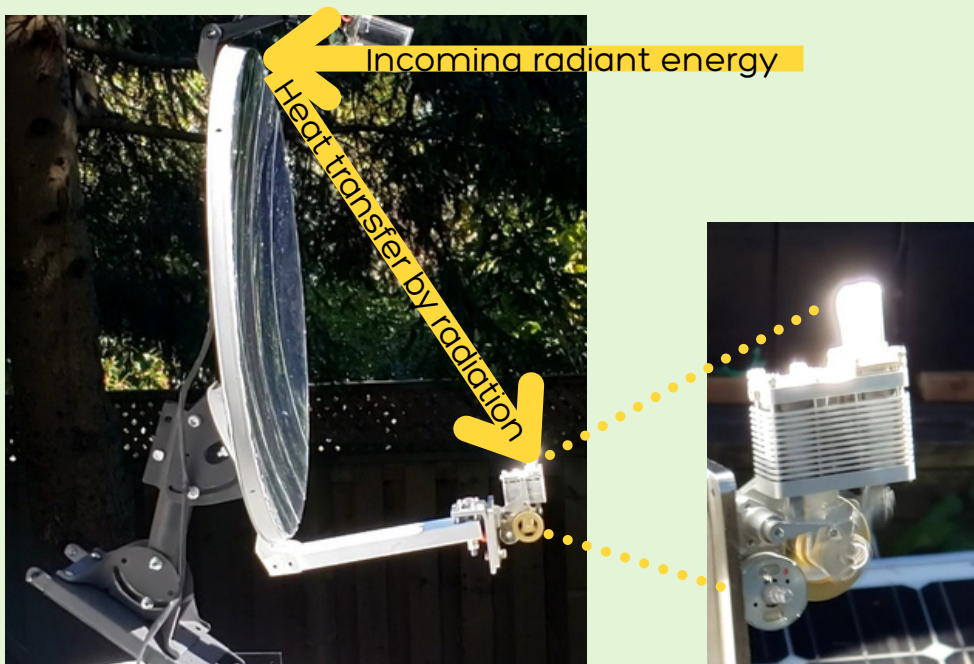


Sources of heat and heat transfer: Radiation, Conduction, and Convection

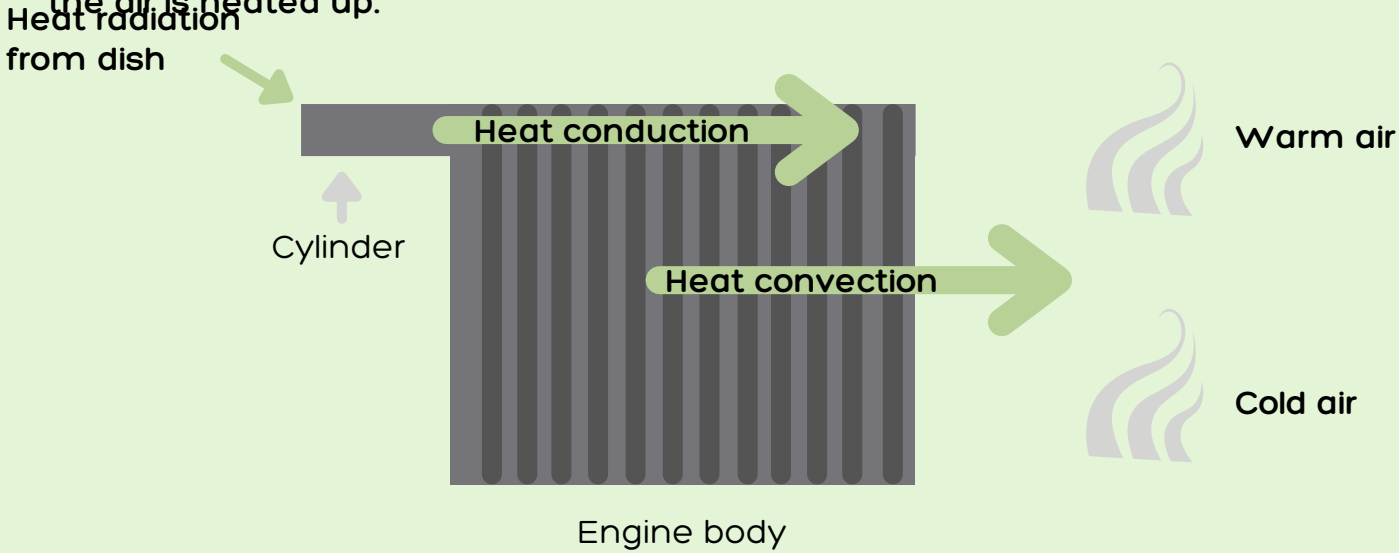


Energy comes from two main sources, renewable and non-renewable. Sun and geothermal are renewable sources while gas and coal are non-renewable sources of energy. Heat is a form of energy that is transferred from one object at a higher temperature to another one at a lower temperature.

In other words, heat is transferred when there is a temperature difference. Radiation is an important method of heat transfer. The sun's energy is transferred to the earth by radiation. The sun's energy is dilute and it must be concentrated to be used in a practical way. A reflecting dish or a concave mirror can be used to reflect this energy and concentrate it. This concentrated energy can be used in many ways.



A Stirling engine is a device that converts heat into work. It absorbs part of this concentrated energy. The absorbed radiant energy heats the cylinder and runs the engine. Heat conduction is another method of heat transfer. The heat from the cylinder is transferred to the body of the engine by conduction. Heat convection is the transfer of heat through the movement of heated fluid. The heat from the engine body is transferred to the air by convection. In other words, the body is cooled down by the ambient air and the air is heated up.



Question 1:

In the flame experiment, when the Stirling engine is operated by the flame from the alcohol, what is the main heat transfer from the flame to the engine?

Question 2

What are the advantages and disadvantages of applying flame compared to solar dish?

