

HARROW COLLEGE & UXBRIDGE COLLEGE (HCUC)

A LEVEL
BIOLOGY
STUDY PACK

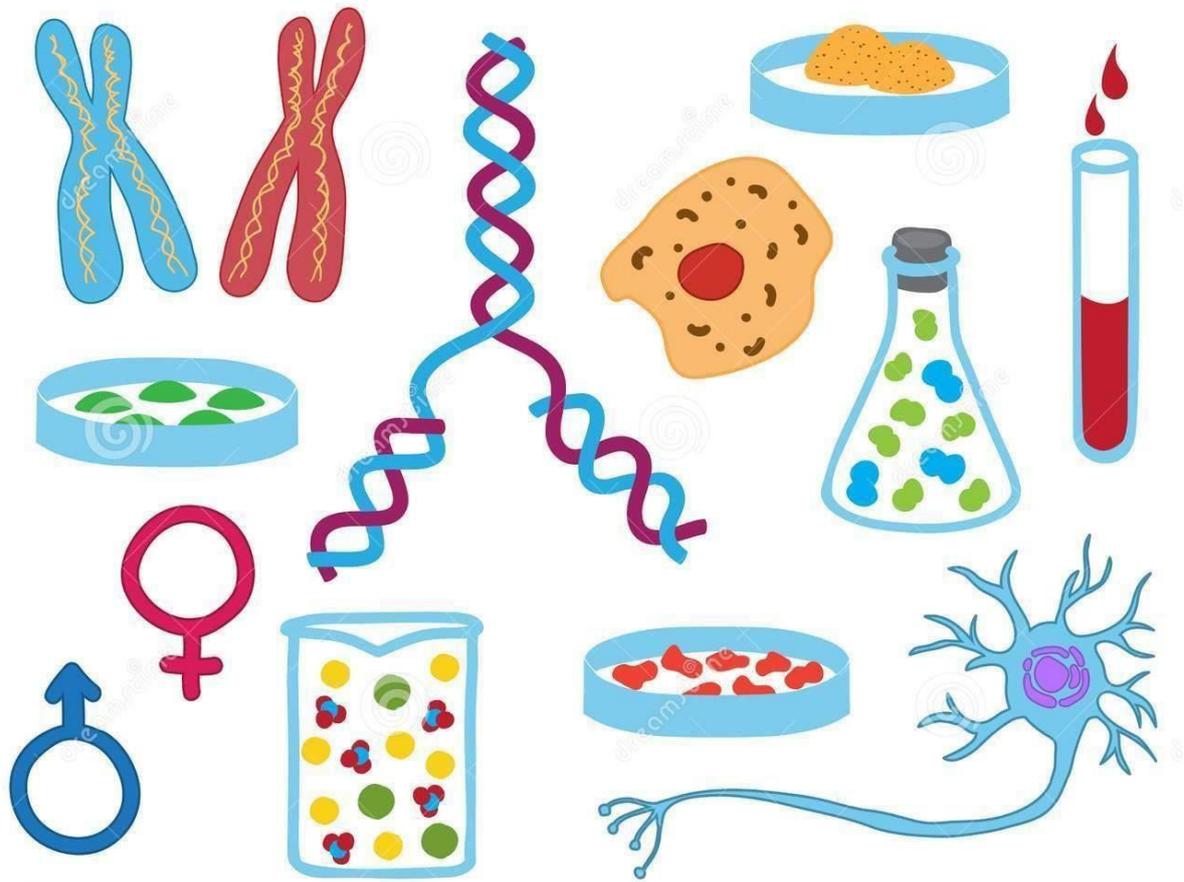
HCUC

A merger between Uxbridge College and Harrow College

Harrow
COLLEGE

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Transition pack



A level Biology.

This pack contains a programme of activities and resources to prepare you to start A level Biology in September. It is aimed to be used after you complete your GCSE throughout the remainder of the Summer Term and over the Summer holidays to ensure you are ready to start your course in September.

Topic 1: Biological Molecules

Topic 2: Cells

Topic 3: Organisms Exchange Substances with the Environment

Topic 4: Genetic information, variation and relationships between organisms

A level biology will use your knowledge from GCSE and build on this to help you understand new and more demanding ideas. Complete the following tasks to make sure your knowledge is up to date and you are ready to start studying.

Tasks to complete.

Topic 1: biological molecules.

Biological molecules are often polymers and are based on a small number of chemical elements. In living organisms carbohydrates, proteins, lipids, inorganic ions and water all have important roles and functions related to their properties. DNA determines the structure of proteins, including enzymes. Enzymes catalyse the reactions that determine structures and functions from cellular to whole-organism level. Enzymes are proteins with a mechanism of action and other properties determined by their tertiary structure. ATP provides the immediate source of energy for biological processes.

Read the information on these websites:

<http://www.s-cool.co.uk/a-level/biology/biological-molecules-and-enzymes>

<http://www.bbc.co.uk/education/guides/zb739j6/revision>

And take a look at these videos:

<https://www.youtube.com/watch?v=H8WJ2KENIK0>

<http://ed.ted.com/lessons/activation-energy-kickstarting-chemical-reactions-vance-kite>

Task:

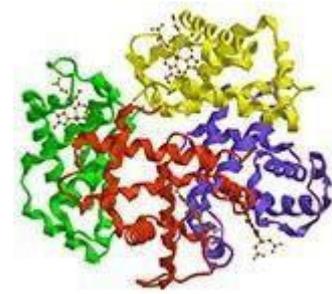
Krabbe disease occurs when a person doesn't have a certain enzyme in their body. The disease effects the nervous system.

Write a letter to a GP or a sufferer to explain what an enzyme is.

Your poster should:

Describe the structure of an enzyme

Explain what enzymes do inside the body



Topic 2: Cells.

The cell is a unifying concept in biology, you will come across it many times during your two years of A level study. Prokaryotic and eukaryotic cells can be distinguished on the basis of their structure and ultrastructure. In complex multicellular organisms cells are organised into tissues, tissues into organs and organs into systems. During the cell cycle genetic information is copied and passed to daughter cells. Daughter cells formed during mitosis have identical copies of genes while cells formed during meiosis are not genetically identical. Read the information on these:

<http://www.s-cool.co.uk/a-level/biology/cells-and-organelles>

<http://www.bbc.co.uk/education/guides/zvjycdm/revision>

And take a look at these videos:

<https://www.youtube.com/watch?v=gcTuQpuJyD8>

<https://www.youtube.com/watch?v=L0k-enzoeOM>

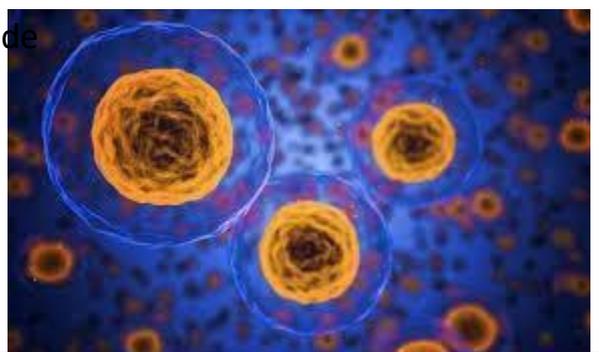
<https://www.youtube.com/watch?v=qCLmR9-YY7o>

Task:

Produce a one page revision guide to share with your class in September summarising one of the following topics: Cells and Cell Ultrastructure, Prokaryotes and Eukaryotes, or Mitosis and Meiosis.

Whichever topic you choose, your revision guide should include:

Key words and definitions

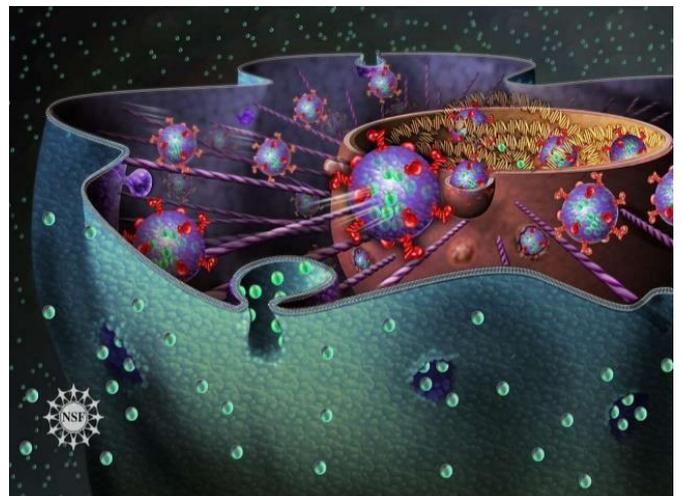


Clearly labelled diagrams

Short explanations of key ideas or processes.

Topic 3: Exchange and transport.

Organisms need to exchange substances selectively with their environment and



this takes place at exchange surfaces. Factors such as size or metabolic rate affect the requirements of organisms and this gives rise to adaptations such as specialised exchange surfaces and mass transport systems. Substances are exchanged by passive or active transport across exchange surfaces. The structure of the plasma membrane enables control of the passage of substances into and out of cells

Read the information on these websites: [http://www.s-cool.co.uk/a-](http://www.s-cool.co.uk/a-level/biology/gas-exchange)

[level/biology/gas-exchange](http://www.s-cool.co.uk/a-level/biology/gas-exchange)

<http://www.s-cool.co.uk/a-level/biology/nutrition-and-digestion/revise-it/human-digestive-system> And take a look at these videos:

<http://ed.ted.com/lessons/insights-into-cell-membranes-via-dish-detergent-ethan-perlstein>

<http://ed.ted.com/lessons/what-do-the-lungs-do-emma-bryce>

Task:

Create a poster or display to go in your classroom in September. Your poster should either: compare exchange surfaces in mammals and fish or compare exchange surfaces in the lungs and the intestines. You could use a Venn diagram to do this. Your poster should:

Describe diffusion, osmosis and active transport

Explain why oxygen and glucose need to be absorbed and waste products removed

Compare and contrast your chosen focus.

Topic 4: DNA and the genetic code. and

In living organisms nucleic acids (DNA and RNA) have important roles and functions related to their properties. The sequence of bases in the DNA molecule determines the structure of proteins, including enzymes.

The double helix and its four bases store the information that is passed from generation to generation. The sequence of the base pairs adenine, thymine, cytosine and guanine tell ribosomes in the cytoplasm how to construct amino acids into polypeptides and produce every characteristic we see. DNA can mutate leading to diseases including cancer and sometimes anomalies in the genetic code are passed from parents to babies in disease such as cystic fibrosis, or can be developed in unborn fetuses such as Down's Syndrome.

Read the information on these websites:

<http://www.bbc.co.uk/education/guides/z36mmp3/revision>

<http://www.s-cool.co.uk/a-level/biology/dna-and-genetic-code>

And take a look at these videos:

<http://ed.ted.com/lessons/the-twisting-tale-of-dna-judith-hauck>

<http://ed.ted.com/lessons/where-do-genes-come-from-carl-zimmer>

Task:

Produce a wall display to put up in your classroom in September. You might make a poster or do this using PowerPoint or similar. Your display should use images, keywords and simple explanations to:

Define gene, chromosome, DNA



that occur with DNA replication and what the consequences of this might be.

base pair

Describe the structure and function
of DNA and RNA

Explain how DNA is copied in the body

Outline some of the problems Interesting videos and TV programmes to watch.

BBC iplayer

Surgeons At The Edge Of Life:

Documentary series going beyond the theatre doors of Queen Elizabeth Hospital Birmingham, where surgeons push medical boundaries to the limits.



Earth From Space:

Cameras in space tell stories of life on our planet from a brand new perspective.

Satellites follow an elephant family

struggling through drought, reveal

previously unknown

emperor penguin colonies from the colour of their poo, and discover mysterious ice rings that could put seal pups in danger. Using cameras on the ground, in the air and in space, Earth from Space follows nature's greatest spectacles, weather events and dramatic seasonal changes. This is our home, as we've never seen it before.



Climate change: The Facts.

After one of the hottest years on record, Sir David Attenborough looks at the science of climate change and potential solutions to this global threat. Interviews with some of the world's leading climate scientists



explore recent extreme weather conditions such as unprecedented storms and catastrophic wildfires. They also reveal what dangerous levels of climate change could mean for both human populations and the natural world in the future.

Ted Talks

Growing new organs: Anthony Atalla's state-of-the-art lab grows human organs —from muscles to blood vessels to bladders, and more.



https://www.ted.com/talks/anthony_atalla_growing_organs_engineering_tissue?language=en

Animations of unseeable Biology: We have no ways to directly observe molecules and what they do -- but Drew Berry wants to change that. He demos his scientifically accurate (and entertaining!) animations that help researchers see unseeable processes within our own cells.



https://www.ted.com/talks/drew_berry_animations_of_unseeable_biology#t-528661

A New Superweapon in the Fight Against Cancer

Cancer is a very clever, adaptable disease. To defeat it, says medical researcher and educator Paula Hammond, we need a new and powerful mode of attack.



[http://www.ted.com/talks/paula hammond a new superweapon in the fight against cancer?!language=en](http://www.ted.com/talks/paula_hammond_a_new_superweapon_in_the_fight_against_cancer?language=en)

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