



# King Edward VI School Science

## Physics Home Learning Task

Every year we throw away **2.5 billion** disposable cups in the UK. Over a year, this adds up to about **25,000 tonnes** of waste, apparently enough to fill London's Royal Albert Hall

It's now possible to buy reusable cups and we want to challenge you to come up with the best insulated cup design that you can. A good place to start is with the old fashioned Thermos flask. Research how these flasks work by going to the Explain That Stuff page here:

<https://www.explainthatstuff.com/vacuumflasks.html>



Your cup design should aim to reduce heat transfer by **conduction, convection and radiation.**

If you're not sure what these are or how they work, have a look at the BBC Bitesize page here:

<https://www.bbc.co.uk/bitesize/guides/z99jq6f/revision/6>



Make your cup and put some hot water in it, close it, and go back and check on its temperature an hour later. You should compare it to an ordinary cup of tea alongside.

### HINTS

- ◆ It must stop CONDUCTION so what are the best materials to use, insulators or conductors?
- ◆ A layer of AIR is a really good idea. Some things, like cotton wool trap a lot of air. How could you trap air around your cup?
- ◆ It must stop CONVECTION, so a good, airtight lid is important
- ◆ It must stop RADIATION, so what colour would be best? Clue: What colour is the thermos flask on the inside?



Draw and label your design, or take a picture of your cup and send it to us at [ch@king-ed.suffolk.sch.uk](mailto:ch@king-ed.suffolk.sch.uk).

Don't forget to tell us how long did your tea stayed hot for!