Stubby Holder

Apparatus

one or more stubby holders, two or more cans of soft drink which have been in the fridge for some hours before hand, one of which has since been in a stubby holder, the other not
extras- piece of wetsuit material, small container of water

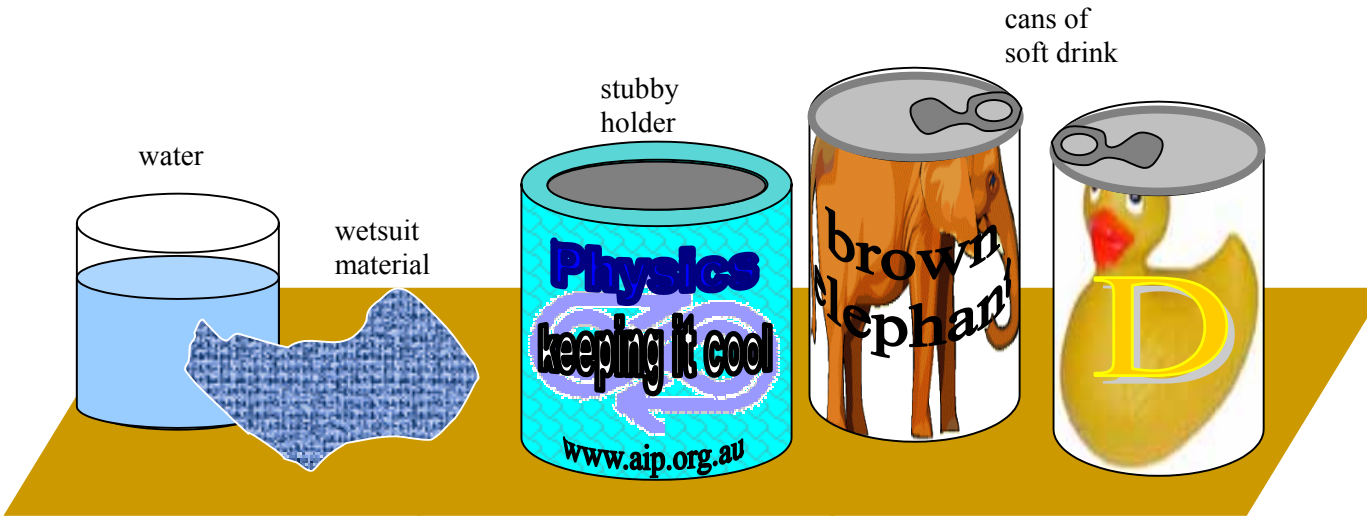
Action

The students measure the temperature or simply feel the temperature difference between the two cans. They should describe which processes of heat transfer are affected by the stubby holder.

If wetsuit material is available then they can also wet their hand and compare how cool or warm it feels when uncovered and when covered by the wetsuit material.

The Physics

A stubby holder works the same way as a wetsuit, and is often made of similar material. The stubby holder prevents heat loss by convection and conduction. A wetsuit works by decreasing conduction, and by trapping a layer of water against the skin it prevents convection, hence a wet hand covered by wetsuit material will feel warm, while an uncovered wet hand cools quickly. The stubby cooler and wetsuit prevent evaporative cooling. If the temperature difference is great enough the students will observe droplets of condensation on the cold uncovered cans, but not on the stubby holders containing cans.



Accompanying sheet

Stubby holder

Measure the temperature of the can which has been sitting out of the fridge.
How does it compare the one which has been out but in the stubby holder?

How does the stubby holder keep the can cool?
Which process of heat transfer is affected?