Fair test

To make this experiment a fair test I will make sure that all crisps that I burn are the same weight, to ensure fair results. I will also make sure that the height between the burning crisp and the boiling tube full of water is 5 cm, top ensure that the crisps are burned fairly .I will also make sure that the starting temperature of the water is 20 C through out the experiment .To ensure that the results are Wright and are fairly done I will repeat the burning of each crisp twice and then find the average temperature of both readings to determine the amount of energy the crisps that are being burnt are producing. I will also make sure that there is the same amount of water in the boiling tube for each crisp that is burnt. I am going to use 5 types of crisps; all are different makes, flavours and types (organic. Etc), to ensure a different set of results from each crisp, so I get a good range of readings from my experiment. I hope that this will ensure that my experiment is fairly done.

Prediction

In this experiment I hope to find out which one of my five crisps produces the most energy when it is burned under a boiling tube full of water .I predict that the crisp with the most fat content, will produce the most energy when it is burnt, because it will produce the most heat from burning which will heat the water to a fairly high temperature, also the amount of calories in the crisp will determine the amount of heat given off by the crisp when it is burnt under the boiling tube of water, I can support this idea by using this equation :

1 Cal raises the temperature of the water, by 1 C

1 Cal = 4.2 J

Cal= volume of water X temperature difference

This equation will help me to find out how much energy is produced, by knowing the temperature of the water that has been heated by the energy given off by the burning crisp underneath the boiling tube.

Method

1. Collect apparatus.
2. Weigh crisp and place on tripod.

3. Measure 10ml of water into a test tube and place in clamp stand.
4. Assemble apparatus according to diagram.
5. Record temperature of the water at the beginning
6. Light piece of crisp using Bunsen burner and tongs and replace on the tripod and   allow burning and heating the water.
7. When crisp stops burning record the final temperature of the water.
8. Repeat twice to obtain the average temperature increase of flavour of crisp.
9. Repeat with all flavours.

Results:

Flavour		Mass (g)	Start Temp.C	End Temp.C	Temp.Increase .C
Ready salted					
	1	1.54	19	37	18
	2	1.58	20	37	17
	Average	**1.58**	**19.67**	**37**	**17.5**
Bacon	1	1.61	20	35	15
	2	1.56	20	35	15
	Average	**1.57**	**19**	**35**	**15**
Lites	1	1.58	17	45	28
	2	1.49	16	40	24
	Average	**1.55**	**16.67**	**42.5**	**26**
Pringles	1	1.57	15	27	12
	2	1.58	17	27	10
	Average	**1.58**	**17.67**	**27**	**11**
Organic	1	1.67	15	36	21
	2	1.54	15	36	21
	Average	**1.60**	**15.67**	**36**	**21**

<u>Graph</u>   <u>A graph to show the temperature caused by the burning</u>
                        <u>Of the crisps</u>

<u>˚C</u>

1. <u>Ready salted crisps (energy)</u> = volume of water X temperature difference = 10 x18 = 180 calories = (1 cal) = 4.2 joule s =180 X 4.2 =756 joules

2. <u>Bacon crisps (energy)</u> = volume of water X temperature difference= 10 X 15 = 150 = (1cal)=4.2 joules = 150 X 4.2= 630 joules

3. Lites (energy) = volume of water X temperature difference = 10 X 26 = 260 = (1cal)= 4.2 joules = 260x 4.2 = 1092 joules

4. Pringles crisps (energy) = volume of water X temperature difference = 10 X 11 = 110= 1 cal = 4.2 joules = 110 X 4.2 = 110x 4.2 = 462 joules

5. Organic crisps (energy) = volume of water X temperature difference = 10 X 21 = 210 = (1 cal) = 4.2 joules = 210 X 4.2 = 882 joules

Order of energy in the crisps

1. Walkers lutes
2. Organic crisps
3. Ready salted crisps
4. Bacon crisps
5. Pringles

What I found out

From my results I found out that the lower fat content in the crisps the higher energy given of when burned to heat the water.
My results do not agree with my original prediction that I made.
In my results I found out that the lite crisps, which had less fat content than the other four crisps, gave of more heat energy to heat the water in the boiling tube above, the reason why this happened is because there might be certain chemicals in the crisps that give off more energy without being high in fat.
Another surprise in my results was the Pringles. They had the highest fat content, of my five crisps, but they only gave off 462 J of energy when burned. The results showed that my prediction was proved wrong by the final results and calculations.

Evaluation

Overall this experiment was a success. The experiment was good in many ways. The reason why it was good is because I managed to get accurate precise results from my method of burning the crisps. My method was helpful and safe. I managed to get enough results from this experiment. Also by following my fair test rules I got more accurate results.
If I could do the experiment again I would choose a wider range of different crisp and would probably improve my method of observation and recording results in a more suitable detailed results table. I would also research more into the theory of energy and how you can calculate the amount of energy given off by light and heat.
I would also like to change my method of finding out how much energy was given off by the burning crisp by using a more accurate equation.
I had no odd results from this experiment and found my method was quite accurate.