**Topic Overview: Chemical Energy**

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|  | Ref | Outcome | Achieved | ☺ |
| Emerging | E9ScC1.1 | Know that all reactions require energy |  |  |
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| E9ScC2.1 | Know that temperature change indicates the type of reaction and some give out energy and some take it in |  |  |
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| Developing | D9ScC3.1 | Describe how if the energy released is greater than the energy required, the reaction is exothermic. If the reverse, it is endothermic. |  |  |
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| D9ScC4.1 | Explain that during a chemical reaction bonds are broken (requiring energy) and new bonds formed (releasing energy). |  |  |
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| Securing | S9ScC5.1 | Use a diagram of relative energy levels of particles to explain energy changes observed during a change of state. |  |  |
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| S9ScC6.1 | Use experimental observations to distinguish exothermic and endothermic reactions. |  |  |
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| Mastering | M9ScC7.1 | Use energy data to select a reaction for a chemical hand warmer or cool pack |  |  |
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| M9ScC8.1 | Predict whether a chemical reaction will be exothermic or endothermic given data on bond strengths. |  |  |

**Keywords**

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| **Catalysts:** Substances that speed up chemical reactions but are unchanged at the end. |
| **Exothermic reaction:** One in which energy is given out, usually as heat or light. |
| **Endothermic reaction:** One in which energy is taken in, usually as heat. |
| **Chemical bond:** Force that holds atoms together in molecules. |