

## Answer Key

1. How fast or slow the chemical reaction occurs.
2. They must collide with the right orientation and with sufficient energy.
3. The rate of consumption of hydrogen would be twice that of oxygen.
4. Higher temperature results in an increase in reaction rate. Higher concentration results in an increase in reaction rate. Larger surface area results in an increase in reaction rate.
5. Increased concentration means more molecules. More molecules means more collisions per second between the particles. This results in an increase in reaction rate.
6. The catalyzed reaction has a lower activation energy than the un-catalyzed reaction.
7. The minimum amount of energy that reacting particles must have to form the activated complex.
8. If they do not collide with the correct orientation. If they do not have sufficient energy.
9. The activation energy for the forward reaction is less than the activation energy for the reverse direction.
10. A catalyst lowers the activation energy.
11. a) 2   b) 3   c) 4   d) 1
12. The products have less energy than the reactants. It is an exothermic reaction.