

**Limestone and building materials**

1.	(a)	any <b>one</b> from:		
		• wear safety goggles		
		• use mat under apparatus		
		• wear lab coat		1
	(b)	(i) 0.89 (g)		1
		(ii) to check accuracy etc		1
		(iii) experimental error or any other sensible answer		1
		(iv) not accurate enough or other sensible answers		1
		(v) 0.89 (g)		1
		<i>accept 0.88 g/0.90 g</i>		
		<i>accept their average from (ii)</i>		
	(c)	(i) any <b>two</b> from:		2
		• dust		
		• noise		
		• eyesore		
		• pollution		
		• destroys habitats		
		• lorries along local roads		
		<i>accept any sensible answer</i>		
		(ii) any <b>two</b> from:		
		• makes useful products		
		• named useful products / uses (could get both marks here)		
		• building material / stone		
		• employment		
		• makes money		2
				[13]
2.	(a)	(i) calcium oxide / CaO		1
		carbon dioxide / CO <sub>2</sub>		1
		<i>products can be in either order</i>		
		<i>ignore chemical names other than calcium oxide or carbon dioxide</i>		
		(ii) (thermal) decomposition		1
		<i>accept endothermic</i>		
	(b)	(i) (chemical) reaction / react		1
		<i>accept calcium hydroxide / slaked lime produced; ignore incorrect products</i>		
		energy / heat <u>released</u> / exothermic		1
		<i>ignore gets hot / heats up</i>		

*if neither mark awarded then allow 'mixing the chemicals heats up the coffee' for 1 mark*

(ii) any **two** from:

- foil has been broken(\*)
- ring pull used(\*)

*(\*)if neither mark awarded accept 'cannot / difficult to repair' for 1 mark ignore button pushed*

- quicklime and / or water mixed / reacted 2  
*accept reaction not reversible*  
*accept cannot / difficult to replace quicklime / water / chemicals*

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3. (a) (i) calcium oxide / quicklime 1  
*allow calcium monoxide; do **not** accept calcium dioxide;*  
*ignore chemical formulae*

(ii) any **three** from:

- carbon dioxide / CO<sub>2</sub>
- (carbon dioxide) reacts (with the calcium hydroxide / slaked lime / plaster)  
*allow reaction 3 identified; do **not** allow incorrect reaction;*  
*ignore mixes, unless they state the correct product*
- limestone / calcium carbonate / CaCO<sub>3</sub> forms  
*allow marble / chalk*
- water is lost / evaporates 3  
*it = plaster*  
*allow moisture*  
*ignore dries*

(b) (i) as the amount / volume of sand decreases the strength of the mortar increases 1  
*accept as sand decreases the mortar is stronger / harder to crack*  
*allow as sand decreases the mortar increases*  
*allow converse; ignore references to height of metal ball*

(ii) any **two** from:

- 400 / 5<sup>th</sup> result is anomalous  
*accept two results (36 and 37 / 400 and 500 / 4<sup>th</sup> and 5<sup>th</sup>) are almost the same; accept result at 400 should be 42*
- the interval between the others is similar or the interval is about 6/7  
*allow the other results fit a pattern / are on a straight line*
- he has only one set of results 2  
*allow he has only done it once; ignore reliable*

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4. (a) (i) clay 3  
*for one mark*

(ii) calcium oxide / quicklime / CaO  
*for one mark*

(iii) sensible answers such as cost of fuel etc. / *accept a wide range of appropriate answers*

	<i>for one mark</i>	
(b)	sand gravel (owtte) e.g. crushed rock water  <i>any two for 1 mark each</i>	2
		<b>[5]</b>
5.	(a) (i) <u>oxygen</u> / <u>air</u> reacts with carbon / methane (to form carbon dioxide)  <i>accept from the decomposition / reaction of calcium carbonate ignore CO<sub>2</sub> from the air</i>  nitrogen is (unreacted) from the air	1
	(ii) CaO	1
	CO <sub>2</sub>	1
	<i>any order; ignore words; any incorrect balancing max 1 mark</i>	
(b)	any <b>one</b> from:	1
	<ul style="list-style-type: none"> <li>• more energy / efficient <i>allow converse for present fuel</i></li> <li>• from a sustainable / renewable resource</li> <li>• produces less / no carbon dioxide / greenhouse gases / global warming <i>ignore no pollution / environmental damage</i></li> <li>• more profit <b>or</b> money for local economy <i>accept fuel is cheap(er)</i></li> <li>• more readily available <i>it = different fuel</i></li> </ul>	
(c) (i)	any <b>two</b> from:	2
	<ul style="list-style-type: none"> <li>• not near where people / residents live <i>accept not between cement works and where people live ignore sensors are unsightly</i></li> <li>• not positioned where concentration of particles was likely to be highest</li> <li>• not positioned downwind</li> </ul>	
(ii)	the average / concentration was 1.8(ppm) <b>or</b> the average / concentration was below 2(ppm) <i>accept 1.8(ppm) is less than 2.0 (ppm)</i>	1
(iii)	any <b>three</b> from:	3
	<ul style="list-style-type: none"> <li>• children / people suffering asthma attacks</li> <li>• result was an average</li> <li>• readings (at some (2/3) sensors) could have been higher than 2ppm</li> <li>• sensors did not detect particles below 0.5mm</li> <li>• small particles / particles below 0.5mm / 0.4mm / 0.3mm / 0.2mm could (still) cause cancer / asthma <i>ignore global dimming <b>or</b> cars becoming dirty <b>or</b> position of sensors</i></li> </ul>	
		<b>[11]</b>