Placenta, protection and puberty

Student activity • observation and reasoning

YEAR 11 / LESSON 87 / BIOLOGY + SCIENCE (DOUBLE AWARD)

The question

How is a developing embryo supplied and protected?

Use the supplied examples, record your reasoning and correct it using evidence.

Equipment

- Student booklet, pencil and ruler
- Placenta and amniotic-fluid reference diagrams

Paper, modelling and written reasoning only. No chemicals or biological samples are handled.

Course coverage: Shared Biology / Double Award: 3.11–3.13. Placenta, amniotic fluid and secondary sexual characteristics.

Plan, model or apparatus sketch

Draw and label the apparatus or biological model; identify one limitation.

Method and reasoning

Read the whole sequence before starting

YEAR 11 / LESSON 87 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Draw maternal and fetal blood spaces at the placenta as adjacent but normally separate.

2. Show oxygen and nutrients moving towards fetal blood and carbon dioxide and wastes towards maternal blood.

3. Explain the umbilical cord’s connection with the fetus and distinguish it from direct mixing of the two blood supplies.

4. Explain how amniotic fluid cushions against mechanical shocks without claiming protection from every hazard.

5. Link oestrogen and testosterone with typical secondary sexual changes during puberty, recognising variation in timing.

6. Explain that the placenta is not an absolute barrier to all substances or pathogens.

Cleanup

- Return models and keep the corrected work.

Record your evidence

Blank spaces are for your own work

YEAR 11 / LESSON 87 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Reference and task data

Placental exchange supplies the developing embryo/fetus while maternal and fetal blood normally remain separate. Amniotic fluid provides cushioning. Pubertal changes vary between individuals; this lesson uses anatomical diagrams and general biological examples.

Example / trial	Observation / evidence	Explanation / limit
Evidence / comparison		
Explanation		
Limit / correction		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

YEAR 11 / LESSON 87 / BIOLOGY + SCIENCE (DOUBLE AWARD)

1. Do maternal and fetal blood normally mix directly?

2. Name two substances supplied across the placenta.

3. Name one substance removed from fetal blood.

4. What does amniotic fluid do?

5. Name hormones associated with secondary sexual development.

6. Does the placenta block every harmful substance?