

# GCSE Science – Investigative Skills Assignment – Marking Guidelines

## Chemistry 1.4 – Testing Emulsions

For use until May 2009

**Last date for submission for moderation May 2010**

Please mark in red ink, and use one tick for one mark. Each part of each question must show some red ink to indicate that it has been seen.

Subtotals for each part of each question should be written in the right hand margin.

Please add annotations where necessary to explain why marks have or have not been awarded.

Enter the marks for **Section 1** and **Section 2** and the **total mark** on the front cover of the answer booklet.

The teacher must sign and date the front cover of the ISA.

The papers must be kept in a secure place and must **not** be returned to candidates.

The marking guidelines show examples of typical responses that candidates may make. However, teachers should use their professional judgement in deciding whether or not to award marks. If, in the judgement of the teacher, the candidate has provided a response which correctly answers the question, then a mark should be awarded even if this response is not shown in the mark guidance. If necessary, the teacher should annotate the script and/or mark guidance to justify the decision.

In the mark guidance:

- the use of a solidus (/) indicates an alternative answer
- the use of brackets ( ) indicates wording that is not essential in the candidate's answer, but makes the guidance clearer.

### SECTION 1

	Answer	Additional Guidance	
1	Statement referring to change in the dependent variable eg to see if stability of the emulsion changes	Dependent variable must be identified,  Just stability alone is <b>not</b> sufficient	1 mark
	Independent variable correctly identified and linked to dependent variable eg when I changed the amount / volume / proportion of emulsifier used		1 mark
2(a)	Any <b>one</b> from: eg <ul style="list-style-type: none"><li>• volume of oil</li><li>• volume of water</li><li>• the emulsifier</li><li>• consistency of mixing / shaking process</li><li>• time chosen to check stability</li></ul>		1 mark

	Answer	Additional Guidance	
(b)	Affects formation of stable emulsion		1 mark
	Explanation of how it affects the formation of a stable emulsion eg changing emulsifiers may give different results / different volumes of oil will need different volumes of emulsifiers		1 mark
3	A categoric variable ringed	Accept correct alternative response	1 mark
4	Source of largest error correctly identified eg deciding when a stable emulsion had formed		1 mark
	Reason correctly given eg difficult to see if there are one or two layers		1 mark
5	One of the results would be much bigger / smaller than the other repeated results	Accept one of the results would not fit into the pattern of the others	1 mark
6	To decide on any <b>one</b> of the following before the investigation is carried out: <ul style="list-style-type: none"> <li>• volume of oil</li> <li>• volume of water</li> <li>• mass / volume of emulsifier</li> <li>• how much mixing / shaking needed</li> <li>• time chosen to check stability</li> </ul>	Accept : <ul style="list-style-type: none"> <li>• to see if the two ends of the range give a significant difference</li> <li>• to see if the range chosen gives measurable results</li> </ul>	1 mark
7	Amplified statement eg the stability of the emulsion <b>increases</b> for <b>1</b> mark <b>plus</b> eg as the amount / volume of emulsifier used <b>increases</b> for <b>2</b> marks	<b>NB</b> the statement <b>must</b> relate to the candidate's own work  Simple correct statement stating for <b>1</b> mark only eg the stability of the emulsion depends on the amount / volume / type of emulsifier used for <b>1</b> mark	2 marks
	<b>or</b> eg the stability of the emulsion does not depend on the amount / volume / type of emulsifier used for <b>1</b> mark <b>plus</b> eg as the results do not show a trend / are random for <b>2</b> marks	<b>or</b> the stability of the emulsion does not show a trend / is random for <b>1</b> mark	

	Answer	Additional Guidance	
8	<b>Table:</b>		
	Correct headings AND units all correct for all measured variables	Table with incomplete headings or units for the measured variables gains <b>1</b> mark eg all headings present = 1 eg all units present = 1	2 marks
	<b>Graph/chart:</b>		
	X axis: suitable scales chosen and labelled with quantity and units	Accept axes reversed	1 mark
	Y axis: suitable scales chosen and labelled with quantity and units		1 mark
	Points or bars plotted correctly to within $\pm 1\text{mm}$	Allow <b>one</b> plotting error out of every 5 points plotted.  Allow error carried forward from incorrect plots	1 mark
	Suitable line drawn on graph or bars correctly labelled on bar chart		1 mark
If wrong type of graph / chart, maximum <b>3</b> marks			
If the independent variable is: <i>continuous</i> should draw a <i>best fit line graph</i> <i>categoric</i> should draw a <i>bar chart</i> <i>discrete</i> may draw either a <i>best fit line graph</i> or a <i>bar chart</i> (but allow dot-to-dot joining of points in this case)			
			<b>Max 18 marks</b>

**SECTION 2**

	<b>Answer</b>	<b>Additional Guidance</b>	
<b>9</b>	Sunflower		1 mark
<b>10</b>	27	Award <b>1</b> mark for 26/26.6/26.7/etc. (as a result of failure to round correctly)  Accept an answer in the space by the question, if one is not given in the table	2 marks
<b>11</b>	Sunflower Test 3 <b>or</b> Sesame Test 3 Volume of emulsifier needed much greater than other 2 results		1 mark
<b>12</b>	Any <b>one</b> from: <ul style="list-style-type: none"> <li>• a homogenous / cloudy mixture</li> <li>• no separation of oil and water</li> <li>• only one layer formed</li> </ul>		1 mark
<b>13</b>	Bar chart		1 mark
<b>14(a)</b>	Use a burette / pipette to measure the volume of oil / water	Accept use an instrument with a smaller scale division  Accept use graduated pipette	1 mark
<b>(b)</b>	Smaller scale divisions	Accept accurate volume delivery for graduated pipette	1 mark
<b>15(a)</b>	Test each oil when it is delivered	Accept add more emulsifier	1 mark
<b>(b)</b>	<b>Either</b> oil is a natural product <b>or</b> oil composition may vary from batch to batch	Accept oil from different sources	1 mark

	Answer	Additional Guidance	
16	<p>Any <b>two</b> from: eg</p> <ul style="list-style-type: none"> <li>vegetable oils are unsaturated and claimed to be healthier</li> <li>less fatty</li> <li>less cholesterol</li> <li>company ice cream has less KJ/100g</li> <li>peanut oil causes allergies / gives an allergic response in some people</li> <li>peanut oil can be fatal for some people</li> <li>eating too much ice cream will still make you fat</li> <li>additives may cause health problems</li> </ul> <p><b>Quality of written communication</b></p> <p>Candidates should use at least <b>two</b> technical terms from: eg</p> <ul style="list-style-type: none"> <li>unsaturated</li> <li>healthy / healthier</li> <li>cholesterol</li> <li>obese / obesity</li> <li>heart attack</li> <li>anaphylaxis / anaphylactic</li> <li>shock</li> <li>allergy / allergic</li> <li>additives</li> </ul>	<p>The mark is to be awarded for the <b>correct</b> use of the terms</p> <p>The marker should circle these terms Annotate below candidate answer with <i>Q✓</i> for mark given or <i>Q×</i> for mark not given</p>	<p>2 marks</p> <p>1 mark</p>
17(a)	To increase sales	Accept to sell more ice cream	1 mark
(b)	<p>Any <b>one</b> from: eg</p> <ul style="list-style-type: none"> <li>traditional implies that it is made from an old recipe</li> <li>dairy implies that it is made from milk or cream</li> <li>farm implies that it is made directly from the milk on a farm</li> </ul>	Do <b>not</b> accept 'misnamed'	1 mark
			<b>Max 16 marks</b>
			<b>ISA Total 34 Marks</b>