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## Assignment Brief 1.2

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<b>Unit Name:</b> Science at work (Induction)	<b>Unit Number:</b> Unit 1
<b>Assignment Title:</b> Vinegar Problem Assignment	<b>Assignment Number:</b> 1.2
<b>Date Set:</b>	<b>Due Date:</b>
<b>Brief:</b> Quantitative analysis can be used to determine the concentration of active ingredients in foods. Vinegar is a weak acid. The concentration of acid present in samples of vinegar can be analysed by a titration of the acid using a base. You have been provided with two samples of vinegar, one removed from a restaurant and one removed from a take-away. Trading Standards suspect that these two establishments of watering down the vinegar. They need evidence that the samples contain less acid than the standard vinegar sample provided.	
<b>Task 1:</b> Complete a risk assessment for the practical work.	
<b>Task 2:</b> Follow the standard procedure given on the Scientist Information Sheet 'Performing a Titration'.	
<b>Task 3:</b> Record all your results on the Trading Standards Report Form.	
<b>Task 4:</b> Repeat your experiments where necessary and if possible calculate the concentrations of the vinegar samples provided.	
<b>Task 5:</b> In your report, evaluate your experimental work and suggest any improvements which will enable your evidence to be more reliable.	
<b>Resources:</b> Include here any suitable reference material that is used at the centre, books/Internet/web references etc.	

Analyst's Name: ..... Date:.....

### Scientist Information Sheet: Performing a Titration

1. Wash out a 25cm<sup>3</sup> graduated pipette with the sodium hydroxide solution provided.
2. Use the pipette and the pipette filler to measure out 25cm<sup>3</sup> sodium hydroxide solution into a clean 250cm<sup>3</sup> conical flask that has been washed with distilled water.
3. Add 3-4 drops of the indicator provided.
4. Secure the burette on a clamp and stand and wash twice with a few cm<sup>3</sup> of the vinegar solution whose concentration is to be analysed.
5. Carefully pour in the vinegar solution. **Caution: bring the burette to your eye level and use a filter funnel lifted slightly from the top of the burette to allow for air escape.**
6. Fill the burette to about 1cm<sup>3</sup> above the 0cm<sup>3</sup> mark. Then run a little through the top until the level is on 0cm<sup>3</sup>. If the level falls below this record the precise volume (to the nearest 0.05cm<sup>3</sup>).
7. Titrate slowly with the sodium hydroxide solution, with constant swirling adding 2-3 cm<sup>3</sup> at a time.
8. When the indicator has reached the required colour (your supervisor will tell you this), stop adding the vinegar and record the volume.
9. Repeat, recording the volume each time, until you have **three** suitable values.

### Trading Standards Report Form

Vinegar sample collected from:.....

Date analysed:.....

Burette Reading	Titration 1	Titration 2	Titration 3
Final reading			
Initial Reading			
Volume used			

**Result:** \_\_\_\_\_ of the vinegar sample \_\_\_\_\_ was needed to neutralise \_\_\_\_\_ of the sodium hydroxide supplied.

**Calculation:**

The concentration of the vinegar sample was found to be\_\_\_\_\_.

**Supervisor's report on analyst's work:**

Signature_____
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