

# Hot and Cold (P2)

## Possible Chemical Reactions to Heat a Baby's Bottle

You are required to carry out a series of reactions to check for their suitability for a device that will heat a baby's bottle up to about 35 Degrees C. In each case record the starting temperature and the final temperature and then work out the temperature change. Once you have done this you will need to decide which reactions have given out heat and which have taken heat in. The last task is to answer the questions in section 2.

### Section 1

Reaction	Starting Temp' (Degrees C)	Final Temp' (Degrees C)	Temp' Change (Degrees C)	Is heat given out or taken in?
1. Hydrochloric Acid and Sodium Hydroxide				
2. Magnesium and Copper Sulphate				
3. Sulphuric Acid and Magnesium				
4. Sodium Hydrogencarbonate and Citric Acid				
5. Hydrogen Peroxide and Manganese Dioxide				

### Section 2

1. Which reaction(s) were giving out heat?
2. Which reaction(s) took in heat?
3. Which reaction was gave out the most heat?

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### Section 2

1. Which reaction(s) were giving out heat?
2. Which reaction(s) took in heat?
3. Which reaction was gave out the most heat?

## Hot and Cold (M2)

### Section 3

Using the results of the investigation as examples, explain why some of the reactions can be classified as being exothermic and some can be classified as being endothermic.

## Hot and Cold (D2)

### Section 4

Explain why some reactions are exothermic and some reactions are endothermic in terms of the energy changes. Your explanation must link the energy changes to bond breaking and bond making.