**GCSE**

*“We are what we repeatedly do. Excellence, therefore, is not an act but a habit”*



Core Gateway Science B

C1: Carbon Chemistry

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Use the activities and past exam questions in this booklet to plan and support your revision ready for the B1C1P1 science exam.

REVISION WEBSITE – The follow website is available for you to use to support you revision and help you answer the exam questions in this revision guide

http://www.bbc.co.uk/schools/gcsebitesize/science/ocr\_gateway/



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| **C1a: Making Crude Oil Useful** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| Crude oil is a mixture of **hydrocarbons**. These are separated into useful products, such as fuels, using a process called **fractional distillation**. The demand for **short** hydrocarbon molecules is **greater** than their supply in crude oil, so a reaction called **cracking** is used. Cracking converts long **alkane** molecules into shorter **alkanes** and **alkenes**, which are more useful. |
| *Revision Ideas*  |
| 1. Draw and label the apparatus uses for cracking paraffin in the laboratory
2. Make a poster about fractional distillation. Label the column showing the different uses of each fraction
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| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is about crude oil.***Crude oil is a mixture of different lengths of hydrocarbons called fractions. To make crude oil useful it has to be separated into these fractions. **Describe** how the process of fractional distillation works and **explain** how the fractions are separated (***6marks)*** |
| ***Important words list***HeatedGradientColumnBitumenLPGDieselBoiling pointsChain lengthCooled down |  |
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| **C1b: Using Carbon Fuels**  |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| Fuels react with **oxygen** to release **energy**. **Complete combustion** happens in a plentiful supply of air and **incomplete combustion** occurs when the supply of air is limited. Complete combustion releases more energy than incomplete combustion. Incomplete combustion also creates **carbon monoxide**, and more **soot**. Several factors must be considered when choosing the best fuel for a particular purpose |
| *Revision Ideas*  |
| 1. Write out the word equations for complete and incomplete combustion of fuels.
 |
| 1. Chose a fuel for the following purposes and explain what properties make it suitable. Heating a home, cooking food and powering a car.
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| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is about choosing a fuel***Donald is choosing a fuel for powering his new canal boat. **Explain** to Donald what factors he needs to consider when choosing a fuel and **suggest** what fuels wouldn’t be suitable. (***6marks)*** |
| ***Important words list***Energy valueAvailabilityEase of storageCostToxicityPollutionEase of useCoalOilWood |  |
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| **C1c: Clean Air** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| The **atmosphere** consists mainly of **nitrogen** and **oxygen**, with smaller proportions of other gases such as **carbon dioxide**. The amount of carbon dioxide in the atmosphere is maintained through a balance between processes such as **photosynthesis**, **respiration** and **combustion**. But human activities are **polluting** the atmosphere. **Photosynthesis** by plants is thought to be a key process in the **evolution** of the Earth’s atmosphere**.** |
| *Revision Ideas*  |
| 1. Draw a diagram of the carbon cycle with a description of the following processes; respiration, combustion and photosynthesis
 |
| 1. Make a card sort on the different types of air pollution and their sources.
 |
| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is the changing levels of gases in our Atmosphere.*** The Earth’s atmosphere hasn’t always been the same as today. **Describe** how the atmosphere has changed over billions of years and **explain** what has caused these changes***. (6marks)*** |
| ***Important words list*** VolcanoesAmmoniaCarbon dioxidePhotosynthesisPlantsOxygenRespiration |  |
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| **C1d: Making Polymers** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| Hydrocarbons are **compounds** made from **carbon** and **hydrogen** **atoms** joined by covalent bonds. Alkanes are **saturated** - they have only **single bonds**. Alkenes have a double bond - they are unsaturated. Alkenes react with **brown bromine water and decolourise** it, but alkanes do not.Alkenes can act as **monomers**. Under high **pressure** and in the presence of a **catalyst** many monomer molecules join together to make **polymer molecules**. These polymer molecules are saturated. |
| *Revision Ideas*  |
| 1. Make a card match game using the diagrams of different alkanes and alkenes and their names
2. Create a revision card on polymerisation
 |
| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is alkanes and alkenes***Alkenes made by the cracking of alkanes can be made into polymers. **Describe** the **difference** between and alkene and alkane, how you can **test** for alkenes and how alkenes can be **joined** **together** to make polymers (***6marks)*** |
| ***Important words list***Covalent bondSingle / doubleBromine waterDecolourisePolymerisationHigh pressureCatalystMonomersLong chain  |  |
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| **C1e: Designer Polymers** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| A lot of everyday items are made from **polymers**. Many of these polymers are not **biodegradable** - microbes cannot digest them and they take a long time to break down. Polymers are usually disposed of by burying them in **landfill** sites or **burning** them in incinerators. These methods of disposal cause **environmental** problems, and waste valuable resources.The properties of polymers depend on the **structure** and **bonding** found in their molecules. Smart materials such as **Gore-Tex®** have more useful properties than other polymers**.** |
| *Revision Ideas*  |
| 1. Create a table to show the different properties of polymers and their uses
 |
| 1. Make a poster advertising your new product “Gore-Tex”.
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| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is about waste polymers***We produce a large amount of plastic waster (polymers) which can be difficult to dispose of. **Discuss** the **advantages** and **disadvantages** of **3** different disposal methods***.*** (***6marks)*** |
| ***Important words list***Landfill SitesNon-biodegradableBurningAir pollutionToxic FumesValuable resourcesRecyclingCostNeeds sorting |  |
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| **C1f: Cooking and Food Additives** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| Cooking brings about **chemical** **changes** in food. The texture and taste changes when food is cooked. **Baking powder** contains **sodium hydrogencarbonate**. This breaks down when heated, releasing **carbon dioxide** that helps cake mixtures to **rise** during baking.Food additives are included in food to **improve** their **shelf**-**life**, **appearance** and **flavour**. **Antioxidants** such as ascorbic acid prevent food from going off by reacting with oxygen. **Emulsifiers** help oil and water to mix - for example, in mayonnaise |
| *Revision Ideas*  |
| 1. Write out the word equation for the decomposition of baking powder.
2. Produce a card sort on the different types of food additives and what they do.
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| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is about chemical changes during cooking.***A food changes when it is cooked. Cooking is a chemical change. **Explain** what a chemical change is and **describe** what happens to proteins (in eggs and meat) when they are cooked. (***6marks)*** |
| ***Important words list***IrreversibleEnergy changeChemical changesEggs / meatProteinsChange shapeDenaturingColourTexture |  |
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| **C1g: Smells** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| **Esters** are made by reacting an **alcohol** with an **organic acid**. They are used in **perfumes**, and as **solvents**. Nail varnish dissolves in nail varnish remover, but not in water.  |
| *Revision Ideas*  |
| 1. Make a poster advertising a new perfume. Tell the customers about all the properties of the perfume that make it a good perfume
 |
| 1. Make a key word definition list for the following words; pungent, insoluble, soluble, evaporates, ester, volatile, solvent, solute, solution
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| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question making a perfume***Perfumes can be made from natural sources, whilst others can be made synthetically in a laboratory. **Explain** how an ester is made and **describe** three properties of a perfume.(***6marks)*** |
| ***Important words list***EsterAlcoholAcidWaterEvaporatesNon-toxicIrritableInsolubleNo reaction with water |  |
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| **C1h: Paints and Pigments** |
| Grade E 🡪 Grade C 🡪 Grade A |
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| *Key Information* |
| **Pigments** are coloured substances used in paint. Paints are a type of mixture called a **colloid**. They contain several components, including the **pigment**, a **solvent** and a **binding** **medium**. **Thermochromic** and **phosphorescent** pigments are very useful, and extend the normal properties of paints. |
| *Revision Ideas*  |
| 1. Draw a diagram to show what happens when oil paints and emulsion paints dry.
2. Write an exam question and mark scheme on the different substances in paints.
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| QWC Question (6 marks) |
| When answering a QWC question remember the following points: Use correct science vocabulary, organise ideas, avoid using “it”, and write in full sentences. You also need to try and keep you answer relevant to the question. A good way to do all this is to write out important key vocabulary and then use them to structure your answer. Underlining them will help you keep track and highlight to the examiner your good use of key terms, |
| ***Question – This question is paints and pigments***Some paints have special properties. **Describe** what is special about themochromic and phosphorescent pigments and **describe** some uses for each (***6marks)*** |
| ***Important words list***Change colourHot / coldTemperatureAbsorbLight energyGlow in the darkSafetyWarningBath toys |  |
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