

# WJEC England Biology GCSE

## SP6.2: Decomposition Practical Notes



## Decomposition

### Aim

Investigation into the effect of temperature on the rate of decomposition of urea by urease into ammonia using universal indicator. As urea is broken down into ammonia, it forms an alkaline solution, the pH of the solution increases causing a colour change in the solution.

### Equipment

- Boiling tubes
- Boiling tube rack
- Labels
- Syringe
- Pipette
- 1.5% urease solution
- 1.25% ethanoic acid
- Universal indicator
- 1% urea solution
- Stopwatch

### Method

1. Label 5 boiling tubes a range of temperatures from 20-60°C at 10°C intervals.
2. Use a syringe to add 2.5 cm<sup>3</sup> of urea, 1.5 cm<sup>3</sup> of ethanoic acid and 10 drops of universal indicator to each boiling tube.
3. Add 10 cm<sup>3</sup> of urease to another boiling tube.
4. Place both boiling tubes in a thermostatically-controlled water bath at 20°C for a few minutes.
5. Mix the two test tubes together and start timing immediately.
6. Record the time taken for the colour of the solution to change from red to blue in a table as seen below.
7. Repeat steps 1-6 for each of the remaining temperatures.

Temperature / °C	Time taken for solution to change from red to blue / s

### Risk Assessment

Urea, urease, and ethanoic acid are irritants. Avoid contact with skin and wear eye protection.

### Sources of error

The colour change at the end-point may be subjective and difficult to determine.

