**SPH3U 5.4 Efficiency, Energy Sources, and Energy Conservation**

1. **Efficiency**

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| --- | --- |
| Efficiency: |  |
| equation |  |

A firefly’s body transforms chemical energy in food into radiant energy to glow. What is a firefly’s efficiency if its body transforms 4.13 J of chemical energy into 3.63 J of radiant energy?

What is the efficiency of a rope-and-pulley system if a painter uses 1.93 kJ of mechanical energy to pull on the rope and lift a 20.0 kg paint barrel at constant speed to a height of 7.5 m above the ground?

1. **Improving the efficiency of energy transformations**

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| --- | --- | --- | --- |
| **Device or Process** | **Transformation** | **Waste Energy** | **Efficiency** |
| gas-powered vehicle |  |  |  |
| electric vehicle |  |  |  |
| bicycle |  |  |  |
| speakers |  |  |  |
| electric heater |  |  |  |
| **Device or Process** | **Transformation** | **Waste Energy** | **Efficiency** |
| hydroelectric power plant |  |  |  |
| nuclear power plant |  |  |  |
| solar cell |  |  |  |
| photosynthesis |  |  |  |
| animal muscles (including human) |  |  |  |

1. **Sources of energy**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type** | **Resources** | **Pros** | **Cons** |
| **Renewable** |  |  |  |
| **Non-Renewable** |  |  |  |

**Homework:** page 249: #1-4