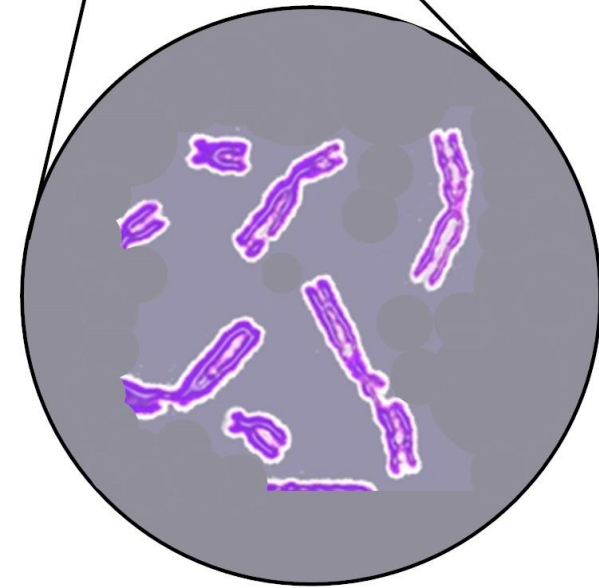
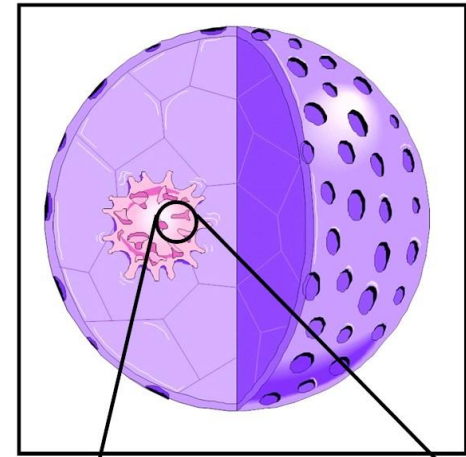
What do each of these have?



A nucleus which contains the DNA



**The nucleus carries
your DNA.**



Where did you get your DNA from?

You got half of your DNA from your mum and half from your dad

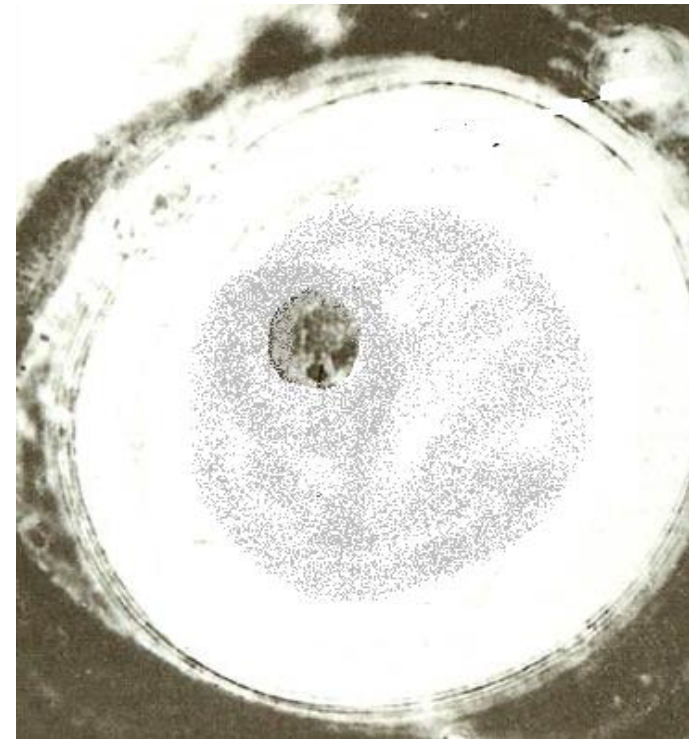
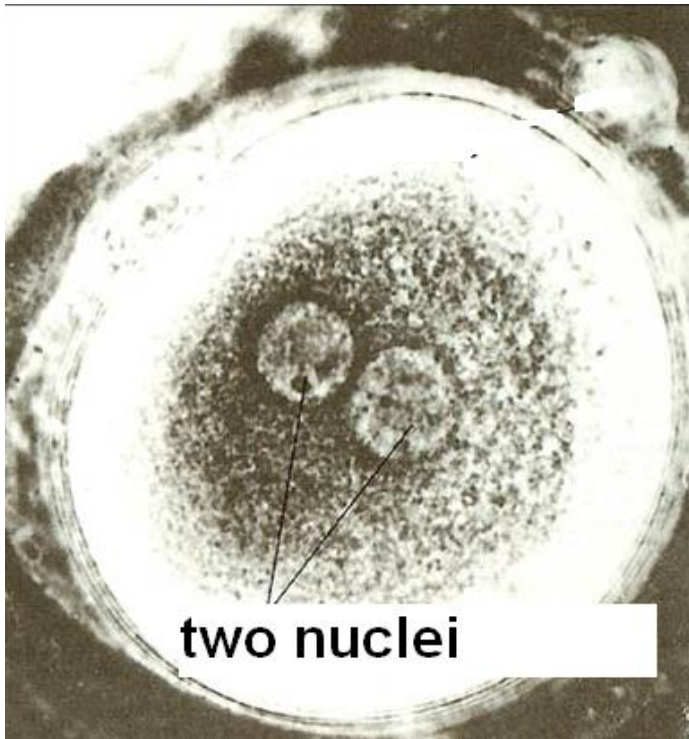
Who did you inherit your eye colour from?

Nose shape?

Hair colour?



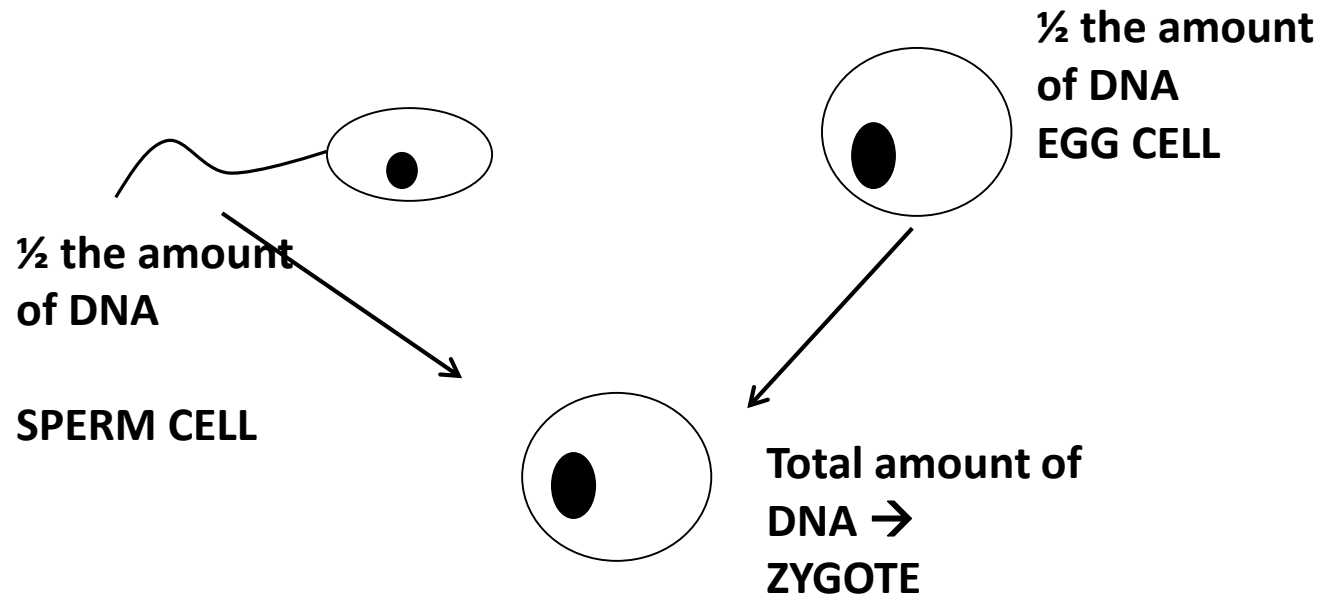
Which egg is fertilised? How do you know?



What is fertilisation?

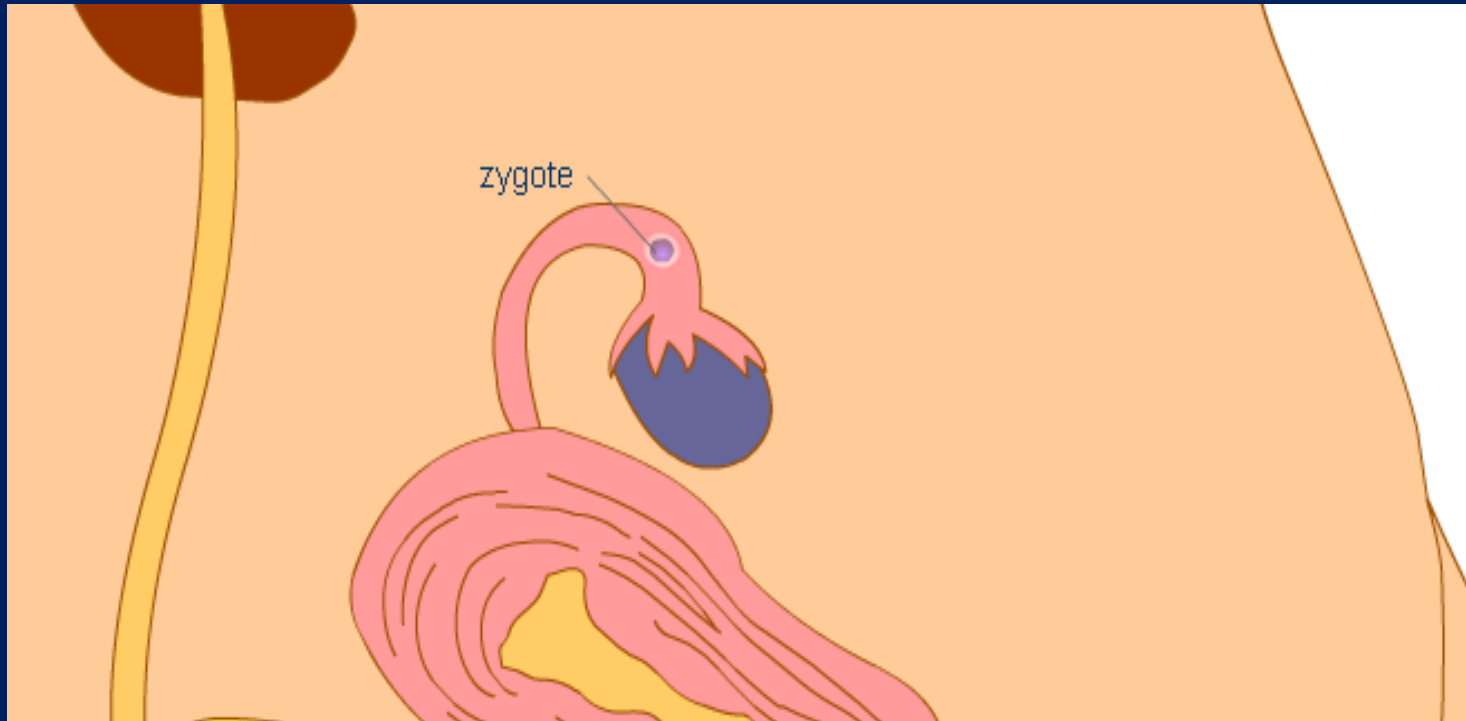
Draw this diagram in your notes and explain what it shows.

What is this process called?





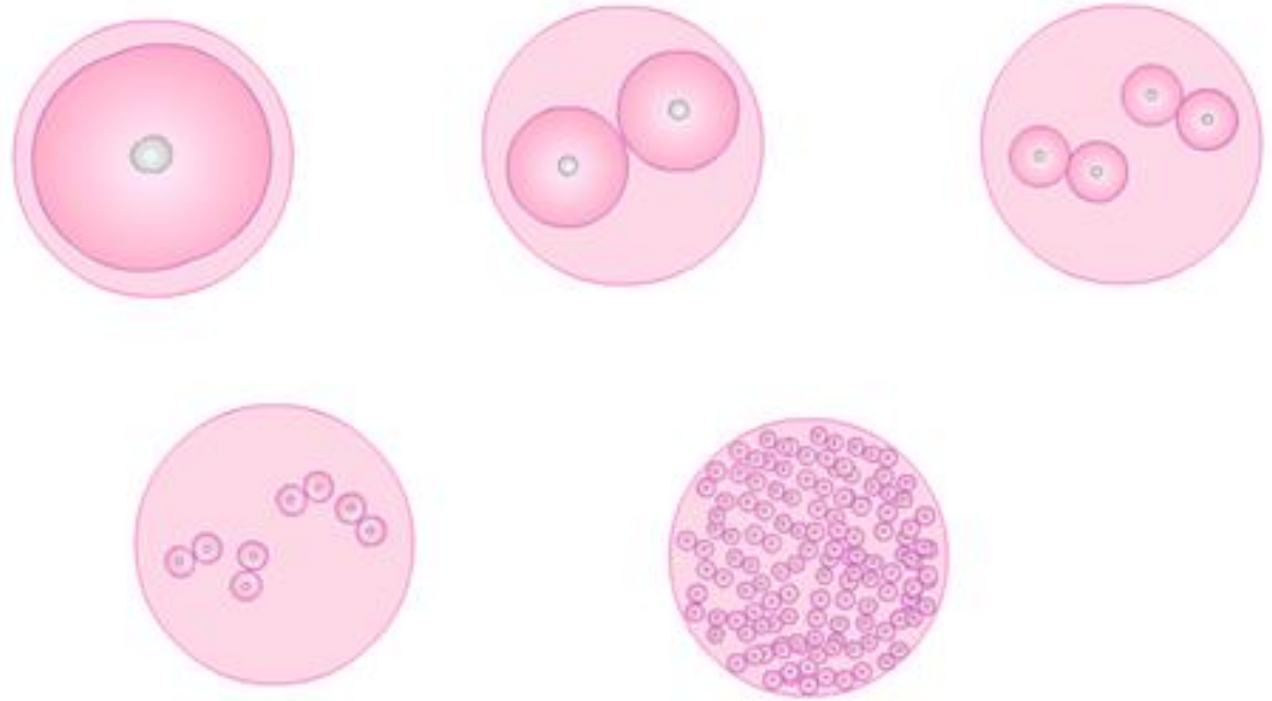
What happens to the zygote?



After fertilisation the zygote continues to move down the fallopian tube to the uterus

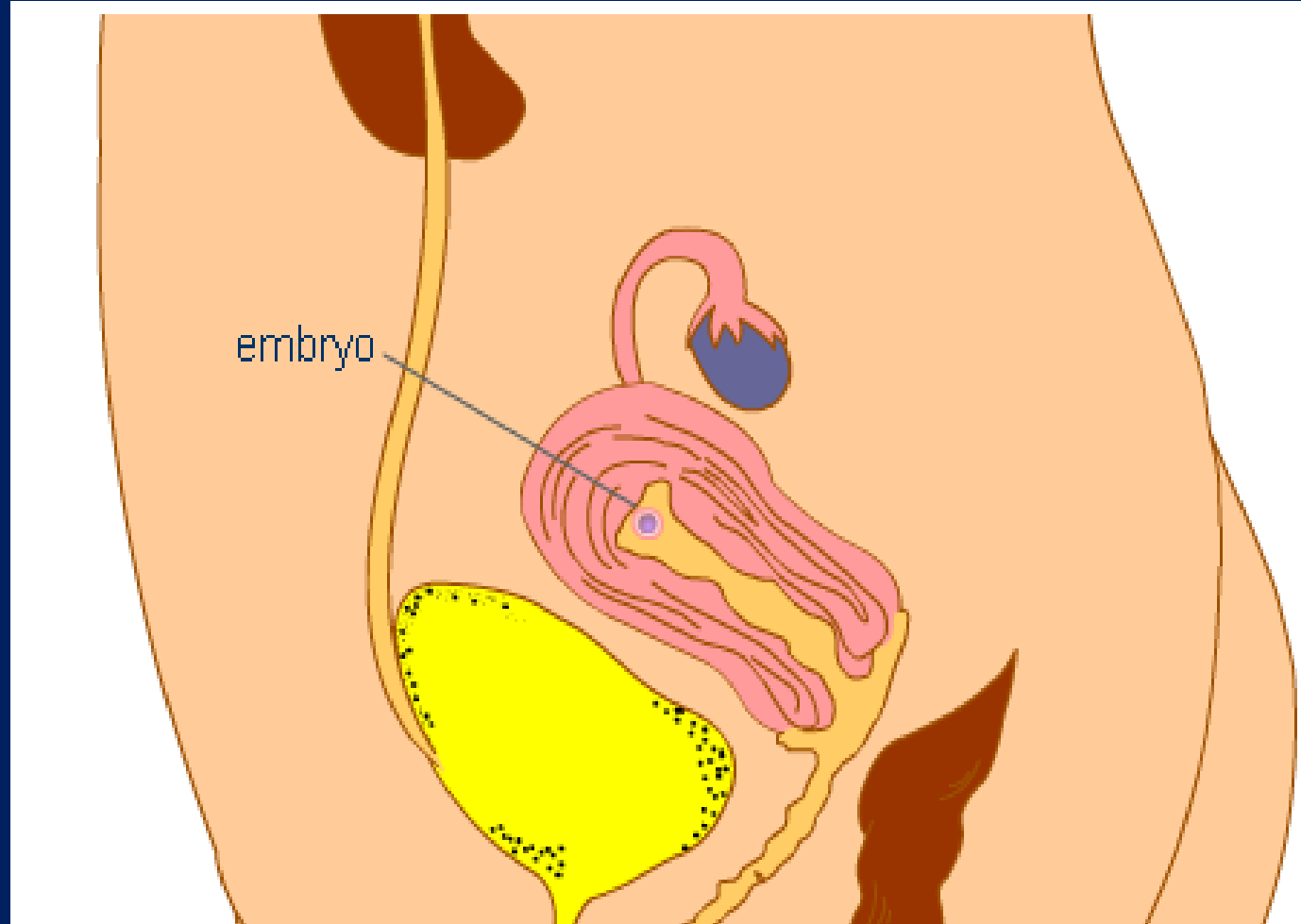
After fertilisation the zygote continues to move down the fallopian tube/oviduct to the uterus

What is fertilisation?



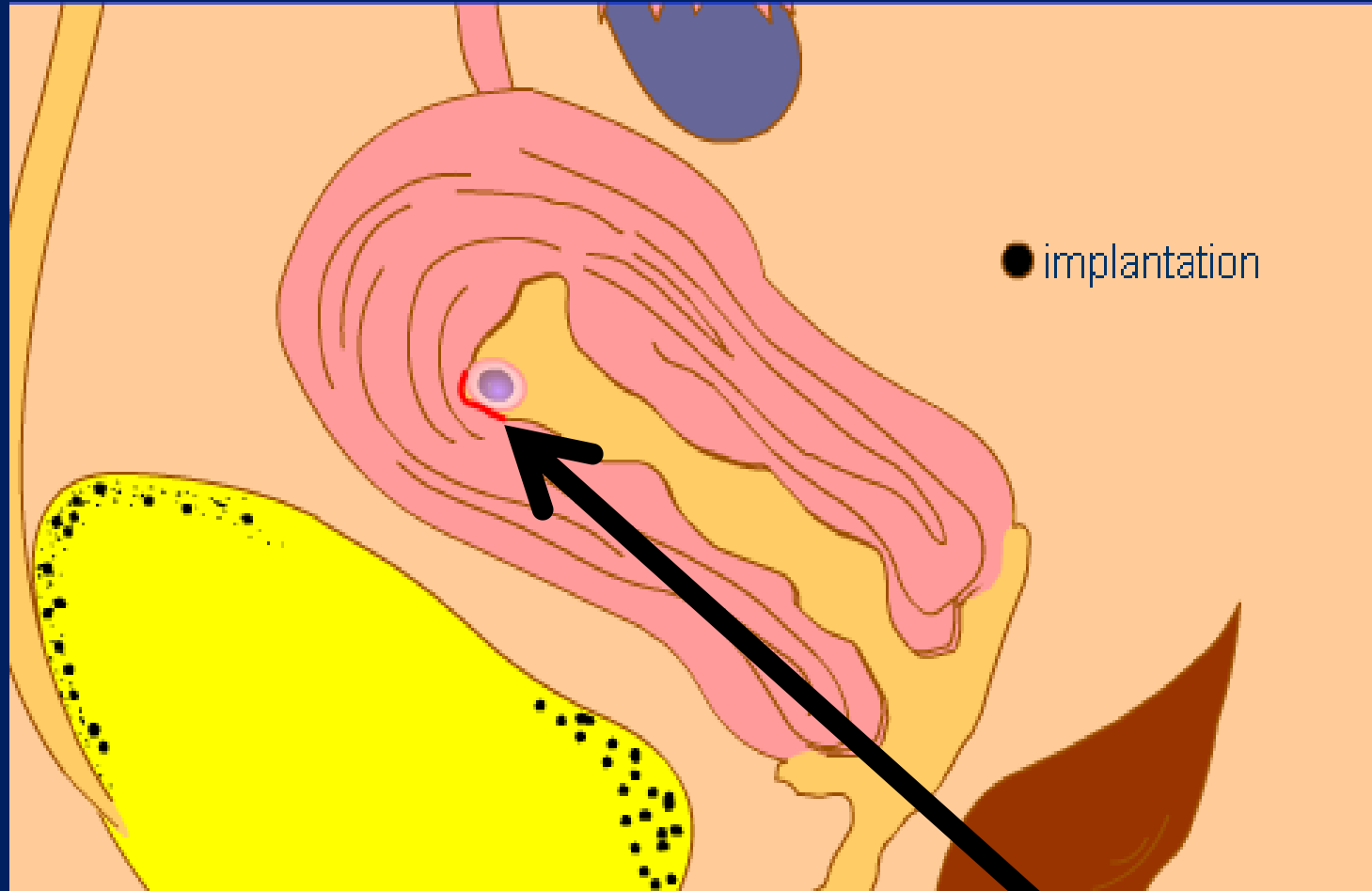
The fertilised egg (Zygote) Then divides and copies itself several times. It then becomes a ball of cells called an embryo.

What is fertilisation?



**Lining of womb/uterus thickens
ready to receive the embryo**

Implantation?



Embryo attaches itself to the uterus wall. This is called **IMPLANTATION**.

Today we will learn about Foetal development and pregnancy



What happens after fertilisation?



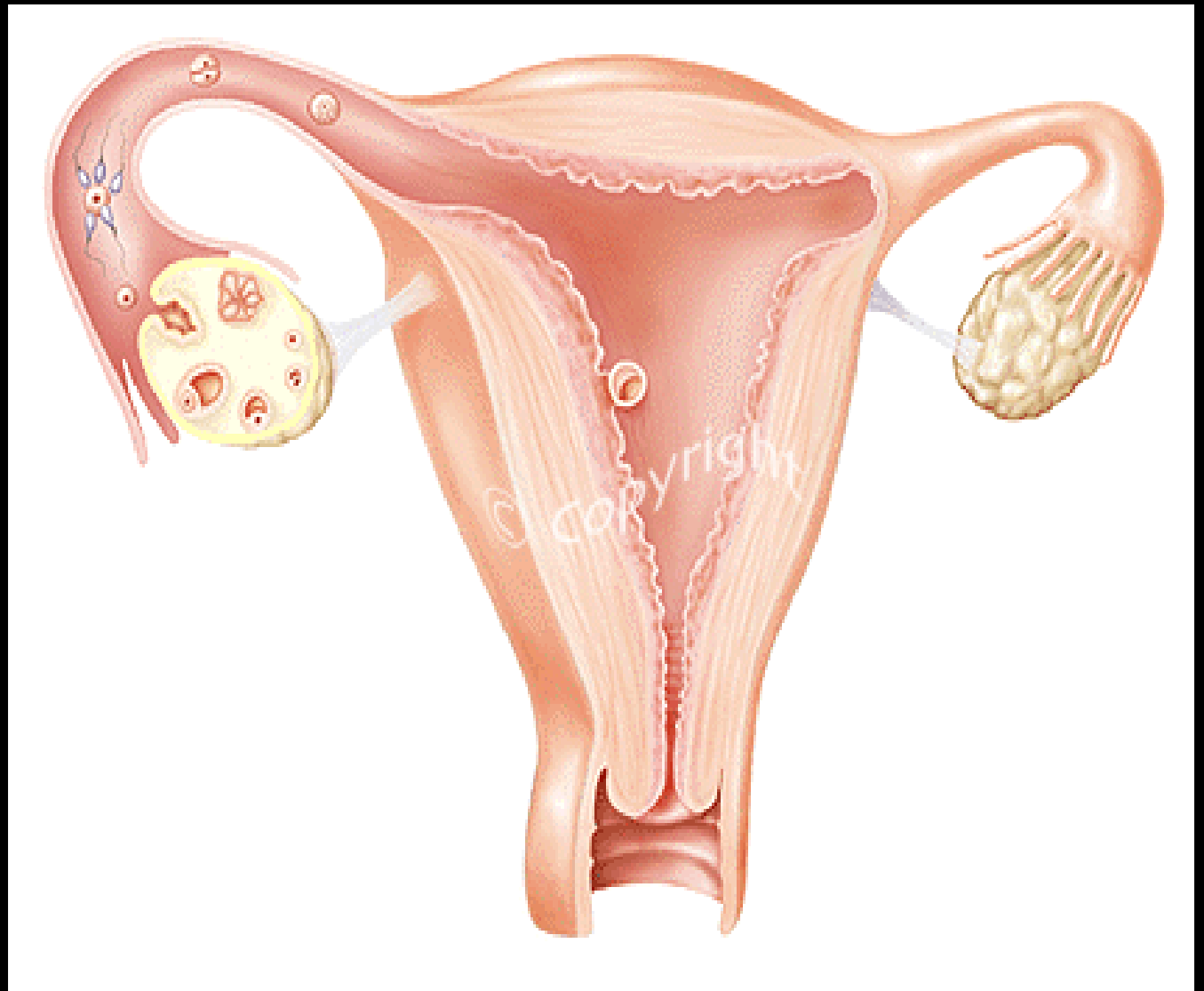
What happens after fertilisation?

The zygote (fertilised egg) divides and copies itself.

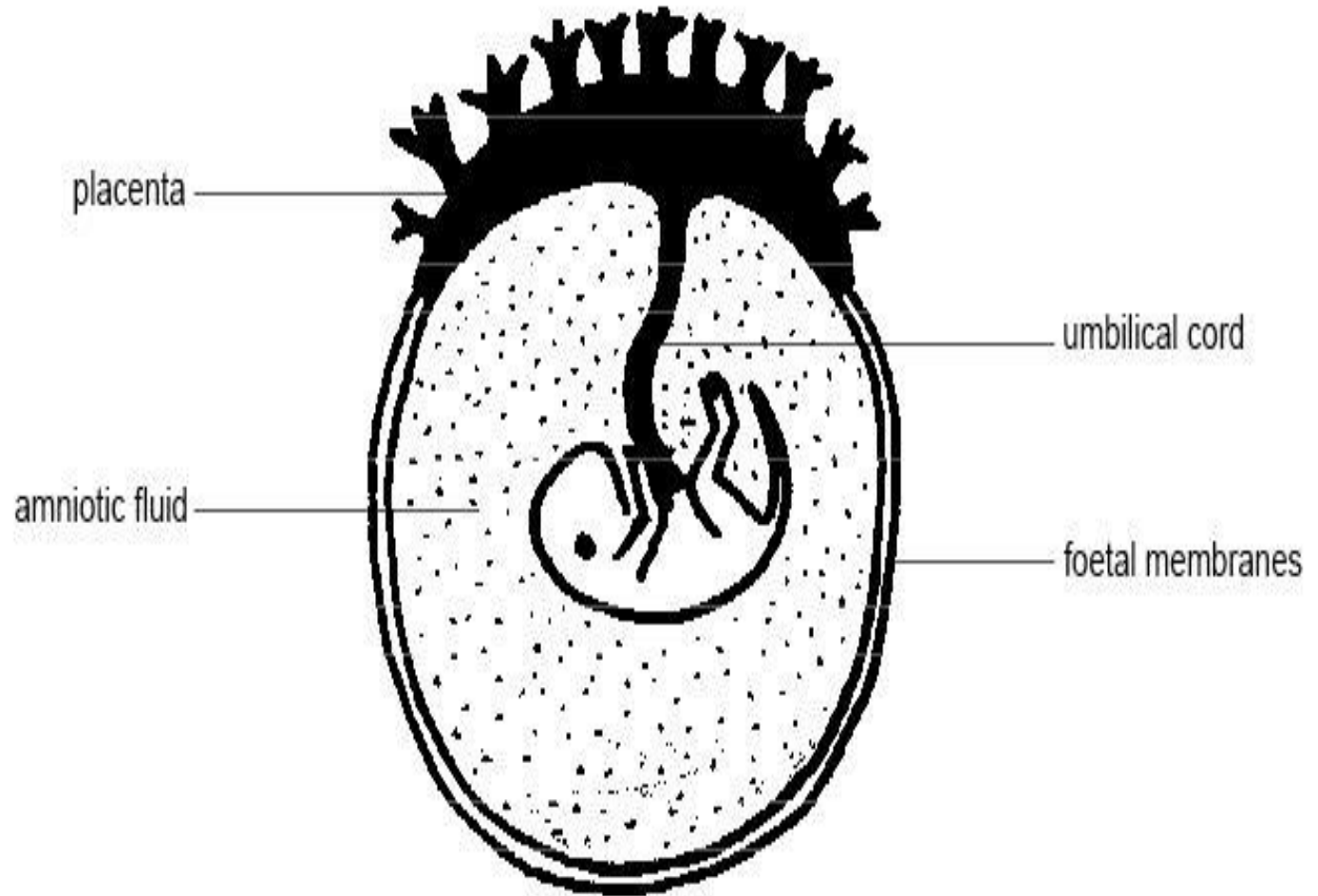
This is called an embryo. The embryo floats towards the uterus/womb.



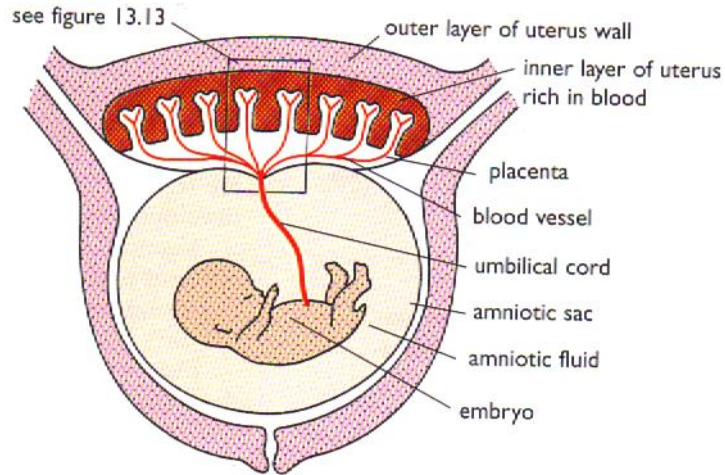
Embryo implants in the uterus wall



A placenta starts to develop

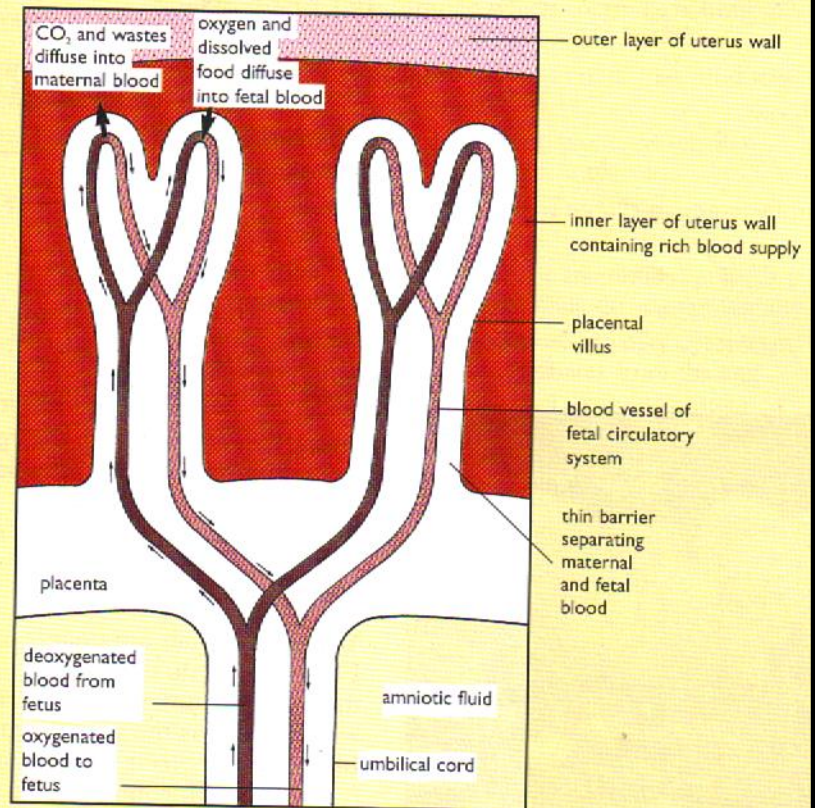


The placenta



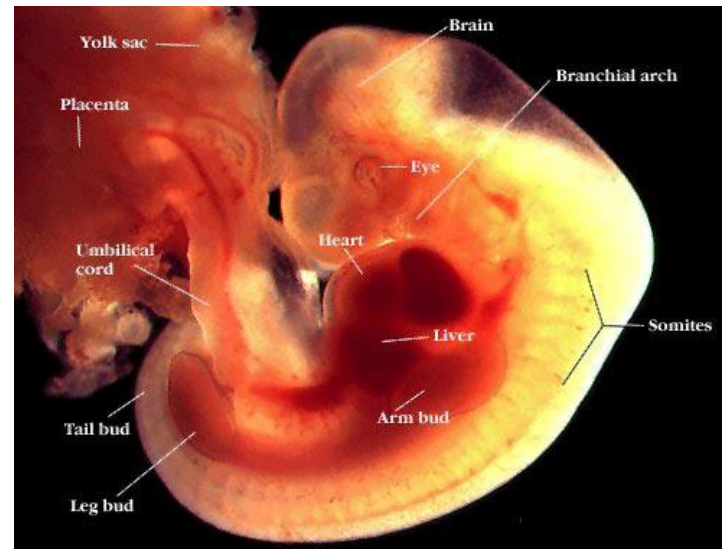
Blood vessels from the baby form finger like projections into the maternal blood supply so that diffusion can take place

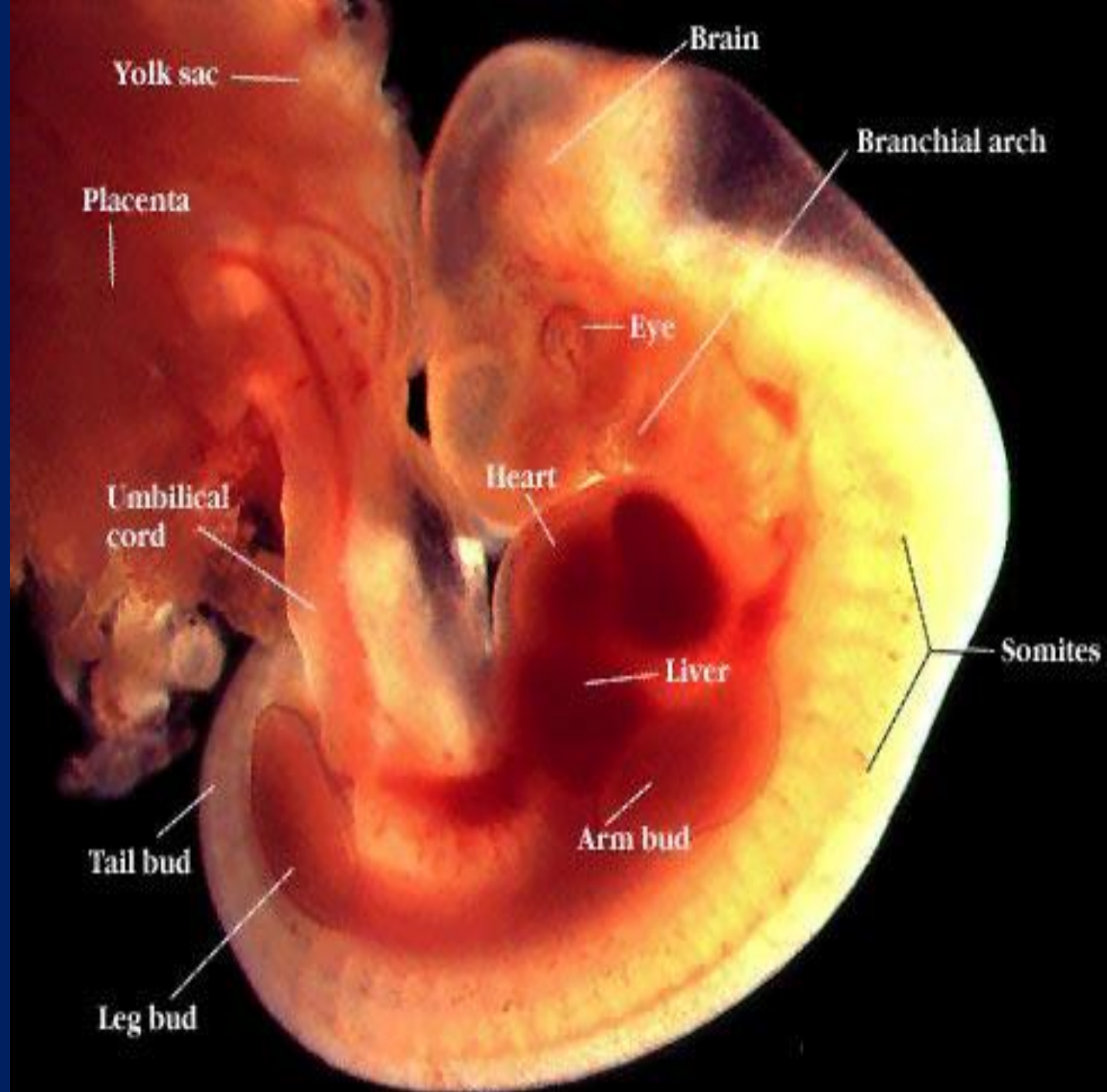
The placenta is an organ of nourishment, gaseous exchange and excretion for the foetus



3-5 weeks

WEEK 3-5 The embryo's tiny heart begins to beat by day twenty-one. Arm and leg buds are visible and the formation of the eyes, lips, and nose has begun. The spinal cord grows faster than the rest of the body giving a tail like appearance which disappears as the embryo continues to grow. The placenta begins to provide nourishment for the embryo.





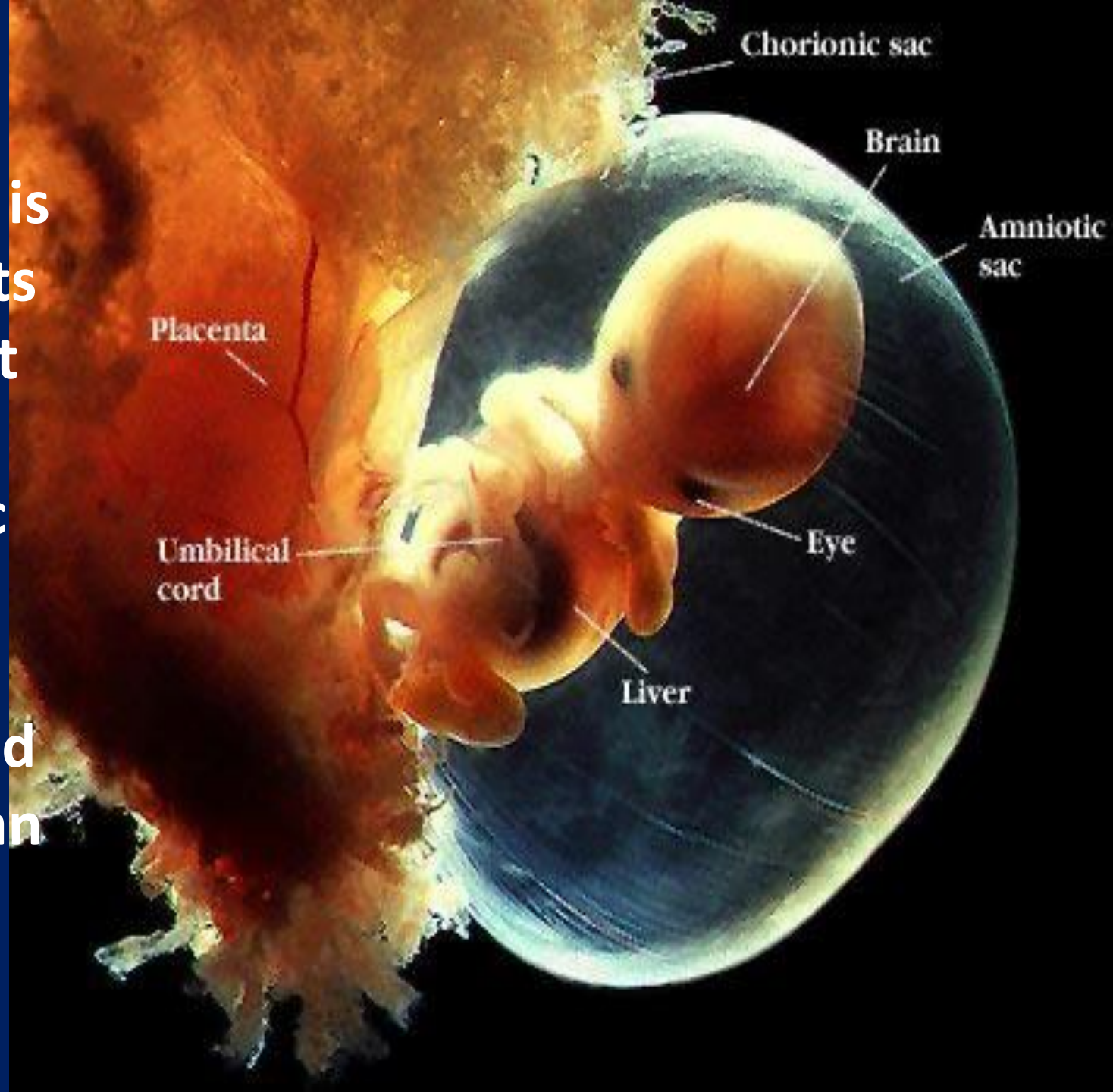
Week 7

Major organs have all begun to form. The embryo has developed its own blood type, unique from the mother's. Hair follicles and knees and elbows are visible.



WEEK 8-12

The embryo is reactive to its environment inside the amniotic sac where it swims and moves. Hands and feet can be seen.



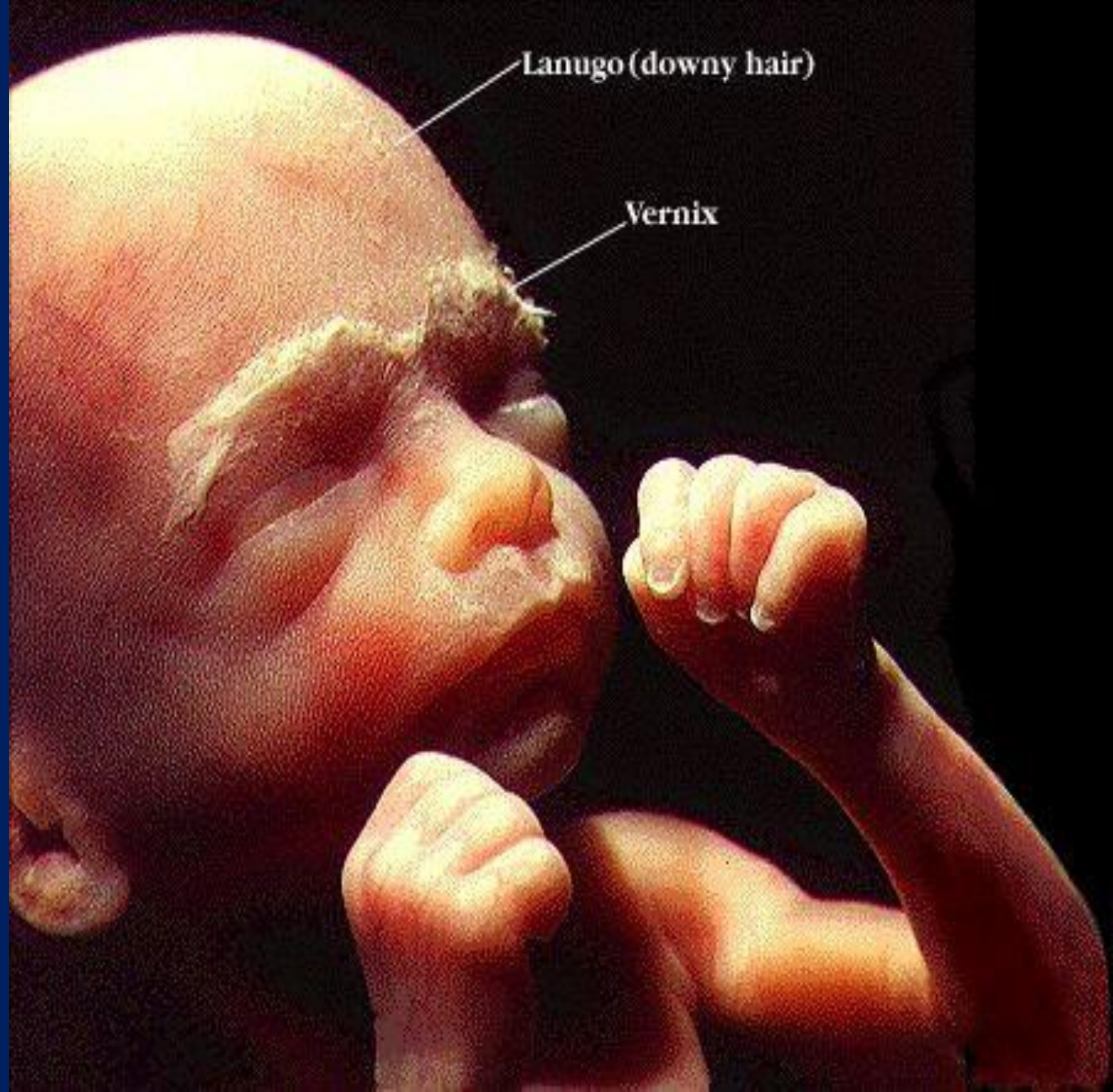
Weeks 13-16

The brain is fully developed and the foetus can suck, swallow, and make irregular breathing sounds. Foetus can feel pain.



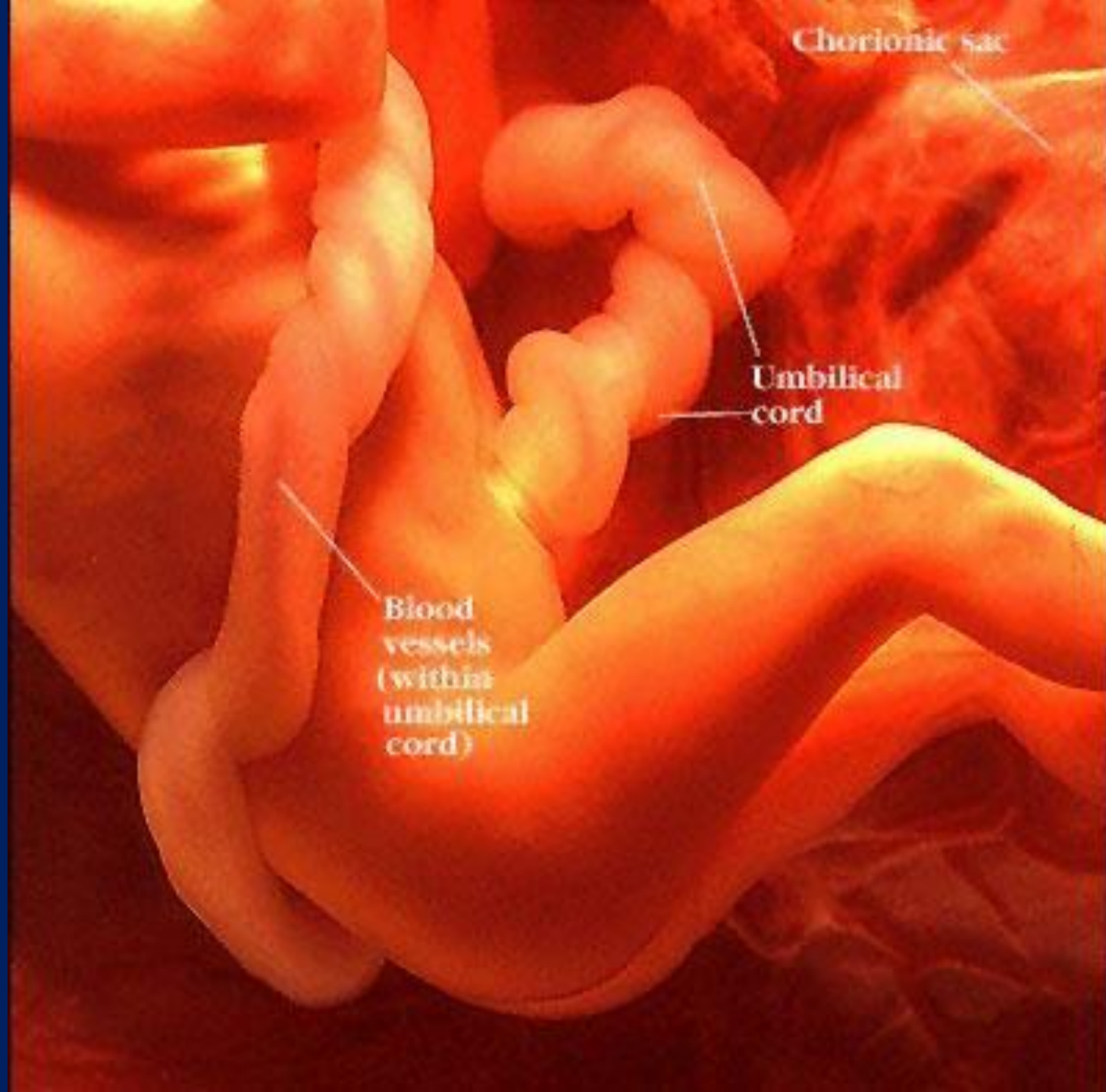
Week 20-24

Foetus has a hand and footprints and fingerprints are forming. Foetus practices breathing by inhaling amniotic fluid into its developing lungs.



Weeks 25 – 28

Rapid brain development occurs during this period and the nervous system is able to control some bodily functions. The foetus' eyelids now open and close. At 25 weeks there is a 60% chance of survival if born.



Weeks 29 – 32

There is a rapid increase in the amount of body fat the foetus has. At this point there the survival rate is above 95% if the baby is born.





Task-Pregnancy worksheet

Write the correct statement next to the correct picture.

Outcomes:

Identify the key stages during pregnancy

Describe how the mother and baby exchanges substances

Keywords

Zygote

Embryo

Umbilical cord

Foetus

Oxygen

Carbon dioxide

Glucose

The embryo is now called a foetus and has human features

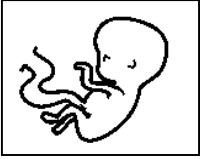
The foetus has defined fingers and toes and begins to grow hair, eyelashes and nails

The foetus is fully developed and ready to be born, it is about 50 cm long and about 3.5kg

The foetus is 30cm long and the brain is very active. The foetus sleeps and wakes at regular intervals

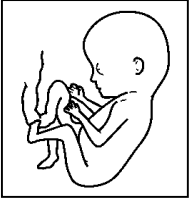
The foetus is 7 cm long and has all body parts are in place

Answers



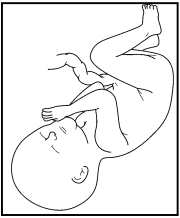
Week 8

The embryo is now called a foetus and has human features



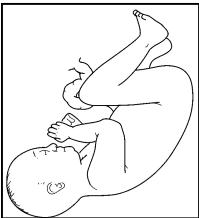
Week 10

The foetus is 7 cm long and has all body parts are in place



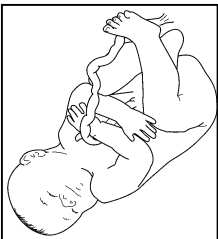
Week 20

The foetus has defined fingers and toes and begins to grow hair, eyelashes and nails



Week 30

The foetus is 30cm long and the brain is very active. The foetus sleeps and wakes at regular intervals



Week 40

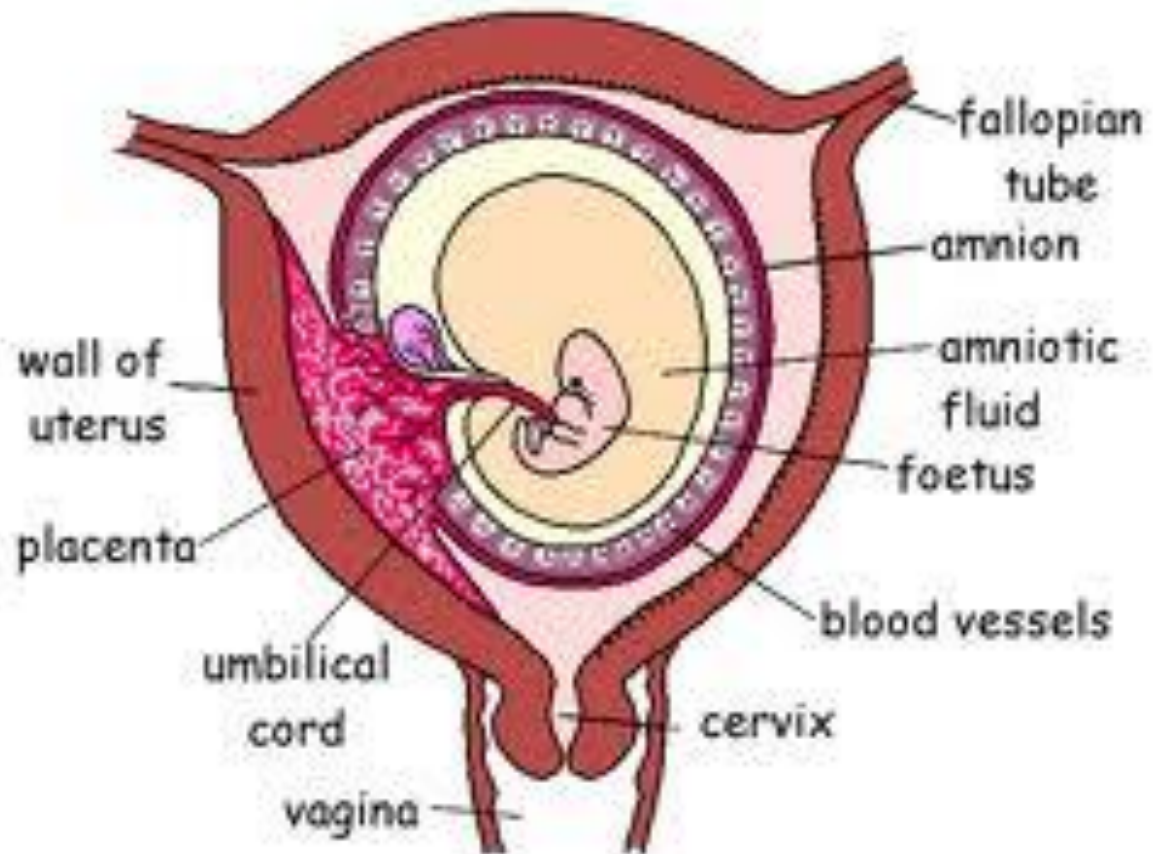
The foetus is fully developed and ready to be born, it is about 50 cm long and about 3.5kg

How does the foetus get oxygen?

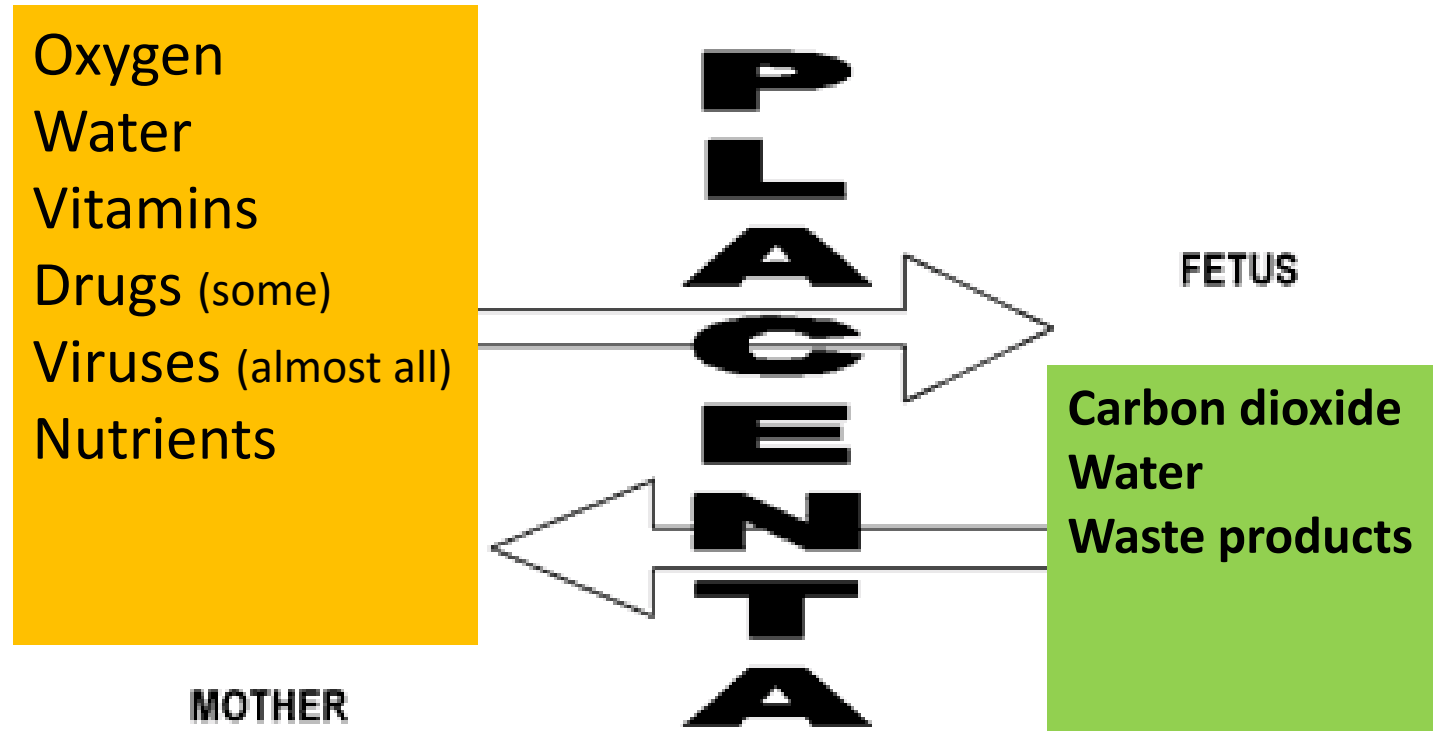
Any ideas?



The placenta



Placenta



How does the foetus get the substances it needs?

Agony Aunt

Dear Agony Aunt,

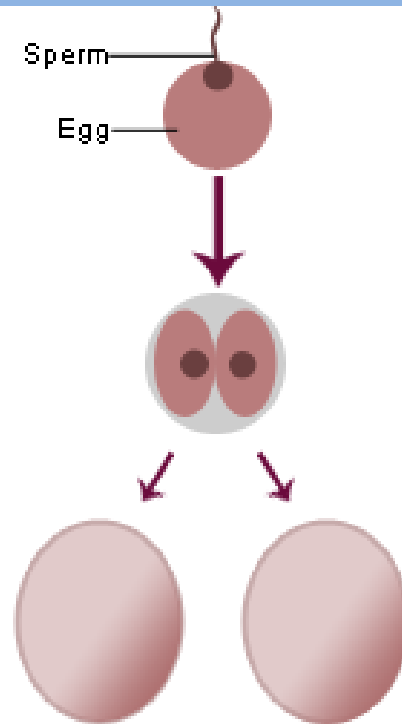
I am pregnant and I am wondering How my baby gets all the nutrients and oxygen it needs. Also, If I smoke will it affect the baby?

From Jenny

Task: Write a response to Jenny to explain how her baby gets the oxygen and nutrients it needs and gets rid of the waste products. You should explain if they baby is affected by smoking.

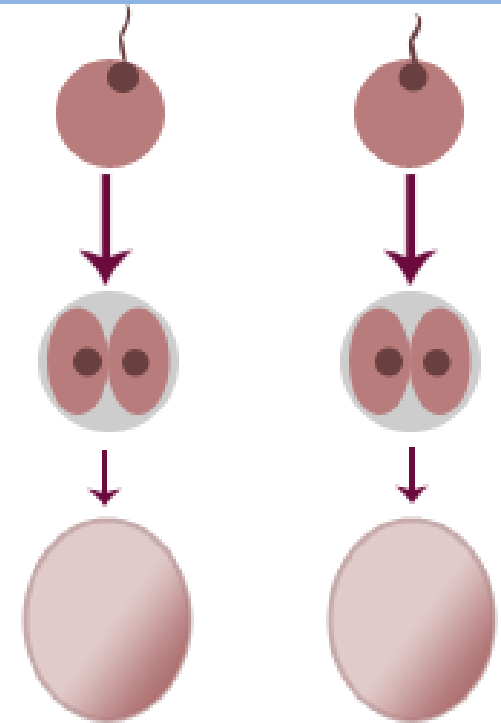
What about twins?

Identical



(Shared placenta)

Non-Identical

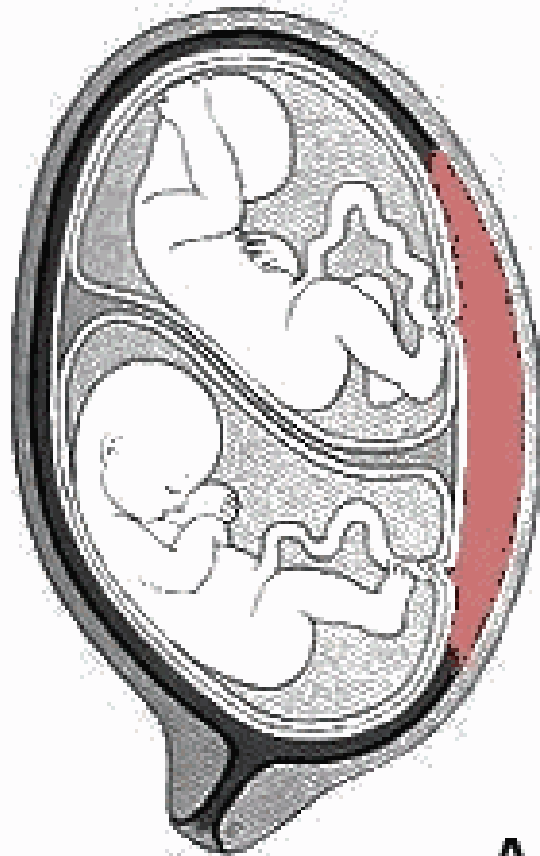


(Separate placentas)

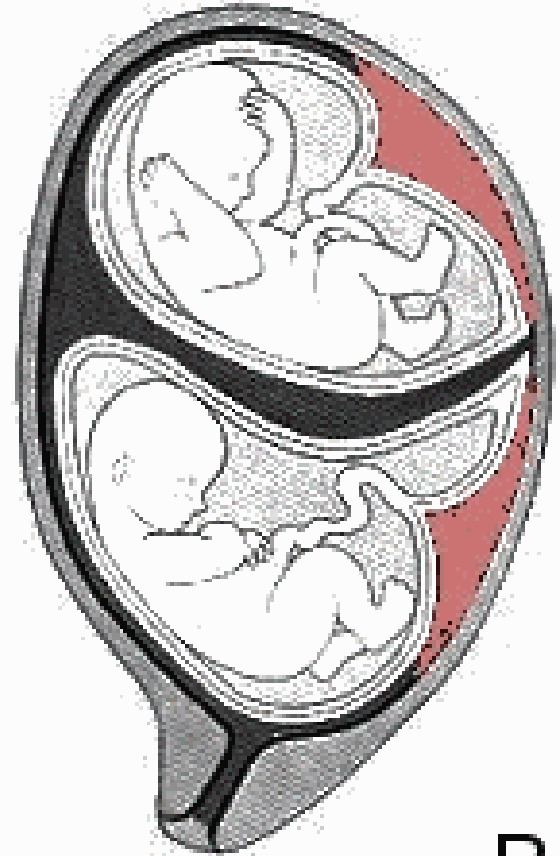
Twins

Identical

Non-Identical



A

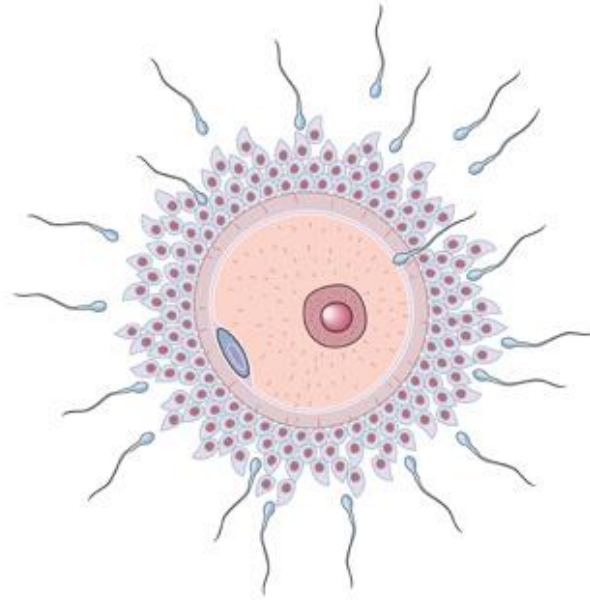


B

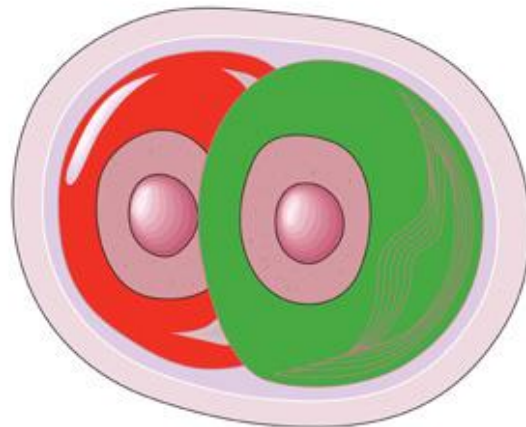
Conjoined twins



Conjoined twins



The copied cells do not separate properly! They start to develop individually even though they are joined.



True or false

1. When a zygote divides into a ball of cells it is called an embryo.
2. Oxygen passes from the foetus to the mother
3. Nutrients pass to the foetus from the mothers blood.
4. Smoking will not harm a baby
5. Alcohol and some other drugs will harm the baby.

Today we will learn about puberty



What makes these changes happen?

HORMONES

chemicals in the body



Male hormone

Testosterone



Female hormone

Oestrogen

Who is this? What's changed?



Hips widen



Pubic (body) hair grows



Voice breaks



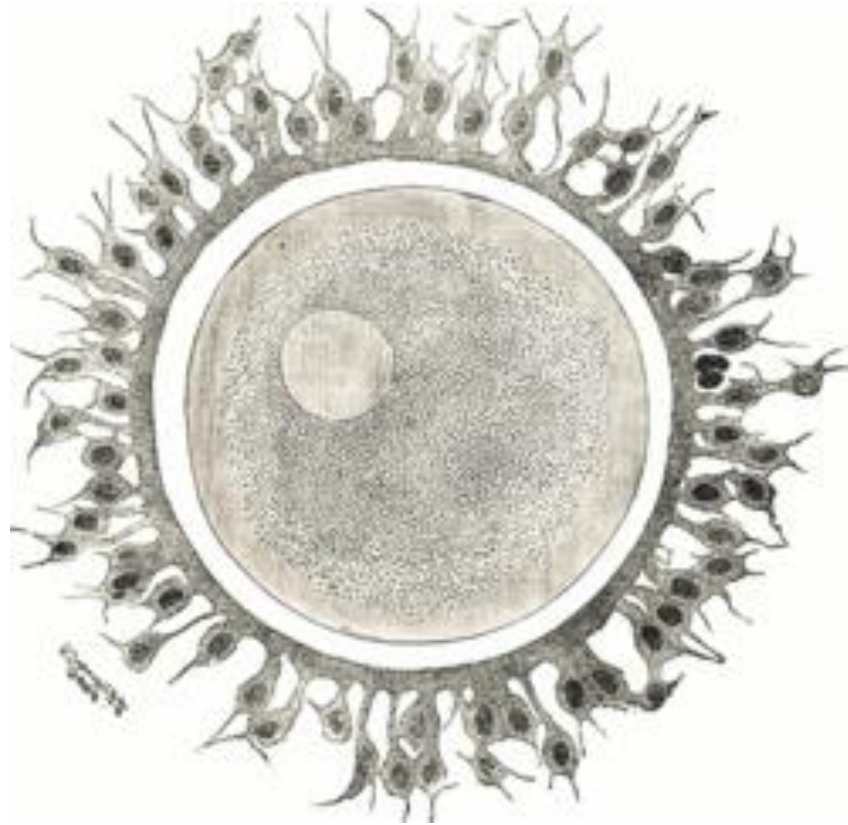
Body Odour



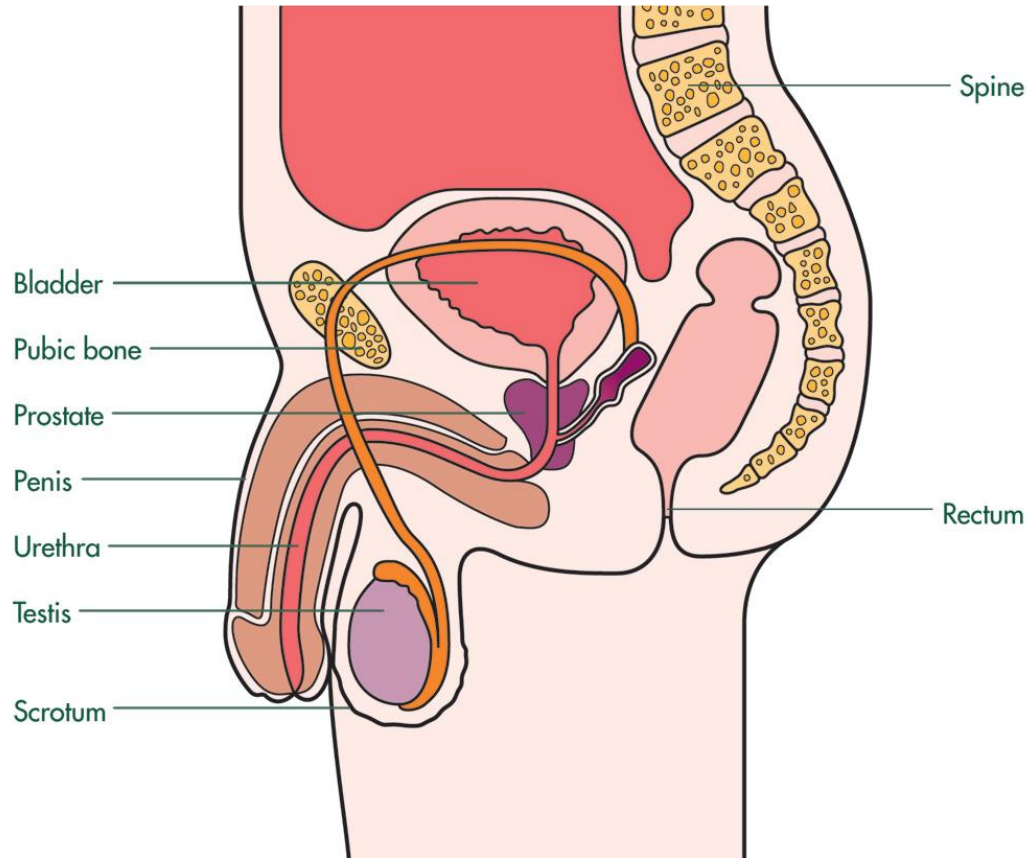
Sperm are produced in the
testicles



Eggs are matured in the ovaries



Penis grows/ Breast grow



Shoulders widen





Girls usually start
puberty first

Males:

Sperm production begins

Penis grows

Hair grows

Body odour

Voice breaks

Shoulders widen

Females:

Hips widen

Pubic hair

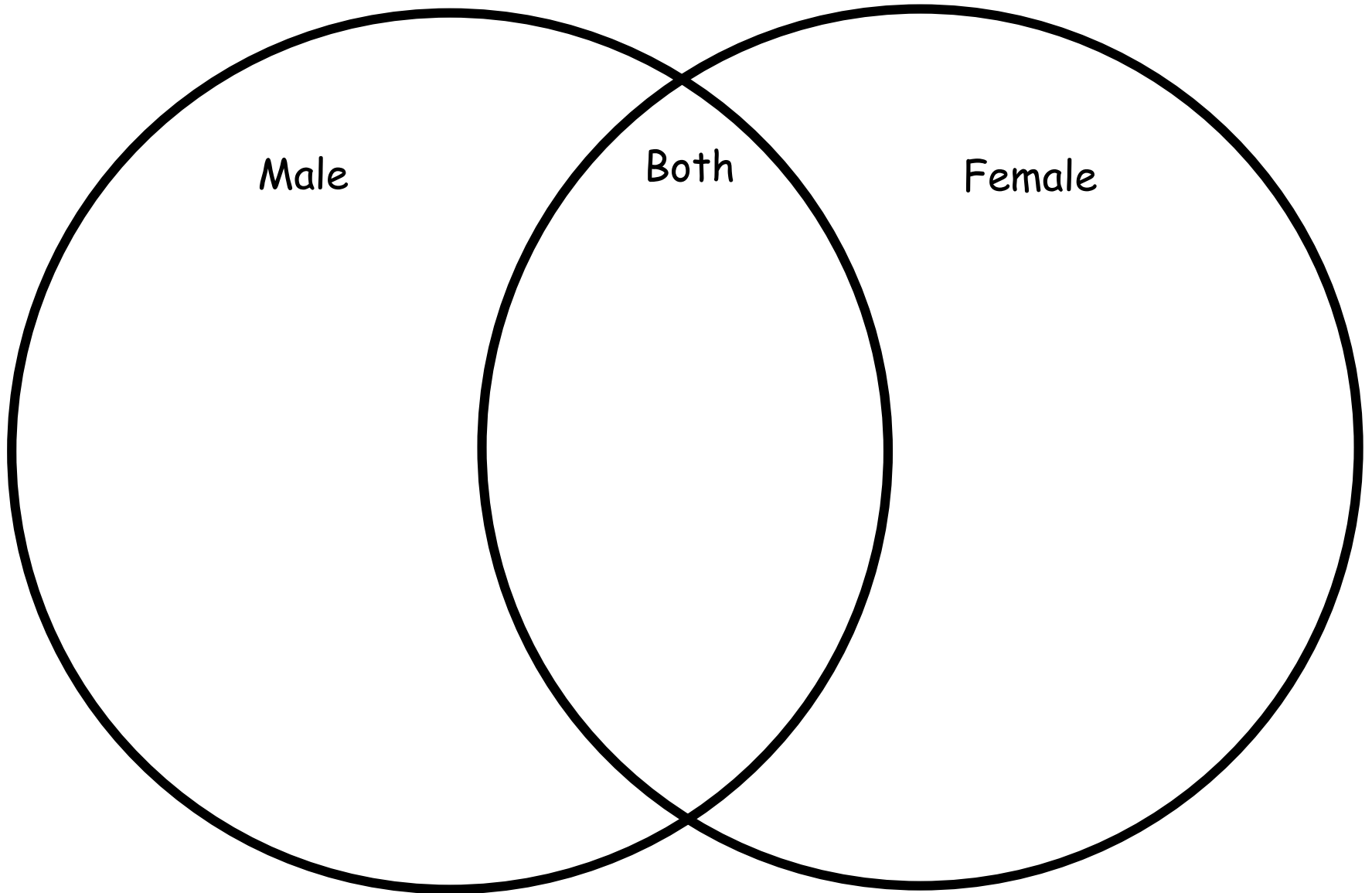
Underarm hair

Breasts grow

Ovaries begin to release eggs

Body odour

There are 8 different changes



Puberty

Female changes	Common changes	Male changes
menstrual cycle	sex hormones circulate	sperm produced
hips widen	pubic and under-arm hair	voice deepens
breasts develop	sex organs get larger	face and body hair
layers of fat	pituitary gland is active	muscles develop
	sweat glands develop	
	growth spurt	

Puberty

Draw the table in the your book and fill in the table with correct changes

menstrual cycle

pubic and under-arm hair

sweat glands develop

hips widen

sperm produced

muscles develop

breasts develop

growth spurt

voice deepens

sex hormones circulate

Female changes	Common changes	Male changes
	sex organs get larger	face and body hair
layers of fat		

When a girl goes through puberty one of the changes that occurs is that she will begin to have **periods**.

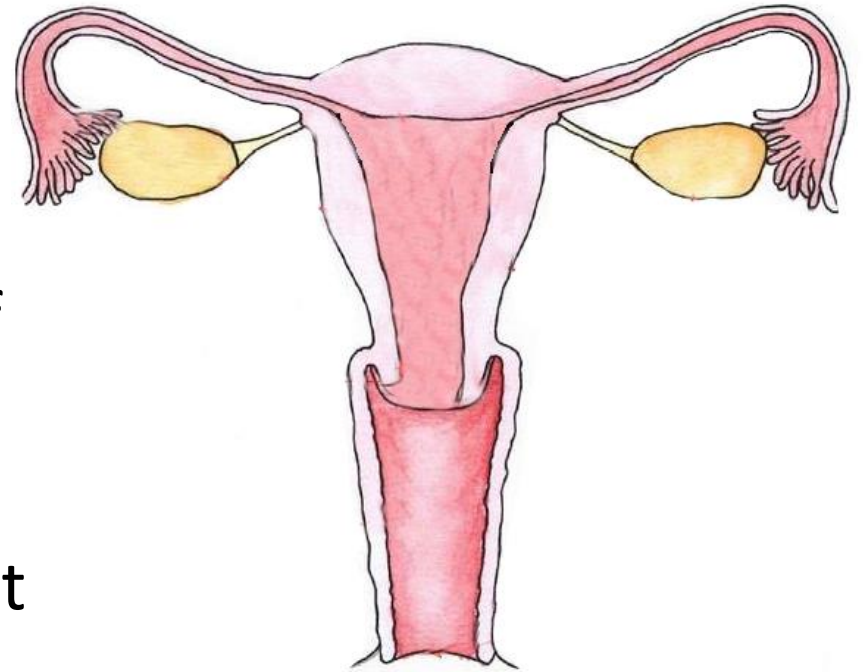
This is the female body's way of preparing to reproduce

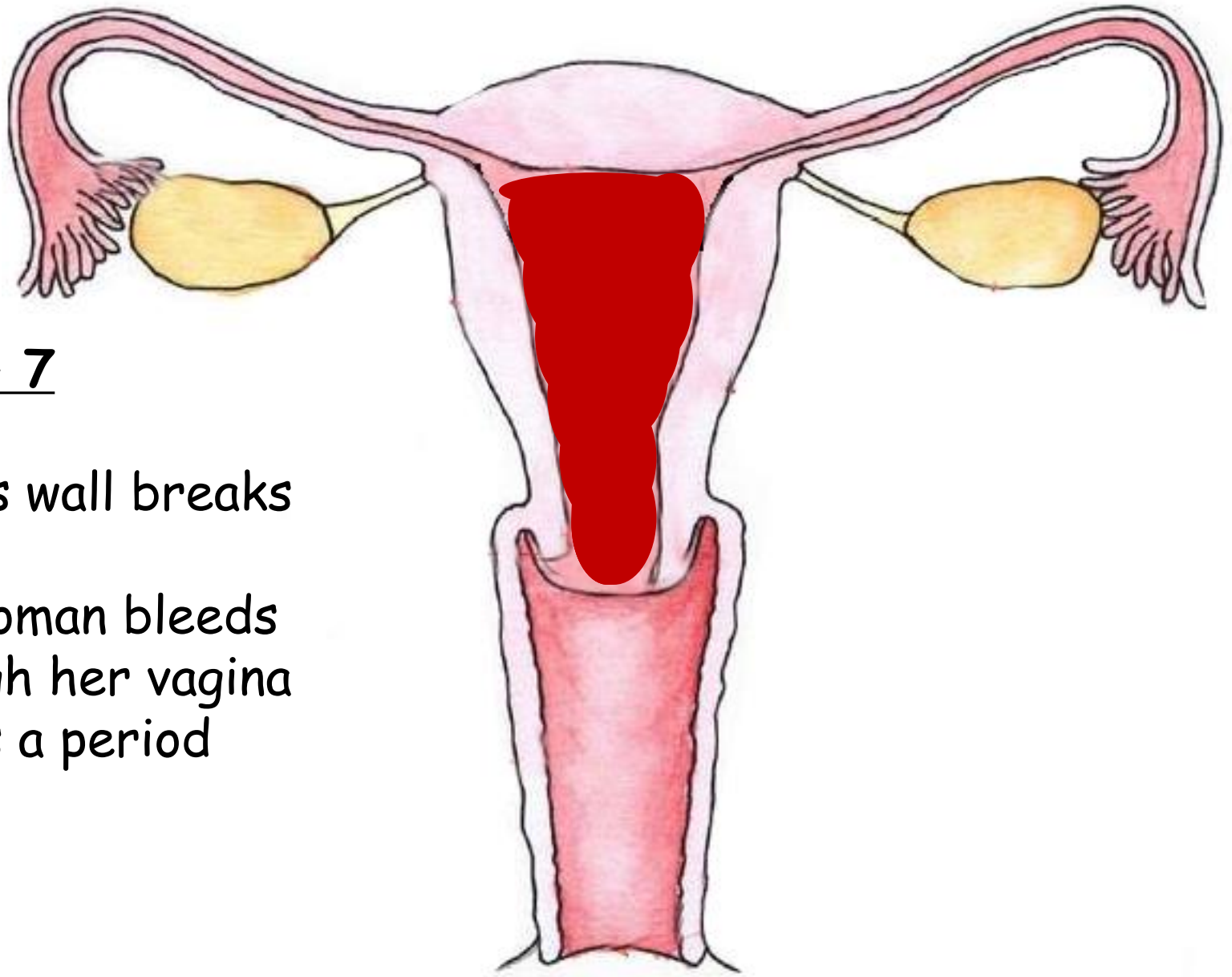
A woman's reproductive system works on a **28 day cycle**

This cycle is known as the **menstrual cycle**

The menstrual cycle consists of
A number of stages

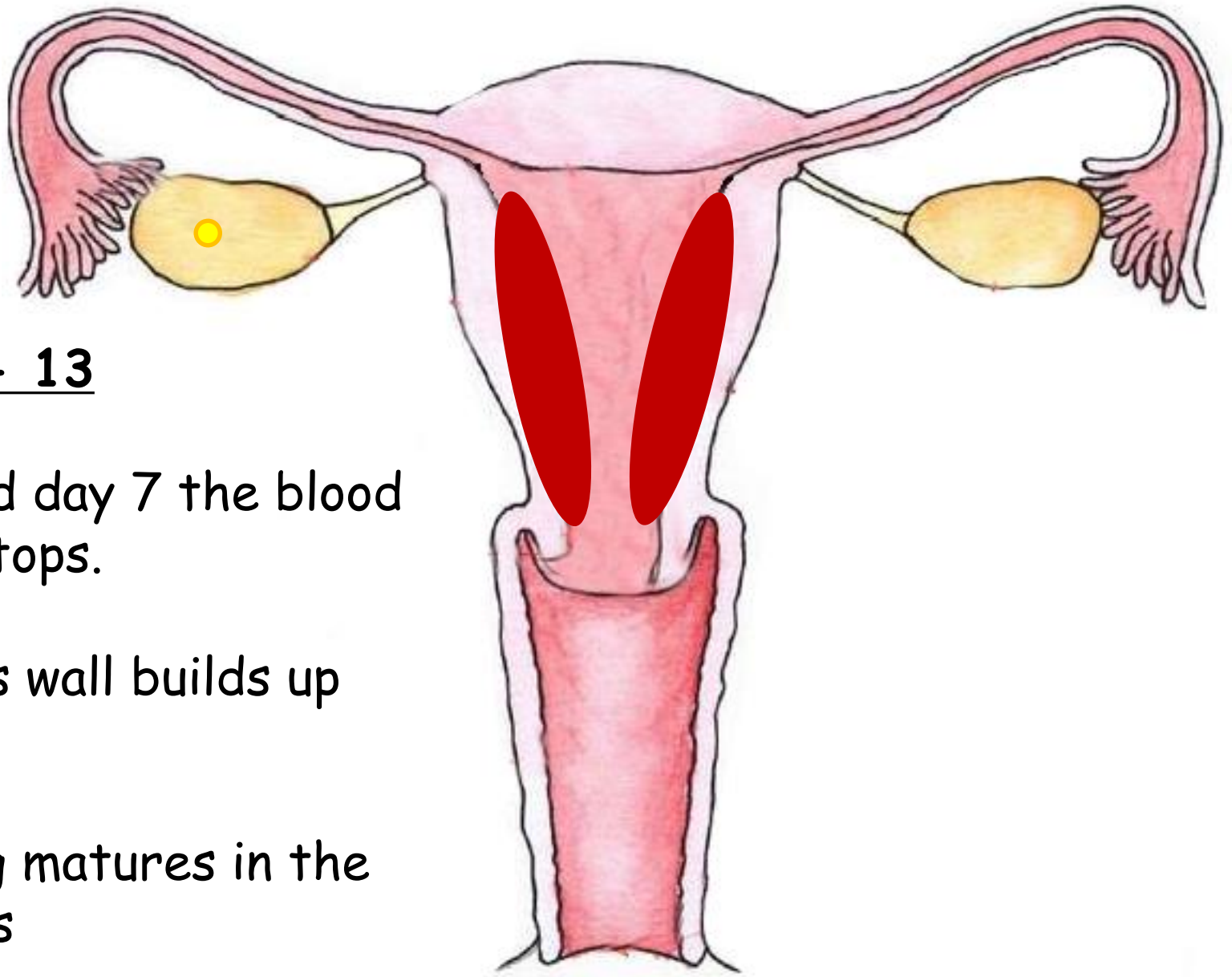
In this lesson we will learn what
those stages are.....





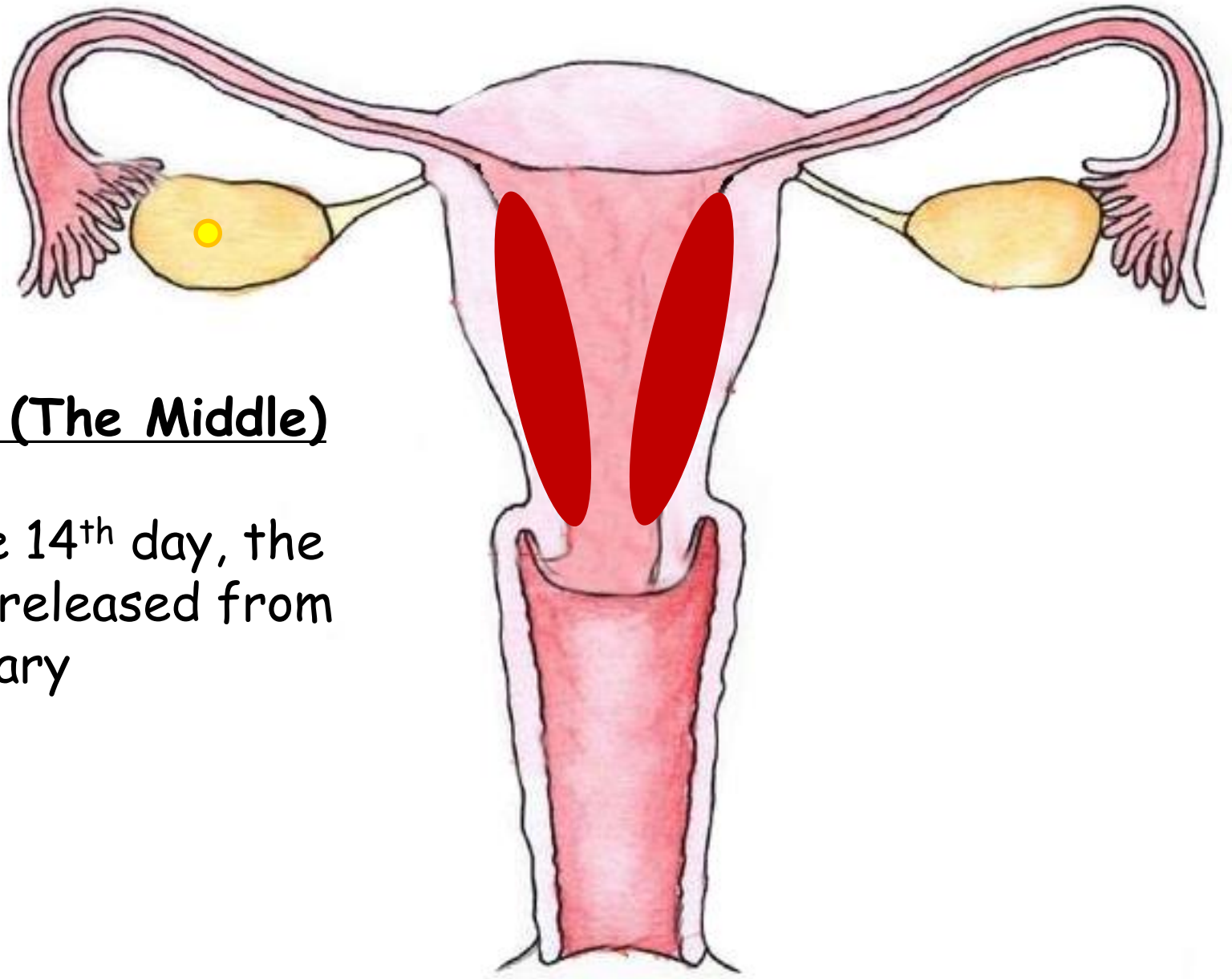
Day 1 - 7

- Uterus wall breaks down
- The woman bleeds through her vagina
- This is a period



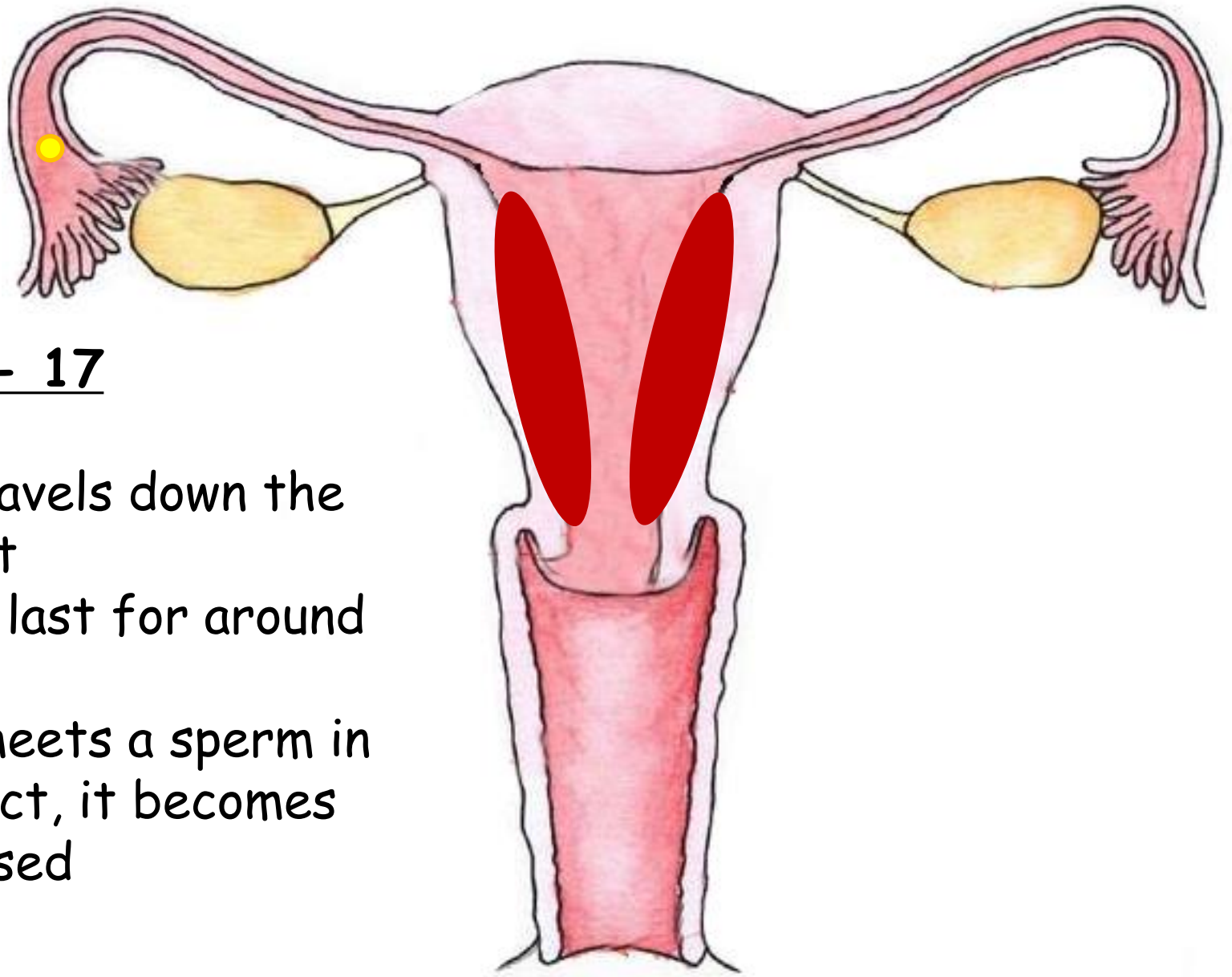
Day 7 - 13

- Around day 7 the blood flow stops.
- Uterus wall builds up again
- An egg matures in the ovaries



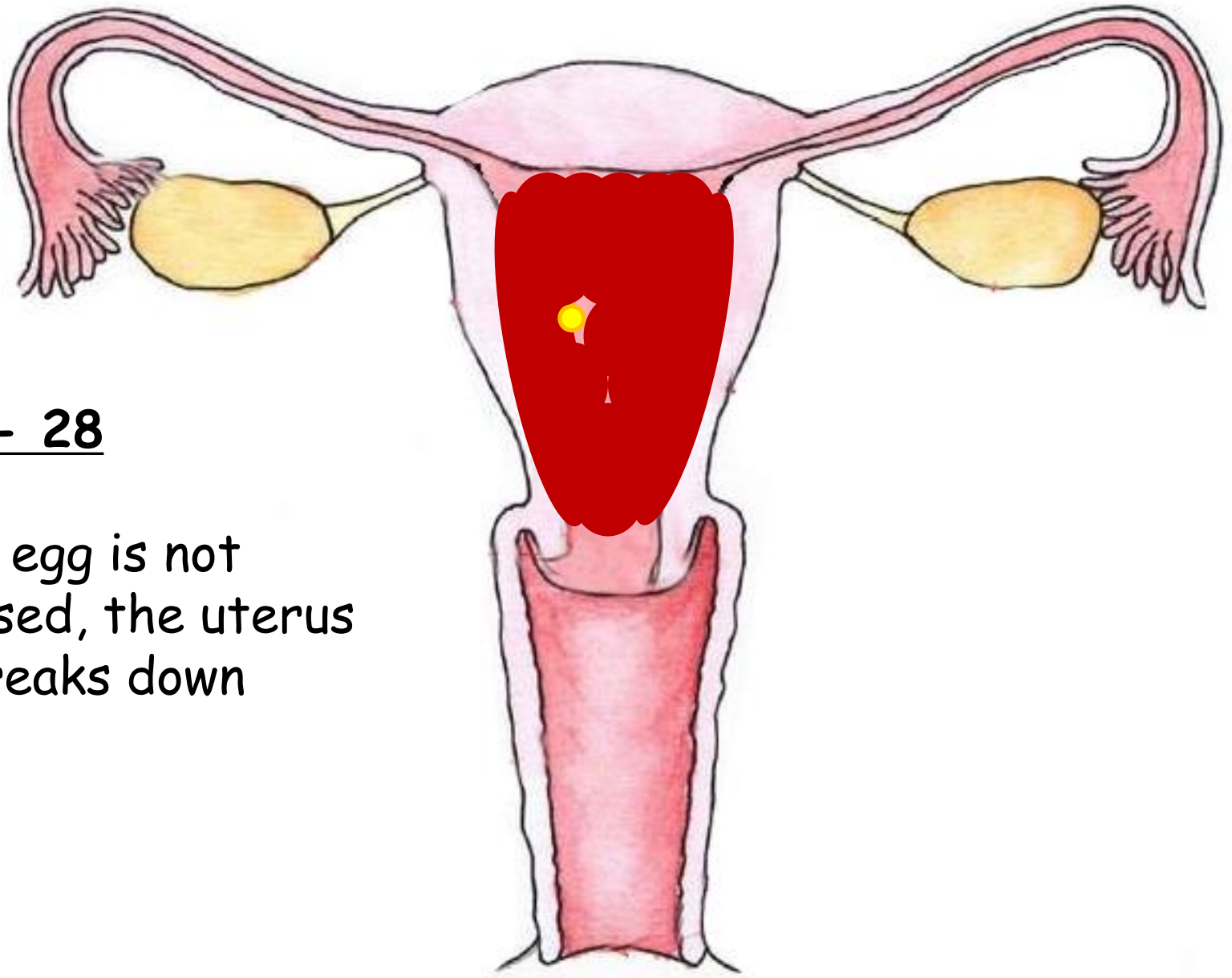
Day 14 (The Middle)

- On the 14th day, the egg is released from the ovary



Day 14 - 17

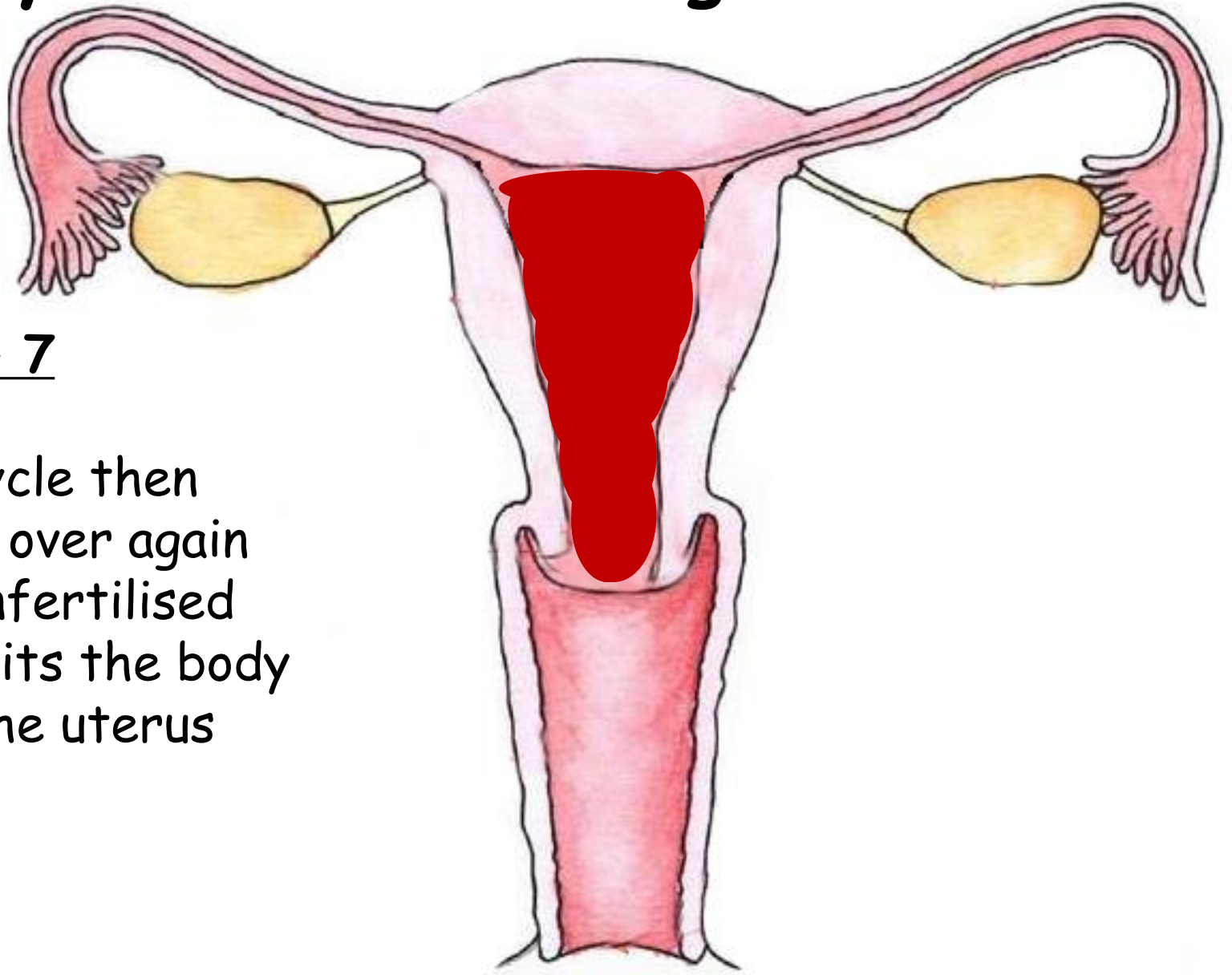
- Egg travels down the oviduct
- It can last for around 3 days
- If it meets a sperm in the duct, it becomes fertilised



Day 18 - 28

- If the egg is not fertilised, the uterus wall breaks down

The cycle starts over again...



Day 1 - 7

- The cycle then starts over again
- The unfertilised egg exits the body with the uterus lining

Question	True/ false	Challenge: Why
1. The menstrual cycle lasts for 28 days		
2. The uterus wall builds up at the start of the cycle		
3. Eggs are made in the ovaries		
4. The ovaries travel down the oviducts when released and can last for 3 days		
5. If the eggs is fertilised, the uterus wall breaks down		
6. A period is when the cervix breaks down and bleeds		
7. The place where an egg will meet a sperm is in the oviduct		
8. The best time to get pregnant is between days 14-17		