

Solutions

Each answer shows the steps, then the **result**.

2.1

- fertilisation occurs in the **oviduct**

2.2

- amniotic fluid **cushions** / **protects** the fetus

2.3

- any **two**, each with its use: **flagellum** to swim / **mitochondria** for energy / **acrosome** enzymes to digest the egg membrane

2.4

- from fetus to mother: **carbon dioxide** and **urea**

2.5

- the mother's blood pressure is **much higher** and would damage the fetus's vessels
- the **blood groups** may differ, so the bloods could react

3.1 B

- the egg is **larger and stores food**
- A, C and D describe the sperm

3.2

(a)

- any **two** of: **oxygen** / **glucose** / dissolved nutrients

(b)

- e.g. a **flagellum** lets the sperm **swim to the egg**

3.3

(a)

- **placenta; umbilical cord; amniotic fluid** in the amniotic sac

(b)

- mother's blood has a **higher oxygen concentration**
- oxygen **diffuses** down the gradient across the placenta
- villi give a **large surface area**, so diffusion is fast enough

(c)

- any **two** of: **flagellum** to swim / **mitochondria** for energy / **acrosome** enzymes to digest the egg membrane

(d)

- fertilisation in the **oviduct**
- the zygote divides by **mitosis** as it travels to the uterus
- the ball of cells **implants** in the uterus lining

(e)

- carbon monoxide binds to haemoglobin (or nicotine narrows vessels), so **less oxygen** reaches the fetus
- the fetus grows more slowly and has a **lower birth mass**