**Topic Overview: Heating and Cooling**

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|  | Ref | Outcome | Achieved | ☺ |
| Emerging | E9SpH1.1 | Explain the difference between hot and cold in terms of energy |  |  |
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| E9SpH2.1 |  Know that when there is a temperature difference, energy transfers from the hotter to the cooler object. |  |  |
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| Developing | D9SpH3.1 | Explain observations about changing temperature in terms of energy transfer |  |  |
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| D9SpH4.1 | Explain how heat energy is transferred as conduction, convection and radiation  |  |  |
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| Securing | S9SpH5.1 | Explain how a method of thermal insulation works in terms of conduction, convection and radiation |  |  |
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| S9SpH6.1 | Compare and contrast the three ways that energy can be moved from one place to another by heating. |  |  |
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| Mastering | M9SpH7.1 | Describe how an object's temperature changes over time when heated or cooled. |  |  |
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| M9SpH8.1 | Sketch a graph to show the pattern of temperature change against time.  |  |  |
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| M9SpH9.1 | Evaluate a claim about insulation in the home or for clothing technology.  |  |  |

**Keywords**

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| **Thermal conductor:** Material that allows heat to move quickly through it. |
| **Thermal insulator:** Material that only allows heat to travel slowly through it. |
| **Temperature:** A measure of the motion and energy of the particles. |
| **Thermal energy:** The quantity of energy stored in a substance due to the vibration of its particles. |
| **Conduction:** Transfer of thermal energy by the vibration of particles. |
| **Convection:** Transfer of thermal energy when particles in a heated fluid rise. |
| **Radiation:** Transfer of thermal energy as a wave. |