

Task

Read the statements about rates of reaction.

Decide if they are true or false.

Explain each of your answers.

		T / F
1	Increasing temperature will increase the rate of a reaction. .....	
2	If a solid is broken into small pieces it has a smaller surface area. .....	
3	Catalysts have no effect on a chemical reaction because they are not used up. .....	
4	Increases in concentration make particles collide more frequently. .....	
5	For particles to react, they must collide with enough energy. .....	
6	Adding a catalyst increases the activation energy for a reaction. .....	
7	Increasing concentration will increase the number of particles in the same volume. .....	
8	If pressure is decreased, there is less space between particles. .....	
9	The minimum energy that particles must collide with in order to react is called the activation energy. .....	
10	Catalysts must be shown in the chemical equation for a reaction. .....	

## Answers and teaching notes

This can be used in a revision lesson, or as an AfL activity. It works well as individual task or in pairs/groups. Students can easily self/peer assess to highlight areas of strength and weakness. Additional teaching notes are given in italics showing important points to draw students' attention to, or further explanation.

		T / F
1	Increasing temperature will increase the rate of a reaction.	T
	<i>This is because particles have more energy.</i>	
2	If a solid is broken into small pieces it has a smaller surface area.	F
	<i>If a solid is broken into small pieces it increases the surface area. Students often find this hard to visualise - modelling with small cubes and counting the number of 'faces'/surfaces exposed when all are in one big block, and then in small pieces can help to illustrate this point.</i>	
3	Catalysts have no effect on a chemical reaction because they are not used up.	F
	<i>Catalysts are not used up, but still change the rate of a chemical reaction.</i>	
4	Increases in concentration make particles collide more frequently.	T
	<i>Remind students here of the importance of the reference to <u>frequency</u> of collisions - just saying 'more collisions' is insufficient.</i>	
5	For particles to react, they must collide with enough energy.	T
	<i>i.e. not all collisions will lead to a reaction.</i>	
6	Adding a catalyst increases the activation energy for a reaction.	F
	<i>Adding a catalyst decreases the activation energy for a reaction (by providing an alternative pathway).</i>	
7	Increasing concentration will increase the number of particles in the same volume.	T
	<i>Opportunity here to highlight the difference between increasing concentration and increasing volume of reactants.</i>	
8	If pressure is decreased, there is less space between particles.	F
	<i>If pressure is decreased, there is more space between particles. or If pressure is increased, there is less space between particles.</i>	
9	The minimum energy that particles must collide with in order to react is called the activation energy.	T
	<i>i.e. not all collisions will lead to a reaction. The activation energy varies for different reactions.</i>	
10	Catalysts must be shown in the chemical equation for a reaction.	F
	<i>Catalysts are not shown in the chemical equation for a reaction. This is because they are not 'used up' in the reaction.</i>	