

**Handout 30a: Identifying useful phrases for responding to the different command terms (Science)**

In pairs, highlight any sentence starters/connectives for each type of science answer.

**1. Explain – responses to explain-type questions**

*Example 1a*

By the time the temperature is 22ºC, the photosynthesis enzymes are working at maximum rate for the conditions and the graph is flat. It means that either light intensity or carbon dioxide is rate limiting at that stage, not temperature.

*Example 1b*

The molecules in the egg yolk have a ‘head’ part that dissolves in water, but a long ‘tail’ part that dissolves in oil. A large number of these molecules surround the oil droplet and so it can stay suspended in the water as an emulsion which is stable. The egg yolk molecules act as an emulsifier.

*Example 1c*

Because black is a good absorber of the radiation from the sun, in a given time, more of the sun’s energy will be captured and transferred into the water, making it hotter.

**2. Describe – responses to describe-type questions**

*Example 2a*

First of all the heat (stimulus) will be detected by the temperature receptors in the skin. The receptors will send an electrical impulse along the sensory neurone to the synapse in the spinal cord. A chemical messenger is released, which crosses the synapse space and triggers an impulse in the relay neurone. The same thing happens at the next synapse so that an impulse is sent down the motor neurone to the muscle, which is the effector. When the impulse reaches the muscle, it causes the muscle to contract and pulls the hand away from the heat. This is a reflex action, which does not have to be processed via the brain.

*Example 2b*

In the beginning, dust particles and gases are pulled together by the force of gravity. As the atoms of hydrogen gas are forced together, the nuclei collide and nuclear fusion begins. The star becomes stable as the forces acting inwards and the forces acting outwards are balanced. Eventually, it runs out of hydrogen, so the star starts to cool and becomes a red giant. Then it starts to shrink under its own gravity and, as the material comes closer together, the temperature rises and the star glows much brighter as a white dwarf.

**3. Compare – responses to compare-type questions**

*Example 3a*

Generating electricity for an immersion heater burns fossil fuels, which releases carbon dioxide into the atmosphere, whereas solar energy doesn’t release any extra carbon dioxide. Moreover, solar energy is a renewable energy source, which also means that we are conserving fossil fuels, which are in danger of running out. However, solar energy does have disadvantages because it needs the daylight and some countries don’t have enough hours of sunlight, like Scotland in the winter. This means there will be times when not enough hot water is available for the household, whereas an immersion heater can supply hot water all of the time.

*Example 3b*

The advantages of phytomining are that it would take less energy than the traditional method and it will be carbon neutral because the plants will take the same amount of carbon dioxide out of the atmosphere as they grow as they release when they are burnt.On the other hand, the traditional method is quicker as the plants take a long time to grow.

**4. Evaluate – responses to evaluate-type questions**

*Example 4a*

Fossil diesel is mainly used because it is quick to produce from crude oil and, up to this point, is cheaper than biodiesel.

However, biodiesel has a lot to recommend it, as it is a renewable resource, whereas crude oil is running out. In addition, it is carbon neutral because it takes in the same amount of carbon dioxide when the plants are growing as it gives out when burnt as fuel.

Although burning biodiesel does produce the same amounts of both carbon dioxide and carbon monoxide as fossil diesel, there is less sulphur dioxide, so there will be less acid rain, and less carbon particles – which cause global dimming. Also, waste oils can be used up to produce fuel.

Overall, I think we should be using more biodiesel, as it is important for us all to reduce our carbon footprint in an effort to halt global warming.

*Example 4b*This trial involved large numbers, so that would have given valid results. It was also a good trial of the general population because, if poor uneducated women could make it work, it would be reliable. However, the trial was not very ethical by today’s standards because we don’t know that the women gave informed consent, and they were not told it was experimental or that there could be side effects. The trial was not well designed as there was no placebo control group and they did not do pre-trials to find the best dose and check for side effects. I believe that this was an unethical trial.

**5.** **Suggest – responses to suggest-type questions**

*Example 5a*

The particles might be small enough to pass through the skin and they might be toxic inside the body.

*Example 5b*

This could be a control group so that the researchers had a group with no cancer to compare their results with.

(Material adapted from AQA’s ‘Command Words for GCSE Sciences’)