

# **Easter Brain Boost**

## **Science**

**10 X 10**



# CORE SCIENCE B1: BIOLOGY

**HIGHER content labeled**

Video

Exam Q



## KEEPING HEALTHY

Describe the components of a balanced diet and say why each is needed.			
Describe the effects of an unbalanced diet – eating too much or too little.			
Describe how exercise affects health.			
Explain metabolic rate and the affect of exercise on metabolic rate.			
State how inherited factors may affect metabolic rate or cholesterol.			
Define pathogen.			
Describe how viruses and bacteria make us ill.			
State some ways the body protects against pathogens.			
Describe the 3 ways white blood cells work.			
Describe how an individual may become immune to a pathogen.			
Describe how vaccinations can protect individuals and populations.			
Describe the work of Semmelweiss and explain its importance.			
State how some different types of medicines work.			
Explain why antibiotics don't work on viral infections, and why treatment is difficult.			
Explain antibiotic resistance. <b>HIGHER</b>			
Give some of the problems with resistance strains of bacteria or viruses. <b>HIGHER</b>			
Write a method for culturing microorganisms in sterile conditions.			
Explain differences in school & industrial conditions for growing microbes.			

## NERVES AND HORMONES

State the role of the nervous system in responding to the environment.			
Link some examples of stimuli and receptor cells.			
State some of the features of light receptor cells.			
Describe the pathway of a simple reflex action.			
Explain how water, ions, temperature & blood sugar levels are controlled.			
Describe the general role of hormones in the body.			
Describe the role of hormones in controlling the menstrual cycle.			
Explain the use of hormones in controlling fertility			
Describe how plants are sensitive to light, moisture and gravity.			
Explain how hormones can control growth in plants.			
Give some agricultural uses of hormones.			

## USE AND ABUSE OF DRUGS.

Describe the stages in developing and testing new medical drugs.			
State the use of statins.			
Describe the problems, and current use of, thalidomide.			
Describe what a 'drug' is and the problems with dependence and addiction.			
State some of the effects of misuse of legal and illegal recreational drugs.			
Describe some examples of performance enhancing drugs in sport.			

ADDITIONAL SCIENCE P2: PHYSICS Higher content in bold	Video	Exam Q	☺ ☹ ☹
<b>Resultant Forces</b>			
Define resultant force & describe its effect on moving & stationary objects.			
Predict the motion of an object based on the forces acting on it.			
<b>Forces and Motion</b>			
Use the formula: $f = m \times a$			
Construct and interpret distance-time graphs.			
<b>Calculate the speed of an object from the distance-time graph.</b>			
Define velocity.			
Use the formula: $a = v - u / t$			
Interpret velocity-time graphs.			
<b>Calculate acceleration and distance travelled from a velocity-time graph.</b>			
<b>Forces and Braking</b>			
Label forces acting on a moving object.			
Describe the relationship between braking force, distance and speed.			
Explain the energy transfers that occur on braking.			
Define stopping distance, thinking distance and braking distance.			
Explain the factors affecting thinking and braking distance.			
<b>Forces and Terminal Velocity</b>			
Calculate the weight of an object, using: $W = m \times g$ .			
Explain how air resistance changes as the speed of a falling object changes.			
Explain how an object falling through a fluid reaches terminal velocity.			
Draw & interpret velocity-time graphs for objects reaching terminal velocity.			
<b>Forces and Elasticity</b>			
Describe how forces acting on an object may change its shape.			
Explain how this could store elastic potential energy.			
Describe how the force on an elastic object relates to extension, using: $F = k \times e$ .			
<b>Forces and Energy</b>			
Define work done.			
Use the equation: $W = F \times d$			
Explain how energy can be transferred when work is done.			
Use the equation: $P = E / t$			
Describe gravitational potential energy using: $E_p = m \times g \times h$			
Calculate kinetic energy using: $E_k = \frac{1}{2} \times m \times v^2$			
<b>Momentum</b>			
Describe momentum, using: $p = m \times v$ .			
Describe how momentum is conserved after an event.			
Calculate momentum before and after an event.			
<b>Static Charges</b>			
Explain how static charges can be built up on insulating materials.			
Describe forces acting on similarly or oppositely charged objects brought close together.			
Describe how charges may easily flow through some substances but not others.			

<b>Electrical Circuits</b>			
Describe what current is, and calculate using: $I = Q/t$			
Describe potential difference, and calculate using: $V = W/Q$			
Draw and interpret circuit diagrams, using correct symbols.			
Explain the applications of thermistors and LDRs in circuits in terms of how their resistance			
Interpret current-potential difference graphs for resistors at a constant temperature, filament bulbs			
Describe the relationship between resistance and potential difference & current, and how it may			
Use the equation: $V = I \times R$			
Describe current, resistance and potential difference in series and parallel circuits.			
Describe the properties and used of LEDs.			
<b>Household Electricity</b>			
Describe alternating and direct current and give examples of both.			
State the frequency of the alternating current in mains electricity, and its potential difference.			
Describe the structure and wiring of a 3-pin plug.			
Describe how fuses and RCCBs protect electrical equipment.			
Describe how an earth wire protects equipment with a metal casing.			
<b>Current, Charge and Power</b>			
Describe the energy transfers when current flows through a resistor.			
Compare the efficiency of filament bulbs and CFLs.			
Describe the power of an appliance, using the equation: $P = E/t$			
Describe the power of an appliance, using the equation: $P = I \times V$			
<b>Explain the energy transferred in a circuit, using the equation: <math>E = V \times Q</math></b>			
<b>Atomic Structure</b>			
Describe the structure of an atom, and experiments that have given us evidence for this.			
State the relative masses and charges of protons, neutrons and electrons.			
State how an ion may be formed.			
Define mass number, atomic number and isotope.			
<b>Atoms and Radiation</b>			
Describe how some atoms decay randomly.			
Explain half life of a radioactive substance.			
Describe the origins of background radiation.			
Describe alpha, beta and gamma radiation <b>and write nuclear equations to show alpha and beta</b>			
Compare and explain the differences in ionising power, penetrating power and range in air of the			
Describe how electrical and magnetic fields affect each type of radiation.			
Describe the uses and dangers of each type of radiation.			
<b>Nuclear Fission</b>			
State that uranium-235 and plutonium-239 are fissionable substances in common use.			
Define and describe the stages in nuclear fission.			
Explain how this may start a chain reaction.			
<b>Nuclear Fusion</b>			
Define and describe nuclear fusion			
State that this is the way energy is released in stars.			
Describe how stars are formed from clouds of dust and gas in space.			
Describe the forces acting on a main stage star.			
Describe the life cycle of both stars the size of our Sun and those much bigger.			
Describe how fusion in stars provides all elements in the universe.			

<b>INTERDEPENDENCE AND ADAPTATION</b>			
Describe what animals compete			
Describe what plants compete for			
Explain how particular adaptations help animals to survive in their habitats			
Explain what extremophiles are			
Describe how distribution of organisms can change when the environment changes			
State some examples of changes in the environment			
Explain how lichens and invertebrates can be used as indicator species			
Describe how we can use equipment to measure oxygen levels, temperature and rainfall			
<b>ENERGY AND BIOMASS IN FOOD CHAINS</b>			
State that the sun is the source of energy for living organisms			
Describe the energy transfer that takes place during photosynthesis			
Draw a pyramid of biomass for a food chain			
Explain why the energy and biomass decrease further up the pyramid			
<b>WASTE MATERIALS FROM PLANTS AND ANIMALS</b>			
State that living things remove materials from the environment			
State that when organisms die and decay, materials are returned to the environment			
Define the term 'decay' & describe the conditions that microorganisms grow fastest in			
Explain why decay is important for plant growth			
Describe a stable community in terms of the materials being cycled within it			
State how carbon dioxide is removed from, and released into the atmosphere			
Describe the role of plants, animals and microorganisms in the carbon cycle			
Explain how combustion affects carbon dioxide levels			
<b>GENETIC VARIATION AND ITS CONTROL</b>			
Define the term 'gene' & describe how genes are passed on from parents to offspring			
State that genes control characteristics			
Give reasons to describe why there may be differences in characteristics in organisms			
Describe what sexual reproduction is			
Describe what asexual reproduction is			
Explain if offspring will be identical or different to their parents based the type of			
Describe the process of taking cuttings & state some advantages of taking cuttings			
Describe the stages involved in tissue culture, embryo transplants and adult cell cloning			
Describe what genetic engineering is			
Define what GM (genetically modified) is			
Give examples of ways in which we could modify crops and evaluate GM crops			
<b>EVOLUTION</b>			
Describe Darwin's theory of evolution			
Give three reasons why the theory of natural selection was not accepted at first			
Describe the main stages of natural selection			
State that variation can occur due to mutation			
State the groups that living are classified into			
Interpret evolutionary trees			
Describe Lamarck's theory of evolution			

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