



General Certificate of Secondary Education

**Additional Applied Science
4863**

AASC/2F Science at Work

Mark Scheme

2009 examination – June series

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Foundation / 2F

question	answers	extra information	marks
1(a)(i) G	Lines linking: Bicycle Cycle helmet Training shoe Ski Jacket	Low density for increased speed Shock absorbance to prevent injury Flexible for comfort Thermal insulation to help maintain body temperature	1 1 1 1
1(a)(ii) E	Bicycle frame: metal / <i>carbon fibre</i> / composite or named suitable example eg <i>Aluminium</i> / <i>Titanium</i> Cycle helmet: polymer or named suitable example eg <i>fibre glass</i> / <i>plastic</i> Training shoe: leather / <i>suede</i> or synthetic material or named suitable example eg <i>cotton, polyester, nylon, canvas</i>	<i>Allow steel</i> <i>Ignore rubber / plastic / cloth</i>	1 1 1
1(b)(i) E	One smooth / one rough <i>owtte</i> / <i>different texture</i> / <i>one has grip</i>	<i>Difference must refer to the surface texture not pattern</i>	1
1(b)(ii) E	To provide grip / friction / make it easier to catch / so it wont slip out of your hand		1
1(b)(iii) E	Slows (<i>you</i>) down / causes wear / produces heat / <i>causes blisters</i> / <i>burns</i>	<i>Allow marks on surfaces</i>	1
Total			10

question	answers	extra information	marks
2(a)(i) A	Salmonella		1
2(a)(ii) E	Any one from: <ul style="list-style-type: none"> • Stomach pains / <i>tummy ache</i> • Vomiting / <i>sickness / being sick</i> • Diarrhoea • <i>fever / (high) temperature</i> 	<i>Ignore feeling ill, headaches, dehydration</i>	1
2(a)(iii) E	Any two from: <ul style="list-style-type: none"> • Food source / <i>any named food</i> • Warmth • Moisture 	<i>Ignore references to hygiene or heat</i> <i>Allow room / correct temperature / humidity</i>	2
2(b)(i) E	Stage 1: dip a wire loop / inoculating wire <i>into the sample / bacteria or take a sample / bacteria</i>	<i>Idea of taking a sample</i> <i>Allow cotton bud</i>	1
	Stage 2: Make streaks across <i>(one edge of) plate / dish / jelly</i>	<i>Must imply transfer of sample to dish etc</i>	1
	Stage 3: Make a second series of streaks at angles to the first	<i>Must imply further spreading of sample</i>	1
2(b)(ii) E	Flame the loop / <i>sterilise</i>	<i>Allow clean</i> <i>Ignore wash</i>	1

question	answers	extra information	marks
<p>2(b)(iii) E</p>	<p>Separates the bacterial (colonies) Allows you to see the different types of bacteria</p>	<p><i>Allow makes them easier to see or Different pattern / colour for different bacteria</i></p>	<p>1</p>
<p>2(c) A</p>	<p>A sterile cotton swab was wiped on the work surface</p>		<p>1</p>
<p>Total</p>			<p>10</p>

question	answers	extra information	marks
3(a)(i) A	B		1
3(a)(ii) A	Scar Tattoo		1 1
3(b)(i) E	Any one from: <ul style="list-style-type: none"> To know where it came from When it was taken Who took it So it doesn't get mixed up with other samples 		1
3(b)(ii) A	Blood group DNA profile		1 1
3(b)(iii) E	No – could have been present at the scene but not involved / <i>could be there <u>after</u> crime / helping victim / someone else could have been wearing the shoes</i>	<i>Ignore at different time or planting of evidence</i>	1
3(c)(i) G	Solvent Stirred Dissolved Suspension		1 1 1 1
3(c)(ii) A	Carbonate		1
Total			12

question	answers	extra information	marks
<p>5(a)(i)</p> <p>E</p>	$\frac{540}{2000} \times 100 =$ <p>or</p> $\frac{2249}{8400} \times 100 =$ <p>27%</p> <p>or</p> <p>26.7738</p>	<p><i>1 mark for working</i></p> <p><i>2 marks for correct answer</i></p> <p><i>Accept 26.7 / 26.8</i></p>	2
<p>5(a)(ii)</p> <p>E</p>	<p><i>New rice crisps (no mark)</i></p> <p>Only 24g fat present (compared with 36 g)</p> <p><i>Or less / lower fat</i></p>	<p><i>Brand must be identified</i></p> <p><i>Do not accept just 24g</i></p> <p><i>Must make a comparison</i></p>	1
<p>5(b)(i)</p> <p>E</p>	<p><i>Any two from:</i></p> <ul style="list-style-type: none"> • <i>Fat content (still) in high category / more than 20g fat</i> • <i>Saturated fat (still) in high category / over 5g saturated fat</i> • <i>Sodium content (still) in high category / more than 0.6g sodium</i> 	<p><i>Figures must be correct</i></p> <p><i>Do not accept reference to sugar</i></p>	2

question	answers	extra information	marks
<p>5(b)(ii)</p> <p>E</p>	<p>Any two from:</p> <ul style="list-style-type: none"> • Salt / <i>sodium</i> – high blood pressure / heart disease / heart attack / stroke • Sugar / obesity / putting on weight / diabetes / tooth decay • Fat – high cholesterol / heart disease / blocks arteries / clogs arteries / heart attack / stroke / obesity / putting on weight 	<p><i>Must have name and explanation</i></p> <p><i>The nutrient and its health risk must be clearly paired up</i></p> <p><i>Allow kidney disease / heart failure</i></p> <p><i>Ignore high cholesterol / diabetes / cancer / heart problems</i></p>	<p>2</p>
<p>5(b)(iii)</p> <p>E</p>	<p>Any two from</p> <ul style="list-style-type: none"> • Fills you up and stops you snacking on sugar and fat / feeling hungry • Prevents colon disease / bowel cancer • Helps move food through the (<i>digestive</i>) system / clears <u>digestive</u> system • Adds bulk to the food • prevents constipation / softer stools 	<p><i>Ignore clears waste / keeps you regular / breaks down food / aids digestion / makes it easier to excrete</i></p>	<p>2</p>
<p>Total</p>		<p>9</p>	

question	answers	extra information	marks
6(a)(i) E	8.5 x 3 = 25.5 7	2 marks for correct answer 1 mark for correct working	1 1
6(a)(ii) E	Any three from: <ul style="list-style-type: none"> • Make (<i>cardboard</i>) support / box / frame • Mix plaster (<i>of Paris</i>) with <u>water</u> • Pour (<i>mix</i>) into mould / shoeprint • Allow to set / leave to dry 	Max 2 marks if a shoe is put into the plaster	3
6(a)(iii) E	Any two from: <ul style="list-style-type: none"> • Tread pattern / sole marking / design of sole / detail of sole • Areas of wear / depth of edges • Logos / brand / type • Random damage / unique marks / nicks • Shape 	Must refer to sole / tread ignore print Ignore width / design / detail of shoe Allow impression <u>of sole</u>	2

question	answers	extra information	marks
<p>6(b)</p> <p>E</p>	<p>Any two from:</p> <ul style="list-style-type: none"> • Photograph / <i>scan</i> the print/cast • <i>Compare against shoeprints stored</i> • <i>Match with know makes / brands</i> 	<p><i>Ignore adding or entering a database</i></p>	<p>2</p>
<p>Total</p>			<p>9</p>
		<p>Overall mark = 60</p>	