6.9(A) The student will investigate methods of thermal energy transfer, including conduction, convection, and radiation.
Energy Transformations

Thermodynamics is the study of heat energy.

Energy is the ability to do work.

Law of Conservation of energy -
• energy is always conserved, can’t be created or destroyed. (energy can be transformed into another energy type)
Conduction – The transfer of heat energy through a solid. (heat goes through pan on stove)

Convection – Transfer of heat in a fluid, gas or liquid. (rice rising and falling in boiling water)

Radiation – heat in the form of waves. Doesn’t require a medium to travel through (Heat from the sun)
Type of matter through which energy is transferred

<table>
<thead>
<tr>
<th>Energy</th>
<th>Solid</th>
<th>Liquid</th>
<th>Gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduction</td>
<td>X</td>
<td>Possible</td>
<td></td>
</tr>
<tr>
<td>Convection</td>
<td></td>
<td>X</td>
<td>X</td>
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<tr>
<td>Radiation</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Energy Types

**Mechanical** – motion (both potential and kinetic)

**Thermal** – heat (toaster)

**Radiant/Solar** – (sun)

**Sound** – carried by sound waves/vibrations (stereo)

**Electrical** – electric charges (anything that plugs in)

**Chemical** – Chemical reaction (eating something)

More examples: Nuclear, Biomass
Energy Transformations

Mechanical – stored and moving
Thermal – heat (toaster)
Radiant/Solar – (sun)
Sound – carried by sound waves/vibrations (stereo)
Electrical – electric charges (anything that plugs in)
Chemical – Chemical reaction (eating something)
Path is complete. Click Reset to start a new path.

**Person**
People eat food for energy and nutrients. Inside each cell a chemical reaction called respiration releases energy from food and oxygen.

*Picture taken from Gizmos: Energy Conversions*
Vocabulary

Demonstrate – present by examples
Radiant – emitting heat or light
Radiation – Energy carried by light or electromagnetic waves
Transfer – Cause to pass from one to another
Transformation - Changing in form, shape or appearance
Verify – prove