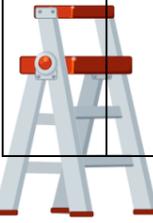
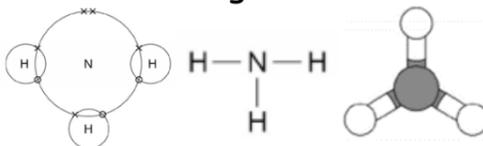


%	I can ...	Prove it!
	<ol style="list-style-type: none"> 1. Explain how ethanol is produced by fermentation (triple only) 2. Write balanced symbol equations for the reactions of alcohols with oxygen (triple only) 3. Explain why carboxylic acids are weak acids in terms of ionisation and pH (triple only) 4. Represent addition polymers using structural equations (triple only) 5. Draw diagrams to show the conversion of a monomer to a polymer and vice versa (triple only) 6. Explain the process of condensation polymerisation (triple only) 7. Use simple diagrams to show condensation polymerisation e.g. ethane diol and hexanedioic acid reacting together (triple only) 	<ol style="list-style-type: none"> 1. Draw a flow chart to show the stages in ethanol production. 2. Write a balanced symbol equation for the following reactions: <ol style="list-style-type: none"> a. ethanol burning in air b. methanol burning in air 3. Explain why carboxylic acids are only weak acids using these key words: ionise, dissociate, fully, water 4. Draw a general equation for addition polymerisation 5. Draw a structural equation for the following reactions: <ol style="list-style-type: none"> a. ethene \rightarrow poly(ethene) b. propene \rightarrow poly(propene) 6. Write a paragraph to explain what condensation polymerisation is and give one example, using these words: diols, dicarboxylic acids, amino acids, polypeptides, peptide links 7. Draw a diagram to show the following condensation polymerisation reactions: <ol style="list-style-type: none"> a. polymerisation of glycine b. formation of Terylene
 	<ol style="list-style-type: none"> 1. Explain what crude oil is and how it is formed 2. Explain the process of fractional distillation 3. Describe why carbon can form such a vast array of natural and synthetic compounds 4. Explain how the size of hydrocarbon is linked to their boiling point, viscosity and flammability 5. Describe the combustion of hydrocarbons and write balanced symbol equations 6. Balance chemical equations for cracking 7. Describe the structure of amino acids (triple only) 8. Describe how amino acids form polypeptides by condensation polymerisation (triple only) 9. Link this to the structure of DNA and the importance of polymers in producing proteins, cellulose and starch (triple only) 	<ol style="list-style-type: none"> 1. Write a paragraph explaining what crude oil is and how it is formed using these words: fossilised, rocks, finite, hydrocarbons 2. Draw a flow chart to show the stages in fractional distillation. You must include the words 'evaporation' and 'condensation'. 3. Give 5 examples of substances that contain carbon atoms in living and non-living things. 4. Complete the following: <ol style="list-style-type: none"> a. The larger the hydrocarbon, the _____ viscous it is, the _____ its boiling point, the _____ volatile it is, and the _____ easily it ignites. 5. Write balanced symbol equations for the following: <ol style="list-style-type: none"> a. complete combustion of methane b. incomplete combustion of methane 6. Write and balance symbol equations for the following cracking reactions: <ol style="list-style-type: none"> a. hexane b. decane c. octane 7. Write a paragraph to explain the structure of amino acids using these words: condensation polymerisation, polypeptide, peptide link, carboxyl group 8. See above 9. Explain the impact of any damage to these peptide links on a living cell.

- Evaluate the use of different models of representation (double only recap)
- Work out the empirical formula for different ionic compounds (double only recap)
- Describe and explain the properties of ionic compounds (double only recap)
- Explain the properties of simple and giant covalent compounds (double only recap)
- Work out the molecular formula of a substance given a model or diagram of its structure (double only recap)
- Explain how atoms bond metallically (double only recap)
- Describe what is meant by 'cracking'
- Describe why cracking is required
- Describe the methods and conditions used for 'catalytic cracking' and 'steam cracking'
- Recall the uses of alkenes produced during cracking (polymers)
- Describe the reactions between alcohols and sodium, oxygen, water and an oxidising agent (triple only)
- Recall the formulae and structures for the first 4 alcohols (methanoic acid, ethanoic acid, propanoic acid and butanoic acid) (triple only)
- Describe the reactions between carboxylic acids and carbonates and alcohols (triple only)
- Describe what happens when carboxylic acids dissolve in water (triple only)
- Draw the structure of ethyl ethanoate (triple only)
- Describe the process of addition polymerisation (triple only)

- Give 2 advantages and 2 disadvantages of using the following diagrams:



- Calculate the empirical formula of each of the following:

- iron (II) hydroxide
- magnesium carbonate
- aluminium chloride

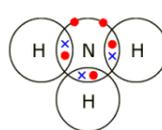
- Complete the following sentences;

- Ionic compounds have high melting and boiling points because...
- Ionic compounds can conduct electricity when molten or dissolved because...
- Ionic compounds form crystals because...

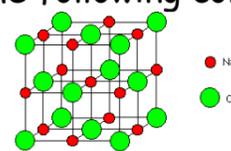
- Explain the following:

- Why hydrogen is a gas at room temperature.
- Why water has a low boiling point but diamond has a very high melting point
- Why graphite can conduct electricity but diamond cannot
- Why graphite can be used in pencils but silica cannot

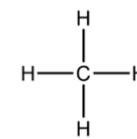
- Give the molecular formula of the following compounds:



a.



b.



c.

- Write a paragraph explaining how atoms bond metallically using these words: **ion, electron, electrostatic, delocalised**

- Give a definition of cracking and use an example to explain what you mean.

- Explain why long hydrocarbons are not always useful.

- List the conditions needed for cracking to take place.

- Give the use of these new alkenes produced during cracking.

- For each reaction below, give the general word equation:

- alcohols and sodium
- alcohols and water
- alcohols and oxidising agents

- For each of the following, give the formula and draw the structure:

- methanoic acid
- ethanoic acid
- propanoic acid
- butanoic acid

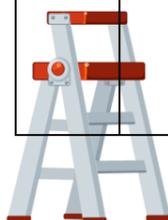
- For each of the following reactions, write the general word equation:

- carboxylic acids and carbonates
- carboxylic acids and alcohols

- Complete the following sentence: 'When carboxylic acids dissolve in water, they form.....'

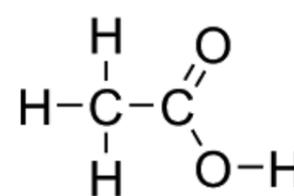
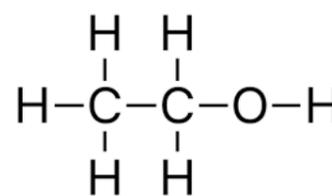
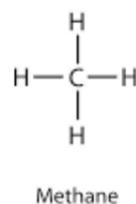
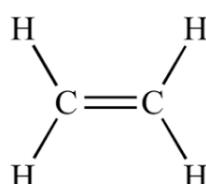
- Draw the structure of ethyl ethanoate

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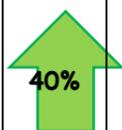


1. Name the three types of bonds that can form (double only recap)
2. Explain how atoms bond ionically (double only recap)
3. Use different models to represent the ions in an ionic compound (double only recap)
4. Explain how atoms bond covalently (double only recap)
5. Use different models to represent the atoms in a covalent compound (hydrogen, chlorine, oxygen, nitrogen, hydrogen chloride, water, ammonia, methane) (double only recap)
6. Describe the structure of diamond, graphite, graphenes and fullerenes (double only recap)
7. Describe the structure of a polymer (double only recap)
8. Describe and explain the properties of giant metallic structures (double only recap)
9. Identify the different functional groups of organic compounds (alkanes, alkenes, alcohols, carboxylic acids) from their formulae/structural diagram (triple only)
10. Describe the reactions and conditions between alkenes and hydrogen, water, the halogens (Cl, Br, I) and oxygen (triple only)
11. Draw the displayed structural formulae for the products of the reactions above (triple only)
12. Name the monomers that make up DNA (nucleotides), protein (amino acids), starch (glucose) and cellulose (triple only)

1. Name the three types of bonds
2. Explain how sodium bonds ionically with chlorine to form sodium chloride. You must use the word electrons, lose, gain and electrostatic attraction in your answer.
3. Draw the ionic bond between sodium and chlorine
4. Explain how an atom of oxygen bonds covalently with two atoms of hydrogen to form water. You must use the words electrons, share and pair in your answer.
5. Draw the covalent bond in hydrogen, chlorine, oxygen, nitrogen, hydrogen chloride, water, ammonia and methane
6. Draw and annotate the following to show their structures:
 - a. diamond
 - b. graphite
 - c. graphene
 - d. fullerenes
7. Write a definition for what a polymer is and draw a diagram to show what you mean.
8. Complete the following sentences:
 - a. metals have high melting and boiling points because...
 - b. metals are good conductors of heat and electricity because...
9. Draw the functional groups in each of the following using the diagrams:
 - a. alkenes
 - b. alkanes
 - c. alcohols
 - d. carboxylic acids



10. For each of the reactions below, write a general word equation AND give the conditions needed:
 - a. alkenes and water
 - b. alkenes and hydrogen
 - c. alkenes and halogens
 - d. alkenes and oxygen
11. Draw the displayed structural formula for each of the products of the reactions above.
12. Name the monomers that make up the following: DNA, protein, starch and cellulose



- 
1. Define an 'organic compound' (triple only)
 2. Recall the formulae and structures for the first 4 alcohols (methanol, ethanol, propanol and butanol) (triple only)
 3. Recall the main uses of these alcohols (triple only)
 4. Define 'alkanes' and give the general formula
 5. Recall the formulae and structures for the first 4 alkanes (methane, ethane, propane and butane)
 6. Define 'alkenes' and give the general formula
 7. Recall the formulae and structures for the first 4 alkenes (ethene, propene, butene, pentene)
 8. Define the terms 'saturated' and 'unsaturated' and link to alkanes and alkenes
 9. Use the bromine test to identify whether there are alkanes or alkenes present
 10. Name and describe the uses (fuels and feedstock for the petrochemical industry e.g. solvents, lubricants, polymers and detergents) of each of the fractions produced (petrol, diesel, kerosene, heavy fuel oil and LPG)

1. Complete the following definition of an organic compound: 'An organic compound is a compound that contains _____'
2. Give the formula and draw the structure of the following:
 - a. methanol
 - b. ethanol
 - c. propanol
 - d. butanol
3. For each alcohol above, give one use.
4. Write a definition for an alkane and give the general formula.
5. Give the formula and draw the structure of the following:
 - a. methane
 - b. ethane
 - c. propane
 - d. butane
6. Write a definition for an alkene and give the general formula
7. Give the formula and draw the structures of the following:
 - a. ethene
 - b. propene
 - c. butene
 - d. pentene
8. Complete the definition: 'A saturated hydrocarbon is one which contains..... An unsaturated hydrocarbon is one which contains....'
9. Write a method you would use to carry out the bromine test and make sure you give the result you would expect to see with an alkane and an alkene.
10. Complete the table:

Fraction	Uses
petrol	
diesel	
kerosene	
heavy fuel oil	
LPG	

Key Terms

Organic compound hydrocarbon alkane alkene carboxylic acid alcohol crude oil fractional distillation viscous saturated unsaturated combustion cracking addition reaction bromine water fermentation hydroxyl homologous series carboxyl esters amino acids polymerisation addition polymerisation condensation polymerisation

