

Please read the instructions printed below. **One** of these sheets, suitably completed, should be attached to the assessed work of **each** candidate.

Specification Code	J649	Unit Code	B483		Session	Jan / June	Year	2	0	0
---------------------------	-------------	------------------	-------------	--	----------------	-------------------	-------------	----------	----------	----------

Centre Name		Centre Number				
--------------------	--	----------------------	--	--	--	--

Candidate Name		Candidate Number				
-----------------------	--	-------------------------	--	--	--	--

You need to produce a laboratory notebook or file in which you have recorded four activities. These must include:

1. a report on how science is used in the workplace [11 marks];
2. the production of pure, dry samples from two types of chemical reaction [13 marks];
3. a report on the assembly and assessment of the effectiveness of one electronic or optical device [7 marks];
4. a report on mechanical devices [6 marks];
5. a report on monitoring the growth/development/response of an organism [13 marks].

A typical candidate at grades GG, FF, EE will:	A typical candidate at grades DD, CC, BB will:	A typical candidate at grades BB, AA, A*A* will:	Teacher Comment	Location	Mark
<p>a1</p> <ul style="list-style-type: none"> • identify careers that are available in science and science-related industries; • in the study of organisations that use science identify the work carried by one organisation; • identify where an organisation is located; • identify the job titles of people in the organisation; • identify how the people in the organisation use science; • the report has little structure or follows a structure provided by worksheets. <p style="text-align: right;">0 1 2 3 4 5</p>	<p>a2</p> <ul style="list-style-type: none"> • describe the work carried out in two organisations that use science; • identify one reason for the location of each of the two organisations; • list the qualifications required by employees of the organisation; • describe how employees in the two organisations use science; the report is coherent and has an appropriate structure. <p style="text-align: right;">6 7 8</p>	<p>a3</p> <ul style="list-style-type: none"> • explain the importance of work that is carried out in two organisations that use science, these should be chosen from an international, a national and a local example; • explain the location of the two organisations giving a minimum of one scientific, economic, social and environmental reasons; • explain how the qualifications and skills enable the employees of the organisation enable them to carry out their role; • relate the work carried out by the employees of the two organisations to the underpinning science; • the report is concise, logical and well sequenced, with appropriate use of textual and visual material <p style="text-align: right;">9 10 11</p>			(11)

A typical candidate at grades GG, FF, EE will:	A typical candidate at grades DD, CC, BB will:	A typical candidate at grades BB, AA, A*A* will:	Teacher Comment	Location	Mark
<p>b1</p> <ul style="list-style-type: none"> identify the type of chemical reaction used to obtain each product; identify the products and reactants of each reaction; follow step by step instructions to obtain products, using appropriate safety procedures; measure the yield of each product; give the reason(s) for the difference between the actual yield and percentage yield; for one of these reactions, on an industrial scale, identify energy inputs and waste produced. <p style="text-align: right;">0 1 2 3 4 5</p>	<p>b2</p> <ul style="list-style-type: none"> describe the type of chemical reaction used to obtain each product; write a word equation for each chemical reaction; follow instructions to obtain products, using appropriate safety procedures; carry out appropriate calculations to measure the actual yield and determine the percentage yield of each product given the theoretical yield; describe the weaknesses of the technique used to produce each chemical product; for one of these reactions, on an industrial scale, list the energy inputs at each stage of the reaction and describe methods used to treat and dispose of waste <p style="text-align: right;">6 7 8 9</p>	<p>b3</p> <ul style="list-style-type: none"> explain the underlying chemistry involved in each type of chemical reaction used to obtain each product, and explain the industrial importance in this, of this type of reaction; write a balanced chemical equation for each chemical reaction; given a range of apparatus to choose from candidates are able to independently obtain their product; carry out appropriate calculations to determine quantities of reactants required, and the actual yield and percentage yield of each product; identify sources of error and suggest improvements to the technique used to synthesise each product; for one of these reactions, on an industrial scale, explain the energy inputs required at each stage and evaluate methods used to treat and dispose of waste. <p style="text-align: right;">10 11 12 13</p>			(13)
<p>c1</p> <ul style="list-style-type: none"> identify the use of electronic or optical devices; follow instructions to assemble an electronic or optical device with guidance following appropriate safety procedures; identify whether the device that they produced met the original brief. <p style="text-align: right;">0 1 2</p>	<p>c2</p> <ul style="list-style-type: none"> identify a range of components in these electronic or optical devices; follow instructions to assemble an electronic or optical device, with some guidance, using appropriate safety procedures; describe the weakness(es) of the device. <p style="text-align: right;">3 4 5</p>	<p>c3</p> <ul style="list-style-type: none"> describe the functions of the components used in these electronic or optical devices; assemble an electronic or optical device independently using appropriate safety procedures, selecting the most appropriate components for the device; describe the weakness(es) of the device and suggest improvements that could be made to overcome them <p style="text-align: right;">6 7</p>			(7)

A typical candidate at grades GG, FF, EE will:	A typical candidate at grades DD, CC, BB will:	A typical candidate at grades BB, AA, A*A* will:	Teacher Comment	Location	Mark
<p>d1</p> <ul style="list-style-type: none"> identify simple types of mechanical devices; when given the components, follow instructions with guidance to assemble a mechanical device using appropriate safety procedures; measure and record the forces applied and forces produced by a mechanical device. <p style="text-align: right;">0 1 2</p>	<p>d2</p> <ul style="list-style-type: none"> identify a range of components in these mechanical devices; follow instructions to assemble a mechanical device with little guidance, using appropriate safety procedures; calculate the amount the device multiplies forces, the work done by the device and the efficiency of the device. <p style="text-align: right;">3 4</p>	<p>d3</p> <ul style="list-style-type: none"> explain how these components are used in mechanical devices; investigate the performance of at least two mechanical devices, including one specified commercial device; carry out appropriate calculations to explain and evaluate the performance of at least two mechanical devices, including one specified commercial device. <p style="text-align: right;">5 6</p>			(6)
<p>e1</p> <ul style="list-style-type: none"> identify the organism to be monitored; follow instructions to monitor the activity of an organism; make and record simple observations and/or measurements with guidance; present data in simple charts /graphs/images; describe their findings; identify any weaknesses of the monitoring process used. <p style="text-align: right;">0 1 2 3 4</p>	<p>e2</p> <ul style="list-style-type: none"> give reasons for monitoring the activity of the chosen organism; produce a schedule for monitoring the activity of an organism; make and record accurate observations and/ or measurements independently; process the data with some guidance where appropriate and present the data in a suitable format; explain their findings using simple scientific knowledge and understanding; describe the effect of the weaknesses of the monitoring process used. <p style="text-align: right;">5 6 7 8</p>	<p>e3</p> <ul style="list-style-type: none"> explain the importance of this monitoring process in a scientific context; produce a detailed plan for monitoring the organism which defines the conditions that will be monitoring/controlling; make and record sufficient accurate observations and/or measurements; manipulate the data independently using sophisticated techniques; use a full and detailed understanding of the science involved to explain their findings; review the work, identify sources of error and suggest improvements to their monitoring technique. <p style="text-align: right;">9 10 11 12 13</p>			(13)
(50)					

Guidance on Completion of this Form

- One sheet should be used for each candidate.
- Please ensure that the appropriate boxes at the top of the form are completed.
- Circle the mark awarded for each strand of the marking criteria in the appropriate box and also enter the circled mark in the final column.
- Add the marks for the strands together to give a total out of 50. Enter this total in the relevant box.