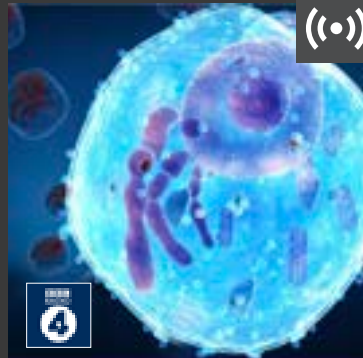


A level Biology

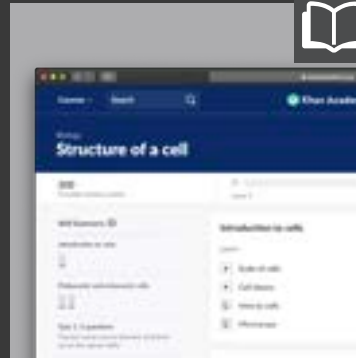
Cells and Organelles – Animal and Plants Cell in Depth



Watch Eukaryopolis - The City of Animal Cells: Crash Course Biology #4.
www.youtube.com/watch?v=cj8dDTHGJBY&t=5s



Listen to 'The Cell' – Melvyn Bragg and his guests discuss the origins and structure of the cell, the fundamental building block of life.
www.bbc.co.uk/programmes/b01mk8vh



Read about the structure of Animal and Plant Cells.
www.khanacademy.org/science/biology/structure-of-a-cell



Read about the careers which you can pursue with an education in Molecular and Cell Biology.
https://study.com/articles/Careers_in_Molecular_Cell_Biology_Job_Options_and_Requirements.html



Use the internet or wider reading to research and produce an A4 poster on the structure of animal and plants cells. Give detailed descriptions describing the roles of the organelles found within both plant and animal cells.

Biological Molecules – The Building Blocks of Life



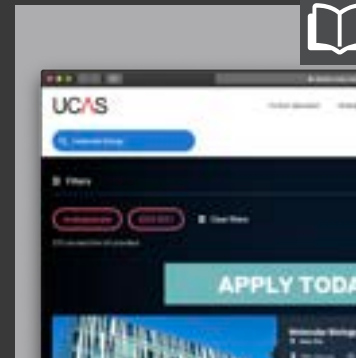
Watch Biological Molecules - You Are What You Eat: Crash Course Biology #3.
www.youtube.com/watch?v=H8WJ2KENIKO



Listen to 'Enzymes' – Melvyn Bragg and guests discuss enzymes, the proteins that control the speed of chemical reactions in organisms which would otherwise happen too slowly to keep the organisms alive.
www.bbc.co.uk/programmes/b08rp369



Read about the role of biological molecules in living organisms.
www.khanacademy.org/science/biology/macromolecules



Read about the degree opportunities in molecular biology.
<https://digital.ucas.com/coursedisplay/results/providers?searchTerm=molecular%20biology&destination=Undergraduate&distanceFromPostcode=&studyYear=2020&sort=MostRelevant>



Use your new knowledge to produce a summary table on all the different types of biological molecules and what they are used for in living organisms. Include; Carbohydrates, DNA, Proteins, Lipids and Water.

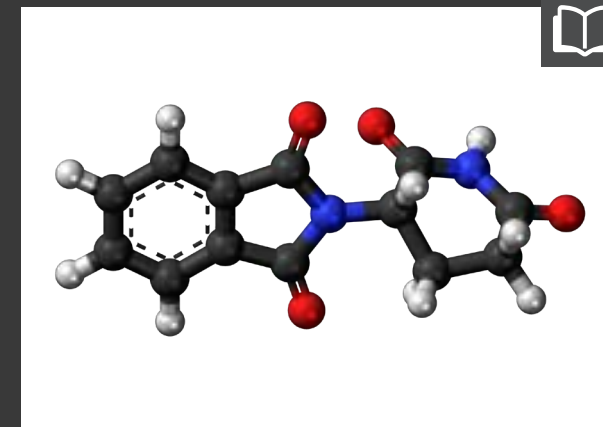
A level Chemistry



Listen to the Chemistry World podcast.
www.chemistryworld.com/podcasts/polypropylene/3010766.article



Find out why oranges are like left-handed lemons. List as many other examples you can find.



Read the story of thalidomide and how it has changed the way that medicinal drugs are developed.

www.news-medical.net/health/History-of-Thalidomide.aspx



Hone your practical skills by carrying out a virtual titration.

<https://edu.rsc.org/resources/titration-screen-experiment/2077.article>



Watch Investigating the Periodic Table with Experiments.

www.youtube.com/watch?v=kqe9tEcZkno



Use the Internet and wider reading to describe and explain how the model of the atom has developed over time. Include the names of scientists and brief details of their discoveries.

A level Physics

Maths Skills for Physics – Orders of Magnitude



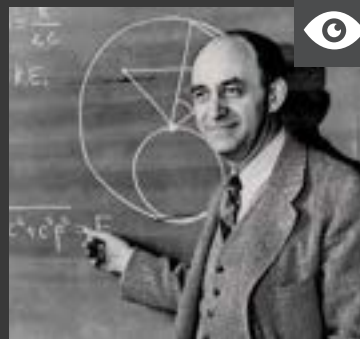
Explore 'The Scale of the Universe' interactive applet.

<https://scaleofuniverse.com/>



Using the link below, the Scale of the Universe applet, and your own research, produce a table of different unit prefixes and the orders of magnitude they represent, giving examples of objects that are those orders of magnitude in size (when measured in metres).

<https://physics.nist.gov/cuu/Units/prefixes.html>



Watch the following video on Fermi estimation:

www.youtube.com/watch?v=9TmymicajXs

Problem solving



Estimate:

1. The number of atoms in your body
2. The (average) mass of an atom in kg
3. The energy required to have a hot shower at the top of the Empire State Building

Hints: think about how you can break each of these down into smaller problems, using values you know from everyday life to help you calculate less intuitive things. You will probably need knowledge about energy transfers from GCSE to answer the third one. Your answers do not need to be exact, but should be within a couple of orders of magnitude of the right answer.



Read about possible careers and degrees using physics, as well as the skills gained by studying physics:

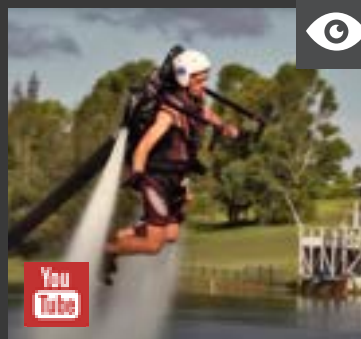
www.ucas.com/job-subjects/physics

Mechanics – Forces, Motion and Launching a Rocket



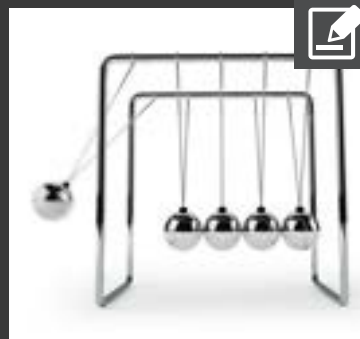
Read about Newton's laws of motion, and try the quiz questions related to them on Khan Academy.

www.khanacademy.org/science/physics/forces-newtons-laws/newtons-laws-of-motion



Watch the following video on using Newton's laws to explain rocket science:

www.youtube.com/watch?v=Hx9TwM4Pmhc



Create an A4 poster summarising Newton's laws of motion. For each law, give two examples of that law in action.

Note: ensure that your poster describes Newton's 2nd law in terms of momentum as well as acceleration.



Consider a rocket launched from Earth into space.

Write a short paragraph describing the forces on the rocket during the launch, and explain how each of Newton's laws of motion would apply in this situation.



Listen to Melvyn Bragg and guests discuss the history of Newton's laws and their philosophical implications:

www.bbc.co.uk/sounds/play/b009mvj0