GCSE

S19-3440U30-1

TASK BASED ASSESSMENT

APPLIED SCIENCE (Single Award) – Unit 3 (3440U30)

APPLIED SCIENCE (Double Award) – Unit 4 (3445U40)

MONDAY, 5 NOVEMBER – FRIDAY, 21 DECEMBER 2018

Instructions to Teachers/Exams Officers

CONFIDENTIAL

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To be opened on receipt for immediate use by TEACHERS / EXAMS OFFICERS

This document should be stored securely by the exams officer when not in use by the teacher. Its contents should not be divulged except to those concerned with the preparation of the assessment.

A. Instructions to Exams Officers/ Teachers

Receipt of Instructions to teachers/ exams officers and assessments

1. The "Instructions to teachers/exams officers" document must be **stored securely by the Examinations Officer**. Appropriate checking-out / checking-in processes for this document must be in place when it is in use by science teachers / technicians, a **log** needs to be kept for this.

2. Sufficient copies of the question papers for all tasks will be sent to the exams officer in each centre in advance of the assessments taking place. The number sent will be **based on the preliminary entries** submitted by the centre, so please ensure these are submitted by **10 October.**

3. **The question papers must be kept in secure storage until the date/s on which you intend conducting the assessments.**

4. On receipt of the examination papers, please check the despatch note to ensure that you have the correct number of question papers for each of the qualifications that your candidates are taking. There are specific tasks for each qualification and it is important that candidates are given the correct ones. Please contact WJEC as soon as possible if additional copies are required.

5. Any access arrangements a candidate is entitled to for the written examination papers also apply to the task-based assessment. **Please ensure that WJEC are made aware of any modified papers that are required by candidates as soon as possible.**

Conducting assessments – General Instructions

6. The assessment window runs from **Monday 5 November – Friday 21 December 2018**. However, in order to maintain the confidentiality of the assessment, the question papers for each group can only be given to the teacher conducting the assessments on the date/s on which each group will complete each particular assessment.

7. Candidates are required to submit **one complete pack**. Candidates cannot mix activities from Pack A and Pack B.

8. Foundation and higher tier packs are available. Candidates cannot mix activities from foundation tier and higher tier packs. Candidates can achieve a maximum of grade C on the foundation tier pack.

9. Candidates may not sit both foundation and higher tier packs.

10. The tasks should be supervised at all times by a member of staff responsible for teaching GCSE Applied Science. Centres may use additional laboratories, provided that a subject teacher is available to supervise all candidates at all times. Technical support should be available in case it is needed.

11. Candidates must write their answers in the spaces provided on the question paper. Should there be a need for additional space then a standard answer booklet should be provided.

12. Centres will need to record candidate attendance data for each session. The centre's MIS / SIMS should be used to produce a centre generated attendance register. This register must list:

- the centre number;
- paper details, including date of assessment;
- candidate numbers and candidate names;
- whether candidates were present or absent from the assessment.

An example of the register is shown below:

Element Entry Listing

Season : June 2018 **Qualification :** GCSE
Board : WJEC/GCSE **Level :** GCSE/B
Code : 3420U3 **Title :** Physics Practical Assessment

Surname	Forename(s)	Year	Reg Group	Exam Number	UCI	Entry Mode
Surname	Forename(s)	11	11BT	4013	UCI	C
Surname	Forename(s)	11	11CO	4022	UCI	C
Surname	Forename(s)	11	11PS	4028	UCI	C
Surname	Forename(s)	11	11BO	4029	UCI	C
Surname	Forename(s)	11	11BT	4044	UCI	C
Surname	Forename(s)	11	11PS	4065	UCI	C

13. There is no requirement for centre staff to trial procedures before candidates conduct the assessment.

14. Centre staff should remind candidates that they are not permitted to pass on any examination/ assessment related information to anyone else by means of talking, electronic, written or non-verbal communication. Such actions will lead to a candidate malpractice investigation. Further information is available on the JCQ Information for candidates – Guidelines when referring to examinations/assessments for Non-Examination Assessment.

https://www.jcq.org.uk/exams-office/information-for-candidates-documents/instructions-for-candidates---non-examination-assessments

Single Award

15. The unit will be completed in four sessions each of 60 minutes duration.

16. Activity 1 will be completed in sessions 1-3 and involves planning an investigation, obtaining results, analysis and evaluation. **At the end of each session the question papers should be collected in and returned to the exams officer for secure storage between sessions.** Activity 2 will be completed in session 4 and involves the analysis and evaluation of given data. This should be collected in at the end of session 4 and returned to the exams officer for secure storage.

17. **Activity 1:** Candidates should work individually to produce their plan. It is permissible for candidates to work in small groups of no more than three candidates to perform the practical procedure **provided their plans are sufficiently similar**. Teachers should ensure that each group has adequate working space and that the groups are set a reasonable distance apart. Each group requires uninterrupted access to the allocated apparatus. This should be carried out under a limited level of control, i.e. candidates may work with others to obtain results but they must provide their own responses to questions set. Teacher assistance should not normally be required, but may be given if an equipment failure occurs. Candidates should complete the analysis and evaluation sections of Activity 1 under a high level of control, i.e. candidates must work individually. This section is to be completed with no teacher feedback or assistance allowed and under formal supervision.

18. If candidates fail to produce a suitable plan for Activity 1, it is acceptable for them to be given a suitable plan by the teacher. **Please include the teacher plans and details of the candidates which have been given these plans on the *'Information required from centres'* form** which is inside this document.

19. If candidates fail to obtain results for Activity 1, it is acceptable for them to be given unformatted teacher results. **Please include the unformatted results and details of the candidates which have been given unformatted data on the *'Information required from centres'* form** which is inside this document.

20. **Candidates should not have access to Activity 1 after they have started Activity 2.**

21. **Activity 2:** This must be carried out under a high level of control, i.e. candidates work individually, set a suitable distance apart and under supervision. This could be carried out in the laboratory or in an examination hall. It is permissible for Activity 2 to be supervised by a member of staff responsible for GCSE Applied Science, although centres may choose to use external invigilators. **At the end of the session the question papers should be collected in and returned to the exams officer for secure storage.**

22. Monitoring visits will take place on a random sample of centres to ensure the task-based assessment unit is being administered correctly. WJEC will contact each centre selected for such a visit to clarify arrangements.

Double Award

23. The unit will be completed in five sessions each of 60 minutes duration.

24. Activity 1 will be completed in sessions 1-3 and involves planning an investigation, obtaining results, analysis and evaluation. **At the end of each session the question papers should be collected in and returned to the exams officer for secure storage between sessions.** Activity 2 will be completed in session 4 and involves the analysis and evaluation of given data. This should be collected in at the end of session 4 and returned to the exams officer for secure storage. Activity 3 should be completed in session 5 and involves a risk assessment. This should be collected in at the end of session 5 and returned to the exams officer for secure storage.

Turn over.

25. **Activity 1:** Candidates should work individually to produce their plan. It is permissible for candidates to work in small groups of no more than three candidates to perform the practical procedure **provided their plans are sufficiently similar**. Teachers should ensure that each group has adequate working space and that the groups are set a reasonable distance apart. Each group requires uninterrupted access to the allocated apparatus. This should be carried out under a limited level of control, i.e. candidates may work with others to obtain results but they must provide their own responses to questions set. Teacher assistance should not normally be required, but may be given if an equipment failure occurs. Candidates should complete the analysis and evaluation sections of Activity 1 under a high level of control, i.e. candidates must work individually. This section is to be completed with no teacher feedback or assistance allowed and under formal supervision.

26. If candidates fail to produce a suitable plan for Activity 1, it is acceptable for them to be given a suitable plan by the teacher. **Please include the teacher plans and details of the candidates which have been given these plans on the *'Information required from centres'* form** which is inside this document.

27. If candidates fail to obtain results for Activity 1, it is acceptable for them to be given unformatted teacher results. **Please include the unformatted results and details of the candidates which have been given unformatted data on the *'Information required from centres'* form** which is inside this document.

28. **Candidates should not have access to Activity 1 after they have started Activity 2.**

29. **Activity 2:** This must be carried out under a high level of control, i.e. candidates work individually, set a suitable distance apart and under supervision. This could be carried out in the laboratory or in an examination hall. It is permissible for Activity 2 to be supervised by a member of staff responsible for GCSE Applied Science, although centres may choose to use external invigilators. **At the end of the session the question papers should be collected in and returned to the exams officer for secure storage.**

30. **Candidates should not have access to Activity 1 or Activity 2 after they have started Activity 3.**

31. **Activity 3:** This must be carried out under a high level of control, i.e. candidates work individually, set a suitable distance apart and under supervision. This could be carried out in the laboratory or in an examination hall. It is permissible for Activity 3 to be supervised by a member of staff responsible for GCSE Applied Science, although centres may choose to use external invigilators. **At the end of the session the question papers should be collected in and returned to the exams officer for secure storage.**

32. Monitoring visits will take place on a random sample of centres to ensure the task-based assessment unit is being administered correctly. WJEC will contact each centre selected for such a visit to clarify arrangements.

Return of scripts

33. The collected question papers must be immediately returned to the exams officer for secure storage. **Teachers should not be given access to the completed question papers after the actual assessments have taken place.**

34. Scripts should be packaged in candidate order, collated so all activities per candidate are together.

35. Candidates' completed scripts must be returned at the end of the assessment period, in **candidate number order** with the centre MIS / SIMS generated register.

36. Prior to despatch centres must check that:
- there is an assessment for every candidate marked as present on the attendance registers;
- the names on the assessments match the details on the attendance registers;
- candidates have used their correct centre and candidate details;
- the "Information Required from Centres" sheets for all the completed tasks are included with the assessments – these sheets are included in this document.

37. The tasks for each **Applied Science qualification** must be **packaged separately**.

38. The tasks will be marked by a WJEC examiner. All completed assessments should be despatched with the centre generated attendance registers, to **WJEC CBAC, Unit A16/A17, Gwaelod Y Garth Road, Treforest Industrial Estate, Pontypridd, Rhondda Cynon Taf, CF37 5XF**. Further information on the despatch of the assessments will be issued to centres in due course.

39. Stationery will be sent to centres for the return of scripts. This will include labels.

B. Specific Instructions

Details of the apparatus and materials required for the tasks follow.

If any difficulty is experienced in providing the apparatus, the WJEC should be informed as soon as possible.

Contact:

Subject Support Officer: Sarah Price 029 2026 5103 sarah.price@wjec.co.uk

GCSE

APPLIED SCIENCE (Single Award)

Pack A – Foundation Tier and Higher Tier

Activity 1

This activity is linked to section 2.2.1 of the Applied Science (single award) specification.

Apparatus Required

The following apparatus is required for each candidate or group of candidates: (each group should consist of no more than three candidates)

- Safety goggles
- dilute hydrogen peroxide solution (20 volume concentration), 50 cm^3 required for each test (total volume of 450 cm^3 per candidate or group)
- manganese(IV) dioxide powder, 0.5 g required for each test (total mass of 1.5 g per candidate or group)
- shredded potato, 5 g required for each test (total mass of 15 g per candidate or group)
- yeast suspension (12 g/dm^3), 5 cm^3 required for each test (total volume of 15 cm^3 per candidate or group)
- 1 × 250 cm^3 measuring cylinder
- 1 × stopwatch (± 0.01 s)
- 1 × 100 cm^3 measuring cylinder
- 3 × spatulas
- washing-up liquid, 2 drops required for each test
- 1 × dropping pipette
- 1 × stirring rod
- CLEAPSS student safety sheet 48 – Manganese and its compounds (page 8)
- CLEAPSS student safety sheet 57 – hydrogen peroxide (page 9)

The numerical values of the various components are intended as a guide only and teachers may use their discretion if these sizes are not readily available.

Teacher/technician notes

- Candidates are required to perform each test three times.
- Catalysts should be pre-weighed before supplying to candidates.
- The hydrogen peroxide solution should be supplied at a concentration of 20 volume.
- This investigation can be messy so it is advisable that candidates are supplied with some means of covering the bench, such as a tray.
- Potato must be shredded and not cut into discs. Freshly shredded potato is the most successful, although this can be stored in a fridge for two days.
- Potato can be shredded using a grater/food processor. Do not cook the potato. Remove the potato skins.
- A bucket or bowl is required for the discarded shredded potato after each repeat experiment. This should not be placed down the sink.
- Dried yeast should be used to produce the suspension.

Activity 2

No specific equipment is required for this activity.

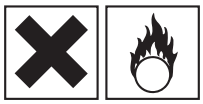
Turn over.

CLEAPSS

STUDENT SAFETY SHEETS 48

Manganese & its compounds

including **Manganese(IV) oxide (dioxide) & Potassium manganate(VII) (permanganate)**

Substance	Hazard	Comment
Manganese (metal) Solid	 **HARMFUL**	It is harmful by inhalation, hence exposure to dust or fumes would present a risk but not bulk metal.
Manganese(II) salts Solid and concentrated solutions (*If about 1 mol/dm^3 or more*)	 **HARMFUL**	These include manganese(II) chloride and sulfate(VI). Manganese(II) carbonate is considered LOW HAZARD.
Manganese(II) salts Dilute solutions *(If less than about 1 mol/dm^3)*	**LOW HAZARD**	These include manganese(II) chloride and sulfate(VI).
Manganese(IV) oxide (Manganese dioxide) Solid	 **HARMFUL**	It is harmful by inhalation or if swallowed. It is often used as a fine powder. Many hazardous reactions occur with reducing agents or concentrated acids. It is used in dry cells (batteries).
Potassium manganate(VII) (permanganate) Solid	 **HARMFUL / OXIDISING**	It is harmful if swallowed and stains the hands and clothing. Many hazardous reactions occur with reducing agents or concentrated acids. On heating, it liberates oxygen gas and releases a fine dust of potassium manganate(VI).
All manganates(VII) (permanganates) Solutions	**LOW HAZARD**	They stain hands and clothing.

Typical control measures to reduce risk

- Wear eye protection.
- Avoid inhaling dusts.
- Avoid skin contact, especially with manganate(VII).
- Avoid contact between manganate(VII) or manganese(IV) oxide and concentrated acids or reducing agents.

Assessing the risks

- ***What are the details of the activity to be undertaken? What are the hazards?***
- ***What is the chance of something going wrong?***
  Eg, Dust is accidentally inhaled.
- ***How serious would it be if something did go wrong?***
  Eg, Are there hazardous reactions, eg, violent oxidations or decompositions?
- ***How can the risk(s) be controlled for this activity?***
  Eg, Can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn? Are gloves needed?

Emergency action

- **In the eye** — Flood the eye with gently-running tap water for at least 10 minutes. See a doctor.
- **Swallowed** — Do no more than wash out the mouth with water. Do **not** induce vomiting. Sips of water may help cool the throat and help keep the airway open. See a doctor.
- **Spilt on the skin or clothing** — Remove contaminated clothing and rinse it. Wash off the skin with plenty of water. [Manganate(VII) will give permanent stains to clothing and the skin.] If skin contamination is more than small, see a doctor.
- **Spilt on the floor, bench, etc** — Wear eye protection and gloves. Scoop up the solid. Rinse the area with water and wipe up, rinsing repeatedly. [Manganate(VII) will give permanent stains.] Rinse the mop or cloth thoroughly.

CLEAPSS

STUDENT SAFETY SHEETS 57

Hydrogen peroxide

Substance	Hazard	Comment
Concentrated hydrogen peroxide solution *[If less than 13.6 mol/dm^3, ie, '170 volume strength' (50%) but 2.3 mol/dm^3 or more, ie, over '28 volume strength' (8%)]*	 **HARMFUL**	It is harmful if swallowed. There is a risk of serious damage to the eyes. The most-concentrated solution found in schools is normally in this category. It decomposes slowly to produce oxygen gas; pressure may build up and care needs to be taken when opening a bottle. It should be stored in the dark. Decomposition is speeded up by catalysts such as some metal oxides and some enzymes. The oxygen formed will assist fires.
Dilute hydrogen peroxide solution *[If less than 2.3 mol/dm^3 but 1.5 mol/dm^3 or more, ie, less than '28 volume strength' (8%) but '18 volume strength' (5%) or more]*	 **IRRITANT**	It irritates the eyes and skin. The typical concentration used in school science practical work. It decomposes slowly to produce oxygen gas; pressure may build up and care needs to be taken when opening a bottle. It should be stored in the dark. Decomposition is speeded up by catalysts such as some metal oxides and some enzymes.
Very dilute hydrogen peroxide solution *[If less than 1.5 mol/dm^3, ie, less than '18 volume strength' (5%)]*	**LOW HAZARD**	It is used for bleaching hair. It decomposes slowly to produce oxygen gas; pressure may build up and care needs to be taken when opening a bottle. It should be stored in the dark. Decomposition is speeded up by catalysts such as some metal oxides and some enzymes. Old stock may have insufficient peroxide molecules for the intended activity.

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Typical control measures to reduce risk

- Use the lowest concentration and smallest volume possible.
- Wear eye protection for all but the most-dilute solutions.
- Store concentrated solutions away from heat and light, in bottles with special vented caps. Beware of a rapid release of pressure when opening a bottle.
- Avoid accidental contamination of solutions which may speed up the formation of oxygen and pressure build-up.

Assessing the risks

- ***What are the details of the activity to be undertaken? What are the hazards?***
- ***What is the chance of something going wrong?***
  Eg, Could an impurity / catalyst cause rapid decomposition and frothing?
- ***How serious would it be if something did go wrong?***
  Eg, If the solution splashes onto the skin, is it sufficiently concentrated to cause burns?
- ***How can the risk(s) be controlled for this activity?***
  Eg, Can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

• **In the eye**	Flood the eye with gently-running tap water for 10 minutes. See a doctor.
• **Swallowed**	Do no more than wash out the mouth with water. Do **not** induce vomiting. Sips of water may help cool the throat and help keep the airway open. See a doctor.
• **Spilt on the skin or clothing**	Flood the area with plenty of water. Remove contaminated clothing and soak it. If a large area is affected or blistering occurs, see a doctor.
• **Spilt on the floor, bench, etc**	For large spills, and especially for (moderately) concentrated solutions, cover with mineral absorbent (eg, cat litter) and scoop into a bucket. Dilute with at least ten times its own volume of water. Rinse the floor etc with plenty of water. Wipe up small amounts with a damp cloth and rinse it well.

GCSE

APPLIED SCIENCE (Single Award)

Pack B – Foundation Tier and Higher Tier

Activity 1

This activity is linked to section 2.1.4 of the Applied Science (single award) specification.

Apparatus Required

The following apparatus is required for each candidate or group of candidates: (each group should consist of no more than three candidates)

- 1 × safety goggles
- 5 × rubber bands
- 1 × stack of slotted weights (3 × 1 N) – this should be provided as one hanger with 2 weights
- 1 × 30 cm ruler
- 1 × stand with 2 × clamp

The numerical values of the various components are intended as a guide only and teachers may use their discretion if these sizes are not readily available.

Teacher/technician notes

- Rubber bands provided should have an unstretched size of approximately 80 mm × 1.7 mm

Activity 2

No specific equipment is required for this activity.

GCSE

APPLIED SCIENCE (Double Award)

Pack A – Foundation Tier and Higher Tier

Activity 1

This activity is linked to section 3.3 of the Applied Science (double award) specification.

Apparatus Required

The following apparatus is required for each candidate or group of candidates: (each group should consist of no more than three candidates)

- chromatography paper – approximately 10 cm × 5 cm to fit in a 250 cm^3 beaker
- 1 × 250 cm^3 beaker
- 1 × pencil
- 1 × 30 cm ruler
- 2 × paper clips
- 1 × wooden splint
- water – approximately 25 cm^3
- 3 different brands of pen of the same colour
- 1 × scissors
- 1 × stopwatch

The numerical values of the various components are intended as a guide only and teachers may use their discretion if these sizes are not readily available.

Teacher/technician notes

- The chromatography paper should be provided to candidates cut to approximately 10 cm by 5 cm. Centres should ensure that this size is suitable prior to the assignment as beaker dimensions vary. The paper size can be adjusted as necessary
- The chromatography paper should be held in place using a splint and paper clips. Other methods can be used as an alternative such as bulldog clips
- Water soluble ink should be used
- Pens should be of the same colour but of different brands. Black or green inks have been found to work best
- Pens should be labelled A, B and C

Activity 2

No specific equipment is required for this activity.

Activity 3

Candidates are required to carry out a risk assessment on the procedure given. They are not required to perform the investigation. Any applicable CLEAPSS Student safety sheets are provided within the assessment.

GCSE

APPLIED SCIENCE (Double Award)

Pack B – Foundation Tier and Higher Tier

Activity 1

This activity is linked to sections 2.3.4 and 3.1 of the Applied Science (double award) specification

Apparatus Required

The following apparatus is required for each candidate or group of candidates: (each group should consist of no more than three candidates)

- 1 × safety goggles
- 5 × rubber bands
- 1 × stack of slotted weights (3 × 1 N) – this should be provided as one hanger with 2 weights
- 1 × 30 cm ruler
- 1 × stand with 2 × clamp

The numerical values of the various components are intended as a guide only and teachers may use their discretion if these sizes are not readily available.

Teacher/technician notes

- Rubber bands provided should have an unstretched size of approximately 80 mm × 1.7 mm

Activity 2

No specific equipment is required for this activity.

Activity 3

Candidates are required to carry out a risk assessment on the procedure given. They are not required to perform the investigation. Any applicable CLEAPSS Student safety sheets are provided within the assessment.

GCSE SCIENCE SUITE

APPLIED SCIENCE (Single Award)

Pack A – Foundation Tier and Higher Tier

INFORMATION REQUIRED FROM CENTRES

Centre Number .....

(Please detach and send with the completed examination papers to the **examiner**.)

Please note below any issues which should be brought to the examiner's attention.

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GCSE SCIENCE SUITE

APPLIED SCIENCE (Single Award)

Pack B – Foundation Tier and Higher Tier

INFORMATION REQUIRED FROM CENTRES

Centre Number .....

(Please detach and send with the completed examination papers to the **examiner**.)

Please note below any issues which should be brought to the examiner's attention.

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GCSE SCIENCE SUITE

APPLIED SCIENCE (Double Award)

Pack A – Foundation Tier and Higher Tier

INFORMATION REQUIRED FROM CENTRES

Centre Number .....

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Please note below any issues which should be brought to the examiner's attention.

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GCSE SCIENCE SUITE

APPLIED SCIENCE (Double Award)

Pack B – Foundation Tier and Higher Tier

INFORMATION REQUIRED FROM CENTRES

Centre Number .....

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