



Theatre of Science Reproduction Module

Thanks for watching! My business model is, all my lessons and print outs are available to all, and if you think they're worth £5 a month you can sign up to support me at <https://ko-fi.com/theatreofscience>. I will send you a rainbow glasses, stickers and magazines to say THANK YOU! It's because of you that this is my job, and it's the best job I can imagine!

If you're interested in knowing how much of the Cambridge iGCSE physics specification you will cover in these lessons, here..!

Lesson

- 1) Describe fertilisation as the nucleus of a sperm cell and an egg cell fusing together
Describe the appearance of human egg and sperm cells
Explain the features of human egg and sperm cells

- 2) Identify on diagrams and state the functions of the following parts of the male reproductive system: testes, scrotum, sperm ducts, prostate gland, urethra and penis
Identify on diagrams and state the functions of the following parts of the female reproductive system: ovaries, oviducts, uterus, cervix and vagina

- 3) Describe fertilisation as the nucleus of a sperm cell and an egg cell fusing together
Identify on diagrams and state the functions of the following parts of the female reproductive system: ovaries, oviducts, uterus, cervix and vagina

State that in early development, the zygote forms an embryo which is a ball of cells that implants into the lining of the uterus.

Identify on diagrams and state the functions of the following in the development of the fetus:

- 4) umbilical cord, placenta, amniotic sac and amniotic fluid
(Advanced) Describe the function of the placenta and umbilical cord in relation to the exchange of dissolved nutrients, gases and excretory products between the blood of the mother and the blood of the fetus. State that some pathogens and toxins can pass across the placenta and affect the fetus.

- 5) Describe the roles of testosterone and oestrogen in the development and regulation of secondary sexual characteristics during puberty
Describe the menstrual cycle in terms of changes in the ovaries and in the lining of the uterus

Identify examples of asexual reproduction

- 6) Describe asexual reproduction as a process resulting in the production of genetically identical offspring from one parent
(Advanced) Discuss the advantages and disadvantages of asexual reproduction: (a) to a population of a species in the wild (b) to crop production
Discuss the advantages & disadvantages of sexual reproduction: (a) to a population of a species in the wild (b) to crop production

Identify in diagrams and images and draw the following parts of an insect-pollinated flower: sepals, petals, stamens, filaments, anthers, carpels, style, stigma, ovary and ovules.

- 7) Describe pollination as the transfer of pollen grains from an anther to a stigma
State that fertilisation occurs when a pollen nucleus fuses with a nucleus in an ovule
Describe the growth of the pollen tube and its entry into the ovule followed by fertilisation
State the functions of the structures listed

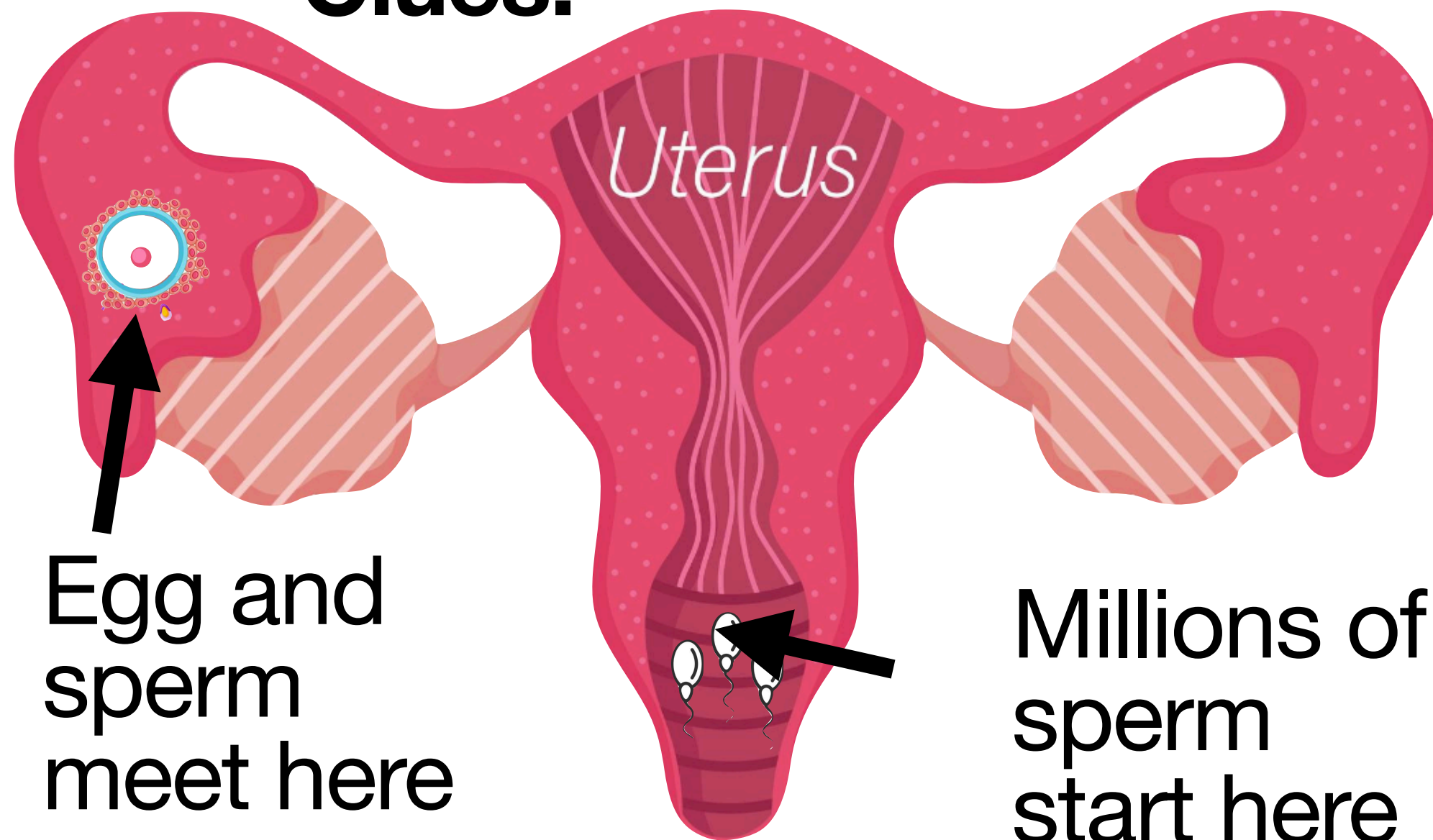


Theatre of Science Reproduction 1: Sex Cells

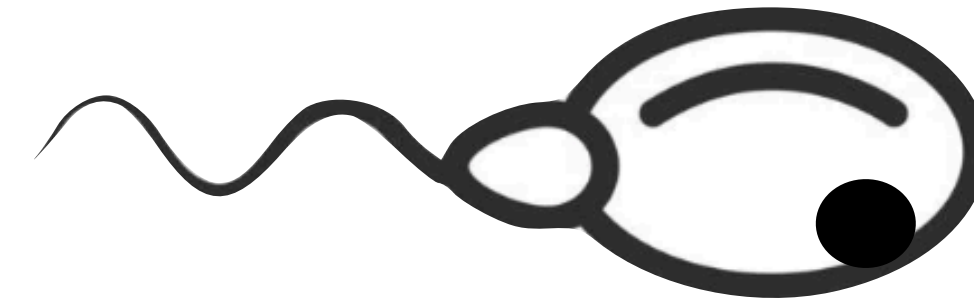
You will need: Three food cans (empty or full), grain of rice or similar!

1) Study each sex cell and match the descriptions to the right one.
One description doesn't fit any cell! Which one?

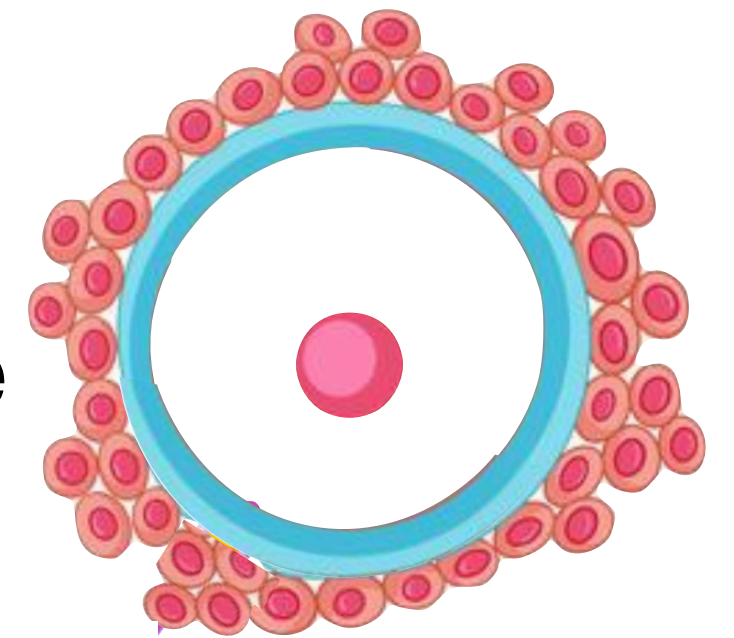
Clues:



Sperm (Male cell)



Egg (Female cell)



1. Good at swimming

2. Stores enough nutrients to feed growing human

3. Jelly coat that only lets one cell in

5. Sharp head to pierce layers

2) For each description, explain why the cell might need to be that way. (Why must one be a good swimmer? Etc). Some explanations are tricky, use your imagination!

4. Head full of digestive juices

6. Lots of energy help it move

GCSE questions!

1) Which feature of the sperm allows it to dissolve the jelly coat of an egg? (1 mark)

- a. Tail
- b. Nucleus
- c. Flagellum
- d. Acrosome

2) Sketch a sperm and label it to show its main features (3 marks)

3) A worm's sperm fuses with another worm's egg. What is the name of this process?



4) List THREE ways a sperm cell is different from an egg cell.



Summary questions!

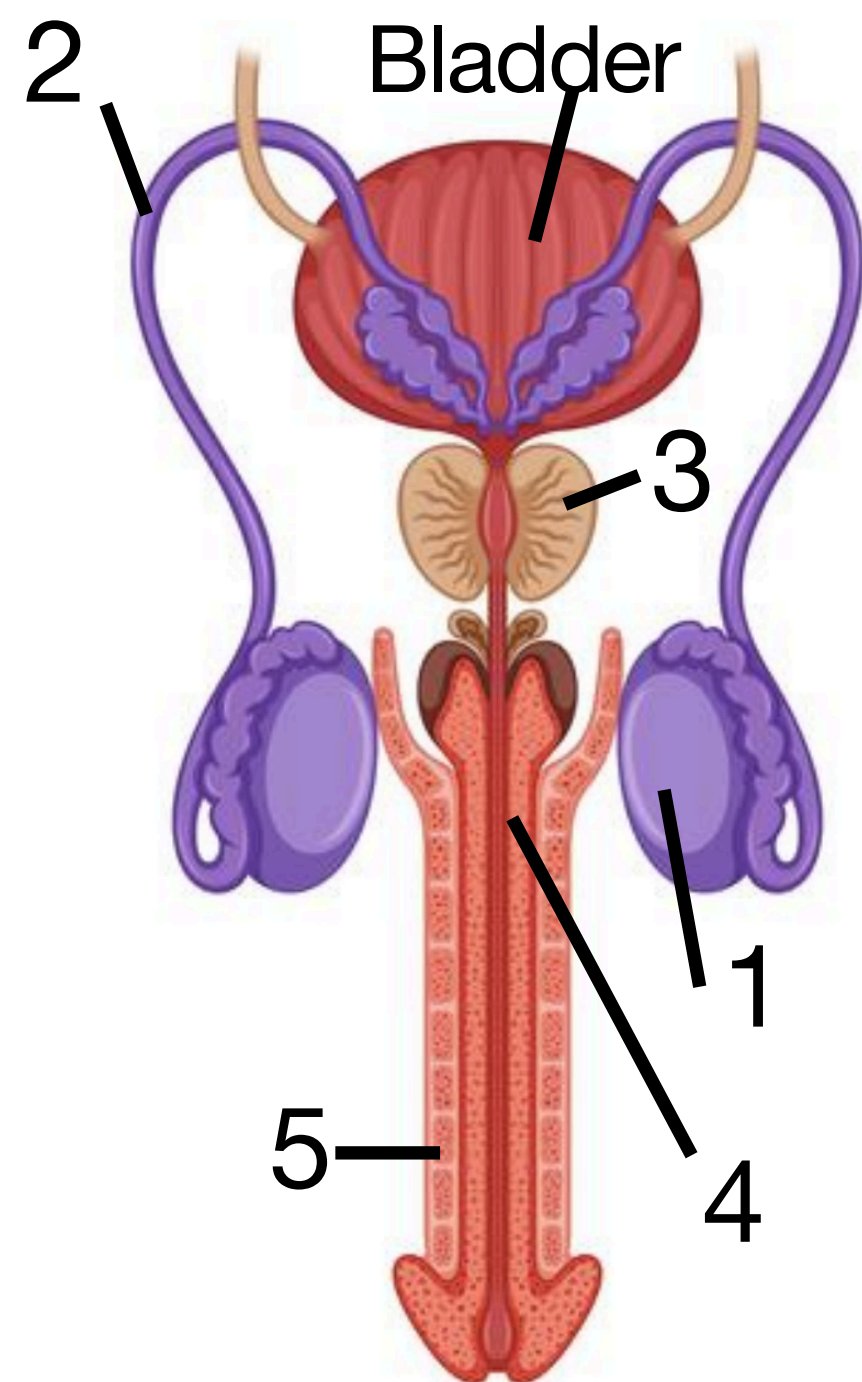
1. What is fertilisation? Use the words sperm, egg and nucleus in your answer.
2. Sketch a sperm and egg and label the tail, head, and jelly coat.
3. Explain why sperm have tails!



Theatre of Science Reproduction 2: The Reproductive Systems

1) Decide whether each word describes the female reproductive system, the male, or neither. Match the number to the right word.

Male system



Uterus__

Oviduct __

Ovaries __

Tummy__

Tesis __

Sperm duct __

Prostate Gland __

Cervix __

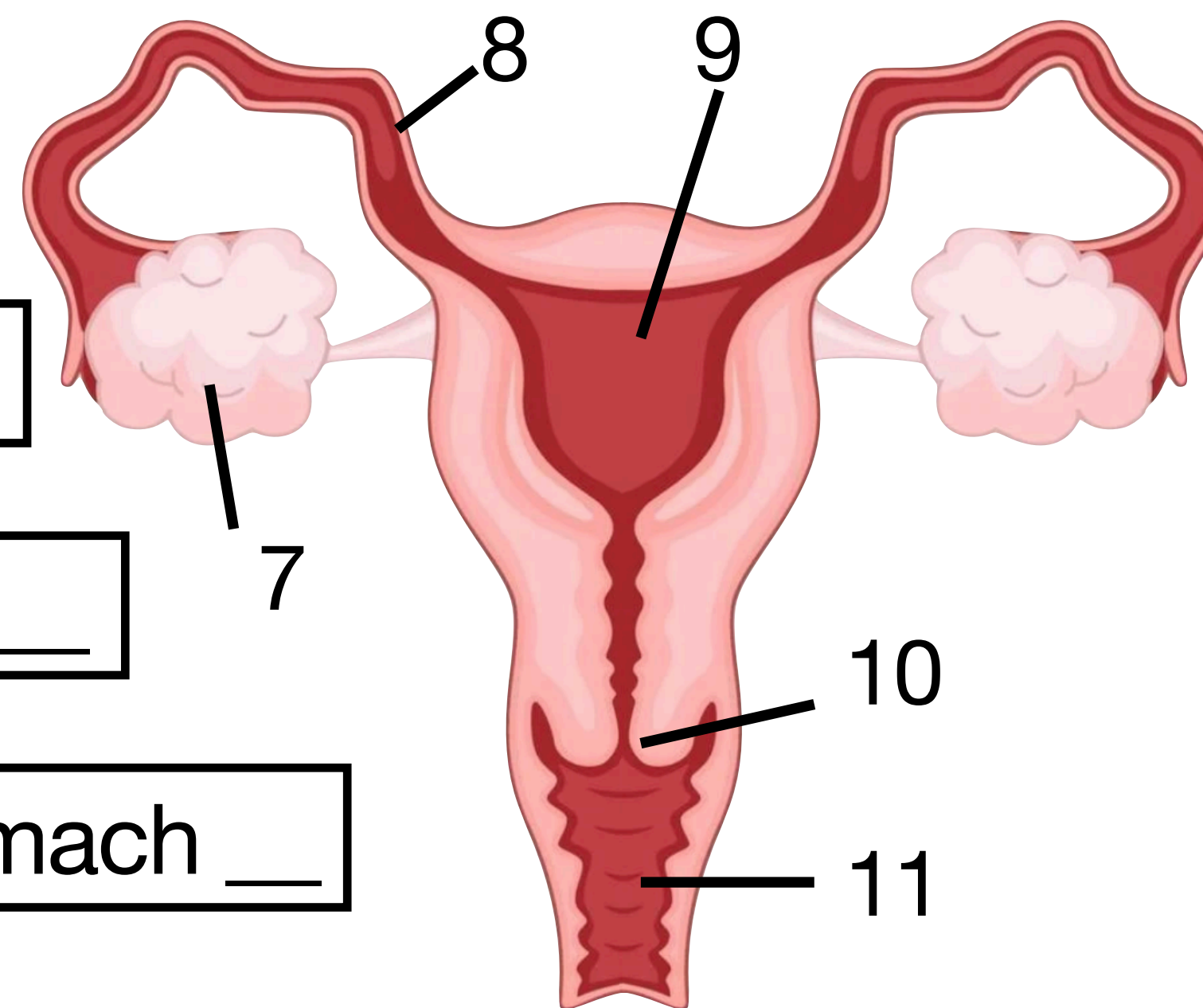
Urethra __

Stomach __

Penis __

Vagina __

Female system



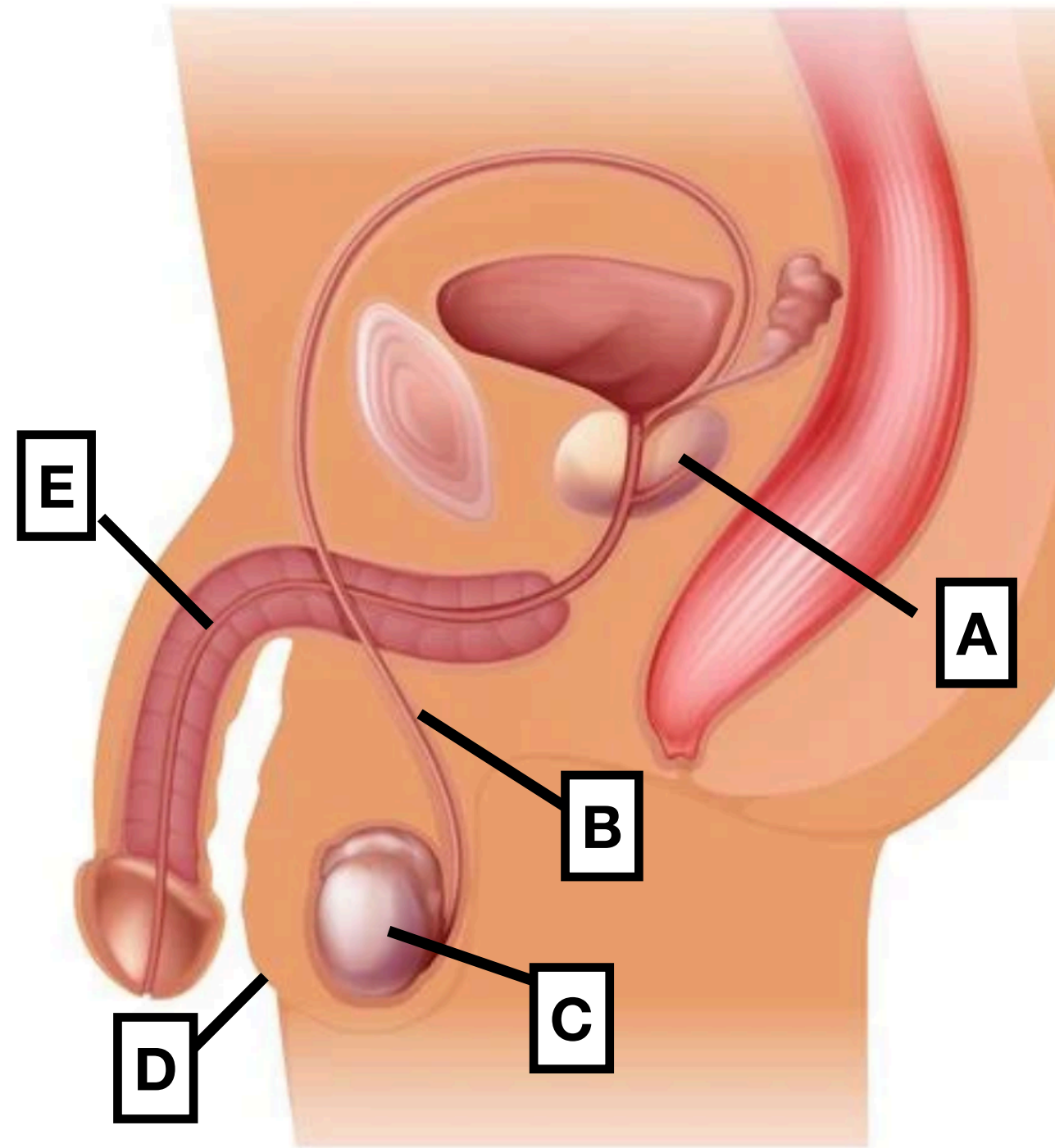
Clues

- There are 2 ovaries & 2 testis.
- 'Urethra' means 'passage for urine' in Greek.
- An 'aqua-duct' is a large pipe or canal!
- 'Ovum' is the proper word for the egg, the female sex cell.
- The testis makes sperm & the ovary holds the egg.

Finished? Liquid is added to the sperm - to help it swim - before it reaches the penis. Which labelled part do you think makes the liquid? Why do you think each testis might be outside the body?

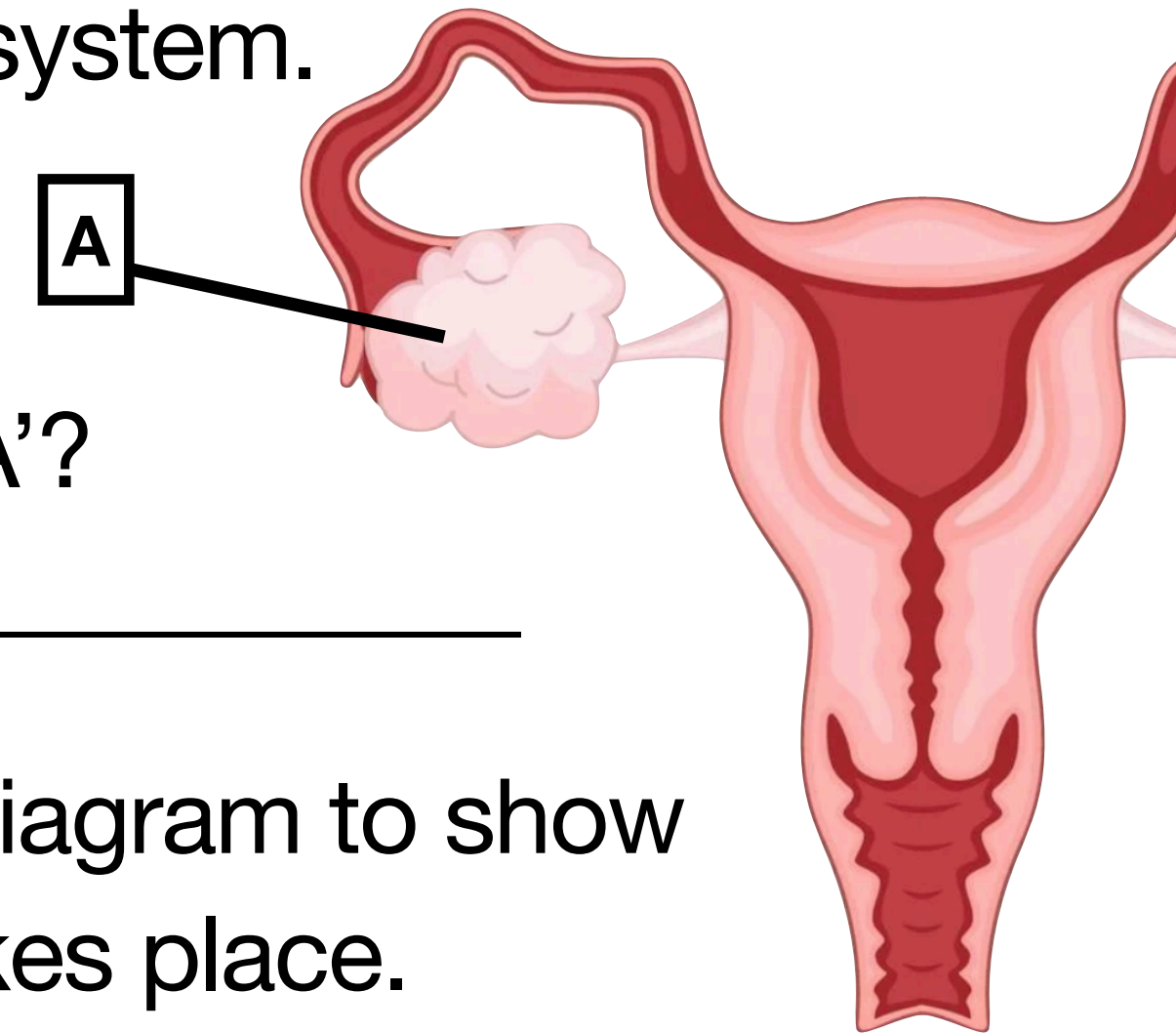
GCSE questions!

1) The diagram shows the male reproductive system. Complete the table to show the purpose of each part. (5 marks)



Name	Job	Letter
	Moves sperm but not urine	
	Tube allows semen & urine through penis	
Prostate Gland		
	Contains the testes	
Testis		

2) The diagram shows part of the female reproductive system.



a) What is name of 'A'?

b) Put an 'x' on the diagram to show where fertilisation takes place.

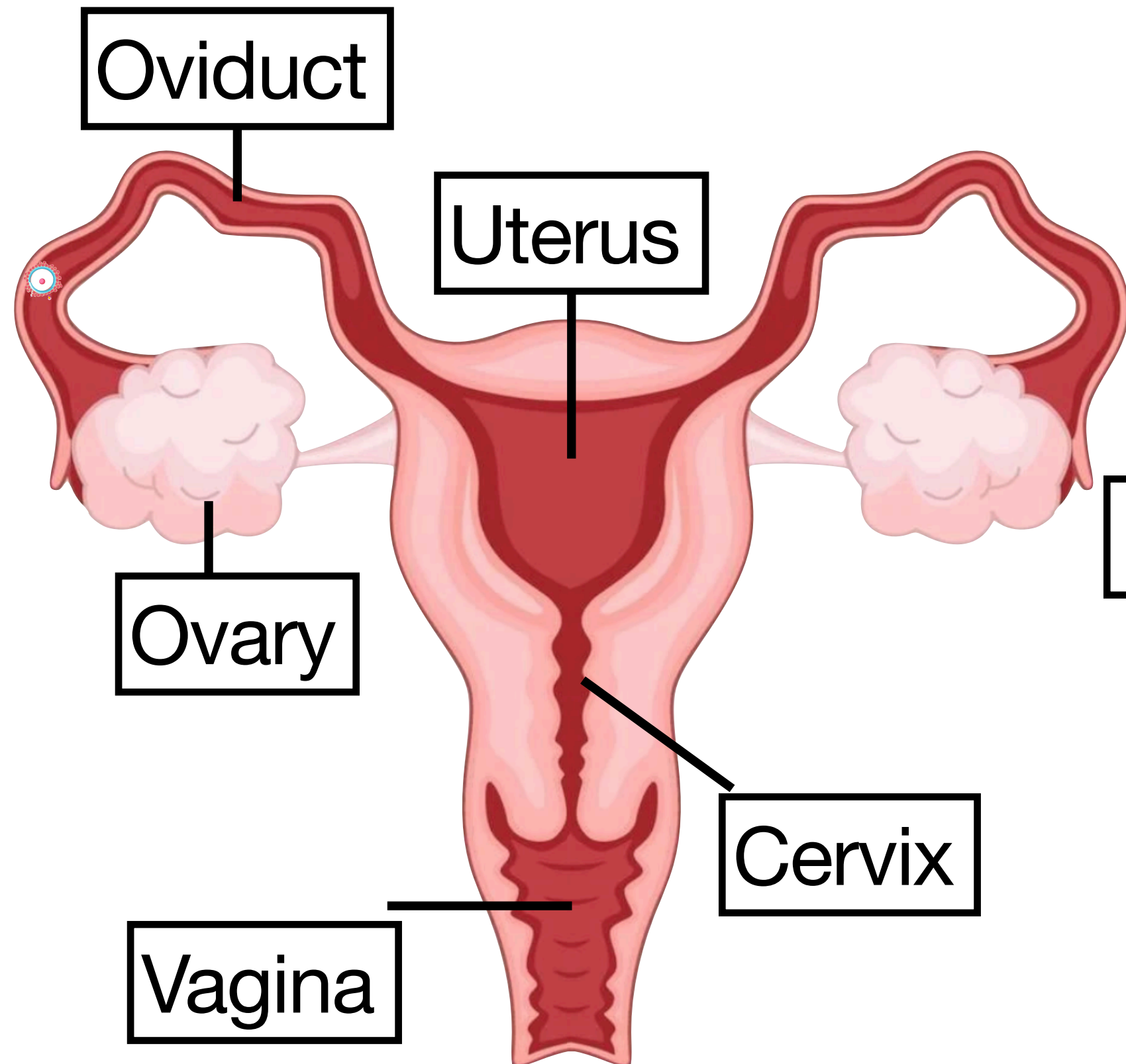
Summary questions!

- Write down two parts of the female reproductive system and two parts of the male.
- Write a sentence to describe what the four parts do.



Theatre of Science Reproduction 3: The Sperm's Journey

Put the stages of the sperm's journey in order from 1 to 10. I'm expecting you to go wrong! A messy crossed out page shows you've been thinking. (One has been done for you).



Those not stuck in channels or mucus make it to the uterus

If they survive, they might choose the wrong oviduct!

Many are trapped in the mucus.

But finally the egg and one sperm fuse!

Where the female immune system might attack them!

The rest enter the cervix which is lined with mucus!

Those that meet the egg have to get through layers of cells.

The sperm begin their journey in acid and must move on quickly to survive!

Some swim the wrong way and die in the acid.

5 Others travel down 'side channels' and get stuck for days!

You're designing a BBC gameshow. Contestants dressed as sperm must complete an assault course of different zones. The zones are listed below.

1) Draw a line to match the challenge to the zone to make the show biologically accurate.

Get stuck for days!	Meet acid!	Chased by white blood cells!	Have to reach membrane	Must choose right path!
Vagina zone	Cervix zone	Uterus zone	Oviduct zone	Egg zone

2) Write a description or draw a picture to show what should happen to the contestants in each zone. Eg in the vagina zone they could have to eat a whole lemon.

Finished? If you saw our first 'cells' lesson, design a costume for the contestants! Or think of a good name for our game show!

No GCSE questions today but there will be a quiz!





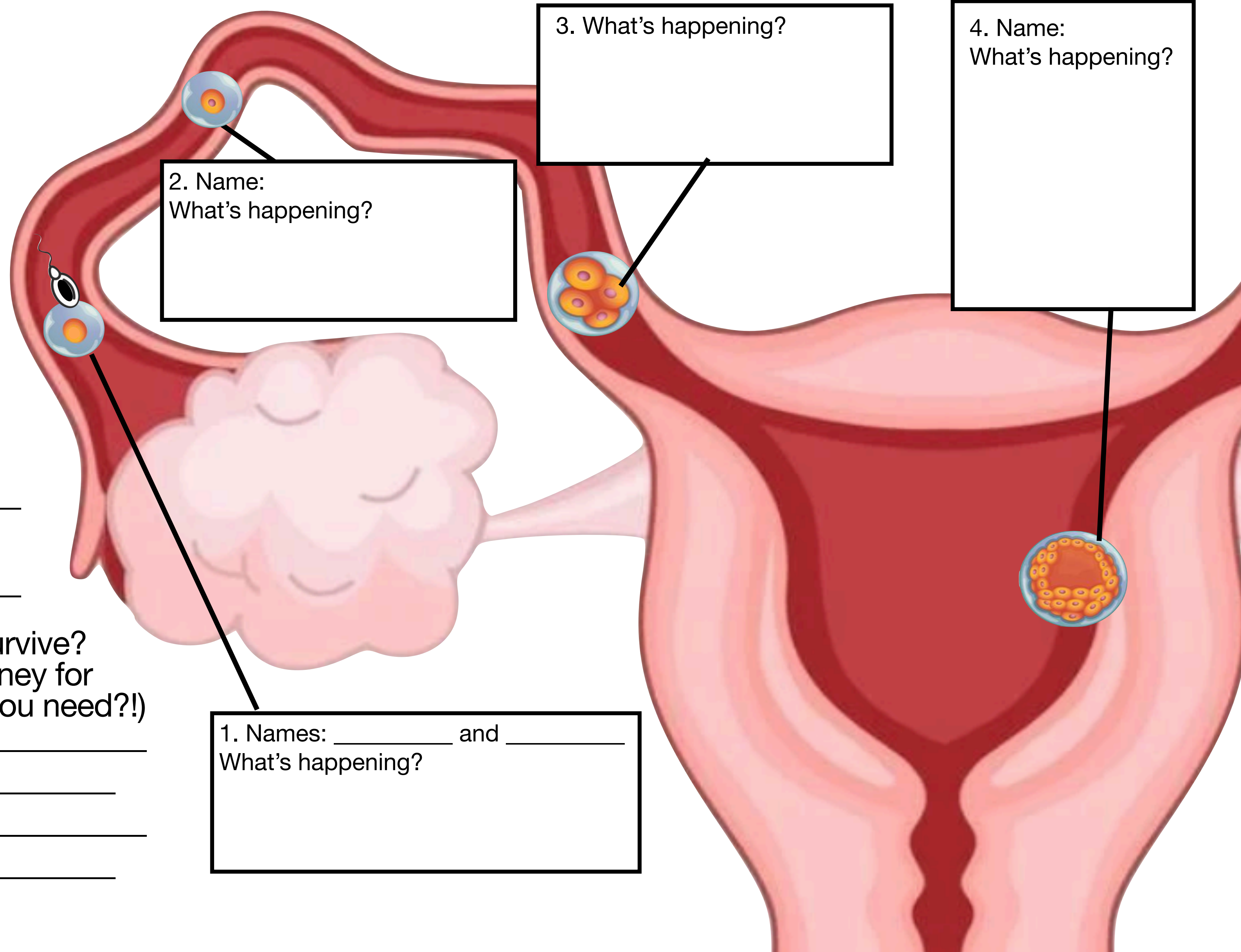
Theatre of Science Reproduction 4: Life in the Womb

For each stage, give the name of the object if required, and say what is happening!

Finished?

a) What mistake have I made in the diagram in stage one?

b) What will the growing human need to survive? (Imagine you're alone on a bumpy car journey for nine months unable to stop! What would you need?!)



2. Name:
What's happening?

3. What's happening?

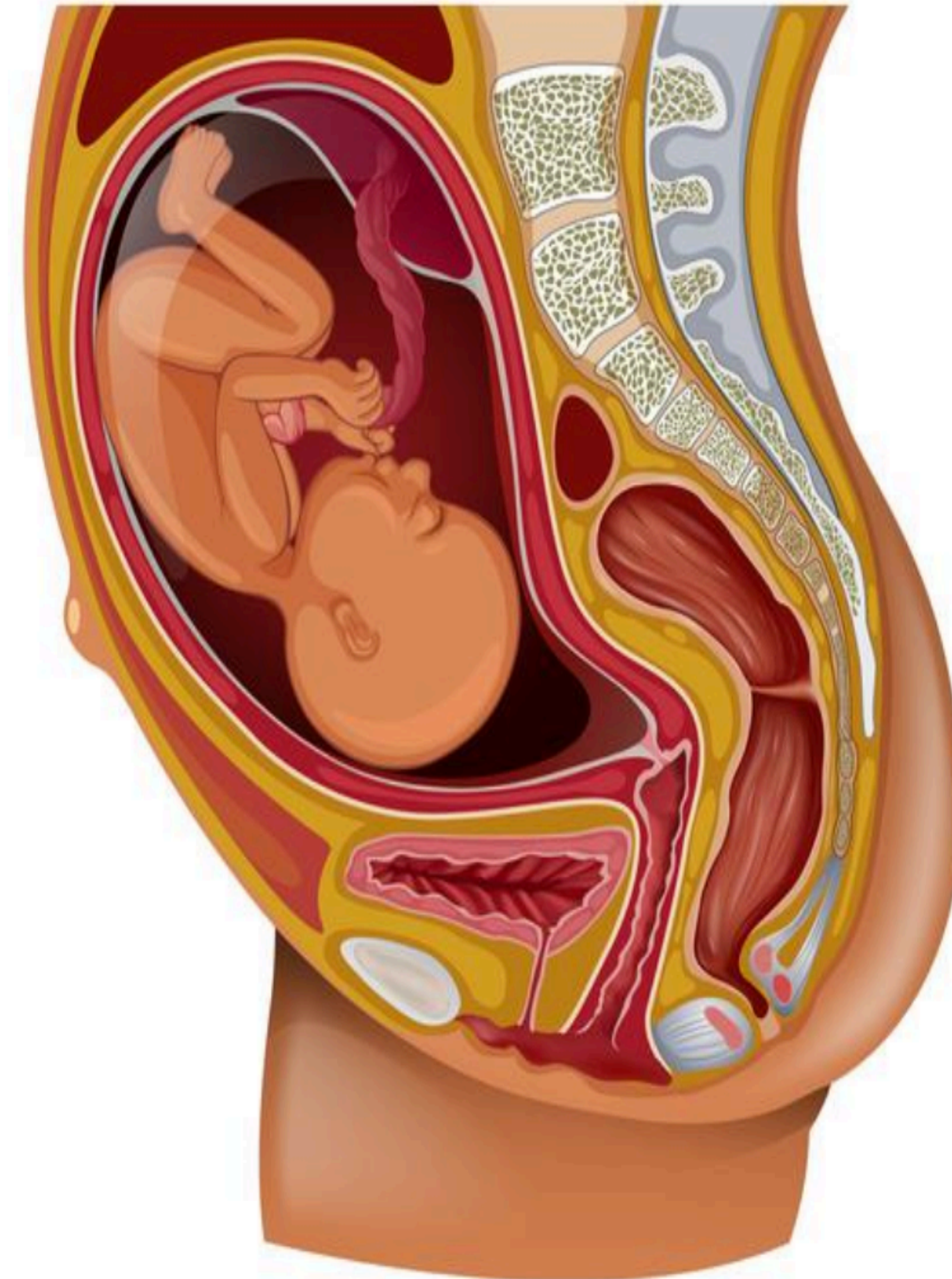
4. Name:
What's happening?

1. Names: _____ and _____
What's happening?

Bingo time!

Placenta	Sperm	Zygote
Uterus	Amniotic sac	Amniotic Fluid
Egg	Embryo	Fetus

Diagram for reference and labelling if you like!



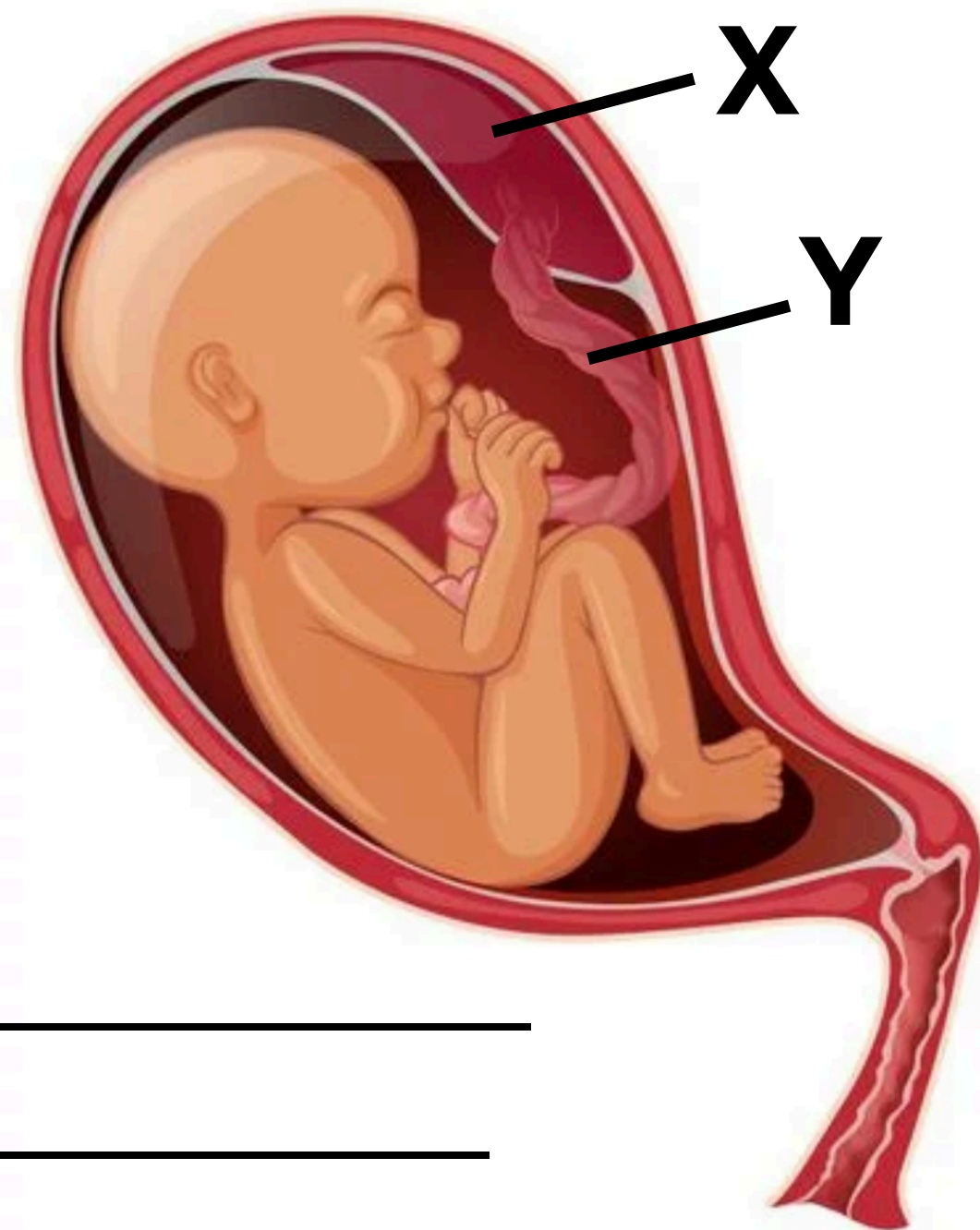
GCSE questions!

1) The diagram shows a foetus in a uterus. State the function of the parts labelled X and Y.

(‘Say what their jobs are’) 2 marks

X: _____

Y: _____



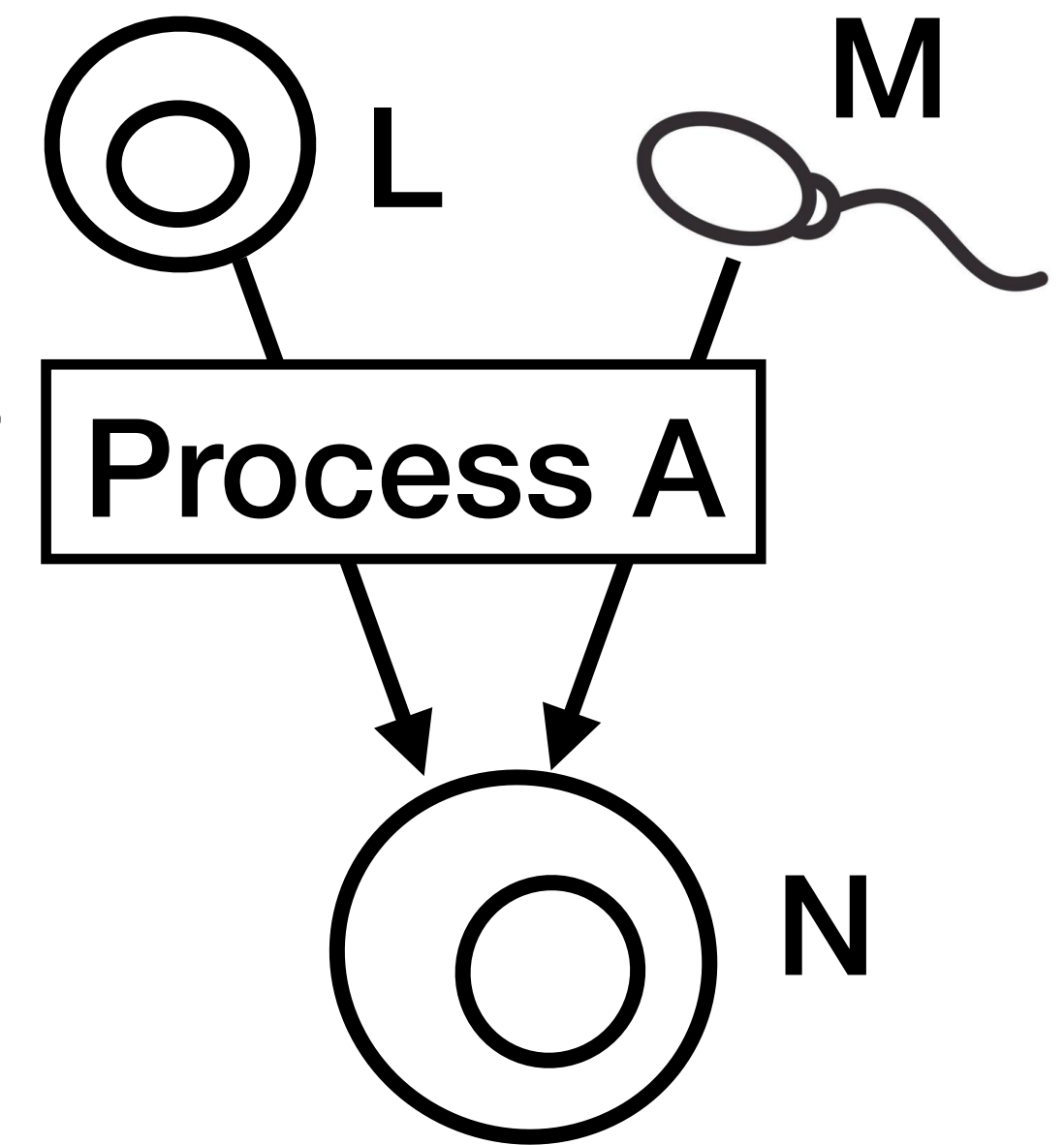
2) The diagram shows the early stages of embryonic development. Name parts L, M, N, and process A.

L:

M:

N:

Process A:



4 marks

Summary questions!

1. What was your belly button attached to before you were born?!
a) Placenta b) Amniotic sac c) Umbilical cord
2. Explain what the amniotic fluid does:

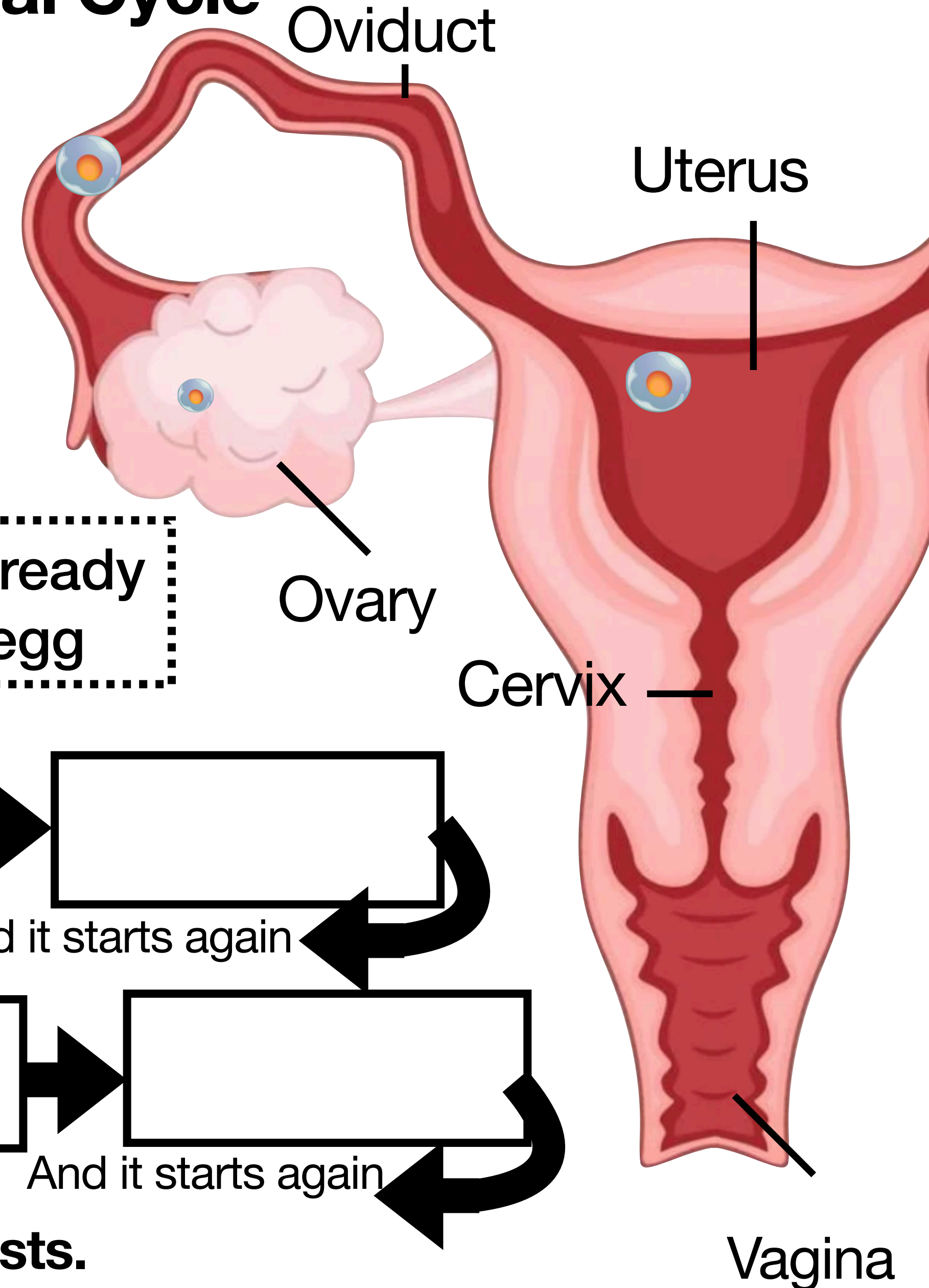
How did this whole lesson have no worms in?





Theatre of Science Reproduction 5: Menstrual Cycle

The egg and the uterus lining must co-ordinate their activities! Fill in the gaps to show what they do if the egg doesn't get fertilised!



Egg doesn't implant in uterus

Uterus lining breaks down, leaves body

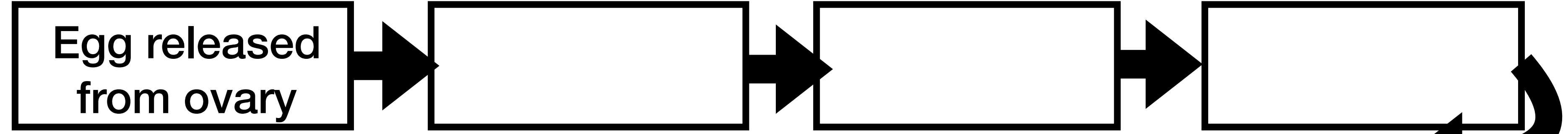
Egg travels down oviduct

Egg leaves body, new egg develops in ovary

Egg doesn't implant in uterus

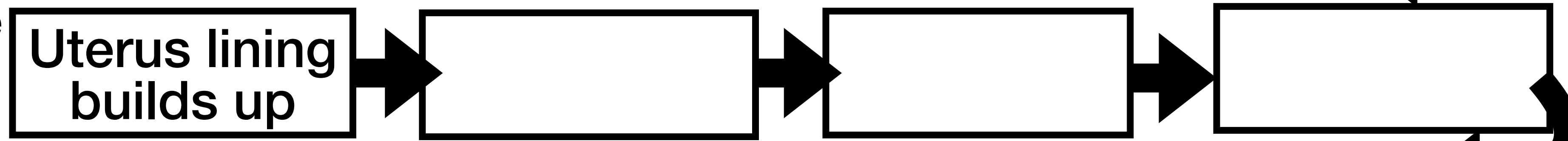
Uterus lining ready to receive egg

Egg's story!



And it starts again

Meanwhile in the uterus...



And it starts again

Finished? Write down your best guess for how long each stage lasts.

Vagina

Read my analogy for the menstrual cycle:

1) A posh hotel has one bed. It receives a phone call saying a celebrity wants to come and stay.



2) The staff prepare a comfy bed.



3) The celebrity sets off for the hotel.



4) The staff arrange chocolates and fresh flowers.



5) The celebrity visits the hotel but doesn't stay!

(Elsewhere, _____ is planning a trip)

6) The staff throw the flowers and chocolates away and remove the sheets



7) Days later they receive a phone call to say a new celebrity wants to come to stay.



1) Which part/s of the story represent..?

- a) The egg
- b) The uterus
- c) Ovulation (egg leaving the ovary)
- d) The uterus lining building up
- e) The egg not implanting
- f) Menstruation (the uterus lining leaving the body)

2) Which parts of the story are..?

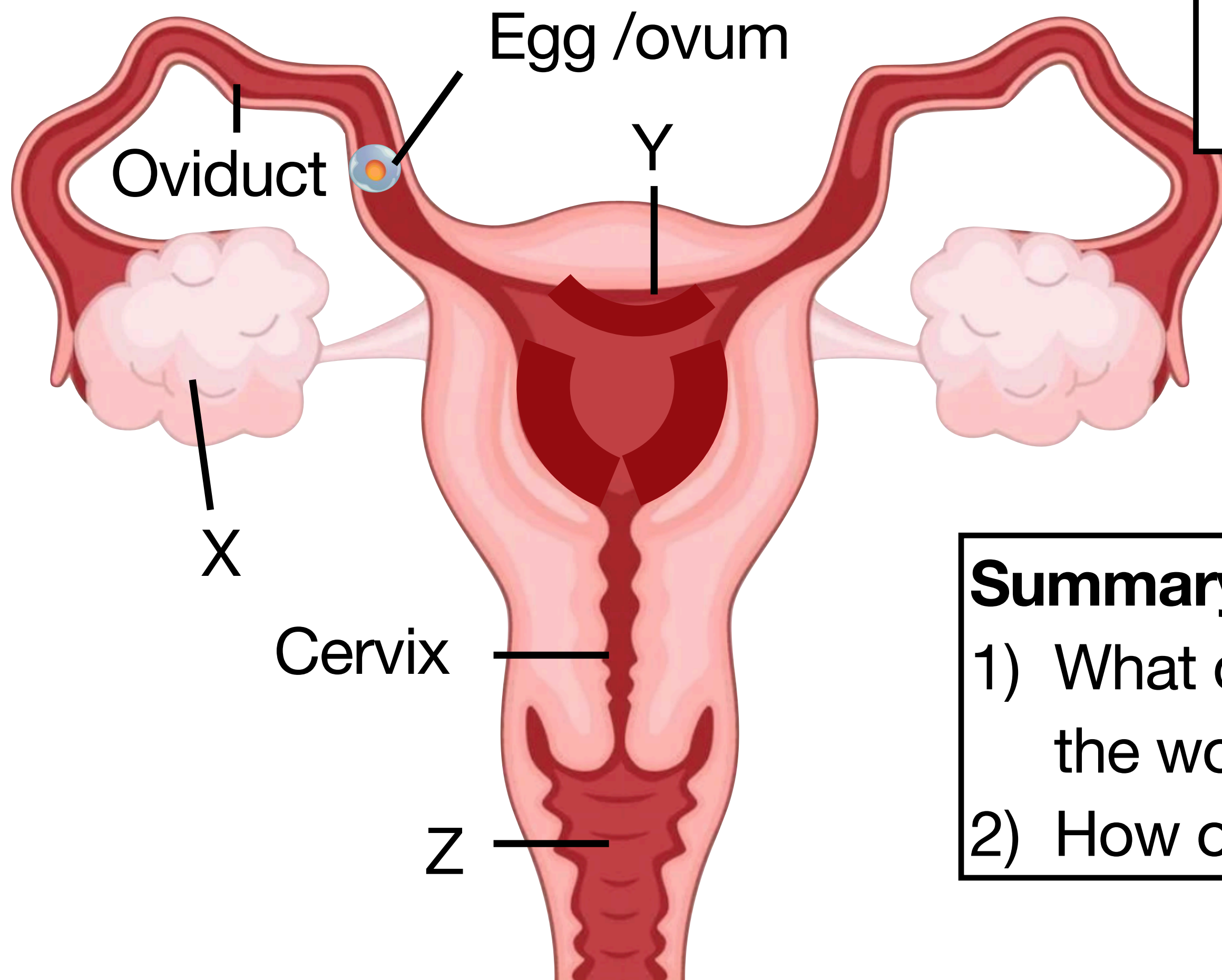
- a) Day one of the menstrual cycle
- b) Day fourteen

3) Write your own analogy! Set in a restaurant, or anywhere you like!

GCSE questions!

1) The diagram shows the female reproductive system.

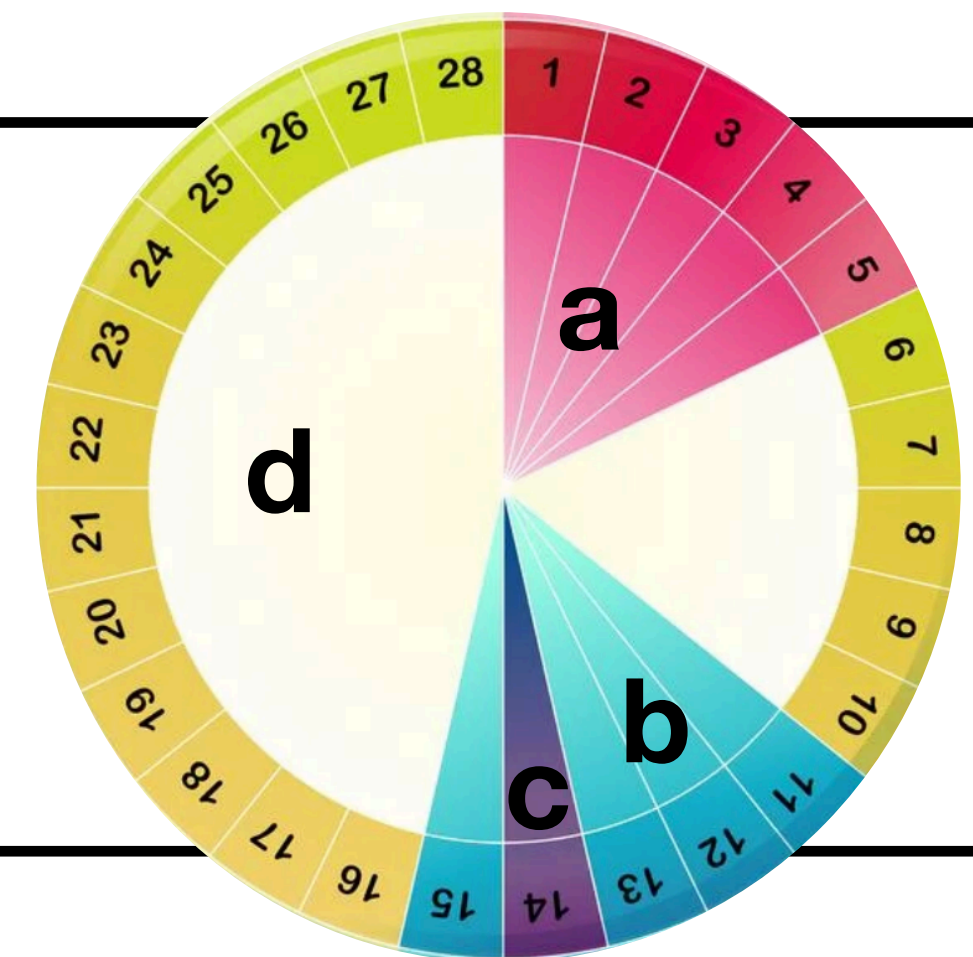
a) Label the parts X, Y and Z. 3 marks



b) Describe and explain two ways in which the diagram would look different on day one of the menstrual cycle. 4 marks

2) The diagram shows the menstrual cycle.

a) On which part does menstruation occur?



Summary Questions

- 1) What does it mean when a person 'has a period'? Use the words uterus lining, egg, fertilised, breaks down.
- 2) How often does the menstrual cycle happen?

Theatre of Science Reproduction 6: Asexual Reproduction

You're part of an alien research team. You intercept a human, travelling alone in hyper sleep. It's your job to suggest how it might reproduce. Write down as many different ideas as you can. Use your imagination!

(Don't mention sperm and eggs, this is a creative task, I don't want right answers!)




Maybe hair grows on its arm, then a head, then a shoulder, and finally a whole new one appears and sort of... pops off?




Types of asexual reproduction

If you like taking notes, you might find these boxes helpful

GCSEs wouldn't cover anything like this level of detail and I wouldn't teach 80% of this in school! So no pressure to formally recall it for exams. It's just fascinating!

Cell division (Eg Bacteria)	Budding Yeast / Hydra	Spores Fungi 	Fragmentation Moss / lichen
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Vegetative Propagation

Stolons Strawberries /spider plants	Rhizome Ginger / turmeric 	Tubors Potatoes / sweet potatoes	Bulbs Onion / garlic
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1. What do all asexual reproduction have in common? Circle or note all correct answers.

No sperm or egg required

Can't happen when it's cold

Relies on wind or animals

One parent needed

Offspring are genetically identical to the parent

Produces genetically identical offspring

Occurs in plants



2. There are advantages and disadvantages to reproducing asexually. Which of these could be an advantage, which a disadvantage, and which could be either?

Write 'a' (advantage) 'd' (disadvantage) or 'e' (either) next to each.



a) Can reproduce quickly

b) Species may be suited to only one habitat

c) More energy efficient

d) Only one parent required

e) Don't have to wait for offspring to develop

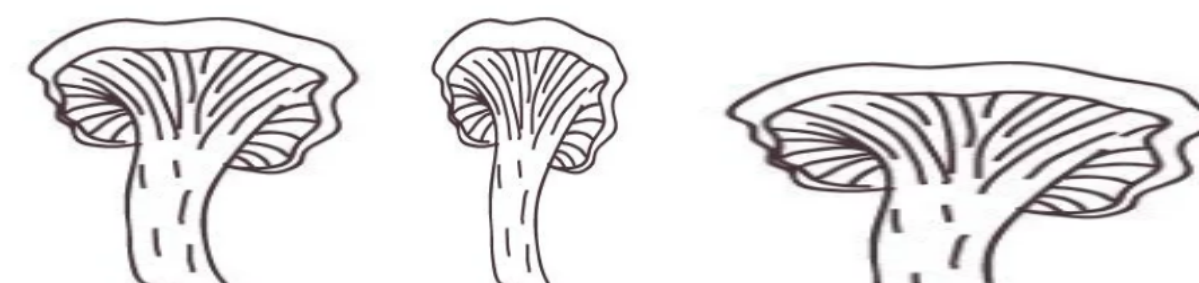
f) Offspring are identical

g) Can easily colonise (grow in) local area

h) Diseases affecting one affect all

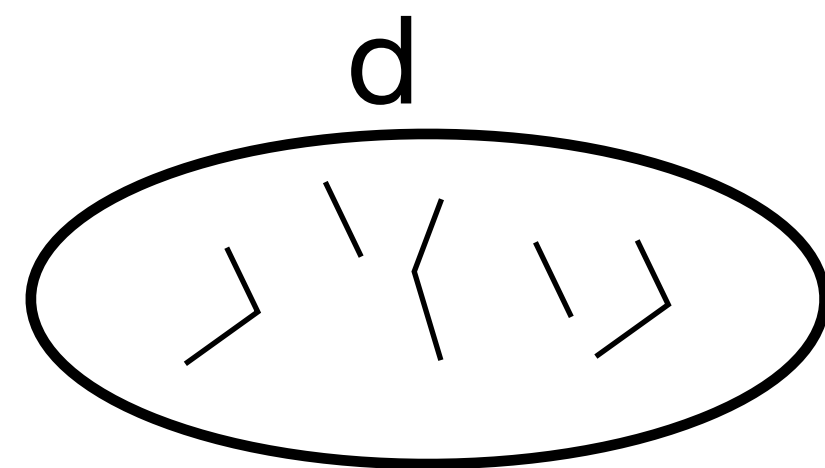
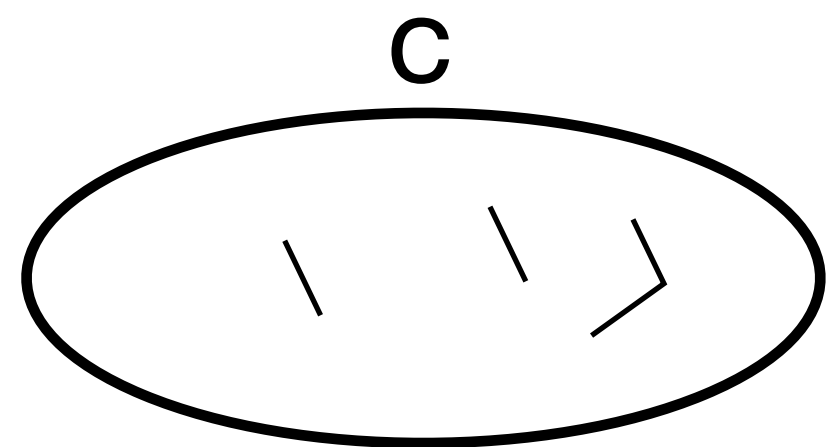
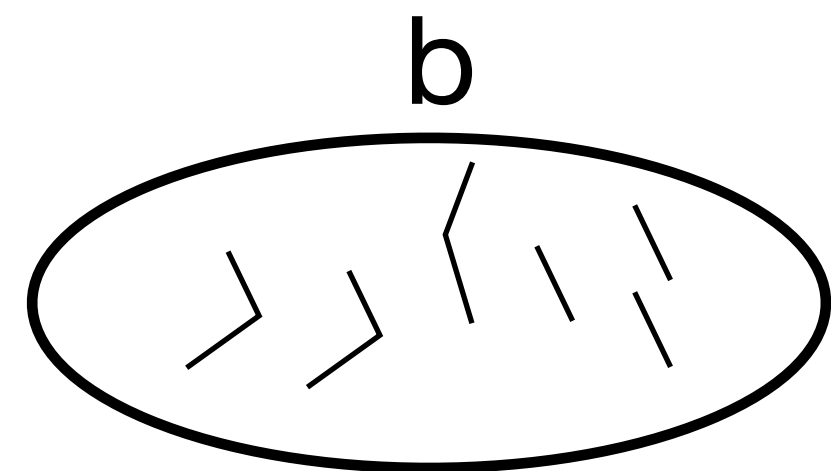
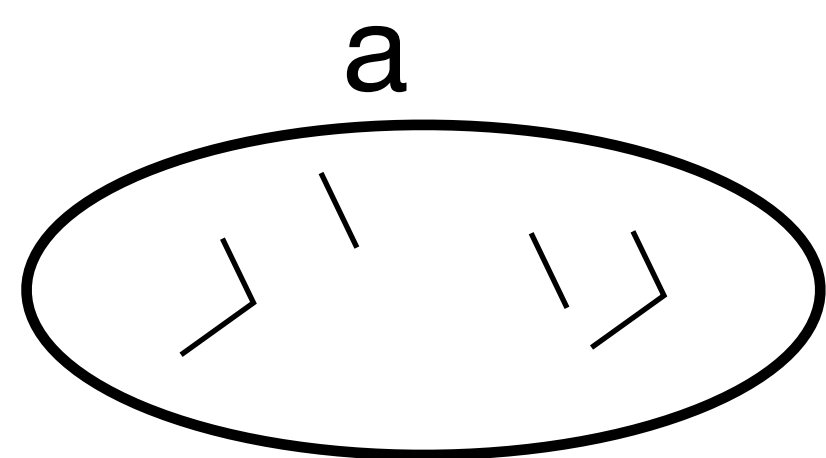
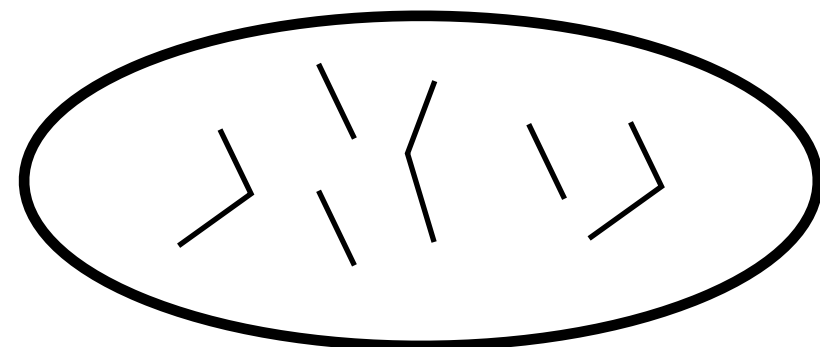
i) Don't rely on pollinators

3. Finished? Why doesn't everything reproduce asexually? Looking for a mate uses time and energy! Nothing reproduced sexually for the first 2 billion years of life on Earth! Why bother?!



GCSE questions!

1) The diagram shows a cell that has reproduced asexually. Which diagram shows the daughter cell?



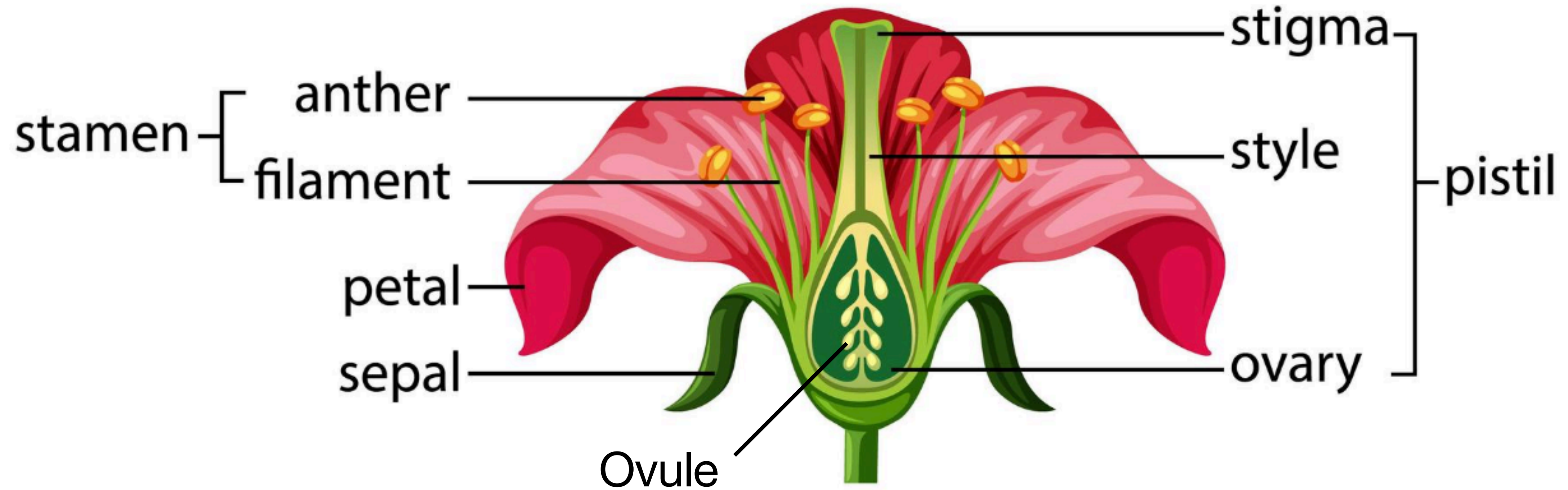
2) Bluebells can reproduce sexually, using seeds, or asexually. Give *three* advantages to the bluebell of reproducing asexually. (3 marks)

Summary Questions

- 1) State two ways that asexual reproduction is different to sexual reproduction.
- 2) Describe *two* advantages and *two* disadvantages of asexual reproduction.

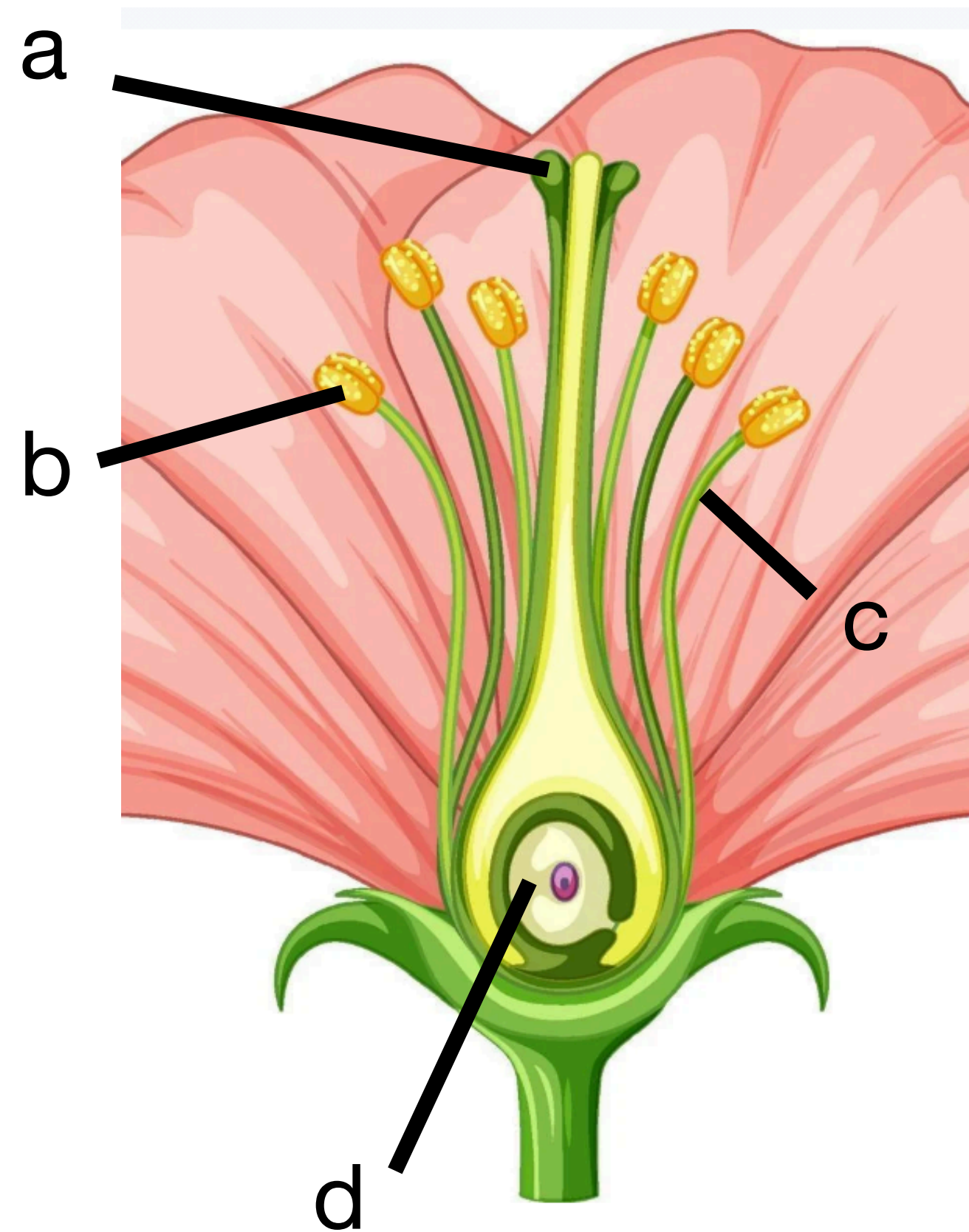


Theatre of Science Reproduction 7: Sexual Reproduction in Plants!



GCSE questions!

1) The diagram shows the inside of a flower. Label parts a, b, c and d.



Where does fertilisation occur?
_____ (4 marks)

2) Suggest why insects rarely visit wind-pollinated flowers.
(2 marks)

Some people are allergic to pollen produced by flowering plants. Suggest why wind pollinated plants are more likely to cause these allergies than insect-pollinated ones. (2 marks)

Summary Questions

What is the difference between pollination and fertilisation in plants? Use the words anther, stigma, insects, pollen and ov in your description.