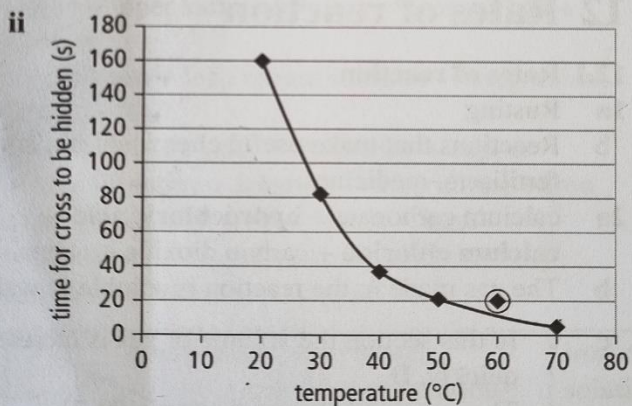
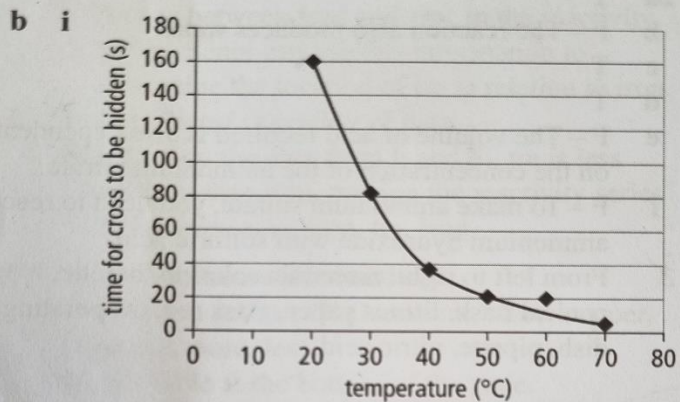


## Workbook/ Answer key

### 12.3 Temperature and reaction rate

- 1a i Ebba  
ii Wanda



- c At higher temperatures, the particles have more energy and collide more frequently. Therefore, the rate of reaction is faster.

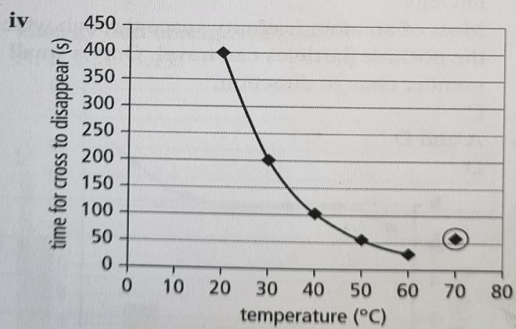
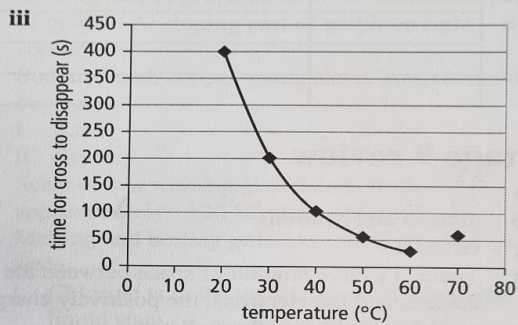
### 12.5 Catalysts and reaction rate

- 1 temperature, concentration, surface area, catalyst, is not, amylase, glucose.
- 2a hydrogen peroxide  $\rightarrow$  water + oxygen
- b Place a glowing splint into the gas. If the splint relights, the gas is oxygen.
- i Manganese(IV) oxide
- ii Iron oxide and zinc oxide

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- 2a
- i temperature
  - ii time taken for the cross to disappear
  - iii amount of sodium thiosulfate, amount of hydrochloric acid, concentration of sodium thiosulfate, concentration of hydrochloric acid, temperature

- b i To reduce error and increase the reliability of his results.
- ii 200



- v As temperature increases, the time taken for the cross to disappear decreases.
- c At higher temperatures, particles have more energy so move around faster. This increase in movement leads to an increase in collisions between reacting particles, leading to an increase in rate of reaction.

- 4a A catalyst is a chemical that helps to speed up a reaction without being used up.

b

Catalyst	Volume of gas produced (cm <sup>3</sup> )