

BTEC Applied Science

12-13 Transition Booklet

Congratulations on successfully completing year 12! The hard work isn't over yet though. The tasks in this booklet will support you in preparing for the year ahead. It's vital that you complete all the work over the summer holidays to ensure that you are best prepared for year 13 in September.

Structure of year 13.

You will study one exam unit (unit 5), and three coursework units (6,10 and 14). Each unit will include 3-4 different assignments. You must complete these to high standard first time, but you will receive guidance to assist you.

Task 1: Command Words in Assignments and Exams

Understanding the command words is vital for success. Write the definition of the command words in the table below and bring them to your first lesson.

Useful support: <https://www.aqa.org.uk/resources/science/gcse/teach/command-words>

Command Word	Definition
Describe	
Predict	
Compare	
Justify	
Define	
Evaluate	
Explain	
Accuracy	
Precision	

Task 2: Revision mind-maps on some important GCSE Single Science topics

Many of the topics you will cover in year 13 require you to have knowledge from both GCSE Combined and Single Science. Use the suggested links (or other similar revision resources) to help you write some revision mind-maps on the following topics.

BIOLOGY

Organisation

www.freesciencelessons.co.uk/gcse-biology-paper-1/organisation/

[Detailed Notes.pdf \(physicsandmathstutor.com\)](#)

Cell Biology

www.freesciencelessons.co.uk/gcse-biology-paper-1/cell-biology/

[1.3 Cell Transport.pdf \(physicsandmathstutor.com\)](#)

CHEMISTRY

Organic Chemistry

[7.1. Carbon compounds as fuels and feedstock.pdf \(physicsandmathstutor.com\)](#)

[7.2. Reactions of alkenes and alcohols.pdf \(physicsandmathstutor.com\)](#)

[7.3. Synthetic and naturally occurring polymers.pdf \(physicsandmathstutor.com\)](#)

Energy Changes

[5.1. Exothermic and endothermic reactions.pdf \(physicsandmathstutor.com\)](#)

Chemical Changes

[4.3. Electrolysis .pdf \(physicsandmathstutor.com\)](#)

PHYSICS

Forces

www.freesciencelessons.co.uk/gcse-physics-paper-2/forces/

[Summary Notes.pdf \(physicsandmathstutor.com\)](#)

Energy

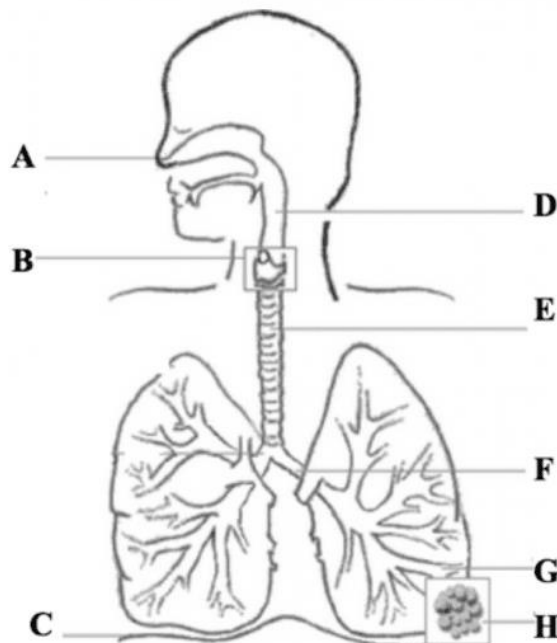
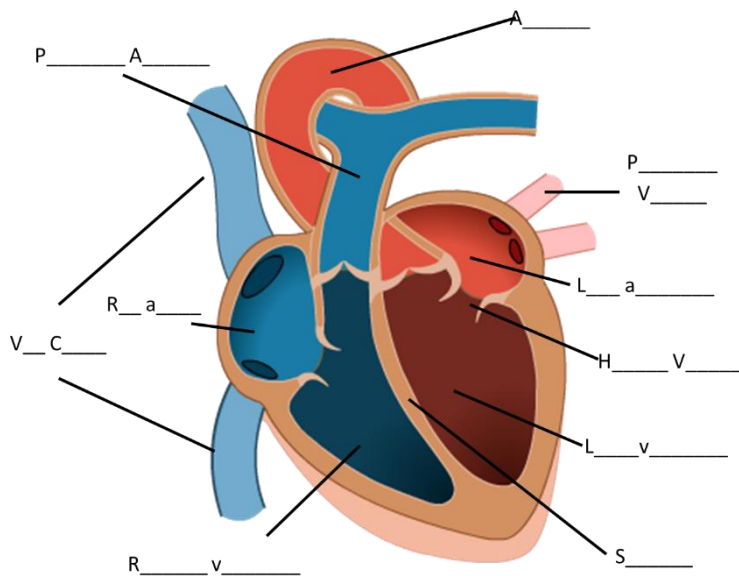
www.freesciencelessons.co.uk/gcse-physics-paper-1/energy/

[Summary Notes.pdf \(physicsandmathstutor.com\)](#)

Task 3: Answer these recall questions and bring them to your first lesson.

BIOLOGY

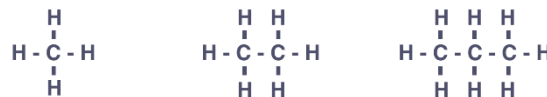
1. Label this diagram of the heart:
2. State the main characteristic features of:
 - a. Arteries
 - b. Veins
 - c. Capillaries
3. Describe the roles of the major blood vessels:
 - a. Aorta
 - b. Pulmonary vein
 - c. Pulmonary artery
 - d. Vena cava
 - e. Coronary artery
4. Describe and explain 5 factors that can increase the risk of cardiovascular disease (CVD)
5. Label this diagram of the respiratory system:
6. Describe the mechanical process of both inhalation and exhalation (you should include the movement of the ribs and diaphragm in your answer).
7. How does the anatomy of the Alveoli support gas exchange?
8. Define the terms:
 - a. Active transport
 - b. Diffusion
 - c. Osmosis



CHEMISTRY

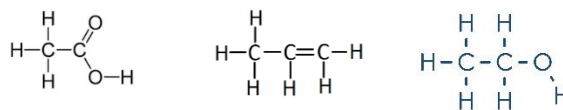
1. Define the terms:

- a. Hydrocarbon
- b. Alkane
- c. Alkene



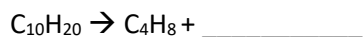
2. Give the general formulae and functional group for:

- a. Alkane
- b. Alkene
- c. Alcohol
- d. Carboxylic acid

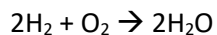


3. Name the hydrocarbons in the picture.

4. Complete the cracking equation below:



5. Hydrogen reacts with Oxygen to form Water. Use the bond energies in the table to calculate the energy change for this reaction. Then determine if the reaction is endothermic or exothermic.



Bond	Bond energy
H-H	436 kJ mol ⁻¹
O=O	498 kJ mol ⁻¹
O-H	464 kJ mol ⁻¹

Energy change = _____ kJ mol⁻¹

Endothermic / Exothermic

6. Sketch the energy profile for the reaction

PHYSICS

1. Write the equation that links work done, distance and force. Include units and symbols.
2. Write the equation for specific heat capacity. Include units and symbols.
3. Define the following terms:
 - a. Specific Heat Capacity
 - b. Specific Latent Heat of Fusion
 - c. Specific Latent Heat of Vaporisation
 - d. Specific Latent Heat of Condensation
4. Calculate the specific heat capacity of mercury if a 25.0 g sample requires 19.3 J to raise its temperature from 24.5°C to 30.0°C
5. Write the equation that links density, mass and volume. Include units and symbols
6. A bottle of water has a density of 1000kg/m³ and mass of 0.5kg. Calculate the volume of the water bottle giving your answer in litres.
7. Define Hooke's Law
8. Write the equation for Hooke's Law. Include units and symbols.