

Limestone and building materials

1.	(a)	any one 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 two from:		2
		• dust		
		• noise		
		• eyesore		
		• pollution		
		• destroys habitats		
		• lorries along local roads		
		<i>accept any sensible answer</i>		
		(ii) any two 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 ₂		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

[7]

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

(ii) any **three** from:

- carbon dioxide / CO₂
- (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 / CaCO₃ 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 / 5th result is anomalous
accept two results (36 and 37 / 400 and 500 / 4th and 5th) 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

[7]

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
		[5]
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 CO₂ from the air</i> nitrogen is (unreacted) from the air	1
	(ii) CaO	1
	CO ₂	1
	<i>any order; ignore words; any incorrect balancing max 1 mark</i>	
(b)	any one from:	1
	<ul style="list-style-type: none"> • more energy / efficient <i>allow converse for present fuel</i> • from a sustainable / renewable resource • produces less / no carbon dioxide / greenhouse gases / global warming <i>ignore no pollution / environmental damage</i> • more profit or money for local economy <i>accept fuel is cheap(er)</i> • more readily available <i>it = different fuel</i> 	
(c) (i)	any two from:	2
	<ul style="list-style-type: none"> • not near where people / residents live <i>accept not between cement works and where people live ignore sensors are unsightly</i> • not positioned where concentration of particles was likely to be highest • not positioned downwind 	
(ii)	the average / concentration was 1.8(ppm) or the average / concentration was below 2(ppm) <i>accept 1.8(ppm) is less than 2.0 (ppm)</i>	1
(iii)	any three from:	3
	<ul style="list-style-type: none"> • children / people suffering asthma attacks • result was an average • readings (at some (2/3) sensors) could have been higher than 2ppm • sensors did not detect particles below 0.5mm • small particles / particles below 0.5mm / 0.4mm / 0.3mm / 0.2mm could (still) cause cancer / asthma <i>ignore global dimming or cars becoming dirty or position of sensors</i> 	
		[11]