



## Film List

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#### Key:

Core Films	
Context Films	
FactPack Films	



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#### Key:

Core Films

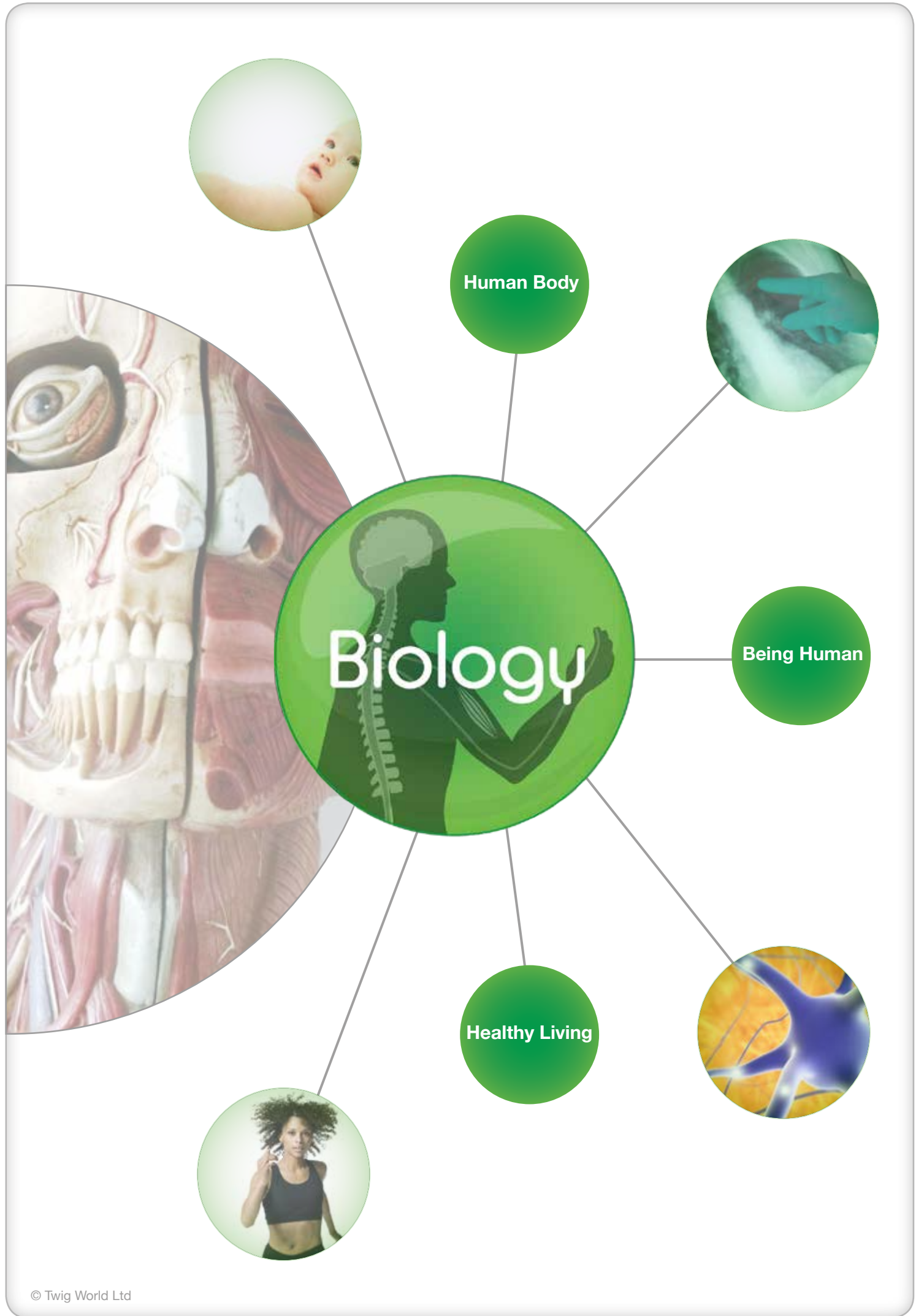


Context Films



FactPack Films







### Digestion

Introduction to Digestion	Follow the journey of food through your digestive system.
Stomach	The digestive journey – how does your stomach break down your food?
Small Intestine	The digestive journey – what happens to food in the small intestine?
Large Intestine	The digestive journey: what happens to food in the large intestine?
Beef Tapeworms: Part 1	Beef tapeworms can grow up to 12 metres inside our bodies – what do they do to us?
Beef Tapeworms: Part 2	Meet the biologist who volunteered to grow a tapeworm in his intestines.
Burps and Farts	Find out how air, gas and bacteria make us burp and fart.
Kidneys	Discover the lifesaving work of our kidneys.
FactPack: Digestion	Learn about the weird and wonderful world of the digestive organs.
FactPack: Teeth	Learn some fun facts about a human's 32 teeth.
FactPack: The Liver	Find out about the liver and its ability to regenerate.

### Heart and Blood

Blood	What blood actually does and why we can't live without it.
Heart	What does the heart look like, and how does it work?
Blood Transfusion: Vietnam	What did the Vietnam War teach doctors about blood clotting?
Blood Transfusion: Falklands	What did the Falklands War teach doctors about blood clotting?
Healthy Heart	Find out why fatty foods harm your heart.
Why Is Blood Red?	Some animals have pink or blue blood. Why is ours red?
FactPack: Heart	How do human and animal hearts compare?



## Lungs

Lungs	A journey through the lungs, the vital organs which allow you to breathe.
Big Breathers	Find out what happens when marine mammals hold their breath.
Little Breathers	Can we train ourselves to hold our breath for longer?
Terrible TB: Part 1	Is the terrible lung disease tuberculosis making a comeback?
Terrible TB: Part 2	Introducing the ethical debate surrounding the treatment of tuberculosis patients in the US.
The Dark Side of Oxygen	How oxygen is vital for life, but corrodes the human body.
Smoking: The Damage	Witness the effect smoking has on the lungs.
Factpack: Lungs	Discover the amazing inner workings of the lungs.

## Muscles and Bones

Bones	Find out how bones develop with age.
Cardiac and Smooth Muscles	Find out how these involuntary muscles work and why you can't control them.
Skeletal Muscles	Find out how skeletal muscles help you control your body.
An Ancient Olympian	Discover how the remains of an ancient olympian athlete reveal his training techniques.
Clever Thumbs	Could opposable thumbs be the key to our intelligence?
Growing Pains	Explore how bones grow and change through puberty, and the impact this has on teenagers.
Joints	An introduction to the movements different types of joint can make.
What Happens When I Crack My Knuckles?	What happens between your joints to cause the cracking noise?



## Brain

Introduction to the Brain	It controls our bodies, our thoughts, our dreams – but what do we know about how the brain works?
Neurons As Cells	Find out how 100 billion cells communicate to form the basis of all our thoughts.
Neurons As Networks	How neurons work and how they help us learn.
The Nervous System	How the various components of the nervous system interact.
Developing Brain: Baby Brain	Babies' brains are a work-in-progress. Find out how they are shaped by the world around them.
Developing Brain: That's Me!	The development of self-awareness: when are we able to recognise ourselves?
Developing Brain: Theory of Mind	Discover the theory behind our unique ability to understand the thoughts and feelings of others.
Developing Brain: Tantrums	Why do toddlers throw temper tantrums? The answer is in the brain.
Developing Brain: Teenage Brain	See how the teenage brain rewires for adulthood.
The First Brain Surgeon	An introduction to the work and legacy of Dr Harvey Cushing, the world's first brain surgeon.
The Curious Case of Phineas Gage	Discover how a freak accident allowed scientists to study the function of the brain.
The Lobotomist	The history of the 'ice-pick lobotomy'.
What Is a Memory?	How does the brain store memories?
Intuition	How does intuition save us from danger?
How We Learn	Discover the best way to learn a new skill.
Can We Control Pain?	If we expect pain, does this change what we feel?
FactPack: Reflex Arcs	What are reflex arcs and how do they work?
FactPack: The Spinal Cord	What is the spinal cord and what does it do?



### Pregnancy

Fertilisation	Find out why the egg and sperm have to race against time to begin a new life.
Pregnancy: First Trimester	What happens in the first three months of pregnancy?
Pregnancy: Second Trimester	What happens between the third and the sixth month of pregnancy?
Pregnancy: Third Trimester	What happens in the last three months of pregnancy?
Birth	After nine months of pregnancy, how does the body prepare for and endure labour?
Sperm	Discover the trials sperm face getting to the egg.
Egg	What are human eggs and how are they released?
Placenta	What is the placenta and what does it do?
Medical Marvels: IVF	What is IVF and how does it work?
Medical Marvels: Ultrasound	What is ultrasound and how was it discovered?
War in the Womb	Witness the fight for nutrition between a mother and her unborn child.
Why Are We Born So Helpless?	Baby elephants can walk at birth – why can't we?
Contraception: History of the Pill	Learn how the pill has changed through time from invention to modern-day.
Chemical Contraception	Learn how chemical contraception, such as the pill or IUS, works.
Contraception: Barrier Methods	Learn how barrier methods, such as condoms and coils, work.
Factpack: Pregnancy Timeline	Find out what happens at every stage of pregnancy?

### Puberty

Introduction to Puberty	Find out how hormones affect teenage bodies and minds.
Puberty in Girls	Which hormones are responsible for changing the female body during puberty?
Puberty in Boys	Which hormones are responsible for changing the male body during puberty?
Melatonin and Sleep	Does an imbalance of melatonin make teenagers moody?
FactPack: Why Do Teens Get Spots?	Discover the biology behind spots and boils.





### Hormones

Introduction to Hormones	Find out how hormones affect the body and mind.
Winning and Losing	Discover how biology can dictate whether we win or lose.
Fight Or Flight	What happens to our bodies when we sense danger?
Melatonin and Sleep	Does an imbalance of melatonin make teenagers moody?
Cortisol and Chronic Stress	Explore how a hormone designed to help us cope with stress could damage our bodies.
FactPack: Why Do Teens Get Spots?	Discover the biology behind spots and boils.

### Senses

How We See Part 1: Eyes	A look at the structure of the human eye.
How We See Part 2: Brain	A look at how the brain functions to create focused vision.
The Senses	An introduction to the five senses and how we use them.
How We Smell	An introduction to the structure of the nose and how we use it to smell.
How We Taste	An introduction to the structure of the tongue and how we use it to taste.
How We Touch	An introduction to how skin helps us feel pressure, pain, heat and cold.
How We Hear	An introduction to the structure of the ear and how we use it to hear.
How We Balance: Part 1	An introduction to how our ears help us balance.
How We Balance: Part 2	Find out how the brain, eyes, skin and muscles help us balance.
Looking into the Future	Sometimes we can see things before they have happened – is this down to instinct?
Animal Senses	Animals share many of our senses, but use them in very different ways – why?
Synaesthesia	Why do some people see smells and hear colours?
Test Your Vision	Can you pass the vision test?
Why Do I Get Travel Sick?	Learn how the brain and the senses detect motion.
What Are Goosebumps?	An introduction to the body's in-built thermostat system.



### Fitness

Insulin and Diabetes	What is diabetes and how does it affect the body's insulin supply?
What Is Fitness?	Discover the three methods used to measure our levels of fitness.
Obesity	What is obesity and how can you tackle it?
Why Is Fat So Hard to Shift?	Why is it easier to put on weight than to lose it?

### Nutrition

Balanced Diet	Which foods should form part of a healthy diet?
Healthy Beauty	How does your diet affect your appearance?
Malnutrition	Discover the biggest risk to health worldwide.
Life Cycle Nutrition	What key nutrients are required by our bodies at each stage in life?
Vitamin Deficiencies	The investigation which revealed the shocking impacts of a vitamin deficient diet.

### Substance Misuse

Harmful Drugs	Find out why recreational drugs can be very harmful.
Alcohol and the Brain	In what ways can alcohol damage the brain, and who is likely to be affected?
Drugs and the Brain	How do psychoactive drugs affect brain function?
Harmful Drugs: Cannabis	What are the hidden dangers of cannabis?
Harmful Drugs: Cocaine	How does cocaine affect the mind and body, and why is it so dangerous?
Harmful Drugs: Heroin	Why is heroin considered the most harmful drug of all?
Harmful Drugs: LSD	What is LSD, and what does it do to our senses?
Harmful Drugs: Ecstasy	How does Ecstasy affect our bodies, and what are the implications?
Alcohol: The Poison	Alcohol is toxic to humans. How does this poison affect our bodies?
What's in a Cigarette?	Discover the effects of the 4000 chemicals contained in cigarettes.
Science of Addiction	Why do some people become addicted to drugs?



**Health and Disease**

Healthy Teeth	What causes tooth decay and how can you avoid it?
Germs and Hygiene	Germs are all around us – what are the risks and how can we protect ourselves?
Antibiotics	How do antibiotics protect us from harmful bacteria?
Sexually Transmitted Infections	Discover the dangers and symptoms of sexually transmitted infections.
Eradication of Polio	The story of how two men developed a vaccine that would save thousands of children’s lives worldwide.

*“ Twig’s aimed at the teenage mind – short, sharp, high impact – it keeps them interested ”*



- Teacher

# Biology

Adaptation  
and Evolution



Cells  
and DNA



Ecosystems



Plants





### Adaptation

Adaptation	Discover how organisms thrive in particular environments due to adaptation.
Variation	See how variation allows certain organisms to thrive in different environments, and makes each individual unique.
Life in the Freezer	Find out why in even the coldest places on the planet there is life.
Life in Hot Deserts	Find out why in even the hottest, driest places on the planet there is life.
Predators and Prey	The hunters and the hunted – explore the adaptations that help them survive.
Bizarre Adaptations	A look at the weird and wonderful adaptations species have developed in order to survive.
Sexual Selection	How do individuals ensure they attract the attention of the opposite sex?
FactPack: Classification	How and why do we group life forms into classifications?
FactPack: Deadliest Animals	What is the deadliest animal on Earth?
FactPack: Super Predators	Can you guess which predator is being described?
FactPack: Super Prey	Discover the surprising ways animals can protect themselves against predators.

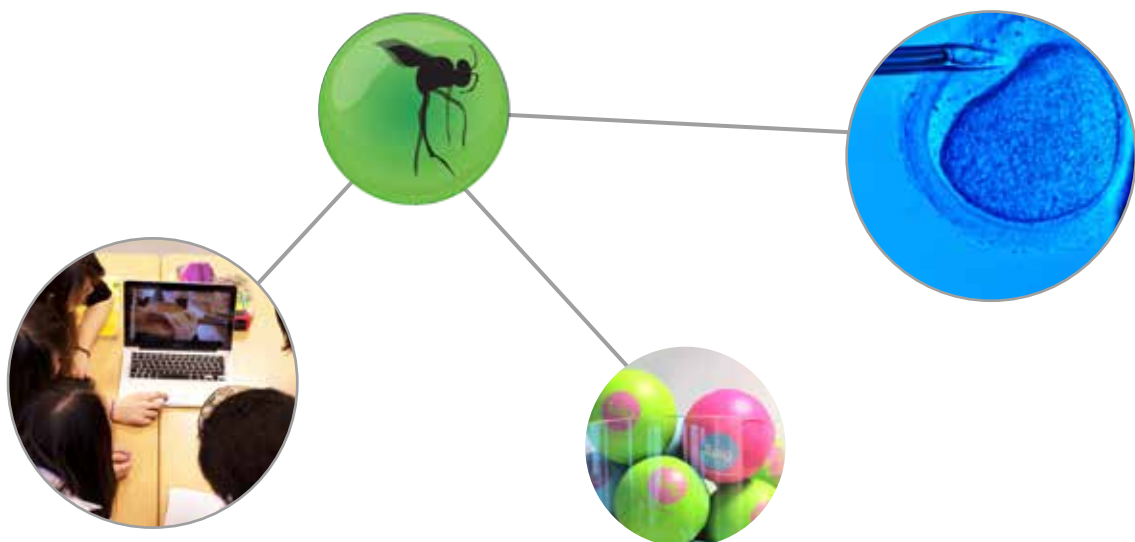
### Extinction

Extinction	How does a species become extinct?
Fossil Evidence	How can evidence of evolution be found in stone?
Mass Extinction: Dinosaurs	What killed the dinosaurs?
A History of Mass Extinctions	There have been five mass extinctions on Earth – will humans cause the sixth?
Endangered Species	An astounding number of animal species are under threat of extinction.
Big Al	The story of one of the most complete dinosaur skeletons ever found.
FactPack: Endangered Species	Where in the world are there an estimated 12,000 captive tigers?



### Evolutionary Theory

Natural Selection	An introduction to the Theory of Evolution.
Mechanisms of Evolution	Explore the processes which drive evolution: mutation, natural selection and genetic drift.
Chimps: Our Closest Relatives?	How similar are humans to chimps?
Evolution: The Evidence	Do fossils provide evidence of evolution?
Origin of Species	How are new species created?
Darwin's Dilemma	The story of Charles Darwin and The Origin of the Species.
Man's First Ancestors	Which species of apeman was the first to walk on two legs, and why?
Habilis and Boisei	Discover why two million years ago Africa became a crossroad in the Evolution of man.
Homo Ergaster	What was one of the most important discoveries in the evolution of man?
Homo Sapiens	Discover the great development in human evolution, which led Homo sapiens to triumph over Neanderthals.
Evolution of Man: The Evidence	Discover why studying the fossils of our ancestors is a crucial tool in detecting changes to the human brain.
Early Man and Agriculture	Discover why learning how to farm changed the course of human evolution forever.
FactPack: Primitive Species	Discover the species that have stopped evolving.
FactPack: Selective Breeding	Find out which vegetables have been selectively bred by man.





### The Cell

What Is a Cell?	An introduction to the building blocks of life – cells.
Cell Division: Mitosis	Where do new cells come from?
Cell Division: Meiosis	How are sex cells formed?
What Is Cancer?	Find out why cancer causes more deaths worldwide than any other disease.
The Cell Membrane	How do cells protect themselves from the external environment and take the nutrients they need?
The History of the Microscope	How were microscopes invented?
The Very First Cell	How did life on Earth begin billions of years ago?
Different Types of Cell	How many types of cell are there, and what do they do?
FactPack: Enzymes	What are enzymes?

### DNA

What Is DNA?	Find out how DNA makes us unique.
How Does DNA Make Protein?	The function of DNA – to carry genetic code that makes proteins.
DNA and Crime	Find out how DNA profiling helps solve crimes.
Discovery of DNA	Learn how the race to discover the structure of DNA was won.
FactPack: DNA	Find out why DNA is the blueprint for life.



### Genetics

Inheritance: Part 1	The genes we inherit make us who we are – how does this happen?
Inheritance: Part 2	Discover the difference between dominant and recessive genes.
Dogs and Wolves: Nature Or Nurture?	Can wolf cubs be raised to behave like domestic dogs?
Breeding and Behaviour	Can Russian silver foxes be domesticated?
Mendel and Inheritance	Learn how an Austrian monk laid the foundations for modern genetic science.
Huntington's: The Disease	Discover the cause and symptoms of the degenerative neurological illness Huntington's disease.
Huntington's: The Dilemma	Would you want to know if you were at risk of developing Huntington's disease?
Cystic Fibrosis	How does a single genetic mutation cause the immune disease cystic fibrosis?
FactPack: Hybrid Animals	Ever heard of a zorse? Discover the breeds created by man, not nature.
FactPack: Fruit Flies	Discover why the fruit fly is used in scientific experiments.

### Using Genetics

Genetic Modification	Should scientists manipulate the genetic information of cells?
Cloning	Discover the process of making identical genetic copies.
Stem Cells	What are stem cells and what makes them unique?
Therapeutic Stem Cells	An introduction to the science and controversy surrounding stem cell therapy.
The First Human Clone	When will we see the first human clone, and should we make one at all?
The Genius Sperm Bank: Part 1	Meet the American millionaire behind the Genius Sperm Bank.
The Genius Sperm Bank: Part 2	Meet the babies created by Robert Graham's Genius Sperm Bank.
Saviour Siblings	Should we create a new life in order to save an existing one?
Dolly the Sheep	Controversial birth of the world's first cloned animal.
FactPack: Twins	Learn why not all twins are identical.



**Immune Defence**

Immune Defence: Part 1	What is your immune system and how does it work?
Immune Defence: Part 2	What are antibodies?
HIV/AIDS: Immune Evaders	What makes HIV/AIDS such a deadly virus?
Smallpox: The First Vaccine	Introducing the science behind the eradication of one of the world's most lethal diseases.
Pandemic Viruses	How do viruses invade our bodies and spread through communities?
Pandemic Viruses: SARS	This contagious disease caused worldwide panic – but what is SARS?
Bee Stings	What happens in the human body after a bee sting?
Tumours: The Kill or Cure Virus	Can we use a virus as a cure? An extraordinary story of pioneering medical research.
FactPack: Bacteria	How can a single cell kill or cure?
FactPack: Viruses	Are viruses alive?

*“It’s good watching Twig at home... you can watch again and again... and tell your Mum and Dad and they’re like ‘How did you know that?’”*



- Pupil

**Energy and Growth**

Photosynthesis	How do plants convert sunlight into usable energy and form the basis of all food chains on Earth?
Plant Transport	From roots to leaves, discover the water and mineral transport systems in plants.
Parasitic Plants	Discover the plants that steal from other plants in the fight for survival.
Carnivorous Plants	The extraordinary meat-eating plants which consume animal prey.
Plants and Medicine	Discover how plants can be used to ease pain and treat disease.
Plants and Medicine: Aspirin	Discover the long history of the 'wonder drug' aspirin.
Tropisms and Hormones	Plants grow towards light or water – how?
What Plants Need to Grow	We know plants need water and sunlight, but what other nutrients are vital for survival?
FactPack: Non-Edible Crops	Find out which common plant crops are not destined for your plate.

**Plant Structure**

Parts of the Plant: Leaves	Discover the role leaves play in the life cycle of plants.
Parts of the Plant: Flowers	What role do flowers play in plant reproduction?
Defensive Plants	Plants cannot run away from predators – so how do they protect themselves?
Plants in Extreme Environments	Discover how some plants have adapted to live in the world's most extreme environments.
FactPack: Amazing Plants	What are the smallest, biggest and oldest plants in the world?
FactPack: Power of Plants	Discover the unlikely sources that provide medical cures.

**Plant Life Cycles**

Sexual Reproduction in Plants	How does pollen travel between flowers?
Asexual Reproduction in Plants	Discover the plants that can reproduce by themselves.
Plant and Animal Mutualism	Witness the unlikely relationships between plants and animals, and how it helps them survive.
Plant Mimics	The ingenious plant species that mimic other life forms in order to survive.
Oak Life Cycle	Witness 1000 years in the life of an oak tree.



### Ecosystems

The Taiga Forest	What lives in the largest land ecosystem on Earth?
Redwoods	Discover some of the oldest and largest organisms on Earth.
Deciduous Forests	Discover the dramatic seasonal changes that occur in this habitat.
Tropical Rainforests	From forest floor to canopy, discover one of the world's most diverse ecosystems.

### Changing Ecosystems

What Is an Ecosystem?	Learn about the interdependence of living and non-living things.
What Is Biodiversity?	Find out why biodiversity is vital to life on Earth.
Algae	Did you know algae are one of the most important plant species on Earth?
Lichen: Indicator Species	Discover why lichens can indicate the good or poor health of ecosystems.
Migration: Reproduction	Take the epic journey from the Pacific to Alaska with the Great Salmon Run.
Migration: Predation	Take the epic journey from the Antarctic to Africa with the Great Sardine Run.
Migration: Seasons	Follow the Great Wildebeest Migration across the Serengeti.
Biotic Factors in Ecosystems	What happens if you introduce a new species into an ecosystem?
Abiotic Factors in Ecosystems	What happens if you alter the non-living factors of an ecosystem?
Conservation	Why is conservation important?
Invading Plant Species	Discover the potential devastation caused by invading plants.
Invading Animals: The Cane Toad	Witness the impact the South American cane toad has on Australian life.
FactPack: Bird Migrations	Just how far do some birds fly?
FactPack: Amazing Migrations	Why do animals and insects migrate?



### Land Biomes

Tundra	Discover what survives in Earth's coldest biome.
Temperate Grassland	Meet the herds that inhabit one of Earth's most diverse biomes.
Savannah	Learn about life in the extreme climates of the Savannah.
Tropical Rainforest	Discover how the world's most diverse ecosystems work, from canopy to forest floor.
The Taiga Forest	Find out what lives in the largest land biome on Earth.
Deciduous Forests	Witness how seasonal changes affect the trees and wildlife in this biome.
Deserts	Discover why deserts are so dry.

### Ocean Biomes

Oceans: Sunlight Zone	Discover the abundance of life near the surface of the ocean.
Oceans: Coral Seas	Discover the largest living structures on our planet.
Oceans: The Deep Blue	What strange creatures live in the dark depths of the ocean?
Oceans: The Abyss	How does life exist in the most inhospitable habitat on Earth?
Oceans: The Intertidal Zone	Meet the plants and animals which live in the ever-changing intertidal zone.
Oceans: Frozen Seas	Meet the creatures living above and below the ice in our planet's polar seas.

### Food Chains

What Is a Food Chain?	Journey through a food chain, from primary producers to consumers.
The Nitrogen Cycle	Learn how nitrogen is recycled between the atmosphere, the ground and living
Fungi	Neither plant nor animal discover why fungi are a separate classification of
Oceanic Food Chain	Explore the cycle of marine life, from the smallest animal to the biggest.
Bioaccumulation in Food Chains	Investigate the effects of industry on the food chain of the peregrine falcon.
Symbiosis: Mutualism	Find out how different species of animal depend on each other.
Symbiosis: Parasitism	Discover how lice and tapeworms use the human body.
FactPack: Mercury in Food Chains	How does mercury fit in the food chain?

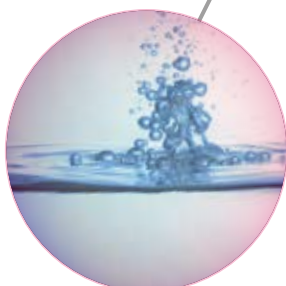
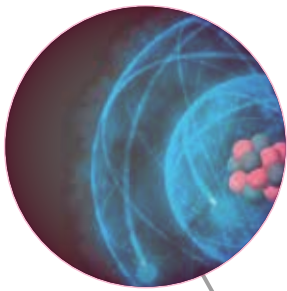
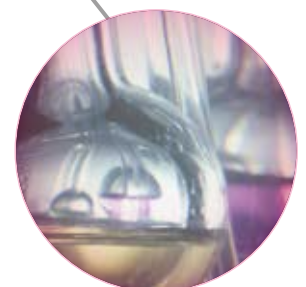
# Chemistry

Atoms and  
Bonding



Chemical  
Industries

Periodic  
Table



**Atoms**

What Is an Atom?	Everything is made of atoms – but what are atoms made of?
Atom Structure: Electron Shells	How does the atomic structure of elements affect their reactivity?
Flame Colours and Fireworks	How are different colours of fireworks created?
Flame Colours and Spectroscopy	How can looking through a prism help us identify elements?
Northern Lights	What causes the Northern Lights?
Heavy Water	Why did World War Two allies sabotage the Nazi's use of heavy water?
Discovery of the Atom	Who discovered the structure of the atom?
FactPack: Scale of the Atom	How small is an atom?
FactPack: Structure of the Atom	How has our understanding of atomic structure changed over time?

**Chemical Bonds**

Introduction to Chemical Bonding	An introduction to how elements combine.
Ionic Bonding	Discover how metals and non-metal elements form compounds.
Covalent Bonding	Discover how non-metal elements form compounds.
Metallic Bonding	Discover how metal elements form compounds.
Carbon: Introduction	What are the different forms of carbon and how are they created?
Carbon: Synthetic Diamonds	Is it possible to create diamonds in a laboratory?
Carbon: Buckminsterfullerene	Introducing a little known natural form of carbon.
Nanotechnology: What Is It?	An explanation of a revolutionary technology.
Nanotechnology: Is It Safe?	Is there a dark side to nanotechnology?
Carbon Monoxide Poisoning	What makes carbon monoxide the 'silent killer'?
FactPack: Elements, Compounds and Mixtures	What makes something a compound, an element or a mixture?



<b>States of Matter</b>	
Changing States of Matter	How does matter change into different states?
Solids, Liquids and Gases	Discover the three states in which all matter on Earth exists.
Solutions	Discover how the physical process of dissolving happens and why.
Salt: Salt and Ice	Discover why salt is used to treat icy roads.
Intermolecular Forces	Discover the hidden forces fundamental to the state of matter.
Salt: Separating Mixtures	How is salt collected from the oceans and Earth?
Non-Newtonian Liquids	Discover the extraordinary liquids which defy explanation.
How Do Snowflakes Form?	How do water molecules form these beautiful, delicate structures?
How to Make Fake Snow	An introduction to the technology that makes snow indoors.
Water Forces	Discover the special forces that allow some animals to walk on water.
Forensics: Tools of CSI	How forensic scientists can link a criminal to a crime scene using only broken glass, fibres and a footprint.
Forensics: DNA Profiling	An introduction to revolutionary technique that can prove innocence, or catch a killer.
Forensics: Bog Bodies	Discover how preserved bodies can help forensic scientists understand our ancient past.
Forensics: Chromatography	How can colours help us solve crimes?
FactPack: Forensics	How do detectives discover the identity of victims?

**Food Basics**

Food Basics: Carbohydrates	Why are carbohydrates such a good source of energy for our bodies?
Food Basics: Fats	Did you know that fats can be good as well as bad?
Food Basics: Proteins	Find out why almost most every process in your body involves protein.
Fermentation	Did you know bacteria, yeast and mould are vital in the production of common foods?
Omega-3: Healthy Fat?	Learn how one man's extreme diet led to an important discovery about omega-3 fatty acids.
What Is a Calorie?	What are calories, and why do we need them to survive?
How Do Carb-Free Diets Work?	Can we survive without carbohydrates?
Ripening Fruit	How do supermarkets ripen green bananas?
Salt: Food Preservative	Find out why an ancient discovery is still used in food preservation today.
Natural versus Artificial	Are all natural chemicals good for us, and all artificial chemicals bad?
Nitrates: Food Preservatives	Learn how one chemical can have two very different uses.
FactPack: Energy Drinks	Find out about the ingredients and effects of energy drinks.

**Oil Products**

Fractional Distillation	How is crude oil converted into valuable products?
Plastics and Polymers	How are different plastics, from shopping bags to dustbins, made?
Esters and Perfumes	Discover the science behind pleasant smells.
Recycling Plastics	An introduction to the different methods for recycling plastics.
Vegetable Oils as Fuel	How can the oil we cook with also be used as fuel to run a car engine?
Leaded and Unleaded Petrol	Why was lead banned from petrol?
Invention of Nylon	An introduction to the discovery and uses of nylon.
FactPack: Hydrocarbons	The difference between alkanes and alkenes.



**Discovering Elements**

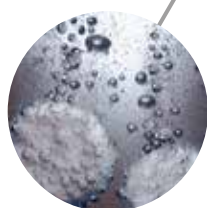
Introduction to the Periodic Table	An introduction to the method of ordering of the elements according to their properties.
Atomic Structure	Explore the Periodic Table and discover what it tells us about each element.
Mendeleev's Prophecy	Find out why the element gallium had been predicted even before it was discovered.
Discovery of Phosphorus	Witness the unusual experiments which led to the discovery of phosphorus.
The Curse of Phlogiston	Discover the theory which hindered Chemistry for centuries.
Phlogiston and Oxygen	How the discovery of phlogiston and oxygen changed chemical theory forever.
The Legacy of John Newlands	Introducing the scientist who found music in the elements.
We Are All Made of Stars	Discover how all the elements on Earth were created.
FactPack: How to Make a Human	What elements are needed to make a human?

**Metals**

Transition Metals	What are the unique properties of metals in the transition group?
Alkali Metals	Alkali metals have distinct properties – what are they?
Reactivity Series	How has man discovered and used reactive metals through history?
Metals in Medicine	Discover the metals used to heal the human body.
Alloys	How do we use alloys in everyday life?
The Elements: Copper	An introduction to copper and its uses.
The Elements: Mercury	An introduction to mercury and its unique properties.
The Elements: Potassium	An introduction to potassium and its unique properties.
The Elements: Silicon	An introduction to silicon and its uses.
The Elements: Iron	An introduction to iron and its uses.
The Elements: Lead	An introduction to lead and its role throughout human history.
The Elements: Uranium	An introduction to uranium and its uses.
The Elements: Plutonium	An introduction to plutonium and its unique properties.
The Elements: Radium	An introduction to radium and its uses.

**Non-metals**

The Halogens	What are the unique properties and uses of the halogen elements?
The Noble Gases	Discover the properties and uses of the noble gases.
The Elements: Oxygen	An introduction to oxygen and its uses.
The Elements: Phosphorus	The unusual experiments which led to the discovery of phosphorus.
The Elements: Hydrogen	An introduction to hydrogen and its uses.
Hard and Soft Water	Discover the hidden minerals in water that affect its usefulness.
FactPack: Atmospheric Gases	What gases make up Earth's atmosphere?

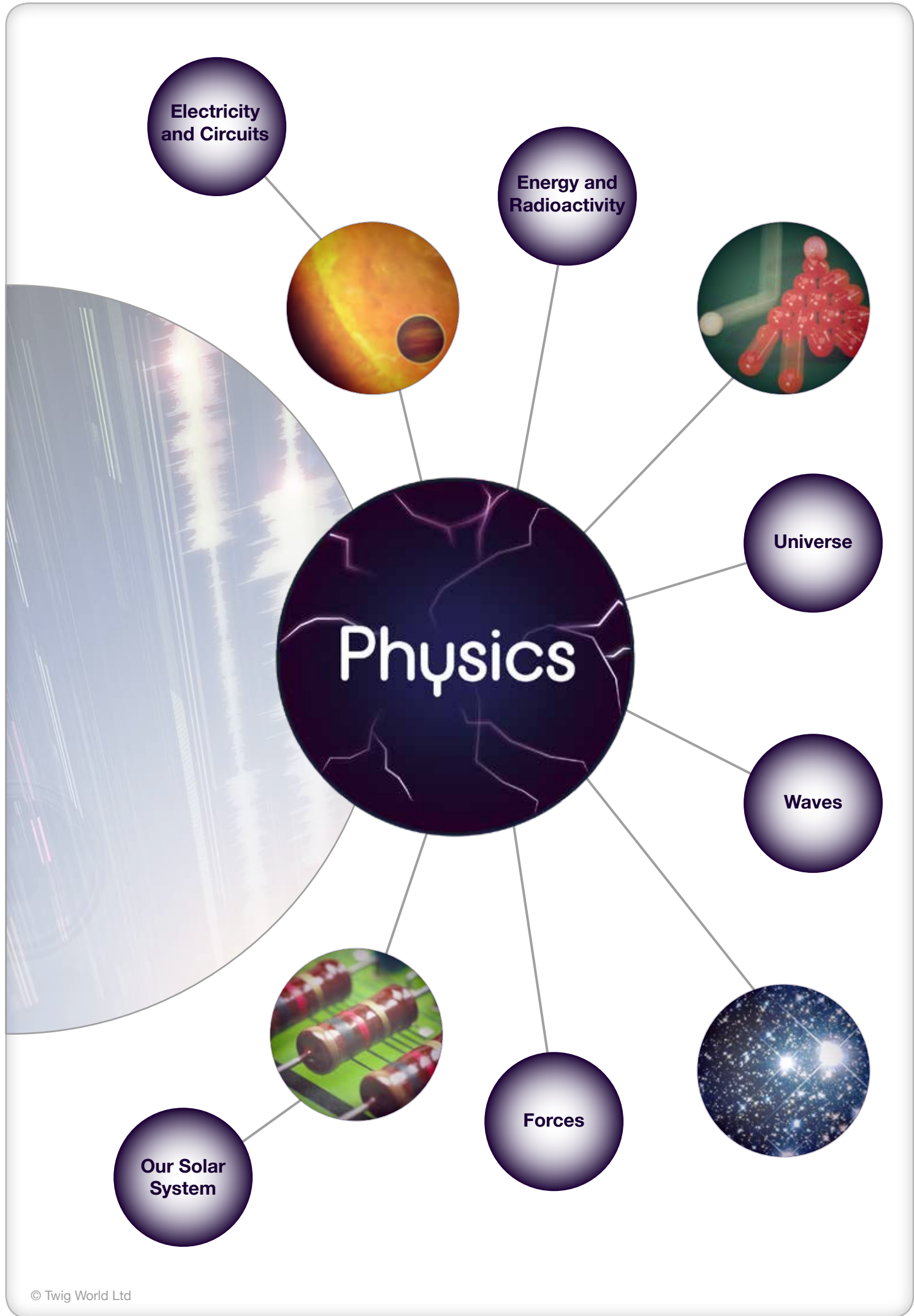


### Acids and Bases

Acids and Alkalis: Part 1	What are acids and alkalis? Explore the extremes of the pH scale.
Acids and Alkalis: Part 2	Discover the importance and uses of neutralisation reactions.
Crystals in Caves	What role does rain water play in creating crystals in caves?
First Synthetic Pigment	How were synthetic paints first created?
Why Do Leaves Change Colour?	What are the chemical reactions that produce vibrant leaf colours throughout the seasons?
FactPack: pH Scale	Can you guess the acidity or alkalinity of five solutions?

### Energy Changes

Energy Change of Reactions	What are exothermic and endothermic reactions, and how do they differ?
Rates of Reaction: Basics	How is the speed of a chemical reaction measured and changed?
Collision Theory	How do particle collisions affect the rate of chemical reactions?
Electrolysis	What is electrolysis, and how does it work?
Redox Reactions	Discover how metals are extracted from their natural ores.
Oxidation Reactions	Find out how oxidation can be useful as well as harmful.
Nobel and Dynamite	Did you know the man who famously founded the Nobel Peace Prize also invented dynamite?
Oxygen and Combustion	What is combustion and why is it essential to life on Earth?
Extraction of Aluminium	Discover the immense power and heat needed to extract aluminium from its ore.
How Do Fireworks Work?	Discover the various chemical reactions at play in the creation of spectacular fireworks.
The Hindenburg Disaster	What caused the famous airship to explode?





**Circuits**

Circuits	Why are circuits vital for electrical currents?
Resistance	What is resistance, and why is it both useful and a hindrance?
Diodes and Transistors	Introducing the simple devices that have revolutionised technology.
Moore's Law	Was the rapid advancement in computing power predicted?
Hi-Fi Engineering	How do hi-fi speakers convert electrical signals into sound waves?
Rock Star Shock	Revealing the potentially deadly dangers of electricity through the story of a tragic accident.
Electric Eels	How does the eel harness the power of electricity?
FactPack: How to Draw a Circuit	Discover the universal symbols used in circuit design.

**Electricity**

What Is Electricity?	We all use electricity every day but what exactly is it?
AC, DC and Transformers	Discover why power is lost from electricity lines, and how transformers tackle this problem.
Electrical Safety	How can you protect yourself against electric shocks?
Static Electricity	Discover the hidden dangers of static electricity.
War of the Currents	Find out how a battle to supply electricity across the USA led to the invention of the electric chair.
Electricity in Medicine	Witness how electricity is used to save lives.
Thermal Imaging	How can a heat-seeking camera and helicopter help keep your lights on?
FactPack: Global Electricity Supply	How do different countries around the world generate their electricity?

**Magnets**

What Are Magnets?	Explore the many uses of magnets.
What Are Electromagnets?	Discover how combining electricity with magnetism can create a useful tool.
How Do Generators Work?	Explore the simple principle that brought electricity into everyday use.
Maglev Trains	Discover the train that defies gravity.
MRI	See how a magnetic machine allows doctors to see inside us.
Earth's Wandering Poles	What would happen if the North and South Poles switched?



**Energy**

Forms of Energy	What forms does energy take?
Energy Transformation	Discover how energy is recycled into different forms.
Potential Energy	Discover the three ways in which energy can be stored.
Steam Power	How do steam engines use heat to produce motion?
The Energy of Formula 1	Introducing the energy-converting engine that powers Formula 1 cars around the track.
Perpetual Motion	Is there a machine that can power itself forever?
FactPack: Horsepower	Find out how one man used horses to measure energy use.

**Heat**

Heat Transport	Discover the three ways heat energy can travel.
Laws of Thermodynamics	Discover the fundamental principles of energy use.
Expansion and Contraction	Why does heat cause objects to change shape?
Red Hot: Emergency Stop	Find out how the everyday process of braking uses extraordinary energy conversion.
Hot Air Balloons	How is flight made possible with little more than hot air?
Cavitation	Witness the tremendous damage that can be caused by tiny air bubbles.
The Race for Absolute Zero: Liquefying Gas	Discover how scientists reached supercool temperatures in the race to liquefy gases.
The Race for Absolute Zero: Laser Cooling	Discover how lasers were used to create the coldest temperature ever recorded.
FactPack: Extreme Temperatures	What are the hottest and coldest temperatures on Earth?

**Radioactivity**

Radioactive Substances	What makes a material radioactive?
Radioactive Half-Life	Will a radioactive material always be radioactive?
Reducing Radiation Risk	How can we work safely with radioactive materials?
Nuclear Fusion: The Hot and Cold Science	Can nuclear fusion be achieved through two methods?
Nuclear Weapons	Witness the science behind the most destructive weapons ever created.
Nuclear Fission	How can energy be released from within atoms?
FactPack: Background Radiation	What radiation do we live with every day?



### Applying Force

Forces of Nature	Discover the four fundamental forces of nature which hold our Universe together.
Friction	Learn about friction, and how it affects us. Too little and we fall – too much and we struggle to move.
Centripetal Force	Discover the forces that control turning and rotation.
Streamlined: Dolphins vs People	Discover how streamlining affects animals' ability to swim.
Aerodynamics in Cycling	Discover how cyclists can manipulate forces to help them to win a race.
Friction in Curling	Discover the ingenious ways curlers use friction in their sport.
Rollercoasters	How do forces combine to create a thrill-packed ride?
Lever, Wheels, Pulleys	How do these simple machines work?
Planes, Wedges, Screws	How do these simple machines work?
Machines: Building the Pyramids	What machines did the Ancient Egyptians use to build the Pyramids of Giza?
Fighter Pilots: G-Force	Learn why fighter pilots must undergo special training to cope with acceleration.
FactPack: Experience Friction	Play along and experience friction first hand.
FactPack: G-Force	How much G-force can a human stand?

### Newton's Law

Newton's Laws of Motion	Discover the physical rules which dictate how objects move.
Speed, Velocity, Acceleration	What is the difference between speed, velocity and acceleration?
Momentum	Discover why some moving objects won't stop.
Terminal Velocity	What happens when you accelerate in freefall?
How Do Animals Fly?	Discover why some animals are able to fly.
How Do Planes Fly?	Discover how planes are engineered to stay in the air.
Body Crash	Discover how airbags and seatbelts can save your life.
FactPack: Acceleration	Which can accelerate faster: man-made objects or living organisms?

Pressure	
Gas Laws	What happens when gases expand?
Buoyancy	Why do objects float or sink?
The Bends	Discover the potentially lethal dangers of changing pressure.
Pressure and Surface Area	Discover the relationship between pressure and surface area.
FactPack: Pressure and Altitude	Discover the effects of extreme changes in pressure with altitude.

*“ You get engrossed in the films... I didn't really like science before but when we started using Twig, I could understand much better ”*







### Solar System

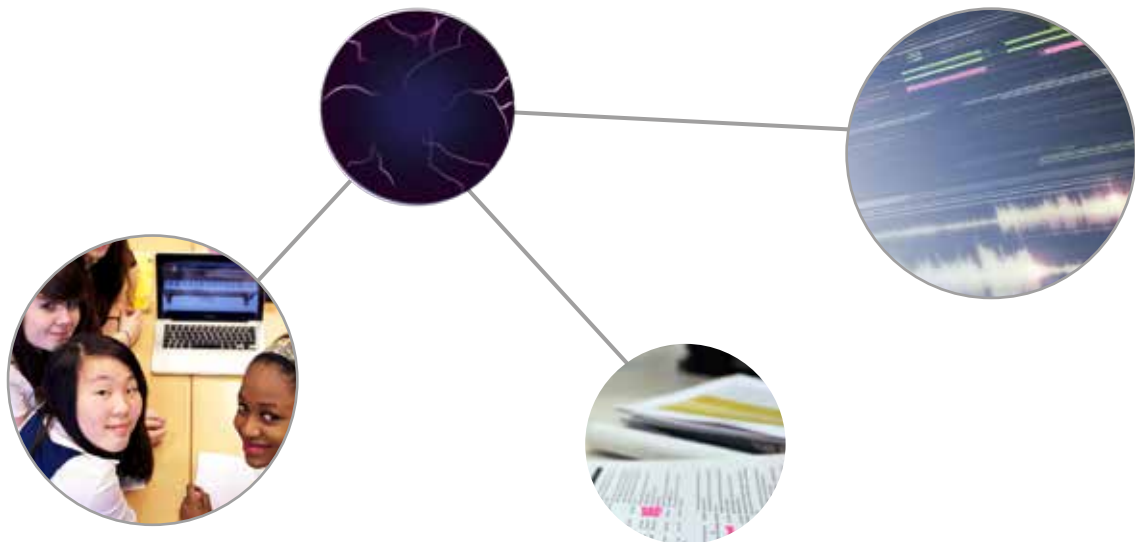
The Birth of Our Solar System	What created our Solar System?
Earth's Twin	Why did colliding with its twin prepare our planet for life?
The Goldilocks Zone	Not too hot and not too cold – why Earth is just right to support life.
How Did Saturn Get Its Rings?	Explore the mystery that plagues the brightest brains in astrophysics.
Venus 1: Atmosphere	Would probes sent to Venus discover an Earth-like planet?
Venus 2: Surface	What did the first probe find on Venus' surface?
What Are Asteroids?	An introduction to asteroids.
Mercury	An introduction to the smallest planet in our Solar System.
Venus	An introduction to the hottest planet in our Solar System.
Earth	An introduction to the planet we call home.
Mars	An introduction to our closest neighbouring planet.
Jupiter	An introduction to the biggest planet in our Solar System.
Saturn	An introduction to the Gas Giant, Saturn.
Uranus	An introduction to the seventh planet from the Sun.
Neptune	An introduction to the eighth planet from the Sun.
What is an Orbit?	All planets orbit the Sun, thanks to gravity.
FactPack: Moons	Find out about the moons of other planets.

### Sun and Stars

The Sun	Journey into the Sun and discover why all life on Earth depends upon it.
Day and Night	What makes it day or night?
What Are Stars?	Find out how stars are born, how they live and how they die.
Why Is the Sky Blue?	From blue horizons to red sunsets, what creates the colour of the sky?
What Are Eclipses?	What causes solar and lunar eclipses?
Northern Lights and Solar Flares	Witness the Sun's role in creating the beautiful Northern Lights.
Shadow Chasers	Meet the party-people who gather to see and study eclipses.
Constellations	Learn how we give meaning to the patterns of stars in our sky.
Death of the Sun	Explore the future life and death of the Sun.

**The Moon**

The Moon	What makes a moon?
The Moon and Its Effect on Life	Could the Moon affect reproductive cycles on Earth?
The Moon and Spring Tides	The effect of the Moon on daily and extreme tides.
Dark Side of the Moon	Journey to the mysterious unseen far side of the Moon.
Life Without the Moon?	Why the Moon is vital for life on Earth.
Man on the Moon: Part 1	The extraordinary story of the Apollo 11 lunar landing, and how 'one giant leap' nearly never happened.
Man on the Moon: Part 2	After 'one giant leap', how did man return home from the Moon?
Fly Me to the Moon	Find out how to launch into outer space.
Moon Measuring	How do we measure the distance from the Earth to the Moon?





### Big Bang

Big Bang Theory	How was our Universe created?
Big Bang Evidence	What is the evidence for the Big Bang theory?
Large Hadron Collider	Discover the machine which could recreate the Big Bang.
Nobel Prize by Chance	How a scientific 'mistake' led to one of the 20th century's greatest astronomical discoveries.
Cold War to Gamma Rays	Discover how Cold War suspicion lead the USA to discover radiation from deep space.
FactPack: Redshift	How wavelengths help measure distance in space.
FactPack: Big Bang Scientists	A brief history of the Universe through the eyes of the men who discovered it.

### Outer Space

Scale of the Universe	Discover the size our Universe from Earth to the Solar System and beyond.
Black Holes	What are black holes and how are they formed?
Milky Way's Black Hole	Is there a supermassive black hole at the centre of our Galaxy?
Telescopes	How do telescopes work and how have they developed through history?
Hubble Space Telescope	Why did the eight year project to build the Hubble Telescope nearly fail?
How Are Mirrors Made?	The amazing techniques used to make some of the world's largest mirrors for telescopes.
The Search for Dark Matter	Why scientists are venturing underground in the hunt for particles that bind our Universe together.
What Is a Light Year?	Why do we measure distance in terms of time?
Kittinger: First Man in Space?	The story of one man's quest to reach space in his hot air balloon.

### Satellites

Shoemaker-Levy	The story of Shoemaker-Levy 9 – one of the most important comets in modern astronomy.
The Satellite Story	What is a satellite?
What Is GPS?	Find out how Global Positioning System (GPS) satellites tell us where we are on Earth.
What Are Comets?	An introduction to the comets orbiting our Sun.



**Life in the Universe**

Mars: Dead Planet	Discover the size our Universe from Earth to the Solar System and beyond.
Mars: The Search for Water	Is there water on Mars?
Planet Hunters	Meet the Planet Hunters.
Mars: Under the Ice	Discover why studies of Antarctica suggest there could be life on the red planet.
Next Stop Mars	As the Sun dies and gets hotter, will we need to move and bring life to the red planet?
Place Like Home: Life On a Moon	Could this moon hold the key to life on Earth?
Colonising the Moon?	Could we colonise the Moon, and who would get there first?
SETI: Are We Alone?	Has the SETI project detected extraterrestrial life?
Place Like Home: Cassini	Introducing the mission to reach Saturn's moon.
Planet Kevin	The story of Kevin, a student who managed to discover his own planet.
Life in Space	Can life survive in the vacuum of space?
Place Like Home: Inside a Probe	Learn how scientists overcame the difficulties of landing a probe on Saturn's moon.



### EM Spectrum

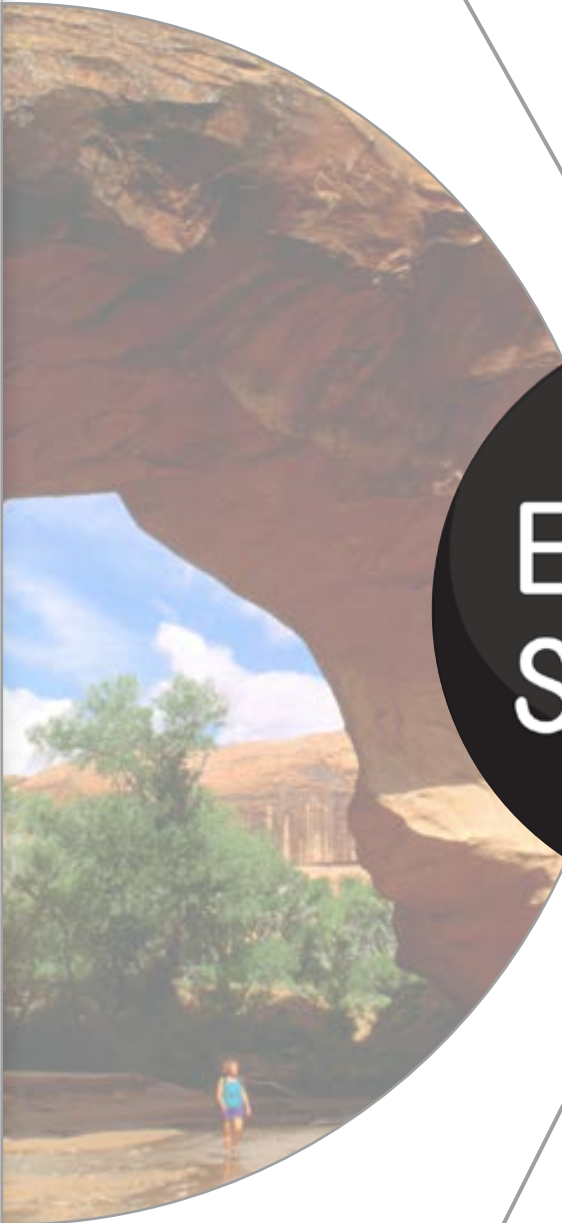
The Electromagnetic Spectrum?	Electromagnetic radiation is all around us, but what is it?
What Makes Up the Electromagnetic Spectrum?	What are the different types of radiation that make up the electromagnetic spectrum?
Waves in Medicine	Why the highest energy radiation in the electromagnetic spectrum can be very useful.
Infrared: Snake Hunt	Discover the extraordinary adaptation which allows snakes to hunt in near darkness.
How Do Mobile Phones Work?	Why are microwaves perfect for communication using small mobile phones?
Submarine Communication	How and why are radio waves used in underwater communication?
FactPack: Animal Vision	How do animals view the world differently?

### Sound

What Is Sound?	How and why do we hear different noises?
Speed of Sound	What factors determine how fast sounds travel?
Resonance	How does sound change as it passes through different mediums?
Doppler Shift	Discover how sound changes when objects move.
Beyond Human Hearing	Discover the sounds we can't hear and why they can be useful.
Shockwaves	Witness the destructive effects of supersonic speed.
Musical Instruments	What distinguishes music from noise?
Echolocation: Dolphins	How do dolphins use sound to navigate?
FactPack: Decibel Range	How loud is too loud?

### Visible Light

What Is Light?	Discover how light allows us to see the world and provides vital energy needed for life on Earth.
Colour	Red, green, yellow, blue – what makes colours different from each other?
Manipulating Light	What happens when light hits an object, or moves through different mediums?
How Do Lasers Work?	How can light be powerful enough to cut through metal?
Fibre Optics	How can light be harnessed to transport information?
Time Travel	We can move freely through space, but is it possible that we could do the same through time?
FactPack: Colour Mixing	Revealing the different ways colour can be made.



Earth's Resources



Human Impacts



# Earth Science

Geology



Weather

**Non-renewable Energy**

Fossil Fuels: Formation	How the fossil fuels we use today were formed over millions of years.
Fossil Fuels: Use	Why and when finite fossil fuels will be used up.
The Carbon Cycle	Learn how the constant biochemical exchange of carbon is vital to life on Earth.
Oil Shocks	What causes dramatic shifts in oil prices?
Electricity: Supply and Demand	Discover the difficult balancing act to meet energy needs.
Electricity: The Costs	Low electricity prices encourage higher consumption – but what is the true cost?
Frontier Oil Exploration	How far will we go to find oil?

**Renewable Energy**

Solar Power	Can we capture the Sun's energy?
Wind Power	Why don't we use wind power more?
Biofuels	Are biofuels a green alternative to petrol and diesel?
Palm Oil: Biofuel of the Future?	Discover the positive and negative impacts of palm oil biodiesel.
Geothermal Power	How can we harness the heat produced deep within our planet?
The Wind Power Debate	An introduction to the pros and cons of wind farms.

**Future of Energy Resources**

Nuclear Power	Is this powerful energy resource worth the risks and controversy that come with it?
Making a Star On Earth	Is large-scale nuclear fusion possible?
Eco-Transport	What will the future car run on – electricity, biofuel or hydrogen?
Chernobyl Disaster	Discover what happened in the world's worst nuclear power plant disaster.
Nuclear Waste	Find out why we can't just throw nuclear waste in the bin.

**Water as a Resource**

Hydropower	Find out how to capture the power of water.
Water As a Resource	Examine the causes and effects of water shortages.
Building the Hoover Dam	Discover how and why the Hoover Dam was built.
Bottled Water: The True Cost	Explore the monetary and environmental costs of bottling water.
Marine Renewables	How can we harness the power of the sea?

*“...there is so much information out there. I don't have time... collating bits of information... With Twig films, it's exactly what I need. I know I won't have to edit it. It's there. I use it. Simple. Done.”*





### Earth's Structure

Structure of the Earth	See the hidden layers deep beneath the Earth's crust.
Fold Mountains: Formation	How did mountain ranges like the Alps and the Himalayas form?
Fold Mountains: Uses	What can humans use the steep, rocky terrain of fold mountains for?
How Did the - Grand Canyon Form?	How was the Grand Canyon formed, and what does it tell us about the past?
How Hot Is Earth's Core?	We can't go to the Earth's core – so how do we know how hot it is?
How Did the Continents Form?	How did early land masses change and converge to form the continents we know today?
Land Formations	An introduction to the geological forces which sculpt our landscape.
FactPack: Mountains	How tall are the tallest mountains?

### Earthquakes

What Is an Earthquake?	What causes earthquakes?
Plate Tectonics	How the Earth's moving plates cause earthquakes, volcanoes and tidal waves.
Tsunami	Discover the most destructive type of wave on the planet.
Living on the Edge	How can cities be protected from the effects of earthquakes?
Predicting Earthquakes	Can we predict earthquakes?
Earthquakes: LEDC Response	As an LEDC, how did Haiti respond to the devastating 2010 earthquake?
Earthquakes: MEDC Response	As an MEDC, how did Japan respond to the devastating 2011 earthquake and tsunami?
Santorini: Looking for Atlantis	Could the story of Atlantis be more than just a myth?

### Volcanoes

What is a Volcano?	What is a volcano and what role does lava play in its construction?
Predicting Volcanic Eruptions?	Can we tell when a volcano is about to erupt?
Yellowstone: Supervolcano	What secret is hidden in Yellowstone National Park?
Danger: Volcanic Ash	A first hand account of the dangers of flying through a volcanic ash cloud.
The Last Day of Pompeii	A dramatic re-enactment of the fateful hours after the eruption of Mt. Vesuvius in 1st century AD.
Kilauea: The Island Maker	Discover the world's most active volcano.
Volcanoes: LEDC Response	As an LEDC, how did the Democratic Republic of the Congo respond to the 2002 eruption of Mt. Nyiragongo?
Volcanoes: MEDC Response	As an MEDC, how did the United States of America respond to the 1980 eruption of Mount St Helens?
FactPack: Extreme Eruptions	Extreme volcanoes from around the world that could pose a danger to humans.

### Earth's Rocks

Rock Cycles	Nothing stands still on Earth, not even rocks.
Rock Types	How are different rocks formed?
Earthly Treasures: Gold	Why is gold revered as a precious metal?
Earthly Treasures: Diamonds	What makes diamonds so valuable?
Earthly Treasures: Precious Gemstones	How are emeralds, rubies and sapphires formed?
Limestone: Features	Limestone is one of the most commonly found rocks on Earth and it has many unique features.
Limestone: Uses	Formed over millions of years, limestone has many forms and uses.
Quarrying: Impacts	Quarries are vital for extracting rock, but what are their impacts on the environment?
Quarrying: Managing Damage	How do we manage the negative impacts of quarrying?

### River Erosion

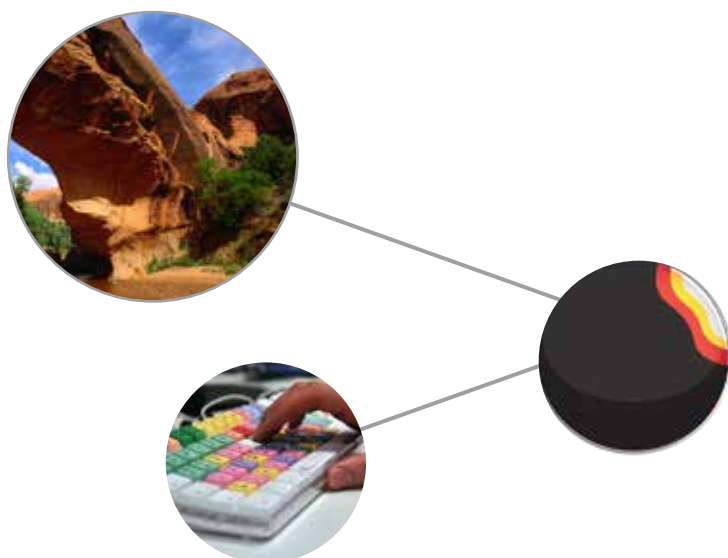
Weathering	Rocks are tough – find out why nature is tougher.
Waterfalls and Gorges	Waterfalls and gorges are some of Earth's most impressive natural features, but how are they formed?
Meanders and Oxbow Lakes	Meanders and oxbow lakes are commonly found in the middle course of a river. What are these features and how are they linked?
Depositional Features	Explore the unique features created by flooding at the end of a river's course.

**Coastal Erosion**

Weathering	Rocks are tough – find out why nature is tougher.
Coastal Processes: Waves	How do waves shape our coastline?
Coastal Landforms	An introduction to unusual coastal land formations and how they are created.
Coastal Processes	Find out how these geological processes shape our coastline.
Coasts: Hard Engineering	Explore the different ways in which these solutions to the problems of coastal erosion work – and the positive and negative effects.
Coasts: Soft Engineering	Explore the different ways in which these solutions to the problems of coastal erosion work and how they compliment natural processes.
How Do Caves Form?	What processes create caves?
How Are Rivers Formed?	Follow the formation of a river, from source to sea.

**Glacial Erosion**

Weathering	Rocks are tough – find out why nature is tougher.
Glaciers	How glaciers shape the world.
Scablands: Carved By Water	Discover how a glacial flood created 40,000 km of North America.
Yosemite’s Valleys	Journey to a landscape transformed by the power of ice.



### Changing Atmosphere

The Ozone Layer	What caused the hole in the ozone layer, and how have we successfully reduced it?
The Greenhouse Effect	Is the greenhouse effect now threatening our planet's future?
Global Warming	What is global warming and how can we stop it?
Beetles	Discover how beetles have revealed climate change throughout history.
Climate Cycles	What can glacial ice cores tell us about global climate cycles?
State of the Greenland Ice Sheet	Is the Greenland Ice Sheet growing or shrinking?
The Big Chill	Why is the most important oceanic current in the world under threat?
Climate Models	Can we predict the future of Earth's climate?
The Great Global Warming Debate: Part 1	Is the world getting warmer?
The Great Global Warming Debate: Part 2	Is global warming unprecedented or could it be a natural phenomenon?
Global Dimming	Discover the climate change paradox – why less sunlight is reaching Earth's surface.
Inventions to Save the Planet	The futuristic technology that could manipulate Earth's climate.
Clathrate Gun Hypothesis	Discover the greenhouse gas which could cause climate catastrophe.

### Pollution

Pollution: Water	Explore the causes and effects of water pollution.
Pollution: Land	Explore the causes and effects of land pollution.
Pollution: Air	Explore the causes and effects of air pollution.
Oil Spills	What is an oil spill and how can it be dealt with?
The Oilmen and the Animals	Does nature have to suffer in our search for resources?
Deforestation	Find out why destroying the rainforest could endanger the future of our planet.
Ecosystem Management: Deserts	Explore the different uses desert ecosystems are put to in MEDCs and LEDCs.
Ecosystem Management: Tropical Rainforests	Find out why the most important ecosystem on our planet needs our help.
Ecosystem Management: Deciduous Forests	Find out how conservation helps to keep these important ancient ecosystems thriving.
FactPack: Light Pollution	Learn about the environmental effects of keeping the lights on.

**Humans and the Carbon Cycle**

The Carbon Family	Get a domestic perspective on pollution. How big is the average family's carbon footprint?
Carbon Capture: Phytoplankton	Discover how mysterious micro-organisms in the oceans could save our planet.
Carbon Trading	Will government caps help industrial polluters to reduce their carbon footprint?
Carbon Capture: Artificial Trees	Investigate the artificial trees of the future.
The Future Carbon Family	How the average family can help save our planet – a domestic perspective on 'greenliving'.

*“ The best thing is that there are no old professors talking for 5 minutes! ”*



**Water**

Types of Weather: Rain	How do water molecules form rain?
The Water Cycle	Discover the cycle that began billions of years ago through which all Earth's water travels.
Cloud Seeding	How are scientists around the world making rain?
What Is a Rainbow?	Investigate the light-splitting process that forms a natural wonder.
Avalanches	What causes these giant snow slides?
Galtür: The Perfect Storm	What caused the devastating avalanche that hit the village of Galtür in Austria?
How the Oceans Formed	Where did Earth's water come from?
How Deserts Are Formed	Why are deserts so dry?
Thunder and Lightning	What happens inside storm clouds to create thunder and lightning?
FactPack: Weird Weather	Find out about some weird and wonderful weather phenomena.

**Wind**

Types of Weather: Wind	What is the wind and where does it come from?
Hurricanes	Hurricanes are destructive and powerful, but where do they come from?
Storm Surges	Discover why, during a hurricane, the ocean can be the biggest threat.
What Is a Tornado?	What do scientists know about these mysterious storms?
Hurricane Katrina: Part 1	Flood defences were designed to protect the city – so why was New Orleans devastated by Hurricane Katrina?
Hurricane Katrina: Part 2	Discover what caused the devastating floods in New Orleans.
FactPack: Beaufort Scale	How powerful is the wind?

**Weather Systems**

Weather Systems	What causes weather and how can we predict it?
Types of Weather: Introduction	Learn how the movement of air is at the heart of all weather.
Coriolis Effect	How does Earth's rotation influence our weather systems?
Climate Zones	Why does Earth's climate vary across the globe?
High and Medium-Level Clouds	Can you tell the difference between the different types of cloud?
Monsoon Zone	Discover where changes in wind direction produce the biggest rain storms on the planet.
Killer Heat Wave	The story of five days of unusually hot weather which brought disaster to the city of Chicago.
Low-Level Clouds	How do different cloud types affect our weather?
Climate Influences	What causes the world's varied climate zones?
FactPack: Superstorms	How many times a day does lightning strike the Earth?

**World Climate**

Ocean Conveyor	Discover how a super-current controls global weather.
Natural Climate Change	What do ice-cores tell us about Earth's climate history?
El Niño	Discover the natural phenomenon that produces some of the world's most chaotic weather.
Secret of the Sahara	Could the world's largest hot desert hide a secret past beneath the sands?

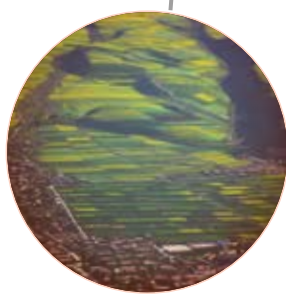


Orientation  
and  
Settlements



# Human Geography

A Changing  
World





### Mapping Earth

Ways of Looking At the World	Discover the many different ways we can survey our planet.
Ordnance Survey Maps	Learn how modern technology has transformed the way these world-famous maps are created.
The Longitude Problem	Discover how one man revolutionised maritime navigation with a watch.
Time Zones	What time is it? Well, that depends where on Earth you are!
Mapping the Sea	How do we map the sea? And why is it so important that we know what lies beneath the ocean's surface?

### Where We Live

Population: Physical Factors	How does the physical environment determine where settlements are built?
Populating the World: Migration	Learn about the human factors which determine migration patterns.
Urban Settlements	What are the common characteristics of urban settlements across the world?
Brazil: Ethnic Diversity	How has Brazil become one of the most racially diverse countries in the world?
Extreme Living: The Frozen North	How do people survive in extremely cold environments?
Extreme Living: The Sahara	Find out how NASA technology revealed a life-changing secret beneath the Sahara's sand dunes.
Extreme Living: Nomads	Discover what life is like for one of the few remaining nomadic tribes on the planet.
Settlements and Apartheid	Discover how racial segregation policies changed the face of Johannesburg.
Tuvalu: The Threat of Rising Seas	Discover why the tiny island nation of Tuvalu might soon disappear forever.

### Town vs Country

Settlement Resources	Which infrastructures are vital to creating sustainable settlements?
Urban Land Use Models	Learn about models which explain the layout of urban settlements.
Rural Settlements	Discover how rural settlements are changing in the face of Urbanisation.
Rural-Urban Fringe	Where the city meets the country is called the Rural-urban fringe. What are the distinctive characteristics of this area?
Rural Deprivation	Why are many rural areas around the world in decline?
Protecting St Paul's	Discover the urban planning laws that maintain London's historic skyline whilst allowing modern developments.
Brownfield Sites	What are Brownfield sites, and do they provide an answer to housing shortages?

**Travel and Migration**

Census: Counting People	Why do we need to know how many people live in a country?
Butler's Tourism Model	The life of a tourist resort passes through six distinct stages which are shown in Butler's Tourism Model.
China's Mass Migration	Find out why rural farmers in China are heading for the bright lights of Shanghai.
Illegal Immigration: Crossing the Sahara	The dangers faced by illegal immigrants seeking a way into Europe.
Hawaii: Impacts of Tourism	The positive and negative impacts of global tourism on the people of Hawaii.
Namibia: Ecotourism	Can global tourism and local interests coexist successfully?
Mass Tourism: Case Study	Can the beautiful environment of Thailand withstand the pressure of mass tourism?



## Globalisation

What Is Globalisation?	How has technology changed the world we live in, and the rate of development?
A Global Village	Explore the impact of improving communications networks on towns and cities around the world.
Transport Networks	Why are transport networks so vital in global trade?
Brazil: Life on a Plantation	What is life like on a sugar cane plantation, and how is increased mechanisation affecting Brazil's sugar cane cutters?
Traffic Congestion	Discover the causes and impacts of traffic congestion.
Brazil: Agricultural Revolution	Find out about the new agricultural methods being pioneered in Brazil to produce more, using less.

## Changing Lives

Overpopulation	How many people are too many? Discover the population capacity of our planet.
Could Climate Change Your Life?	What effects could climate change have on populations around the world?
Feeding the Planet	How will we cope with a global food shortage?
Brazil: Life in a Favela	What is life like in one of Brazil's biggest slums?
India: Curbing Population Growth	Discover the voluntary and compulsory measures used to tackle India's growing population.
Japan: Encouraging Population Growth	What are the problems of an aging population? And what can be done to tackle it?
Manila: Megacity	What is life like in one of the most densely populated cities in the world?

## Unequal World

Global Inequalities	Discover why where you live can affect every aspect of your life.
LEDCs	What determines whether a country is Less Economically Developed?
MEDCs	What are the defining characteristics of a More Economically Developed Country?
LEDCs: Barriers to Development	What are the factors preventing countries from becoming more economically developed?
International Trade: An Unequal Relationship?	Discover the balance of power between countries when they trade.
Demographic Transition Model	How do population dynamics change as countries become more developed?
Brazil: The Wealth Divide	Discover the different lives of the rich and poor in Brazil.
Fair Trade	How does Fair Trade improve the lives of farmers around the world?
Sapphires: A Fair Trade?	Discover the dangers of Madagascan sapphire mines, and who stands to profit.
Different Types of Aid	Aid is an important factor in helping countries recover from disasters. But what is aid?
The Issues With Aid	Aid comes in many different forms. What are the advantages and disadvantages of each type?

**Humans and the Carbon Cycle**

The Carbon Family	Get a domestic perspective on pollution. How big is the average family's carbon footprint?
Carbon Capture: Phytoplankton	Discover how mysterious micro-organisms in the oceans could save our planet.
Carbon Trading	Will government caps help industrial polluters to reduce their carbon footprint?
Carbon Capture: Artificial Trees	Investigate the artificial trees of the future.
The Future Carbon Family	How the average family can help save our planet – a domestic perspective on 'greenliving'.

*“ Twig makes it easy to understand relatively complex ideas ”*



- Pupil





### 3D Shapes

Polyhedra: Platonic Solids	Discover the properties of the Platonic Solids, and why they are considered special.
Cylinders: Fuelling Saturn V	Revealing the size of the giant cylinders that fuelled the most powerful machine ever.
The Power of the Sun	How to calculate the power of the Sun, without leaving Earth.
The Pacific Flyer	How big did this hot-air balloon have to be to break the world record?
Why Are Eggs Egg-Shaped?	Discover why a fragile egg is the ideal shape to protect the life within.
Cubist Art	How artists used geometry to depict the world.

### Circles

Beating the U-Boats	Find out why Churchill's Navy relied on geometry to protect supplies during World War II.
Designing Chartres	Explore circle theorems through the geometric design of Chartres Cathedral.
Pi: Reciting Pi	How many digits of Pi can one man memorise?
Calculating Pi: Archimedes	How was Pi first accurately calculated?

### Similarity and Transformations

Transformations: Skateboarding	See how a skateboard transforms as a skater performs tricks.
The Mirror Lines of the Taj Mahal	Discover how the beauty of the Taj Mahal is created using reflection.
Tessellated Designs	The beautiful patterns that can be created using shapes which fit together exactly.
Bees and Their Hives	Why are beehives made up of hexagons?
Fractals: The Koch Snowflake	Discover the rules that create an infinitely reducing pattern.
Fractals: The Menger Sponge	Introducing the shape that gets bigger the more you take away.
The Tunnel of Samos	Find out how the ancient Greeks ensured a tunnel's ends would meet inside a mountain.

### Triangles

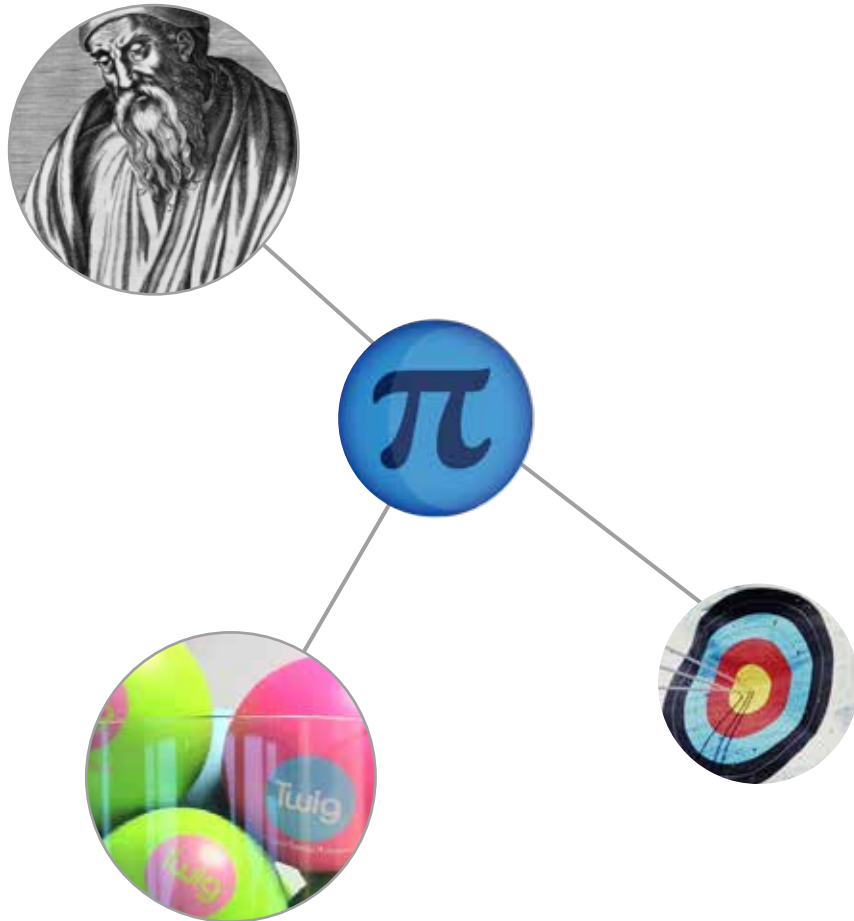
Proving Pythagoras	What is Pythagoras's Theorem, how can it be proved, and why is it useful?
Building the Pyramids	Discover how Egyptian builders used triangles to create perfectly symmetrical pyramids.
Strengthening the Bank of China	Find out why the world's tallest building was constructed from triangles.
Where is the Centre of a Triangle?	Discover the many centres of a triangle.

### Topology

Topology	Can you make a different shape without tearing, cutting or gluing?
The Seven Bridges of Königsberg	Try this ancient puzzle that tested some of the brightest mathematical minds.
Networks: Labyrinths and Mazes	Learn how to create – and find your way out of – these ancient networks.
Degrees of Separation: Erdős	What's your Erdős number?

### Trigonometry

Distance to the Sun and Moon	Find out how astronomers calculated these distances using the sine function.
Measuring the Earth	Discover how maths enabled the first calculation of the Earth's circumference in Ancient times.
Hyperbolic Geometry	Explore how our understanding of the space we live in has advanced since Euclid's time.
What Do Sine Waves Sound Like?	Hear the sound created by sine wave equations, and how their variables affect this.





### Coordinates

Cartesian Coordinates	Learn how coordinates describe a point in space in one, two, three, or even four dimensions!
Vectors: Air Traffic Control	What are vectors and how do they make air travel safe?
Coordinate Geometry: Descartes	Discover how Descartes developed the (x,y) coordinates so familiar today.

### Lines and Curves

Straight Lines: Bee Lines	Why do bees fly in straight lines?
Gradients: Fold Mountains	How small hills under the ocean 'grow' to become the highest peaks on Earth.
Spirals in Nature	What are the different types of spiral, and where are they found in nature?
Arches	Exploring the shape that gets stronger as more force is applied.
Geometry: Euclid	What were the simple rules Euclid set out that form the basis of Geometry?
Calculus: Newton	Discover how Newton's study of movement led to a revolutionary new branch of mathematics.

### Scale and Perspective

Painting By Numbers	Find out how artists began to turn flat drawings into three-dimensional worlds.
Perspective: Parallax	Find out why closing each eye seems to cause objects to move – and how this can help measure extreme distances.
Escher and the Endless Staircase	See how Penrose and Escher played with perspective to create impossible shapes.
Perspective: Dazzle Camouflage	See how some warships 'hid' behind bright geometric designs.
Modelling the Spitfire	See how length, area and volume scale factors affect the size of model planes.
Queen Hatshepsut's Ship	Can a team of archaeologists use scale to recreate this ancient ship?





### Ratio and Proportion

The History of the Golden Ratio	Introducing the beginnings of the Golden Ratio, and how it has endured throughout time.
Maths and the Mona Lisa	Discover how Da Vinci used this ancient ratio to enhance his famous portrait.
The Beauty Formula	Can mathematics explain what we find beautiful?
Proportion: The Vitruvian Man	Learn how Da Vinci used geometry to create the 'perfect' human.
Ratios: The Maths of Baking	Learn how to bake a cake as big as you like!
Ratios: Currency Exchange	Learn how to convert currencies – and make a profit!
Aiming for the Outer Planets	Discover the maths that helped send a spacecraft deeper into space than ever before.

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### Accuracy and Estimation

How Long is a Metre?	Who decided how long a metre is, and how did it become the standard metric measure?
Jai Singh	Why did the Maharaja build the biggest observatories in the world?
Volume: Counting Stars	Revealing how astronomers count the number of stars in the sky.
Speed of the Earth	Calculate how fast Earth is speeding through space.
Rounding: Snails vs Rockets	Discover why rounding numbers is both useful and necessary, by looking at two extreme cases.
Counting Crowds	1.8 million people watched Obama's inauguration speech – but who counted them?

### Proof

How Origami Changed the World	Discover the surprising applications of the paper-folding art of Origami.
The Greeks and Proof	Witness how the Ancient Greeks managed to prove mathematical reasoning beyond doubt.
Proofs: Million-Dollar Maths	Learn how proving a famous hypothesis could net you \$1,000,000.

**Decimals and Fractions**

Why Do We Count in Tens?	Number systems can be based on any number – why is ten so popular?
Decimals: Decimal Day	Discover what happened when the United Kingdom changed to a decimal currency.
Decimal Places: Photofinish	Why decimal places are needed for the world's fastest sprint.
Fractions: Slow Motion	How videos use fractions to slow or speed up moving images.
The Egyptians and Unit Fractions	The legend that led the Egyptians to use a complex system of fractions.
Fractions: Pythagorean Tuning	Discover how music is created using fractions.
Fractional Reserve Banking	Discover the banking system that means your bank can lend out the money you deposit.

**Percentages**

Percentages: Feeding the Nutcracker	See how this tiny bird plays the percentage game to survive the winter.
Could You Owe More Than America?	Discover the staggering amount of money you could owe if you fail to pay off a high-interest loan.
Percentages: Tax Breaks	How progressive tax systems can help make tax payment fairer.
Hyperinflation: 1920s Germany	Find out what happens when interest rates spiral out of control.

**Integers and Natural Numbers**

Numbers: The Discovery of Zero	The number zero has not always existed. Why was it 'invented'?
The Sardine Run	Watch as predators from positive and negative altitudes threaten a sardine shoal.
Numbers: Animal Maths	Can animals really count?
Numbers: Life Without Numbers	Meet the Aboriginal tribe who manage with only numbers 1, 2 and 3.
The Babylonians and Plimpton 322	See the surprisingly familiar numbers that appear on this ancient tablet.
The Egyptians and Multiplication	Find out how the Egyptians tackled multiplication, using powers of two.
The Romans and Numerals	Discover why the Romans were such terrible mathematicians!
India and Negative Numbers	Find out why one of the most positive contributions of Indian mathematicians was, in fact, negative!

**Powers**

The Emperor's Chess Board	Re-telling the legend of a simple request for a few grains of rice that threatened to bankrupt an Emperor.
How Much Does the Internet Weigh?	How to calculate the weight of all the information contained on the world wide web.
The Richter Scale	Discover how to read the Richter Scale, which reveals the true magnitude of earthquakes.
The Biggest Number Ever	Meet the 'inventor' of the biggest number ever used.
The Incredible Strength of Ants	Discover the mathematical law that means ants are the strongest creatures in the world.

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Ratios: The Maths of Baking	Learn how to bake a cake as big as you like!
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**Special Numbers**

Irrational Numbers: Pythagoras	Find out why the discovery of irrational numbers is said to have led to murder.
Primed for Survival	Witness the mating behaviour that suggests insects use prime numbers.
The Prime Number Code	Discover why prime numbers hold the key to encryption.
A Pattern in Primes	Are prime numbers random, or is there a hidden pattern?
Imaginary Numbers	What caused mathematicians to dream up imaginary numbers?
Sets: Infinity	Revealing two different types of infinity.

### Number Patterns

The Most Populous Country	When will India's population exceed China's?
The Fibonacci Sequence	Discover Fibonacci's sequence, which occurs throughout nature.
Enigma: Cracking the Code	Find out why the Nazi's message encoding mechanism proved so difficult to crack.
Chinese Development of Maths	A summary of the independent development of Chinese mathematics.
Number Theory: Gauss	The patterns that allowed a seven-year-old mathematician to perform amazing calculations.

### Binary

Binary: What Is Binary?	The number system that lets you to count to over a thousand using just ten fingers.
Binary: The Computer Language	Why is binary the computer-programmer's code of choice?
Binary: The Alien Language	Discover why Scientists use binary code to try to communicate with extra-terrestrial life.

*“ I also like that there is a movie about almost everything ”*



- Pupil

**Algebraic Modelling**

How Algorithms Change the World	Find out how mathematical functions influence human behaviour.
Variables: Dating By Numbers	Could an algebraic formula get you a date?
Tank Wars	The amazing prediction made using algebra that helped to win World War II.
Algorithms: Turing	Learn how Alan Turing developed the simple mathematical foundation of computing science.
The Birthday Paradox	Explore the likelihood of you sharing your birthday with someone in the same room.

**Coordinates**

Coordinate Geometry: Descartes	Discover how Descartes developed the (x,y) coordinates so familiar today.
Vectors: Air Traffic Control	What are vectors and how do they make air travel safe?
Cartesian Coordinates	Learn how coordinates describe a point in space in one, two, three, or even four dimensions!

**Equations**

The Heartbeat Formula	Discover the formula that can predict how long a wild mammal will live.
Heptathlon	A demonstration of the complex scoring system used to place heptathletes.
The Chase	Can you calculate how long the zebra has to escape the pursuing lion?
The Arabic Science of Balancing	Discover the fundamental principle of algebra.
European Mathematical Symbols	Find out when and why mathematical symbols were invented.
Diophantine Equations: Fermat	Find out why a mathematician's scribbles became one of the world's most difficult maths problems.

**Sets**

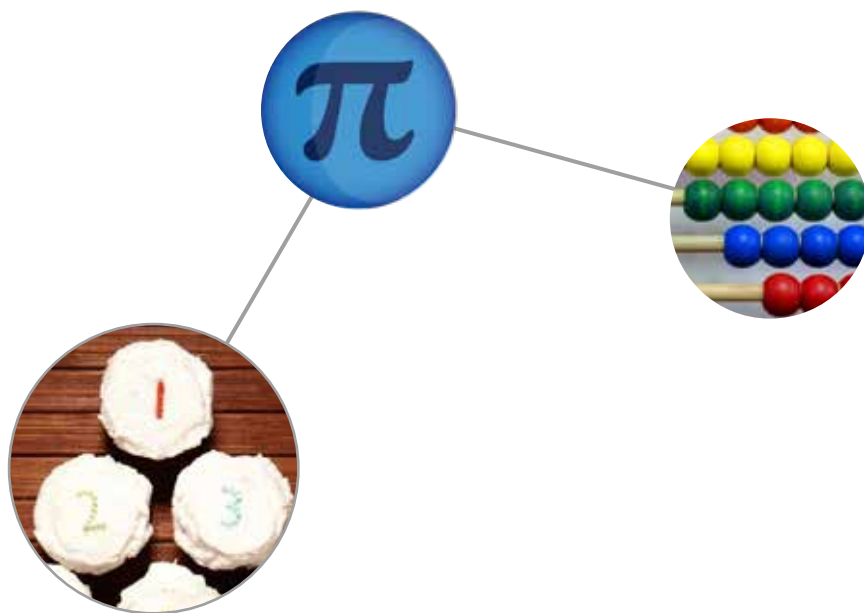
Set Theory: Cantor	Find out how Cantor's work on set theory shaped his life.
Venn Diagrams: Global Habitats	Learn how to compare the relationships between rainforest and desert environments.
Sets: Infinity	Discover why there are two different types of infinity.

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**Probability Modelling**

The Odds Are Against You	Find out the mathematical reason that gambling on horse racing is unlikely to pay off.
The Card Counter	Learn how one mathematician came up with a formula for winning at Blackjack.
The Monty Hall Problem	In this famous game-show, should the contestant choose to switch?
Logic: Bayesian Robots	Discover how robots use logic to learn.
Why Do Shares Change Price?	Discover the economic and social factors that determine share value.
Beating the Stock Market	The story of three mathematicians who tried to eliminate risk from stock market trading.
The Prisoner's Dilemma	Would you choose to inform on your partner in crime?
Benford's Very Strange Law	Introducing the surprising discovery of a pattern in data, across both the man-made and natural worlds.

**Extreme Events**

Probability: Irrational Fears	Discover why often the most common fears are the least rational.
Can Monkeys Write Shakespeare?	Discover why it is possible for monkeys to write Shakespeare – and how it can become a certainty.
Freak Waves	Why were sailors reporting giant freak waves, when statistical models showed them to be unlikely?
Chaos By Mistake	Discover why it is so difficult to predict the behaviour of complex systems, like the weather.
Insuring the Titanic	How did underwriters calculate insurance premiums for the Titanic and her cargo?

**Sampling**

Can You Trust Your IQ?	Is it possible to create an unbiased measure of intelligence?
The Wrong Guy Won	Discover how a magazine's 'random' phone poll led to one of the most surprising election results in history.
Can Fish Oil Make You Smarter?	Find out how simply undertaking a study can jeopardise trial results and how to guard against this.
Mind Control	In the largest trial of human mind control ever, does size equal significance?

**Statistical Measures**

Average Joe	How is it possible for the average American to live with one and a half other people?
Cumulative Frequency: You're Fired?	Find out how Enron employees could see where they rated, and whether they would be fired, on a cumulative frequency graph.
Can Eating Fish Prevent Murder?	Discover the real story behind the study that found a correlation between eating seafood and committing murder.

**Charts**

Most Popular Pet	Are cats, dogs or fish the most popular pet? See how different types of graphs display the whole story.
Nightingale's Diagram	Explore how one nurse's visual representation of data saved thousands of lives.
Histograms: Snapshot	Explore how photographers use the unique properties of histograms to take the best photographs.
Distorted Graphs: Heatwave	Discover how graphs containing limited information can be misleading.

*“ It is a fun website that teaches you facts as well as entertains you ”*





**Maths Through the Ages 1**

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