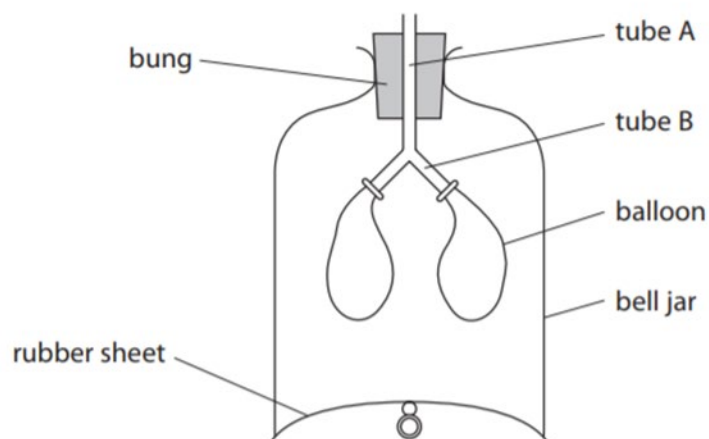


### Activity 9: Marking scripts

Mark all the answers using the official mark schemes

1.

**8** A teacher uses this bell jar model of the thorax to show the process of ventilation.



(b) Evaluate whether the bell jar model can completely demonstrate the process of ventilation. (4)

Question Number	Answer	Mark
<b>8(b)</b>	<p>An answer that makes reference to four of the following points:</p> <ul style="list-style-type: none"> <li>• reference to diaphragm (1)</li> <li>• balloons represent lungs (1)</li> <li>• reference to trachea / windpipe / bronchus (1)</li> <li>• reference to ribs / ribcage / movement of chest / ribcage / bell jar does not move (1)</li> <li>• reference to <u>intercostal</u> muscles (1)</li> </ul>	<b>4</b>

(b) Evaluate whether the bell jar model can completely demonstrate the process of ventilation.

(4)

The bell jar is a good model because it shows how the lungs move in and out. It doesn't have alveoli so can't show gas exchange. There are no chest muscles on it. The balloons are like the lungs and the glass tubes are like bronchioles.

(b) Evaluate whether the bell jar model can completely demonstrate the process of ventilation.

(4)

The bell jar is a very good model for ventilation.

Good things about it:

- balloons are like lungs
- balloons can change size.
- it has a trachea that splits into two bronchi.
- the sheet is a diaphragm that moves up & down.

Bad things:

- glass jar won't move.
- ribs are not there.
- no intercostal muscles

- lungs don't fill jar.

Overall: I think it is a good model. ~~as the~~

(b) Evaluate whether the bell jar model can completely demonstrate the process of ventilation.

(4)

The bell-jar shows most things about ventilation. The sheet moves up and down like a diaphragm. The tube is like a windpipe (air goes through it). It doesn't show the blood / capillaries + gas exchange. There are no alveoli in the balloons.

2.

(c) If the mineral ions are not absorbed, they are egested in the faeces.

The faeces of genetically modified (GM) farm animals contain less phosphate than the faeces of normal farm animals.

(i) Some people catch fish from rivers near farm land.

Discuss why these people might support the genetic modification of farm animals.

(4)

Question Number	Answer	Additional guidance	Mark
4(c)(i)	<p>An answer that makes reference to the following points:</p> <ul style="list-style-type: none"> <li>• fewer plants / fewer algae / less eutrophication (1)</li> <li>• (more) light <b>and</b> (more) photosynthesis (1)</li> <li>• (less) <u>decomposition</u> / <u>decomposed</u> / <u>decomposers</u> (1)</li> <li>• (more) oxygen / not anoxic / less BOD (1)</li> <li>• respiration (ONCE) (1)</li> <li>• (catch) more fish / fewer fish killed / better catch / fish survive / fish do not suffocate / eq (1)</li> </ul>	Allow converse for all Mps	4

(c) If the mineral ions are not absorbed, they are egested in the faeces.

The faeces of genetically modified (GM) farm animals contain less phosphate than the faeces of normal farm animals.

(i) Some people catch fish from rivers near farm land.

Discuss why these people might support the genetic modification of farm animals.

(4)

If there is less phosphate passing into the river, there will be less eutrophication. This means less algae will grow. Algae would block light and so many algae would die - this would give decomposer bacteria food. The decomposer bacteria would respire and use up oxygen. This means there would be less oxygen for fish which would die. This means that less phosphate = more fish = more money!

(c) If the mineral ions are not absorbed, they are egested in the faeces.

The faeces of genetically modified (GM) farm animals contain less phosphate than the faeces of normal farm animals.

(i) Some people catch fish from rivers near farm land.

Discuss why these people might support the genetic modification of farm animals.

(4)

Less phosphate = less algal blooms. (Phosphate is a ~~fertiliser~~ <sup>nutrient</sup>). The phosphate would also bioaccumulate and pass up the food chain. Phosphates are also linked to pollution such as acid rain and global warming. If less algae grows, there will be more fish for the fishermen so that they will make more money. (The algae would poison the fish).

(c) If the mineral ions are not absorbed, they are egested in the faeces.

The faeces of genetically modified (GM) farm animals contain less phosphate than the faeces of normal farm animals.

(i) Some people catch fish from rivers near farm land.

Discuss why these people might support the genetic modification of farm animals.

(4)

If we modify the fish, they will grow bigger (or have some better features). It also means that the people will make more money from the bigger fish. There is a risk that the fish might escape into rivers and outcompete local fish.

3.

2 The photograph shows a type of fish called a salmon.



(Source: © Alexander Rath/Shutterstock)

Some humans eat salmon as a source of protein.

Protein is a component of a balanced diet.

(c) A student investigates the effect of genetic modification on the growth of salmon.

The student measures the mass and length of one normal salmon and one genetically modified salmon when both salmon are 18 months old.

The table shows the student's results.

Type of salmon	Mass in g	Length in cm
normal	1250	33
genetically modified	3000	61

(ii) The student concludes that his results show that genetically modified (GM) salmon are useful in providing a balanced diet.

Discuss the student's conclusion.

(6)

Question Number	Answer	Mark
<b>2(c)(ii)</b>	<p>An answer that makes reference to six of the following points:</p> <ul style="list-style-type: none"> <li>• GM salmon grow more / heavier / longer / larger / more mass / grow faster / eq (1)</li> <li>• (more) protein provided (1)</li> <li>• only need protein in correct amount / only need sufficient protein / only need 50g / too much protein / excess protein / eq (1)</li> <li>• balanced diet also needs vitamins / carbohydrate / lipid / minerals / fibre / no idea of other <b>named</b> component in salmon (1)</li> <li>• one salmon used / not repeated/ should use several fish (1)</li> <li>• (data) not reliable / result may be anomalous (1)</li> <li>• no information on food supply to salmon / temperature / oxygen / pollution (1)</li> <li>• protein need depends on age / sex / activity / eq (1)</li> </ul>	<p><b>6</b></p> <p><b>Mp1</b> <b>Allow</b> <b>converse</b></p>



- (ii) The student concludes that his results show that genetically modified (GM) salmon are useful in providing a balanced diet.

Discuss the student's conclusion.

(6)

A balanced diet needs:

Carbohydrate, protein, vitamins, fats, water, fibre + minerals. The table the student made has none of these. The table is just about how much salmon can grow. It does say that salmon have protein but we don't really know this.

The experiment is not very good as it is not a fair test - we don't know if the two salmon were kept in different conditions. They also only did the experiment once - we need to do it 3x to spot anomalies.

- (ii) The student concludes that his results show that genetically modified (GM) salmon are useful in providing a balanced diet.

Discuss the student's conclusion.

(6)

The data show lots of things. The conclusion might be right because the GM salmon grow faster so it is going to provide people with lots of protein in a shorter time. The problem is that the data doesn't actually tell us about diet - it is all about growth. We need to know how much fat/vitamin A/D/calcium is in the salmon. We also need to know who the RDA is for. Pregnant women might need more calcium. The data is also not accurate as only 1 salmon is used.

- (ii) The student concludes that his results show that genetically modified (GM) salmon are useful in providing a balanced diet.

Discuss the student's conclusion.

The GM salmon grows to 3000g but the normal salmon grew to 1250g - this means it is providing protein as protein is needed for growth and repair.

The problem is there is only protein in the data - no other parts of diet are mentioned. We also don't know how much protein each person needs - athletes would need more.