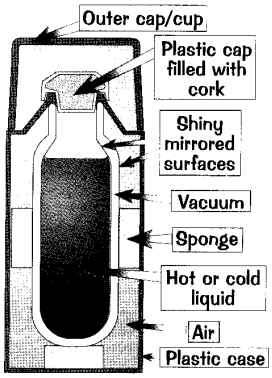
Heat transfer - Keeping things warm

1. The diagram to the right shows a vacuum flask, with features that help to keep it insulated.

For each, state the method of heat transfer that they are reducing

(a) The cap is covered in plastic
(b) The cap is filled with cork
(c) The liquid is contained in a glass bottle
(d) The bottle is double walled
(e) There is a vacuum between the two walls
(f) The inside of each glass layer is silvered
(g) The outside of each glass layer is silvered
(h) The bottle is surrounded by air inside the plastic case
(i) The bottle is supported away from the casing by insulating foam



2. (a) All of the old-fashioned incandescent lightbulbs in a home are replaced for £250. This saves £40 per year. What is the payback time?
(b) A householder is deciding whether to buy draught excluders for their home. This would cost £50, and save £150 on the heating bills in one year. What is the payback time?
(c) A double glazing company advertises their services to install efficient windows for £170 which cast £230. This should save about £40 per year on the heating bills? Explain whether you think this is a worthwhile investment, giving your reasoning.