

potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt



To Hutton Chemistry A Level and other post -16 pathways

*What is a LCA?**
*What are alloys and why are they useful?**
*How can we extract copper from low grade ores?**
*How are fertilisers made and why are they important?**

What are finite and infinite resources? Why should we recycle and how can we recycle materials? What is potable water and how do we obtain it? How is waste water treated?

What are the impacts of global warming? How can we reduce global warming?

Y10

How can we extract metals from their ores using Carbon?
How can we extract metals from their ores using electrolysis?

How has the atmosphere on Earth evolved over time? Why has the composition of gases in the atmosphere changed over time?

How are we polluting the Earth's atmosphere? What are the harmful effects of the different pollutants? How can we reduce pollutants in the atmosphere?

What is causing global warming?

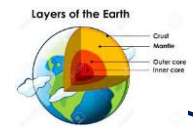
Y9

How can we use the position in the Reactivity series to determine how metals are extracted?
What metals are found in their natural state? What are metal ores?

How is Aluminium Recycled? What are the advantages and disadvantages of recycling Aluminium?

How can we model Global Warming? What are the consequences of Global Warming?

Why Is Global Warming Happening?



Y8

Your Hutton Learning Journey starts here!

What is the structure of the Earth? What are the properties of sedimentary, metamorphic and igneous rocks?

What does the Rock Cycle show us about the formation of rock types? How do the properties of the Rock Types link to the way in which they are formed?

How have the concentrations of carbon in the atmosphere changed over time?

*Separate Chemistry only

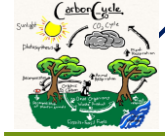


To Hutton Biology A Level and other post-16 pathways

What human activities are polluting the environment?
 What is biodiversity? How can it be maintained?
 How can food production be made more efficient and sustainable?

How are materials recycled in the environment?
 What is the role of decomposers in the carbon cycle?
 How are humans affecting the carbon cycle?

How can the distribution of plants be measured?



Y10

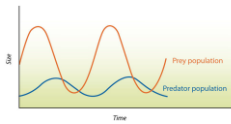
What is the symbol equation for photosynthesis?
 How can the rate of photosynthesis be measured?

What are the limiting factors for photosynthesis?
 How can we make an efficient greenhouse?
 What do plants do with the glucose which is made?

What is the difference between aerobic and anaerobic respiration?

Y11

What are biotic and abiotic factors?



What is meant by the predator-prey cycle?

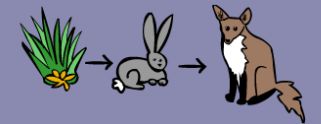
What is interdependence?
 What do animals compete for?
 What do plants compete for?

How are animals and plants adapted to their environment?
 How do they adapt to change in their environment?

Y9

What factors influence where plants can live?
 How can a quadrat be used to measure the distribution of plants?

What is the difference between a food chain and a food web?



Your Hutton Learning Journey starts here!

Y7

How do animals help with pollination of plants?
 How do animals help with the dispersal of seeds?

Y8

What is the word equation for photosynthesis?

Why are green plants known as producers?





To Hutton Physics
 A Level and other
 post -16 pathways

How does the national grid transport energy across the country?
*How do electrical transformers work?**

Where are electromagnets used?
*How can we use magnets and wires to build generators and motors?**

Y11

How do power stations produce energy?

How does energy get from the battery to the device?

Y10

What do all the different circuit symbols mean?
 How do light and temperature sensors work?

How is the mains different from our small circuits?
 What keeps mains electricity safe for us to use?

*What devices use static electricity?**

How much does it cost to boil the kettle?

What does it mean when a light bulb says it uses 5 watts?

Y9

How can we see a magnetic field?
 How can we make an electromagnet?
 Where do we use electromagnets?

Which metals are magnetic?
 How do magnets attract and repel?

How do you build and test different types of circuit?

Your Hutton Learning Journey starts here!

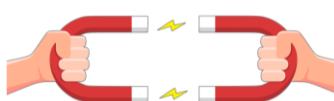
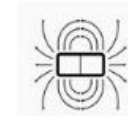
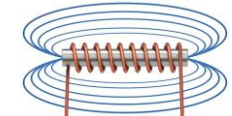
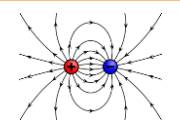
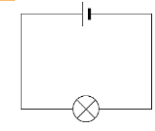
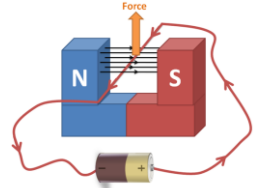
Y7

Which type of force does a magnet exert?

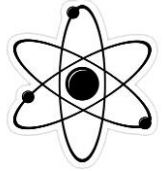
Y8

How do charged objects attract and repel each other?
 How can we explain the effects of static electricity?

How can we improve a circuit so we don't waste energy?



*Separate Physics only

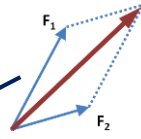


To Hutton Physics
A Level and other
post -16 pathways

*What design features can reduce impact force?**
How does an elastic object behave?
*How can we calculate liquid and atmospheric pressure?**
*How can we calculate the motor effect force?**

*How do machines use levers and gears?**
*How can we apply the principle of moments?**
What are Newton's Laws of Motion?
How does terminal velocity affect falling objects?

What are vectors and scalars?
How can we add force vectors?



How can we work out an object's speed?

What is pressure and what are its effects?
How does pressure depend on depth of liquid?
What is atmospheric pressure?

How can forces create a turning effect?
How can we calculate the work done by a force?

Y10

*How do charged objects attract and repel each other?**
*How can we explain the effects of static electricity?**

Y11



How can we use graphs to describe motion?

Y9
What affects the size and shape of craters?

How can we see a magnetic field?
How can we make an electromagnet?
Where do we use electromagnets?

Which metals are magnetic?
How do magnets attract and repel?

Y8
What is the difference between weight and mass?



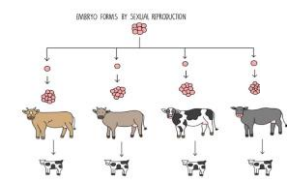
Your Hutton Learning Journey starts here!

Y7
How do we measure forces?
What are balanced and unbalanced forces?

Is friction good or bad?
How does a plane stay in the sky?
What happens when you stretch a spring?

Which forces can act at a distance?

*Separate Physics only

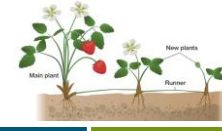
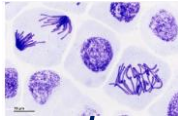


To Hutton Biology A Level and other post-16 pathways

How are different species classified?
What is a domain and a Kingdom?
How can evolutionary trees show how closely related organisms are?
***How does evolution lead to speciation?**

How does genetic variation lead to natural selection?
How are selective breeding and genetic engineering used in farming and industry?
***What is cloning? What are the benefits and risks?**

How are different characteristics and disorders inherited?



What is mitosis and why is it important?

What are microorganisms?
How do they reproduce?
How does a population of antibiotic resistant bacteria evolve?

What are non communicable diseases?
Which one have certain genes as a risk factor?

Y11

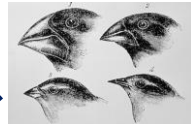
What is the difference between sexual and asexual reproduction?
What is Meiosis and why is it important?

What is DNA?
***How does it replicate?**
What is the genome?

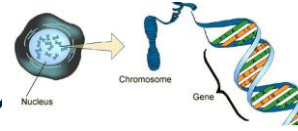
Y10

What causes extinction and how can it be avoided?

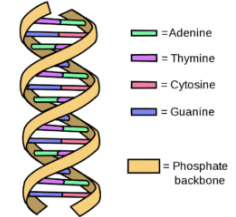
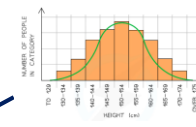
How does variation and competition lead to evolution through natural selection?
Who was Charles Darwin and what did he do?



What is DNA and where is it found?
How was it discovered?
How are identical and non identical twins formed?



What is continuous and discontinuous variation?
How can these types of variation be represented on a graph?



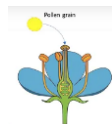
What are the causes of variation?

Y9

Your Hutton Learning Journey starts here!

Y7

What is sexual reproduction?
What is the role of the nucleus in the cell?
What is fertilisation?



Y8

How are leaves adapted for photosynthesis?
Why is this important?



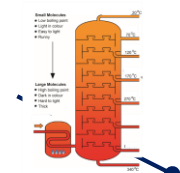
How can the diversity of plants be measured?

*Separate Science only





Matter



To Hutton Chemistry A Level and other post -16 pathways

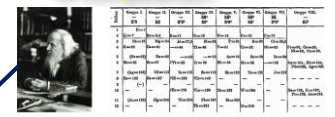
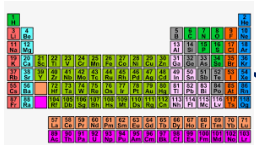
How do you extract copper from plants and microbes?
** Why is the Haber process important in the production of fertilisers?*

What is the difference between finite and renewable resource?
 Explain how water becomes potable water.

What are pure substances and formulations?
 How does Rf values relate to solubility in soluble liquids?
**How do you test for different cations and anions in compounds?*

What are alkanes and how are they extracted?
**Why are alkenes useful?*
**What are alcohols, carboxylic acids and esters?*

**What Are the benefits to industries to obtain high percentage yield and high atom economy for a product in a reaction?*



How is the periodic table arranged?
 What are the trends and patterns in reactivity in different groups?
 What is the basic structure of an atom? How are the subatomic particles arranged in an atom?

Y10

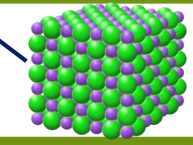
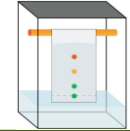
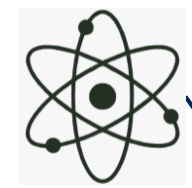
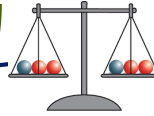
What are the properties of Ceramics, composites + polymers and how does it make them suitable for their use?

How do you calculate number of protons, electrons and neutrons in an atom?
 How has the periodic table developed?

Y11

What are the three types of bonding and what type of molecules do they involve?

What happens to mass of reactants and products in a reaction?



What are the definitions of element, mixture and compound?

Y9

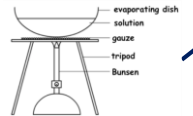
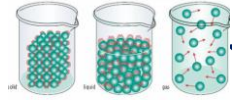
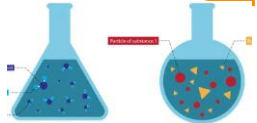
Y8

How do we explain dissolving?
 What is solubility?
 How does temperature affect solubility?

How do you use filtration?
 How do you separate a mixture of liquids?
 How do you separate sand and salt water?

What are atoms, elements and compounds?
 Where are all the elements listed?
 How do we name compounds?

Why do balloons get bigger as you blow them up?



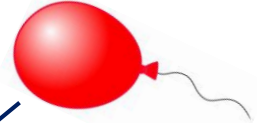
Your Hutton Learning Journey starts here!

Y7

What is the Particle model?
 How does it help us understand how solids, liquids and gases behave?

How does chocolate melt?
 How does water boil?
 What are the names for these changes in state?
 What is sublimation?

How does perfume smell spread out?
 How does temperature affect diffusion rate?



**Separate Chemistry only*



To Hutton Biology A Level and other post-16 pathways

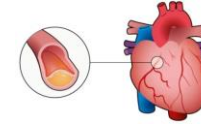
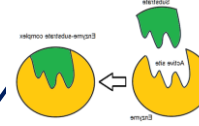
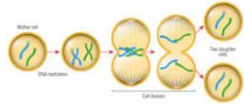
What are hormones? How are they involved in homeostasis, and in the control of plant growth?

How does the nervous system allow animals to respond to their environment?

Y11

How can we measure the rate of photosynthesis? How can we maximize the rate of photosynthesis?

What is the role of the different tissues and organs in plants?



How can different drugs affect the health of our organs?

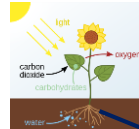
Y10

How does mitosis allow organisms to grow?

Which tissues and organs are involved in the digestive system? What is the importance of enzymes in digestion? Why do we need different ones?

How does the heart, Arteries and veins work together in the circulatory system? What is CHD and how can it be prevented and treated?

What are communicable diseases? How do we become immune to a disease?



How are organisms adapted to extreme environments?

Y9

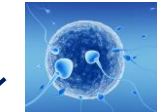
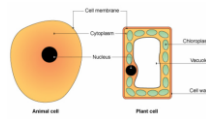
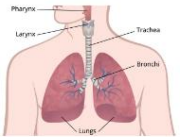
How do plants obtain their own food? Why are plants so important to other organisms?

What is a balanced diet? How do we test for different food groups? What organs are involved in our digestive system? What is a deficiency disease?

How do our muscles, skeleton and joints work together to help us move our bodies?

Y8

How do our lungs work in order for us to breathe?



Your Hutton Learning Journey starts here!

Y7

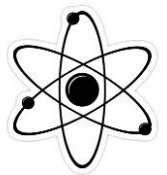
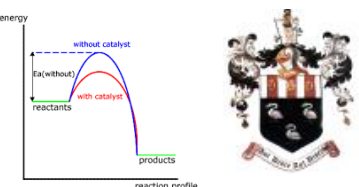
What are organisms made from? How can we use microscopes to study cells? How are different cells specialized to carry out their function?

What changes happen to boys and girls during puberty? How do different organisms reproduce? What factors are needed for germination of seeds?

How is our body organized into different systems?



Reactions



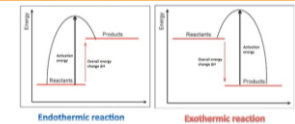
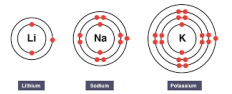
To Hutton Chemistry A Level and other post -16 pathways

*What is the Haber process?**
*What is corrosion?**
*How can we protect materials from corrosion?**

Y11

What is a reversible reaction?
What is a dynamic equilibrium?
What is Le Chatelier's principle?
What affect does changing conditions have on the equilibrium position?

What affect does using a catalyst have on reaction profile diagram?



What are endo/exo reactions?
What is a catalyst?

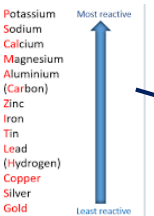
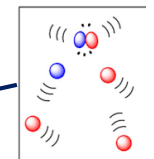
Y10

Can you explain the reactivity trend in group 1/7 using electron configuration?
*What is the reactivity of group 1 compared to transition metals?**

What is formed when metals react with oxygen?
What is the order of reactivity for different metals?
Will a displacement reaction take place?
What happens when a metal/metal compound reacts with an acid?
What happens to pH during a neutralization reaction?

What types of chemical reaction are exo/endo?
What does the energy profile diagram look like for endo/exo reactions?
What is the overall energy change for a reaction?

What factors affect rate of reaction?
Can you explain these factors in terms of collision theory?



What is the reactivity series of metals?
Can I predict if a reaction will take place?

What happens when we react a metal carbonate and acid?
What happens when we react a metal oxide and acid?
What happens when we react an acid and base?

What happens to reactivity down group 1?
What happens to reactivity down group 7?
What happens when we react a metal and acid?

Y9

What is an endothermic reaction?
What is an exothermic reaction?
What is a thermal decomposition?

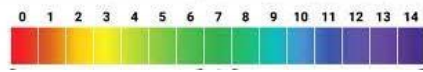
How can we represent a reaction?



Your Hutton Learning Journey starts here!

Y7

What is an acid?
What is an alkali?
How can we tell if something is acidic/alkaline?
What happens when we react an acid with an alkali?



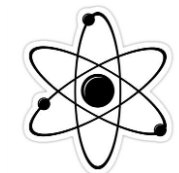
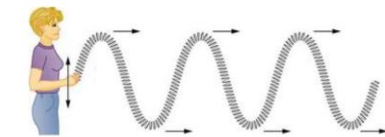
What is a salt?
What happens when you react a metal and an acid?

Y8

What is a chemical change?
What is a physical change?
What happens when we burn fuel?



*Separate Chemistry only



To Hutton Physics A Level and other post -16 pathways

What are the different parts of the electromagnetic spectrum and what are their applications?
 What happens to light when it passes through convex and concave lenses?*

What are longitudinal and transverse waves?
 How can we measure the frequency and wavelength of a wave?
 How can we calculate the speed of waves?
 What are the different types of seismic wave and how can they tell us about the Earth's structure?*

What are the differences between electromagnetic and mechanical waves?



What does the light we observe from objects in space tell us?

What is thermal radiation?
 Which surfaces are the best emitters of radiation?
 How is radiation reflected and absorbed by different surfaces?

Y10

What is infrared radiation?
 How does the radiation emitted by a body depend on its temperature?*

How do scientists believe changes to the amount of infrared radiation absorbed by the atmosphere cause climate change?*
 What is gamma radiation and what are its effects?

Y11



Y8

What is ultrasound?
 What is echolocation and how can it be useful?
 How can we measure the speed of sound waves?

How do we hear sounds?
 How can we protect our ears?
 Can you hear in space?
 What sounds can animals hear?
 How fast do sound and light waves travel?

How can we describe waves?
 What examples of waves are there?
 What is sound?
 How are sounds produced?

What are waves?
 How do waves behave?



Your Hutton Learning Journey starts here!

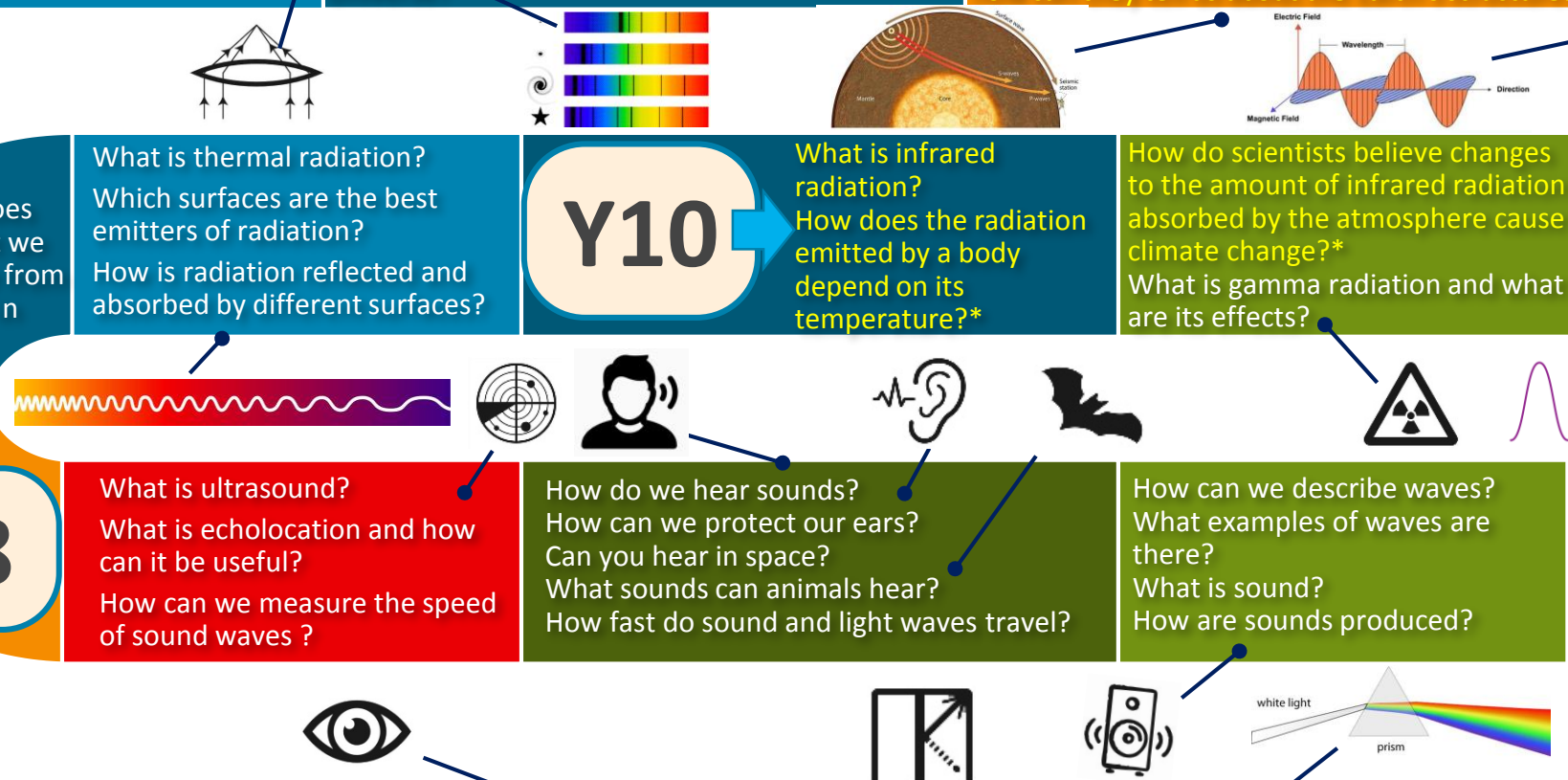
Y7

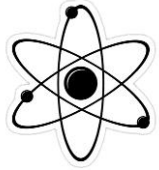
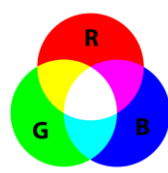
How do we see?
 How is light transmitted?
 What is reflection?
 What is refraction?

How do we observe different colours?
 What are the colours of the visible spectrum?
 What are the primary colours?

What happens when primary colours are mixed?

*Separate Physics only



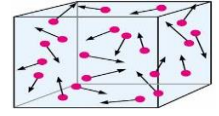
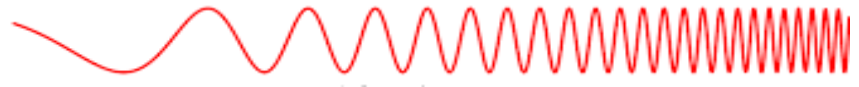


To Hutton Physics A Level and other post -16 pathways

Why are seismic waves so destructive?
How do the properties of waves relate to the energy stored in them?
How are transformers used to transfer energy using electrical circuits?

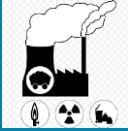
How is the kinetic energy of a car dissipated during braking?
How do waves transfer energy?

How can nuclear fission and fusion be used for electrical power?



What is needed for a car to move?

How does a country meet its energy demands?
What is a good fuel?



What explains the behaviour of solids liquids and gases?

Y10

How do we calculate the energy required to heat a material? Or melt iron?
What is electrical power?

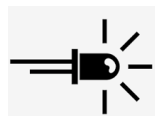
What is the national grid and how is it made efficient?

Y9

How does a thermos flask work?
Why does a pan handle become hot?



How does a phone work throughout the day?
How are circuits designed and built?
What makes an LED or Bulb work?



Why do the planets orbit the Sun?
Why are meteor impacts so destructive?

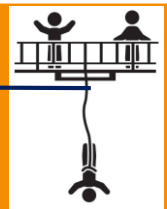


Y8



Your Hutton Learning Journey starts here!

Y7



How does light get to Earth?
Why are there so many colours?
What is a sound? How does it travel?



What makes a sound louder than another?

*Separate Physics only