



**General Certificate of Secondary Education**

**Additional Applied Science 4863**

**AASC/2F Science at Work**

**Mark Scheme**

*2010 examination - January series*

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**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
<b>1(a)</b>	Dried blood – scalpel		1
	Hair – tweezers/tape		1
	Wet blood – swab		1
	Fingerprints – tape		1
<b>1(b)(i)</b>	Two from:		1
	• Blood group blood type		1
	• DNA		
	• Gender / sex		
	• Race		
	• Species / whether it's human		
<b>1(b)(ii)</b>	Comes from living things		1
<b>1(c)</b>	Saliva		1

**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
<b>1(d)(i)</b>	Any <b>two</b> from: <ul style="list-style-type: none"> <li>• Gloves</li> <li>• Body suit protective suit / jumpsuit / overalls / all in one suit / paper suit</li> <li>• Shoe covers / overshoes / overboots</li> <li>• Masks</li> <li>• Head covering</li> <li>• Goggles</li> </ul>	<p><b>Ignore</b> apron / special suit/ suit (on its own)</p> <p><b>Not</b> protective coat</p> <p><b>Not</b> just 'shoes'</p>	<b>2</b>
<b>1(d)(ii)</b>	To collect reliable evidence / don't contaminate (evidence) / not leave fingerprints / hairs / fibre / DNA / their traces		<b>1</b>
<b>Total</b>			<b>11</b>

**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
<b>2(a)(i)</b>	Vitamin C – healthy gums / absorption of iron	In correct order	1
	Vitamin B – release of energy from food		1
	Vitamin A – Healthy eyesight		1
	Vitamin K – clotting of blood		1
<b>2(a)(ii)</b>	Growing / bones contain calcium / healthy teeth and bones	Any mention of teeth and / or bones gets mark	1
<b>2(a)(iii)</b>	Liver		1
<b>2(b)(i)</b>	Blackcurrant		1
<b>2(b)(ii)</b>	Pear		1
<b>2(b)(iii)</b>	$60 / 30 = 2$ <b>or</b> $2 \times 30 = 60$	Correct answer alone for 2 marks	1
	<b>or</b> $30 + 30 = 60$		1
	$100 \times 2 = 200$		
<b>2(b)(iv)</b>	Antioxidant		1
<b>2(c)</b>	Energy		1
<b>Total</b>			<b>12</b>

## Foundation / 2F

question	answers	extra information	marks
3(a)(i)	Protein		1
3(a)(ii)	Builds body / muscle	<b>Ignore</b> strong muscle / makes muscles stronge <b>Ignore</b> repairs cells / tissue	1
3(a)(iii)	Gives <u>energy</u>		1
3(a)(iv)	Biscuit  Potato	Both correct for one mark	1
3(b)(i)	<b>Either</b> dipstick method / testing strip  Compare to a colour chart / look for colour change  <b>or</b>  Benedict's test / Benedict's (solution)  Colour change (from blue to red / orange)	<b>Allow</b> Clinistix / diastix  <b>Ignore</b> specific colours given  Mark for colour change depends on giving a method of testing  Independent marks  No mark if incorrect colour change given	1
3(b)(ii)	Increase  Pancreas  Insulin		1  1  1
<b>Total</b>			<b>9</b>

## Foundation / 2F

question	answers	extra information	marks
4(a)(i)	Mixture		1
4(a)(ii)	Solvent		1
4(a)(iii)	Quickly		1
4(b)	<p>Any <b>three</b> from:</p> <ul style="list-style-type: none"> <li>Chromatography paper / filter paper</li> <li>Place a small dot of each ink / sample near the bottom of the paper</li> <li>Allow the sample to dry and add another drop in the same place</li> <li>label each dot <u>in pencil</u></li> <li>Put the (chromatography) paper in a beaker of solvent (allow water) so the dots of ink are above the solvent</li> <li>(cover and) leave to develop / for chemicals to move up the paper / solvent to rise up paper</li> </ul>	<p><b>Max 2</b> marks if no mention of inks</p> <p><b>Allow</b> non-soluble ink / stationary ink</p> <p><b>Allow</b> other suitable containers <b>Not</b> petri dish</p> <p>‘leave’ alone is not sufficient Must be some explanation as to why it is left</p> <p>Some of these points may be covered in a labelled diagram</p>	3
4(c)(i)	C		1

**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
4(c)(ii)	It only contains one colour / no extra spots seen / it does not separate	<b>Ignore</b> least number of dots or reference how far it moves up the paper  Consequential marking from 4(c)(i)	1
4(d)(i)	D		1
4(d)(ii)	Someone else could have used his pen / lots of people have the same pen / ink		1
<b>Total</b>			<b>10</b>



**Foundation / 2F**

question	answers	extra information	marks
5(a)(i)	<p>4 bars plotted correctly 2 marks</p> <p>1, 2 or 3 bars plotted correctly 1 mark</p> <p>Scale correct 1 mark</p>	<p>± ½ small square</p> <p>If no scale, can still get the plotting marks</p> <p>Scale half the grid or above</p> <p>No marks if given data is used as scale</p> <p>If scale is correct (1, 2, 3, 4, 5) but origin is not labelled, allow mark. If scale starts any other way, the origin must be labelled correctly to gain the mark for the scale.</p> <p>For a line graph <b>max 1 mark for scale</b></p>	3
5(a)(ii)	<p><u>Increase</u> in the number / chickens (kept organically)</p>	<p><u>Not</u> 'it' increases</p> <p><b>Ignore</b> specific values, ie must identify the whole range.</p>	1
5(a)(iii)	<p><u>More</u> people want to eat organic chickens / eggs / more in demand / people concerned about the welfare / health of chickens</p>	<p><b>Ignore</b> it is healthier / tastier</p>	1

**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
<b>5(b)(i)</b>	Any <b>two</b> from: <ul style="list-style-type: none"> <li>• (Artificial) chemicals not used e.g. herbicides, pesticides, chemical fertilisers</li> <li>• No growth hormones / antibiotics / supplements</li> <li>• Fed organic food</li> <li>• Allowed to roam free/given more space /allowed access to outdoors</li> </ul>	<b>Allow</b> biological pest control  <b>Allow</b> allowed to grow naturally  <b>Allow</b> natural food  <b>Ignore</b> daylight	2
<b>5(b)(ii)</b>	Any <b>two</b> from: <ul style="list-style-type: none"> <li>• More expensive (to rear)</li> <li>• Take longer to <u>gain</u> weight / <u>grow</u></li> <li>• More labour</li> <li>• More space needed / more land</li> </ul>	<b>Not</b> higher risk of getting disease  <b>Ignore</b> reference to profit  <b>Ignore</b> lower yield / don't produce as much meat  <b>Allow</b> more prone to predators	2
<b>Total</b>			<b>9</b>

**Foundation / 2F**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>marks</b>
<b>6(a)(i)</b>	Polymer / leather / suede / polyurethane / rubber / silicone	<b>Not</b> plastic / silicon / polythene / material / cloth	1
<b>6(a)(ii)</b>	(Better) grip /(more) friction		1
<b>6(b)(i)</b>	Any <b>two</b> from: <ul style="list-style-type: none"> <li>• Light / less dense</li> <li>• Strong / difficult to break</li> <li>• Doesn't corrode</li> </ul>	Do <b>not</b> accept any points not taken from the table (eg flexible)  <b>Not</b> density  <b>Not</b> just strength <b>Not</b> hard or melting point	2
<b>6(b)(ii)</b>	Hard  Will not corrode	Do <b>not</b> accept any points not taken from the table (eg durable)  <b>Allow</b> hardness, but not hard to break (which refers to strength)  <b>Allow</b> does not rust  <b>Not</b> density / light	1  1
<b>6(c)</b>	Composite		1
<b>6(d)</b>	Any <b>two</b> from: <ul style="list-style-type: none"> <li>• lightweight</li> <li>• doesn't absorb so much water / waterproof / doesn't get heavy when wet</li> <li>• more flexible / soft / stretchy</li> <li>• leather changes shape / synthetic doesn't shrink</li> </ul>	<b>ignore</b> references to cost / comfort / manufacturing / looks / cleaning / strength / durability / environment / breathability / easier to put on / better fit / wicking	2
<b>Total</b>			<b>9</b>
<b>Overall Mark</b>			<b>60</b>