A-level Biology example for required practical 9

Investigation into the effect of a named variable on the rate of respiration of cultures of single-celled organisms:

An investigation of the effect of temperature on respiration in yeast

Student sheet

Yeast is a single-celled fungus. It can respire aerobically and anaerobically. During aerobic respiration, the transport of electrons is linked to the synthesis of ATP. In this investigation, these electrons will be taken up by a substance called methylene blue. When methylene blue is reduced, it changes from blue to colourless.

Method

You are provided with the following:

- yeast and glucose mixture
- methylene blue
- test tubes
- test-tube rack
- beaker to act as water bath
- a way of changing the temperature of the water bath
- graduated pipettes or syringes
- marker pen
- thermometer
- timer.

You should read these instructions carefully before you start your investigation.

1. Use the beaker to set up a water bath at 35°C.
2. Label five test tubes one to five.
3. Shake the yeast and glucose mixture.
4. Add 2cm^3 of the yeast and glucose mixture to all five tubes.
5. Place all five tubes in the water bath and leave them until their contents reach 35°C. Make sure the water bath stays at 35°C
6. Add 2cm^3 methylene blue to test tube 1.
7. Immediately shake this tube for 10 seconds and replace the tube in the water bath. Note the time and do not shake this tube again.
8. Record how long it takes for the blue colour to disappear in the tube.
9. Repeat steps six to eight for the other four tubes.
10. Your teacher will tell you which other temperatures to use. Repeat steps one to nine at each temperature.