14	55	58	68	65
15	54	56	67	64
Temperature	28	31	18	14
change				

The difference between initial temperature and final temperature for 'Copper uninsulated' is 28°C. However the difference between initial temperature and final temperature for 'Copper insulated' is 18°C. The difference between initial temperature and final temperature for 'Glass uninsulated' is 31°C. However the difference between initial temperature and final temperature for 'Glass insulated' is 14°C.

This is because that the insulation has reduced the rate at which the temperature decreases. However, the temperature difference for 'Copper insulated' is higher than the temperature difference for 'Glass insulated'. This shows that copper is a better conductor of heat than glass. The thermal conductivity for glass is 0.8 Wm<sup>-1</sup>k<sup>-1</sup>, however the thermal conductivity for copper is 385 Wm<sup>-1</sup>k<sup>-1</sup>. This means that copper is a much better conductor than glass, glass is an insulator.



As there is a negative correlation of the plotted points, it shows that over time, the temperature decreases as the heat is lost through conduction (also possibly convection). This graph shows that copper loses more heat when it is not insulated. This is shown by the steepness of the negative correlation of 'Copper uninsulated', is greater than the steepness of 'Copper insulated'. The table shows that the temperature change for 'Copper uninsulated' is greater.

As the glass beaker and the coper calorimeter are differently shaped to each other. The glass beaker is slightly bigger with a bigger rim and curved corners. Also, the glass is slightly thicker than the copper, which means it is an even greater insulator and would reduce the rate of heat loss. Also, water which has taken a bigger surface area, cool faster. This means that the uninsulated glass would has lost heat more through convection than the copper calorimeter.

There were different starting temperature for each test. This means that there could have been an error of the water cooling at different rates because of this factor.

We made sure that there was the same amount of water in each container, by using a measuring cylinder. This is to reduce the error of the mass of the water, having a significant change on what the results should be.

To carry out this experiment again, I would test this numerous times and then an average value of the quantity would be taken to increase the validity, reliability and accuracy of the outcome of the results.

A hot water storage tank is a water tank which is used for hot water storage for space heating or domestic use. A highly insulated tank can stay hot for days. Hot water tanks may have a built-in gas or oil burner system, or electric immersion heaters.

The more insulation that is used, the more it would decrease the loss of heat. Insulation is commonly used on the hot water tank. The most common type of water heater blanket is fiber lass insulation with a vinyl film on the outside. It is important that the blanket is the receiver of the tank so that conduction (through the air) and convection does not occur the outbury water heaters have polyurethane foam insulation.

Hot water tanks heat up loads of vate in the morning, having hot water in the morning, then later through the day, heat is solved whis is resulted in paving luke-warm water in the evening. However, if the water rin out, you would have b Solved the next day for more hot water.

The difference between a hot water tank and the experiment is that the hot water tank holds a much greater mass of water. This means that more energy is required to heat up or cool down the water. Due to the greater mass of water, the rate that the heat is loss would be loss than in the experiment. However, as the hot water tank has a bigger surface area, it loses heat faster. due to convection. This is because there is more particles which absorb the heat from the tank.

As the hot water tank may be raised off the ground, there would be less heat loss through the floor through conduction. As the floor is a greater conductor than the air, it will pass on the heat energy more as the particles are much more closer together. Also less energy would be lost by passing on the energy because the particles are packed together in a solid. In a gas, the particles are much more spread out. More energy is lost through kinetic energy, when passing the energy from one particle to another in a gas than in a solid.

To reduce heat loss through radiation, the outside of the hot water tank would normally be painted black. The inside could even be painted white or silver. The white/silver surface would reflect the infrared radiation back into the container. As matt black is a perfect absorber, it would decrease the rate at which the temperature decreases.

The insulating material around the hot water tank would be more secure and properly applied around the tank. However, in the experiment, there were some gaps and holes where heat could