



## Film List

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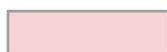
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#### Key:

Core Films



Context Films



FactPack Films





## Contents

### Earth Science

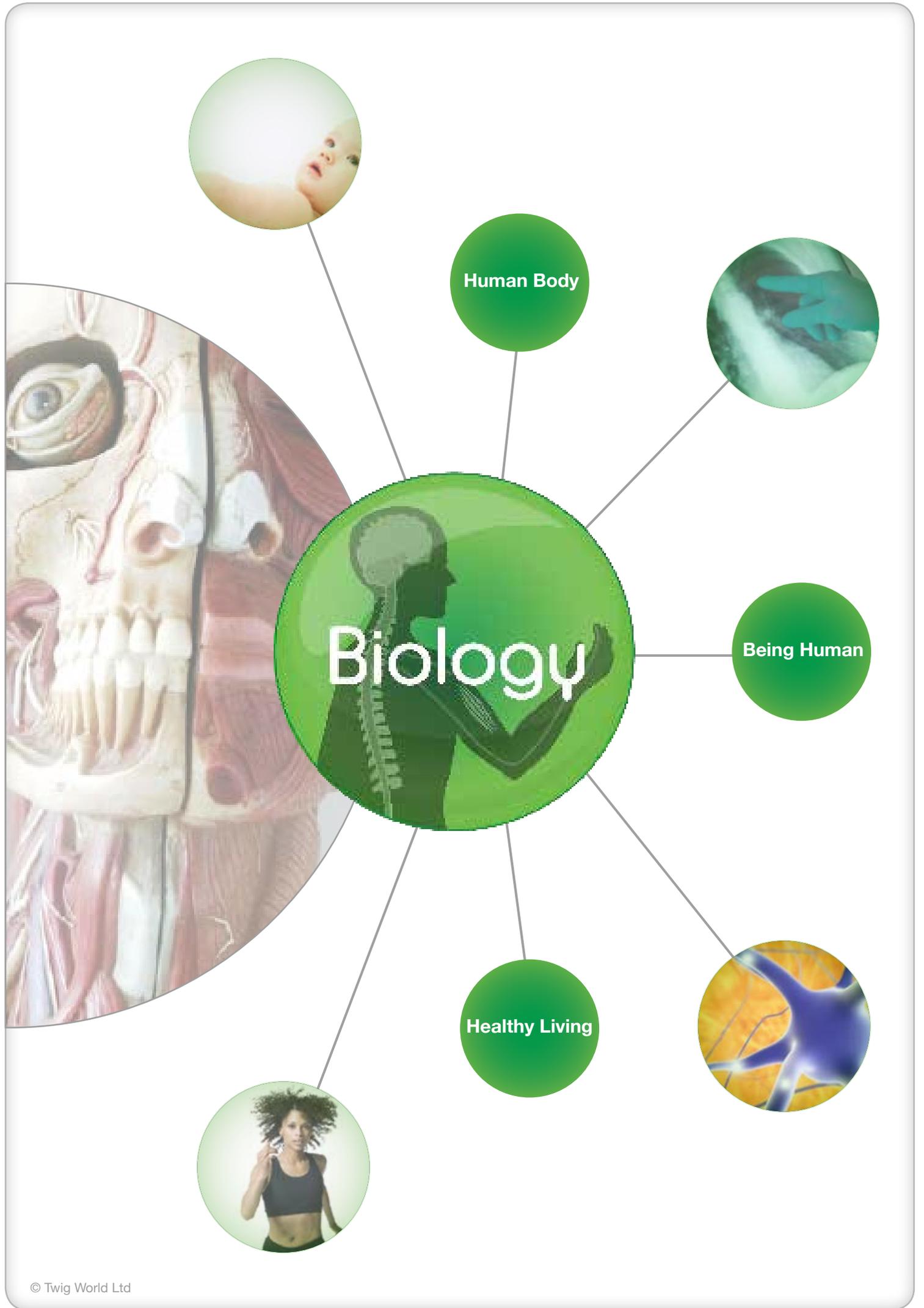
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#### Key:

Core Films	
Context Films	
FactPack Films	



Human Body

Biology

Being Human

Healthy Living



## Digestion

Introduction to Digestion	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 meters 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	How air, gas and bacteria make us burp and fart.
Kidneys	The lifesaving work of our kidneys.
FactPack: Digestion	The weird and wonderful world of the digestive organs.
FactPack: Teeth	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 the Vietnam War taught doctors about blood clotting.
Blood Transfusion: Falklands	What the Falklands War taught doctors about blood clotting.
Healthy Heart	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 that 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	Should tuberculosis patients be held in quarantine?
The Dark Side of Oxygen	How oxygen is vital for life but corrodes the human body.
Smoking: The Damage	Witness the effects of smoking on the lungs.
Factpack: Lungs	Discover the amazing inner workings of the lungs.

### Muscles and Bones

Bones	How bones develop with age.
Cardiac and Smooth Muscles	How these involuntary muscles work and why you can't control them.
Skeletal Muscles	How skeletal muscles help you control your body.
An Ancient Olympian	Discover how the remains of an ancient Olympian athlete revealed his training techniques.
Clever Thumbs	Could opposable thumbs be the key to our intelligence?
Growing Pains	How bones grow and change through puberty, and the impact this has on teenagers.
Joints	The movement of joints.
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 shaped by the world around them.
Developing Brain: That's Me!	The development of self-awareness: when are we able to recognize ourselves?
Developing Brain: Theory of Mind	Our unique ability to understand the thoughts and feelings of others.
Developing Brain: Tantrums	Why do toddlers throw temper tantrums? It's all in the brain.
Developing Brain: Teenage Brain	See how the teenage brain rewires for adulthood.
The First Brain Surgeon	The work and legacy of Dr Harvey Cushing, the world's first brain surgeon.
The Curious Case of Phineas Gage	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 the brain stores memories.
Intuition	How intuition saves 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	How reflex arcs work and some common examples.
FactPack: The Spinal Cord	The structure and function of the spinal cord.



### Pregnancy

Fertilization	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 labor?
Sperm	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	How IVF treatment works.
Medical Marvels: Ultrasound	The discovery of ultrasound and how it works.
War in the Womb	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	How the pill has changed from the time of its invention to the modern day.
Chemical Contraception	How chemical contraception, such as the pill or IUS, works.
Contraception: Barrier Methods	How barrier methods, such as condoms and coils, work.
Factpack: Pregnancy Timeline	See what happens at each stage of pregnancy.

### Puberty

Introduction to Puberty	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?
Growing Pains	How bones grow and change through puberty, and the impact this has on teenagers.
FactPack: Why Do Teens Get Pimples?	Discover the biology behind pimples and boils.



## Hormones

Introduction to Hormones	How hormones affect the body and mind.
Winning and Losing	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	A hormone designed to help us cope with stress could be damaging our bodies.
FactPack: Why Do Teens Get Pimples?	Discover the biology behind pimples and boils.

## Senses

How We See Part 1: Eyes	The structure of the human eye.
How We See Part 2: Brain	How the brain functions to create focused vision.
The Senses	An introduction to the five senses and how we use them.
How We Smell	The structure of the nose and how we use it to smell.
How We Taste	The structure of the tongue and how we use it to taste.
How We Touch	How skin helps us feel pressure, pain, heat and cold.
How We Hear	The structure of the ear and how we use it to hear.
How We Balance: Part 1	How our ears help us balance.
How We Balance: Part 2	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?
Synesthesia	Why do some people see smells and hear colors?
Test Your Vision	Can you pass the vision test?
Why Do I Get Travel Sick?	How the brain and the senses detect motion.
What Are Goosebumps?	An introduction to the body's inbuilt thermostat system.



## Fitness

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

## Nutrition

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

## Substance Misuse

Harmful Drugs	While medical drugs treat illness, recreational drugs can be very harmful.
Alcohol and the Brain	The ways alcohol can damage the brain and who is likely to be most affected.
Drugs and the Brain	How do psychoactive drugs affect brain function?
Harmful Drugs: Cannabis	The hidden dangers of cannabis?
Harmful Drugs: Cocaine	The effects of cocaine on the mind and body and why it is so dangerous.
Harmful Drugs: Heroin	Why heroin is considered the most harmful drug of all.
Harmful Drugs: LSD	LSD and its effects on the senses.
Harmful Drugs: Ecstasy	The effect of ecstasy on the body and its 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 damage and how can you avoid it?
Germ and Hygiene	Germ 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	The dangers and symptoms of sexually transmitted infections.
Eradication of Polio	Polio affected thousands of children until two men developed very different vaccines.

*“ 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	Organisms thrive in particular environments due to adaptation.
Variation	Variation allows certain organisms to thrive in different environments and makes each individual unique.
Life in the Freezer	Why there is life even in the coldest places on the planet.
Life in Hot Deserts	Why there is life even in the hottest, driest places on the planet.
Predators and Prey	The hunters and the hunted: the adaptations that help them survive.
Bizarre Adaptations	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 life forms are grouped into classifications.
FactPack: Deadliest Animals	What is the deadliest animal on Earth?
FactPack: Super Predators	Guess which predator is being described.
FactPack: Super Prey	Discover the surprising ways animals can protect themselves against predators.

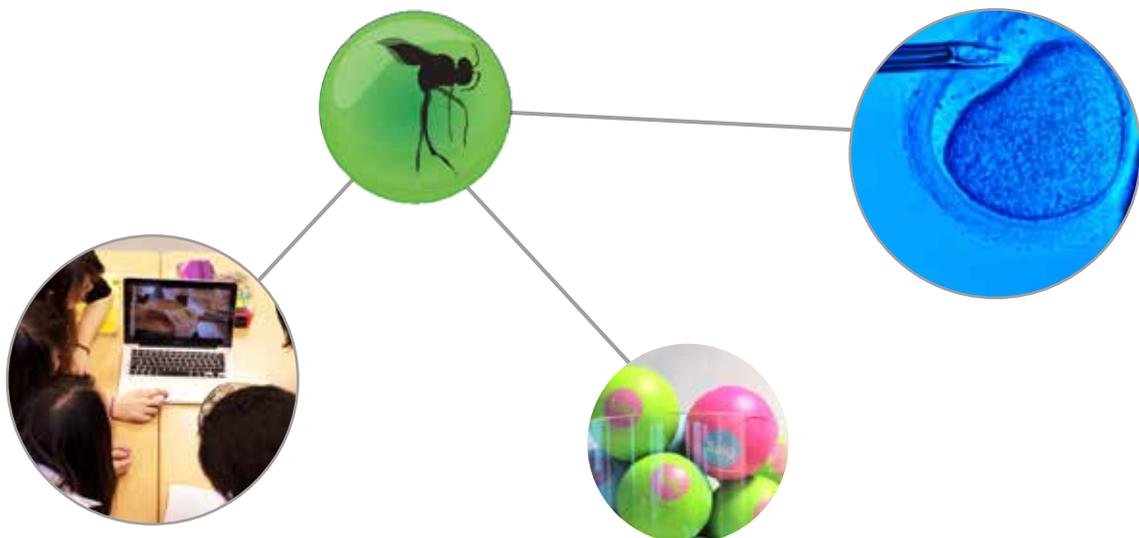
### Extinction

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	Discover why there are so many more tigers in captivity than in the wild.



### Evolutionary Theory

Natural Selection	An introduction to the theory of evolution.
Mechanisms of 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 Species.
Man's First Ancestors	Which species of ape-man was the first to walk on two legs, and why?
Habilis and Boisei	Africa, 2 million years ago: a crossroads in the evolution of man.
Homo Ergaster	What was one of the most important discoveries in the evolution of man?
Homo Sapiens	The great development in human evolution that led Homo sapiens to triumph over Neanderthal man.
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	The formation of new cells.
Cell Division: Meiosis	The formation of sex cells.
What Is Cancer?	Find out why cancers cause 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	What different types of cell are there and what do they do?
FactPack: Enzymes	Fun facts about enzyme reactions.

### DNA

What Is DNA?	How does our DNA make us unique?
How Does DNA Make Protein?	The function of DNA is to carry the genetic code that makes proteins.
DNA and Crime	How DNA profiling helps solves crimes.
Discovery of DNA	The amazing race to discover the structure of DNA.
FactPack: DNA	What is DNA? Discover the blueprint for life.+



### Genetics

Inheritance: Part 1	The genes we inherit make us who we are. How does this happen?
Inheritance: Part 2	T difference between dominant and recessive genes.
Dogs and Wolves: Nature Or Nurture?	Can wolf cubs be raised to behave like domestic dogs?
Breeding and Behavior	Can Russian silver foxes be domesticated?
Mendel and Inheritance	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 a single genetic mutation causes the immune disease cystic fibrosis?
FactPack: Hybrid Animals	Ever heard of a zorse? Breeds created by man, not nature.
FactPack: Fruit Flies	Discover why the humble 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	The science and controversy of 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	The story of an American millionaire and his Genius Sperm Bank.
The Genius Sperm Bank: Part 2	The legacy of Robert Graham's Genius Sperm Bank.
Savior Siblings	Should we create a new life in order to save an existing one?
Dolly the Sheep	The controversial birth of the world's first cloned animal.
FactPack: Twins	Why not all twins are the same.

**Immune Defence**

Immune Defense: Part 1	What is your immune system and how does it work?
Immune Defense: Part 2	What are antibodies?
HIV/AIDS: Immune Evaders	What makes HIV such a deadly virus?
Smallpox: The First Vaccine	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?
Tumors: 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 Mom and Dad and they’re like ‘How did you know that?’”*



- Student

**Energy and Growth**

Photosynthesis	How do plants convert sunlight into usable energy, forming the basis of most food chains on Earth?
Plant Transport	From roots to leaves, discover the water and mineral transport systems in plants.
Parasitic Plants	The plants that steal from other plants in the fight for survival.
Carnivorous Plants	The extraordinary meat-eating plants that consume animal prey.
Plants and Medicine	How plants can be used to ease pain and treat disease.
Plants and Medicine: Aspirin	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: Nonedible Crops	Find out which common plant crops are not destined for your plate.

**Plant Structure**

Parts of the Plant: Leaves	The role of leaves 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	How have plants adapted to live in some of the world’s most extreme environments.
FactPack: Amazing Plants	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 all by themselves.
Plant and Animal Mutualism	The unlikely relationships formed between plants and animals in order to survive.
Plant Mimics	The ingenious plant species that mimic other life forms in order to survive.
Oak Life Cycle	Witness the 1000 years in the life of an ancient oak tree.



### Ecosystems

The Taiga Forest	What lives in the largest land ecosystem on Earth?
Redwoods	Discover the trees that are of the oldest and largest organisms on Earth.
Deciduous Forests	Deciduous forests are characterized by dramatic seasonal change.
Tropical Rainforests	From forest floor to canopy, discover one of the world's most diverse ecosystems.

### Changing Ecosystems

What Is an Ecosystem?	The interdependence of living and nonliving things.
What Is Biodiversity?	Find out why biodiversity is vital to life on Earth.
Algae	What makes algae one of the most important groups of organisms on Earth.
Lichen: Indicator Species	How lichens can reveal the health of ecosystems.
Migration: Reproduction	The Great Salmon Run - from the Pacific to Alaska.
Migration: Predation	The Great Sardine Run - from the Antarctic to Africa.
Migration: Seasons	The Great Wildebeest Migration - following the rains 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 nonliving 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	The impact of the South American cane toad on Australian life.
FactPack: Bird Migrations	Just how far do some birds fly?
FactPack: Amazing Migrations	Why do animals and insects migrate?



### 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 that live in the ever-changing intertidal zone.
Oceans: Frozen Seas	Life above and below the ice in our planet's polar seas.

### Food Chains

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

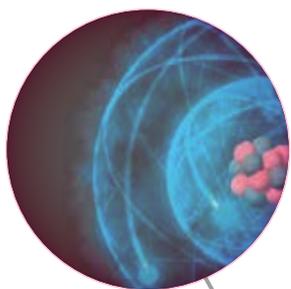
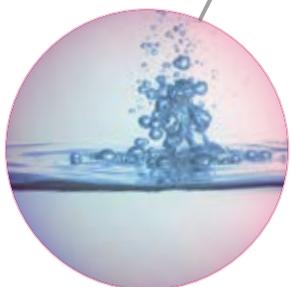
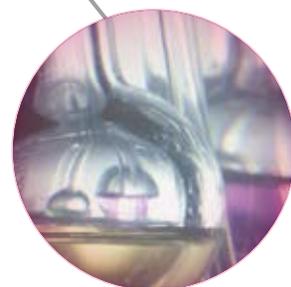
# Chemistry

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 Colors and Fireworks	How are different colors of fireworks created?
Flame Colors 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 Nazis' 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	How metals and nonmetal elements form compounds.
Covalent Bonding	How nonmetal elements form compounds.
Metallic Bonding	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	Understand the physical process of dissolving.
Salt: Salt and Ice	Discover why salt is used to treat slippery, 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 that defy explanation.
How Do Snowflakes Form?	How do water molecules form these beautiful, delicate structures?
How to Make Fake Snow	Understand 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, fibers 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 colors 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	Almost most every process in your body involves protein.
Fermentation	Did you know bacteria, yeast and mold are vital in the production of common foods?
Omega-3: Healthy Fat?	One extreme diet that reversed scientific opinion about omega-3 fatty acids.
What Is a Calorie?	We need calories in order to survive, but what are they?
How Do Carb-Free Diets Work?	Can we survive without one of our food staples, carbohydrates?
Ripening Fruit	How do supermarkets ripen green bananas?
Salt: Food Preservative	The ancient discovery still used in food preservation today.
Natural versus Artificial	Are all natural chemicals good for us, and all artificial chemicals bad?
Nitrates: Food Preservatives	One chemical - two very different uses.
FactPack: Energy Drinks	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 trash cans, made?
Esters and Perfumes	The science behind pleasant smells.
Recycling Plastics	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 Fuel	Why was lead banned from gasoline?
Invention of Nylon	The discovery and uses of nylon.
FactPack: Hydrocarbons	The difference between alkanes and alkenes.

**Discovering Elements**

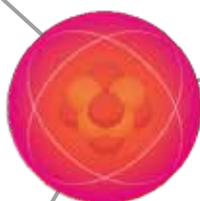
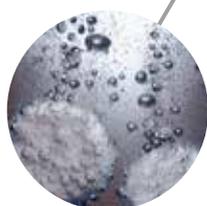
Introduction to the Periodic Table	The ordering of the elements according to their properties.
Atomic Structure	Explore the Periodic Table and discover what it tells us about each element.
Mendeleev's Prophecy	Find out why the element gallium had been predicted even before it was discovered.
Discovery of Phosphorus	The unusual experiments that led to the discovery of phosphorus.
The Curse of Phlogiston	Discover the theory that hindered chemistry for centuries.
Phlogiston and Oxygen	How the discovery of phlogiston and oxygen changed chemical theory forever.
The Legacy of John Newlands	He 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.

**Nonmetals**

The Halogens	The unique properties and uses of the halogen elements?
The Noble Gases	The properties and uses of the noble gases.
The Elements: Oxygen	An introduction to oxygen and its uses.
The Elements: Phosphorus	An introduction to phosphorus and its uses.
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?

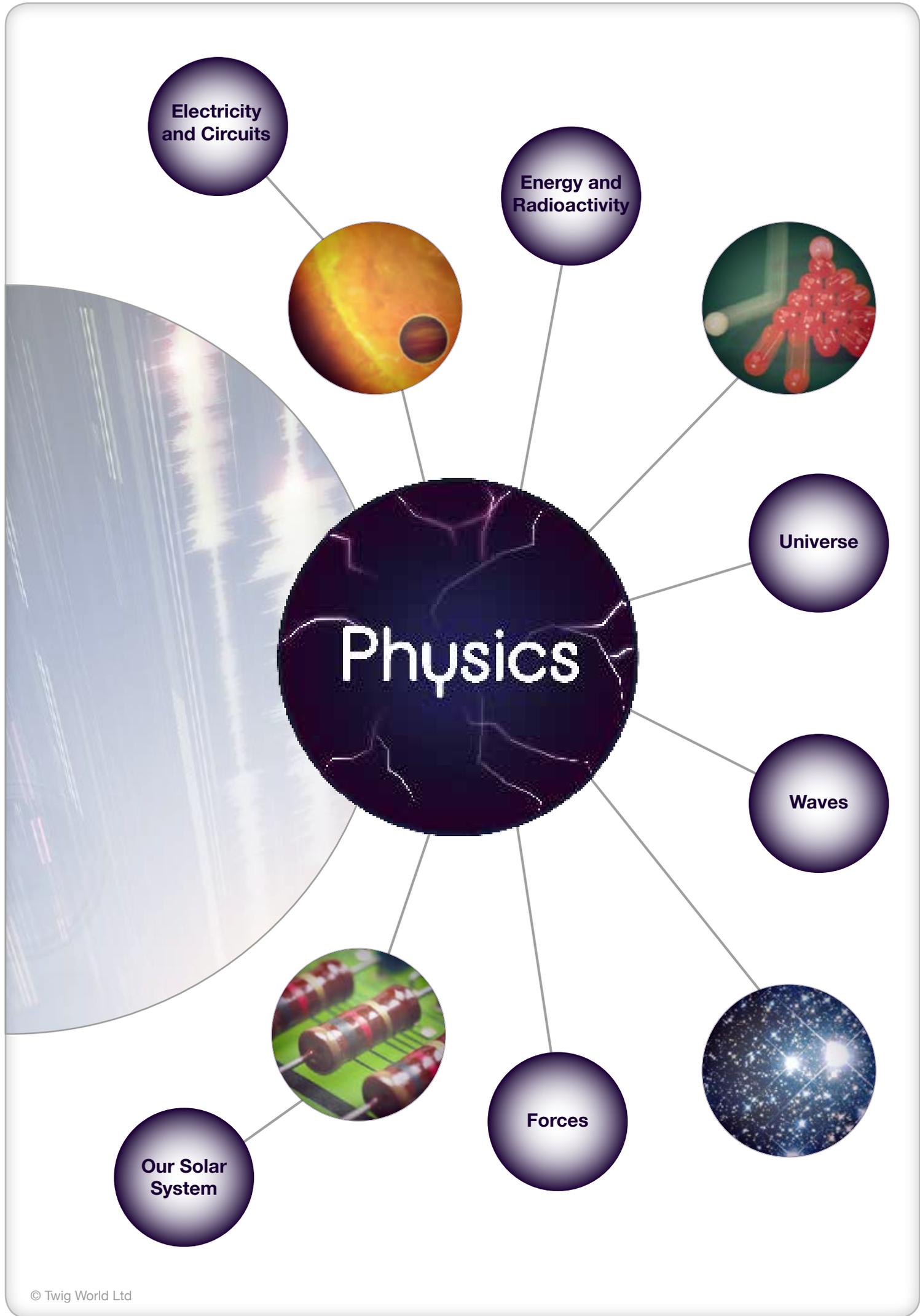


**Acids and Bases**

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 neutralization reactions.
Crystals in Caves	What role does rainwater play in creating crystals in caves?
First Synthetic Pigment	How were synthetic paints first created?
Why Do Leaves Change Color?	What are the chemical reactions that produce vibrant leaf colors 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 Aluminum	Discover the immense power and heat needed to extract aluminum 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?



Electricity and Circuits

Energy and Radioactivity

Universe

Waves

Forces

Our Solar System

Physics



### 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	The simple devices that have revolutionized 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	The potentially deadly dangers of electricity - a tragic accident revealed.
Electric Eels	How does the eel harness the power of electricity?
FactPack: How to Draw a Circuit	The universal symbols used in circuit design.

### Electricity

What Is Electricity?	We all use electricity every day. But what 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	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 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?	How combining electricity with magnetism creates a useful tool.
How Do Generators Work?	The simple principle that brought electricity into everyday use.
Maglev Trains	Discover the train that defies gravity.
MRI	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	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	The everyday process of braking uses extraordinary energy conversion.
Hot Air Balloons	How is flight made possible with little more than hot air?
Cavitation	What 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	What is 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 that hold our Universe together.
Friction	Too little and we fall over; too much and we struggle to move. Learn all about friction.
Centripetal Force	The forces that control turning and rotation.
Streamlined: Dolphins vs People	Discover how streamlining affects animals' ability to swim efficiently.
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 that dictate how objects move.
Speed, Velocity, Acceleration	What is the difference between speed, velocity and acceleration?
Momentum	Discover why moving objects won't always 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	The 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 ”*



- Student



### Solar System

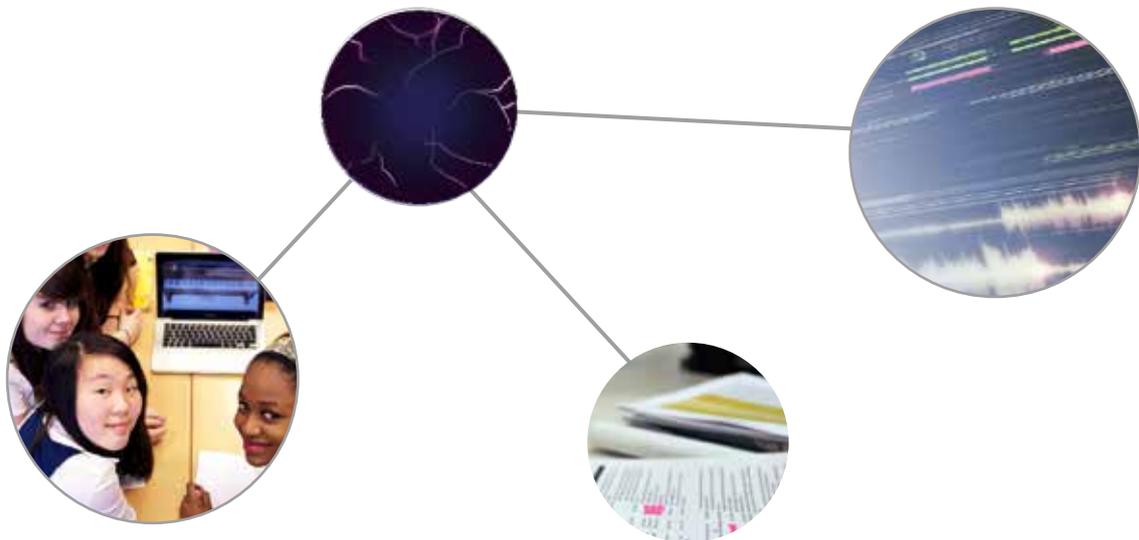
The Birth of Our Solar System	What created our Solar System?
Earth's Twin	Why did colliding with its twin prepare our planet for life?
The Goldilocks Zone	Not too hot and not too cold: why Earth is just right to support life.
How Did Saturn Get Its Rings?	The mystery that plagues the brightest brains in astrophysics.
Venus 1: Atmosphere	Would probes sent to Venus discover an Earth-like planet?
Venus 2: Surface	What did the first probe to land on another planet 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 neighboring planet.
Jupiter	An introduction to the biggest planet in our Solar System.
Saturn	An introduction to Saturn.
Uranus	An introduction to Uranus.
Neptune	An introduction to Neptune
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	The life of the star upon which we all depend.
Day and Night	What makes it day or night?
What Are Stars?	The life cycle of a star.
Why Is the Sky Blue?	From blue horizons to red sunsets, what creates the color of the sky?
What Are Eclipses?	What causes solar and lunar eclipses?
Northern Lights and Solar Flares	The role of our Sun in creating the beautiful Northern Lights.
Shadow Chasers	Meet the party-people who gather to see and study eclipses.
Constellations	How we give meaning to the patterns of stars in our sky.
Death of the Sun	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	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	How Cold War suspicion led 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 center 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?	Measuring 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?	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	Is there life on Mars?
Mars: The Search for Water	Is there water on Mars?
Planet Hunters	Are there other life-supporting planets in our Solar System?
Mars: Under the Ice	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 colonize the Moon, and who would get there first?
SETI: Are We Alone?	Has the SETI project detected extraterrestrial life?
Place Like Home: Cassini	The mission to reach Saturn's largest 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	The difficulties of landing a moon on Saturn's largest moon, and the amazing discovery it made.



### EM Spectrum

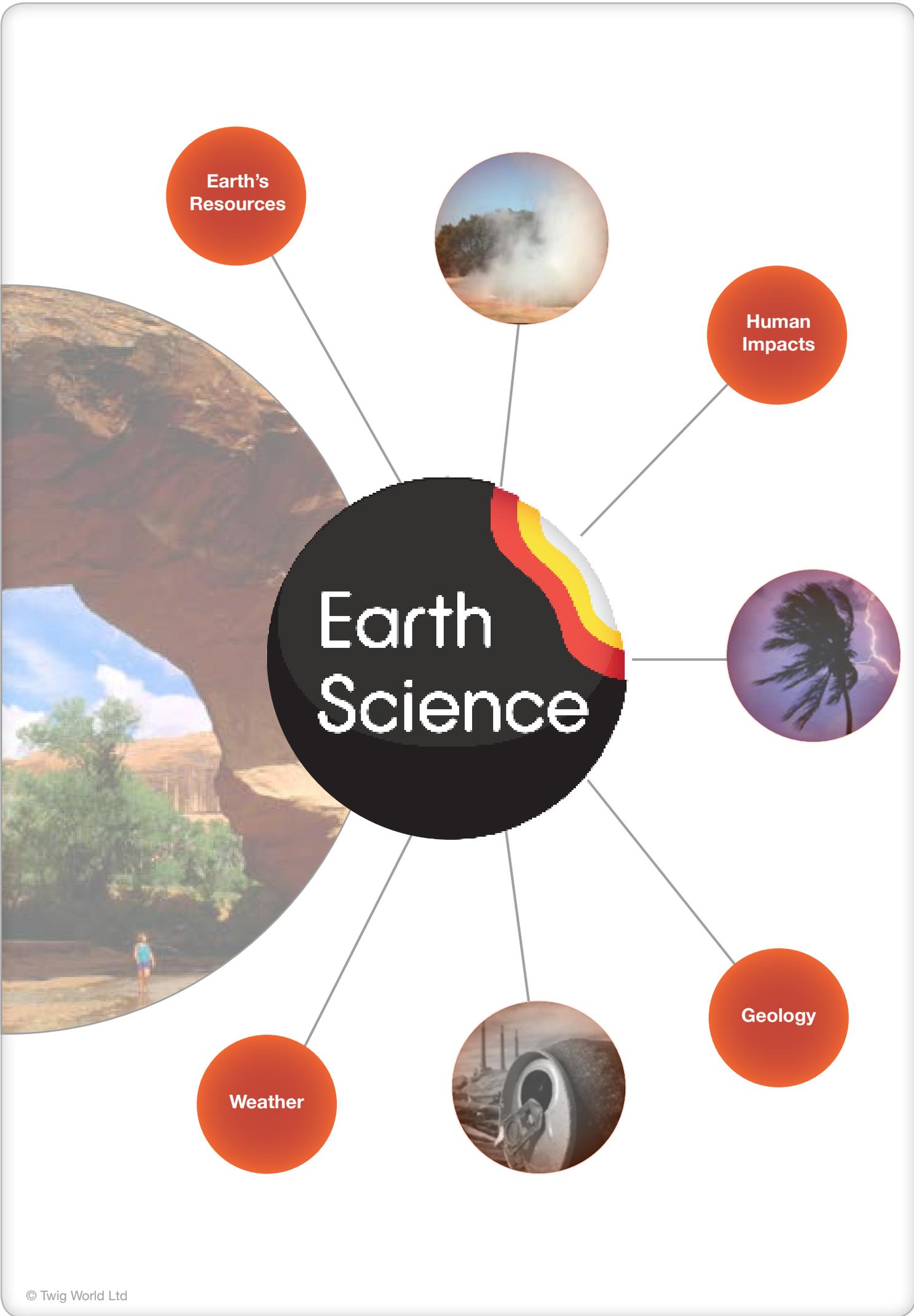
The Electromagnetic Spectrum?	Electromagnetic radiation is all around us, but what is it?
What Makes Up the Electromagnetic Spectrum?	What are the different types of radiation that make up the electromagnetic spectrum?
Waves in Medicine	Why the highest energy radiation in the electromagnetic spectrum can be very useful.
Infrared: Snake Hunt	Discover the extraordinary adaptation that allows snakes to hunt in near darkness.
How Do Cell Phones Work?	Why are microwaves perfect for communication using small cell 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	What are the sounds we can't hear?
Shockwaves	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.
Color	Red, green, yellow, blue – what makes colors 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?
Fiber 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: Color Mixing	Revealing the different ways color can be made.



### Nonrenewable 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	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	The difficult balancing act to meet energy needs.
Electricity: The Costs	Electricity prices are low, but what about the environmental 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 gasoline and diesel?
Palm Oil: Biofuel of the Future?	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	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 your future car run on – electricity, biofuel or hydrogen?
Chernobyl Disaster	Discover what happened in the world's worst nuclear power plant disaster.
Nuclear Waste	Why we can't just throw nuclear waste in the bin.

**Water as a Resource**

Hydropower	How to capture the power of water.
Water As a Resource	Examine the causes and effects of water shortages.
Building the Hoover Dam	How and why the Hoover Dam was built.
Bottled Water: The True Cost	The monetary and environmental costs of bottling water.
Marine Renewables	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.”*



- Teacher

### Earth's Structure

Structure of the Earth	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	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 subsequent 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 this famous National Park hiding?
Danger: Volcanic Ash	A firsthand account of the dangers of flying through a volcanic ash cloud.
The Last Day of Pompeii	A dramatic reenactment 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 USA 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

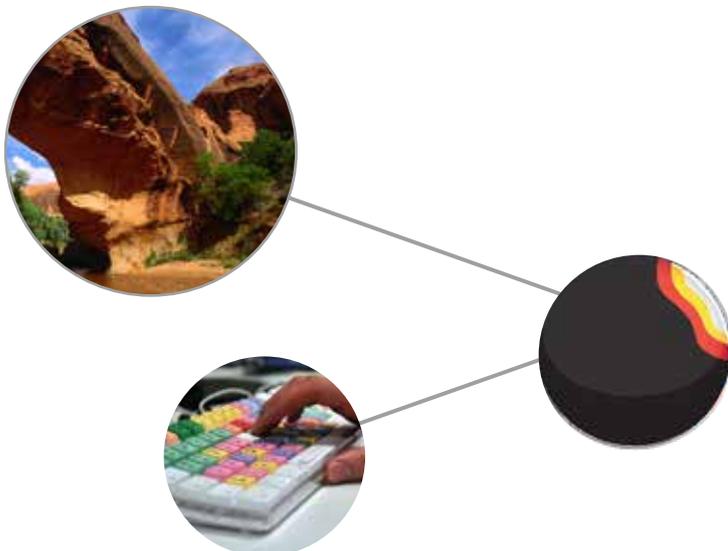
Weathering	Rocks are tough, but nature is tougher.
Waterfalls and Gorges	Waterfalls and gorges are some of Earth's most impressive natural features, but how are they formed?
Meanders and Oxbow Lakes	Meanders and oxbow lakes are commonly found in the middle course of a river. What are these features and 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, but nature is tougher.
Coastal Processes: Waves	How do waves shape our coastline?
Coastal Landforms	Unusual coastal land formations and how they are created.
Coastal Processes	How these geological processes shape our coastline.
Coasts: Hard Engineering	Coastal processes can be managed to reduce erosion. One form of management is called Hard Engineering.
Coasts: Soft Engineering	Coastal processes can be managed to reduce erosion. Learn about Soft Engineering solutions.
How Do Caves Form?	What processes create caves?
How Are Rivers Formed?	The formation of a river, from source to sea.

**Glacial Erosion**

Weathering	Rocks are tough, but nature is tougher.
Glaciers	How glaciers shape the world.
Scablands: Carved By Water	Discover how a glacial flood created 40,000 km <sup>2</sup> of North America.
Yosemite's Valleys	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	The climate change paradox: discover 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 that 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	Why destroying the rainforest could endanger the future of our planet.
Ecosystem Management: Deserts	Hot, arid and expansive: deserts have very different uses in MEDCs and LEDCs.
Ecosystem Management: Tropical Rainforests	The most important ecosystem on our planet needs our help.
Ecosystem Management: Deciduous Forests	Conservation helps to keep these important ecosystems, often called ancient woodlands, thriving.

**Humans and the Carbon Cycle**

The Carbon Family	A domestic perspective on pollution. How big is the average family's carbon footprint?
Carbon Capture: Phytoplankton	Discover how mysterious microorganisms in the oceans could save our planet.
Carbon Trading	Will government caps help industrial polluters to reduce their carbon footprint.?
Carbon Capture: Artificial Trees	In the future, not all trees will be made of wood...
The Future Carbon Family	A domestic perspective on "green living": how the average family can help save our planet.

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

 - Students

**Water**

Types of Weather: Rain	How do water molecules form rain?
The Water Cycle	Did you know that the water we use every day is billions of years old?
Cloud Seeding	How are scientists around the world making rain?
What Is a Rainbow?	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	Do you know about weird 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 defenses 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 systems and how can we predict them?
Types of Weather: Introduction	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 these 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 that 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?





### 3D Shapes

Polyhedra: Platonic Solids	Discover the properties of the Platonic Solids, and why they are considered special.
Cylinders: Fueling Saturn V	Revealed: the size of the giant cylinders that fueled 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	To protect supplies during World War Two, Churchill's navy relied on geometry...
Designing Chartres	Explore circle theorems through the geometric design of Chartres Cathedral.
Pi: Reciting Pi	How many digits of Pi can one man memorize?
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	The shape that gets bigger the more you take away...
The Tunnel of Samos	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	How Egyptian builders used triangles to create perfectly symmetrical pyramids.
Strengthening the Bank of China	Why extremely tall buildings are constructed from triangles.
Where is the Center of a Triangle?	Discover the many centers 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	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	How astronomers calculated these distances using the sine function.
Measuring the Earth	How maths enabled the first calculation of the Earth's circumference in ancient times.
Hyperbolic Geometry	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 find out how their variables affect this.





### Coordinates

Cartesian Coordinates	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	How Descartes developed the (x,y) coordinates so familiar today.

### Lines and Curves

Straight Lines: Bee Lines	Why do bees fly in straight lines?
Slopes: 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	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	How Newton's study of movement led to a revolutionary new branch of mathematics.

### Scale and Perspective

Painting By Numbers	How artists began to turn flat drawings into three-dimensional worlds.
Perspective: Parallax	Why closing each eye seems to cause objects to move – and how this can help measure extreme distances.
Escher and the Endless Staircase	How Penrose and Escher played with perspective to create impossible shapes.
Perspective: Dazzle Camouflage	See how some warships “hid” behind bright geometric designs.
Modeling 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	The beginnings of the Golden Ratio, and how it has endured throughout time.
Math 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	How Da Vinci used geometry to create the “perfect” human.
Ratios: The Math of Baking	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 math that helped send a spacecraft deeper into space than ever before.

**Scale and Perspective**

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**Accuracy and Estimation**

How Long is a Meter?	Who decided how long a meter is, and how did it become the standard metric measure?
Jai Singh	Why the Maharaja built the biggest observatories in the world.
Volume: Counting Stars	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	How the Ancient Greeks managed to prove mathematical reasoning beyond doubt.
Proofs: Million-Dollar Math	How proving a famous hypothesis could net you a million dollars.

**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	Revealed: the banking system that means your bank can lend out the money you deposit.

**Percentages**

Percentages: Feeding the Nutcracker	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	Predators from positive and negative altitudes threaten a sardine shoal.
Numbers: Animal Math	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	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	Why one of the most positive contributions of Indian mathematicians was, in fact, negative!

**Powers**

The Emperor's Chess Board	The legend of a simple request for a few grains of rice that threatened to bankrupt an Emperor.
What 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	The mathematical law that means ants are the strongest creatures in the world.

**Ratio and Proportion**

Ratios: The Math of Baking	How to bake a cake as big as you like!
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**Special Numbers**

Irrational Numbers: Pythagoras	Why the discovery of irrational numbers is said to have led to murder.
Primed for Survival	The mating behavior 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 come to exceed China's?
The Fibonacci Sequence	Discover Fibonacci's sequence, which occurs throughout nature.
Enigma: Cracking the Code	Why the Nazis' message encoding mechanism proved so difficult to crack.
Chinese Development of Math	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 extraterrestrial life.

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



- Student

**Algebraic Modeling**

How Algorithms Change the World	How mathematical functions influence human behavior.
Variables: Dating By Number	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	How Alan Turing developed the simple mathematical foundation of computing science.
The Birthday Paradox	Revealed: the surprising likelihood that you share your birthday with someone in the same room.

**Coordinates**

Coordinate Geometry: Descartes	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	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	Revealed: the complex scoring system used to place heptathletes.
The Chase	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	How the mathematician scribbled a note that created the world's most difficult maths problem.

**Sets**

Set Theory: Cantor	How Cantor's work on set theory shaped his life.
Venn Diagrams: Global Habitats	Compare the relationships between rainforest and desert environments.
Sets: Infinity	Revealing two different types of infinity...

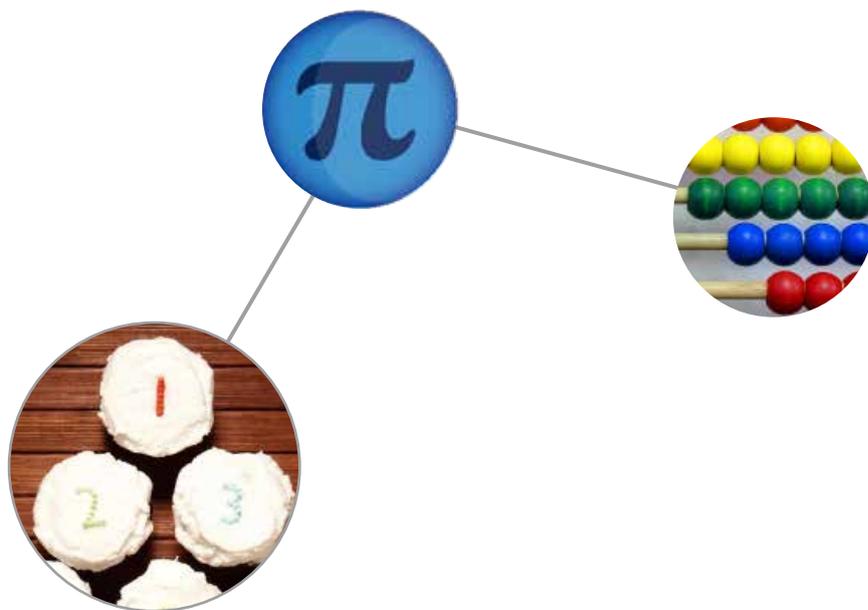


### Accuracy and Estimation

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How Origami Changed the World	Discover the surprising applications of the paper-folding art of origami.





### Probability Modeling

The Odds Are Against You	The mathematical reason that gambling on horse racing is unlikely to pay off.
The Card Counter	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	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	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?	Revealed: not only is it possible for monkeys to write Shakespeare... it could 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 behavior 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	How a magazine's "random" phone poll led to one of the most surprising election results in history.
Can Fish Oil Make You Smarter?	How simply undertaking a study can jeopardize 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?	How employees can tell where they rate, and if they will keep their job, on a cumulative frequency graph.
Can Eating Fish Prevent Murder?	Study finds: eat less seafood and you're more likely to commit murder! But what's the real story?



### 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	How one nurse's visual representation of data saved thousands of lives.
Histograms: Snapshot	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 ”*

 - Student



## Math Through the Ages 1

The Babylonians and Plimpton 322	See the surprisingly familiar numbers that appear on this ancient tablet.
The Egyptians and Unit Fractions	The legend that led the Egyptians to use a complex system of fractions.
The Egyptians and Multiplication	How the Egyptians tackled multiplication, using powers of two.
Building the Pyramids	How Egyptian builders used triangles to create perfectly symmetrical pyramids.
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The Romans and Numerals	Discover why the Romans were such terrible mathematicians!

## Math Through the Ages 2

India and Negative Numbers	Why one of the most positive contributions of Indian mathematicians was, in fact, negative!
The Arabic Science of Balancing	Discover the fundamental principle of algebra.
European Mathematical Symbols	Find out when and why mathematical symbols were invented.
Numbers: The Discovery of Zero	The number zero has not always existed. Why was it “invented”?
Chinese Development of Math	The independent development of Chinese mathematics.

## Math in Modern History

Tank Wars	The amazing prediction made using algebra that helped to win World War Two.
Beating the U-Boats	To protect supplies during World War Two, Churchill's Navy relied on geometry...
Enigma: Cracking the Code	Why the Nazis' message encoding mechanism proved so difficult to crack.
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The Prime Number Code	Discover why prime numbers hold the key to encryption.



## Great Mathematicians 1

Jai Singh	Why the Maharaja built the biggest observatories in the world.
Irrational Numbers: Pythagoras	Why the discovery of irrational numbers is said to have led to murder...
Calculating Pi: Archimedes	How was Pi first accurately calculated?
Geometry: Euclid	What were the simple rules Euclid set out that form the basis of geometry?

## Great Mathematicians 2

Coordinate Geometry: Descartes	How Descartes developed the (x,y) coordinates so familiar today.
Calculus: Newton	How Newton's study of movement led to a revolutionary new branch of mathematics.
Set Theory: Cantor	How Cantor's work on set theory shaped his life.
Algorithms: Turing	How Alan Turing developed the simple mathematical foundation of computing science.
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Number Theory: Gauss	The patterns that allowed a seven-year-old mathematician to perform amazing calculations.
Degrees of Separation: Erdős	What's your Erdős number?



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