

## Appendix: Energy Literacy Framework Alignment Table

Essential Principle/Fundamental Concept	Comments
<p><b>1.2</b> The energy of a system or object that results in its temperature is called thermal energy. When there is a net transfer of energy from one system to another, due to a difference in temperature, we call the energy transferred heat. Heat transfer happens in three ways: convection, conduction and radiation. Like all energy transfer, heat transfer involves forces exerted over a distance at some level as systems interact.</p>	<p>In the kitchen science activity, students observe that the temperature of beakers increase over time and conclude that energy is transferred from the hot plate to the beakers through thermal conduction.</p>
<p><b>1.4</b> Energy available to do useful work decreases as it is transferred from system to system. During all transfers of energy between two systems, some energy is lost to the surroundings. In a practical sense, this lost energy has been “used up,” even though it is still around somewhere. A more efficient system will lose less energy, up to a theoretical limit.</p>	<p>In the building science activity, students observe the temperature difference between the thermal bridges and the environment and conclude that the building is not energy efficient because energy is lost to the surroundings through the thermal bridges.</p>
<p><b>3.1</b> The Sun is the major source of energy for organisms and the ecosystems of which they are a part. Producers such as plants, algae and cyanobacteria use the energy from sunlight to make organic matter from carbon dioxide and water. This establishes the beginning of energy flow through almost all food webs.</p>	<p>In the garden science activity, students observe the temperature difference between the butterfly and the environment and conclude that the Sun is a major source of energy for ectotherms like butterflies.</p>