

Name \_\_\_\_\_

## Cooling and Warming the World: How Heat Pumps and Refrigeration Cycles Work

### Short Answer Key

1. The four main components of a refrigeration cycle are the compressor (pressurizes gas), condenser (releases heat), expansion valve (reduces pressure), and evaporator (absorbs heat). The compressor and expansion valve create a temperature difference, leading to heat transfer.
2. In the summer, a heat pump operates like an air conditioner, absorbing heat from inside and releasing it outside.
3. Heat pumps are energy-efficient because they transfer heat rather than generate it, making them more environmentally friendly and cost-effective.
4. The first law ensures energy conservation, while the second law dictates the direction of heat flow from hotter to colder areas in the cycle.
5. Energy-efficient heat pumps reduce energy consumption and greenhouse gas emissions, contributing to a more sustainable future.

