

Candle as a System

A candle can be used as a simple model of a system. Each group have the same equipment and attempt to use the key terms:

Stores	equilibrium	energy	matter	flows
Open system	closed system	transfer	transformation	

Apparatus

- Enamel dishes
- White tiles
- Jars that have straight edges.
- Paper
- Candles
- Matches
- Wooden Splints

Method / Procedure

- Carefully light the piece of paper whilst holding it over the enamel dish. Drop the paper into the dish before you burn your fingers.
- Observe the way in which the fire develops and then dies away.
- Light the candle observing how the flame develops. Drop some molten wax into the bottom of the dish so that you can stand the candle up on its own.
- Light a splint and then blow out the candle. Relight the candle bringing the splint towards the wick, watch carefully to see if it is necessary to touch the wick with the flame to relight it.
- Extinguish the candle and allow the wax to cool down completely. Relight the candle (is it necessary to touch the wick with the flame?) and observe very carefully the candle flame. Does it stay the same size, or does it get bigger or smaller or both? Does it reach an equilibrium?

Discuss your observations with a systems approach

- (i) Identify the stores
- (ii) Identify the transfers and transformations involved
- (iii) Inputs, outputs, flows
- (iv) Equilibrium
- (v) Feedbacks

Use your observation and discussions to construct a graphical model (flow diagram) to describe the burning candle as a system. (Label the diagram fully with stores, transfer, transformation, processes and feedback).

Use the model to make some predictions

