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| **Topic** | Collision theory | **Level** | GCSE |
| **Outcomes**  | 1. To use the collision theory to explain why changes to a reaction can increase the rate of reaction (temperature, concentration, surface area and catalyst)
2. To understand why not all collisions are successful
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**The collision theory and rates of reaction**



*When two particles collide (hit each other) sometimes a chemical reaction happens. Not all collisions result in a chemical reaction. To increase the number of successful collisions we can change the conditions of a reaction (see page 2).*

1. Do all collisions between particles cause a reaction to happen?
2. What do we call the minimum energy the particles must have for a reaction to happen?
3. What do we call a collision between two particles that causes a chemical reaction?
4. Look at the picture above, how do you know the first reaction is not a successful collision?

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| **Change to the reaction** | **What happens to movement (kinetic energy) of the particles?** | **What happens to the frequency of collisions every second?** | **What happens to the number of successful collisions every second?** | **What happens to the rate of reaction?** |
| Increase the temperature |  |  |  |  |
| Increase the concentration  |  |  |  |  |
| Increase the surface area of a solid |  |  |  |  |
| Add a catalyst |  |  |  |  |

**Progress:** further resources on rates of reaction are available here: <http://www.thescienceteacher.co.uk/rates-of-reaction/>