

Topic	Energy in food	Level	GCSE (or any course for students aged 11-16)
Outcomes	<ol style="list-style-type: none">1. To carry out an experiment to determine the amount of energy in rice cakes and quavers2. To use evidence to justify whether rice cakes or quavers should be taken on a mountain climb		

Food as a fuel: quavers or rice cakes for the adventure?

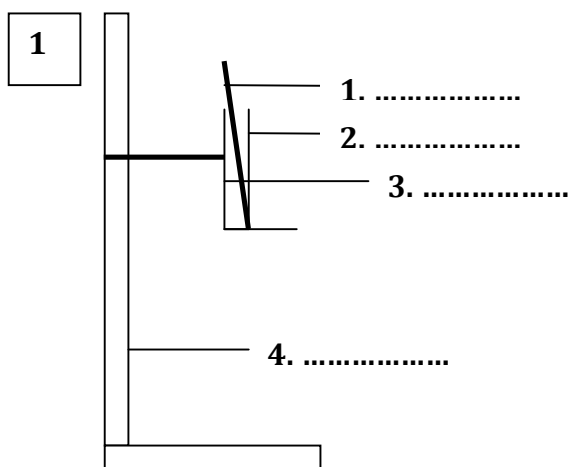
You are going on an adventure to climb a mountain. You need to decide whether to pack quavers or rice cakes. In this practical you are going to investigate whether rice cakes or quavers contain the most energy.

Prediction:

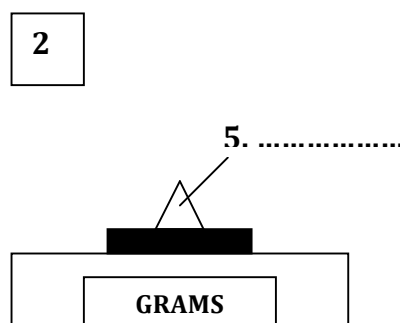
What is your prediction before your begin?



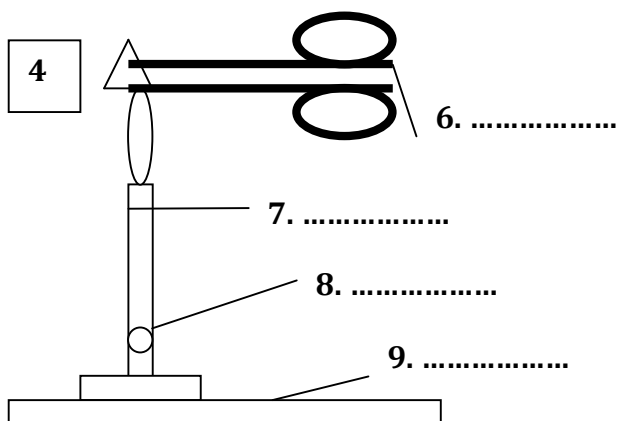
Step one: put 10 ml of water into a boiling tube, clamp the tube and record the temperature of the water.



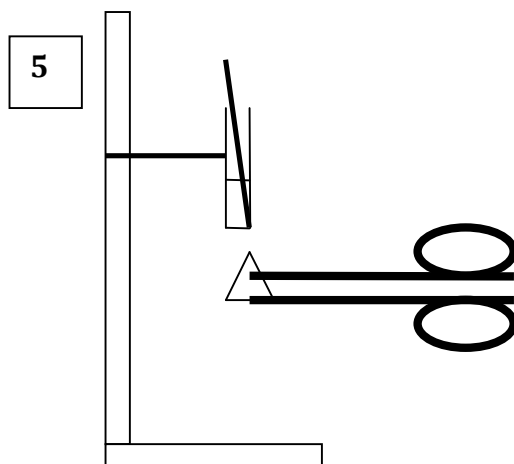
Step two: measure the mass of the rice cake. Record it in the table below.



Step three: a teacher will light the Bunsen. Using a pair of tongs put the piece of rice cake into the roaring blue flame until it catches fire.



Step four: return the Bunsen to the safety flame. Hold the food just underneath the boiling tube. When the food has gone out **place it onto the heat proof mat** and measure the temperature of the water.



Results:

Rice cake repeat	Mass (g)	Temperature of water before burning (°C)	Temperature of water after burning (°C)	Temperature rise (°C)	Temperature increase per gram of food (°C/g)
1					
2					
3					
Average	X	X	X	X	

Quaver repeat	Mass (g)	Temperature of water before burning (°C)	Temperature of water after burning (°C)	Temperature rise (°C)	Temperature increase per gram of food (°C/g)
1					
2					
3					
Average	X	X	X	X	

Questions:

1. Did the rice cake or quaver release the most energy? How do you know?
2. Look at the packets for these foods, does your experimental result agree with the information on the packet?
3. Why do you think your results do not agree exactly with the information on the packets? Think about the transfer of energy from the crisp to the water.
4. If you were climbing a mountain, would you rather take rice cakes or quavers in your backpack? Explain your reasoning.

Progress: further resources on enthalpy are available here
<http://www.thescienceteacher.co.uk/enthalpy/>