Energy Changes
Multiple Choice Questions
Set 1

Tick **one** box.

1. Energy is conserved in chemical reactions. What is meant by the term 'conservation of energy'?

   A. energy is created in chemical reactions ☐
   B. energy is used up in chemical reactions ☐
   C. no energy is transferred in a chemical reaction ☐
   D. the amount of energy in the universe at the end of a chemical reaction is the same as before the reaction takes place ☐

2. A student carried out an investigation into the temperature change when citric acid reacts with sodium hydrogencarbonate. The student's results are shown in **Table 1**.

Table 1

Start Temperature (ºC)	22
Temperature 30 Seconds After Mixing (ºC)	17

What type of reaction takes place between citric acid and sodium hydrogencarbonate?

   A. endothermic ☐
   B. exothermic ☐
   C. isothermic ☐
   D. thermal decomposition ☐

3. Which of the following is an example of an exothermic reaction?

   A. combustion ☐
   B. cooking an egg ☐
   C. photosynthesis ☐
   D. thermal decomposition ☐

4. Which variable would **not** affect the temperature change in a reaction between a metal carbonate and an acid?

   A. the volume of acid ☐
   B. the concentration of the acid ☐
   C. the mass of metal carbonate ☐
   D. the room temperature ☐

5. In an investigation into the temperature change during a chemical reaction, how can the transfer of energy to the surrounding air be minimised?

   A. carry out the reaction in a glass beaker ☐
   B. carry out the reaction in a polystyrene cup ☐
   C. use a higher concentration of reactants ☐
   D. use a thermometer with a higher resolution ☐

6. A group of students carried out an investigation into the reaction between sodium hydroxide and hydrochloric acid. The students' results are shown in **Table 2**.

Table 2

	Start Temperature (°C)	**End Temperature (°C)**	**Temperature Change (°C)**
Trial 1	20	31	11
Trial 2	21	31	10
Trial 3	19	32	13
Trial 4	20	33	13

What is the mean temperature change to 2 significant figures?

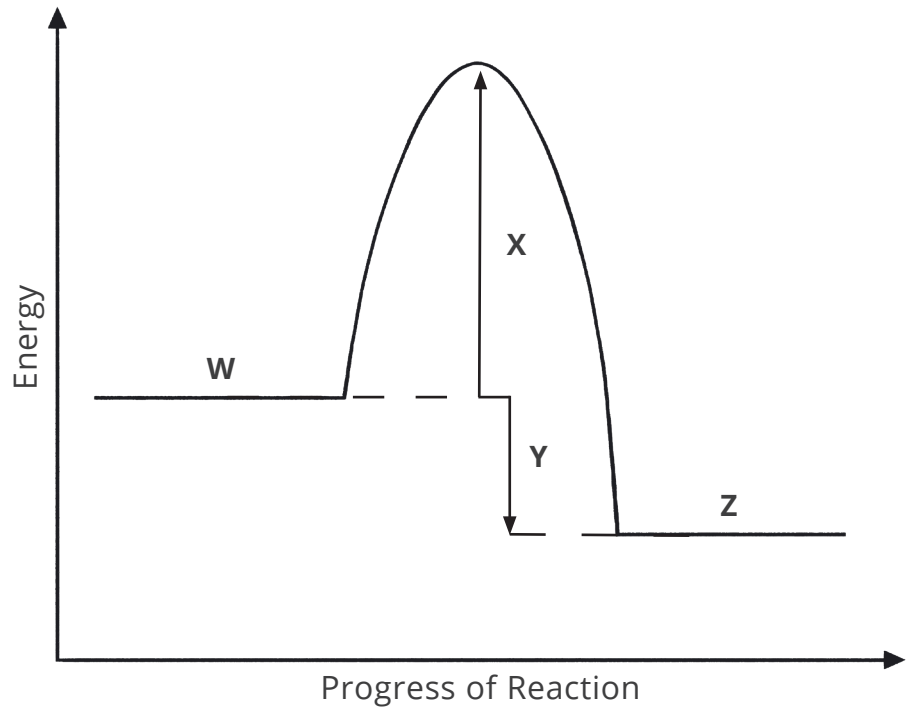
   A. 11°C ☐
   B. 12°C ☐
   C. 13°C ☐
   D. 47°C ☐

7. What is activation energy?

   A. the energy that the reactant particles have at the start of a reaction ☐
   B. the energy that is released in a chemical reaction ☐
   C. the energy needed to get particles moving ☐
   D. the energy needed for a reaction to occur ☐

Figure 1 shows a reaction profile for an exothermic chemical reaction.

Figure 1



8. Which label in **Figure 1** represents the activation energy?

A. W ☐
B. X ☐
C. Y ☐
D. Z ☐

9. Which label in **Figure 1** represents the energy store of the reactants?

A. W ☐
B. X ☐
C. Y ☐
D. Z ☐

10. Which label in **Figure 1** represents the overall energy change of the reaction?

A. W ☐
B. X ☐
C. Y ☐
D. Z ☐