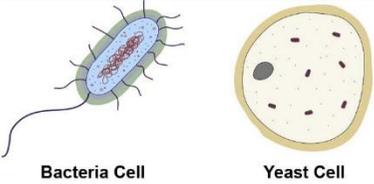
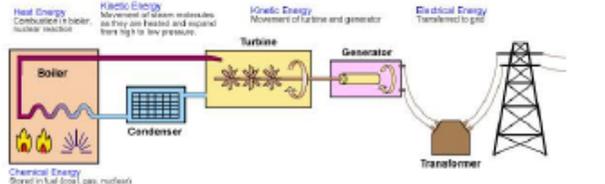
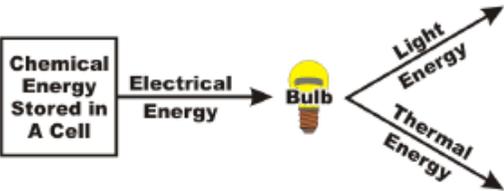
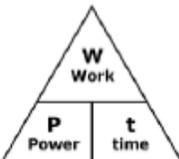


1. Microbes	2. Disease	3. Vaccination
<p>Key ideas</p>  <p>Bacteria Cell Yeast Cell</p> <p>Microbes are tiny living organisms. They can be bacteria, fungi or viruses. Many microbes are useful, for example bacteria decompose waste and are used in the production of cheese and yeast makes bread rise and produces the alcohol in wine. You even have trillions of bacteria inside your gut, they are important in helping you stay healthy. Bacteria are single celled organisms they are much smaller than animal cells, they reproduce very rapidly and their DNA is not contained in a nucleus. Viruses are even smaller than bacteria, they cannot reproduce on their own but hijack the cells of other organisms in order to reproduce.</p>	<p>Key ideas</p>  <p>IMMUNE CELL</p> <p>bacteria</p> <p>PHAGOCYTOSIS</p> <p>Pathogens cause disease by reproducing inside your body, bacteria produce toxins and viruses damage your cells. However if microbes enter the body then your immune system fights the infection, white blood cells engulf and destroy the pathogens and produce antibodies and antitoxins to neutralise the pathogens and the toxins they produce.</p>	<p>Key ideas</p>  <p>Vaccinations protect us from serious infectious diseases. A dead or weakened version of the pathogen is injected and our body produces antibodies to that pathogen. If we are ever exposed to the real live pathogen our white blood cells can respond rapidly and so that we don't get ill.</p>
<p>Aseptic technique when working with microbes uses procedures to prevent cross contamination.</p> <p>Asexual reproduction is a type of reproduction by which offspring arise from a single organism, and inherit the genes of that parent only.</p> <p>Bacteria (singular bacterium) is a type of biological cell. They are the main part of the domain of prokaryotic microorganisms.</p> <p>Binary fission is a kind of asexual reproduction. It is the most common form of reproduction in prokaryotes such as bacteria.</p> <p>Microorganism or microbe, is a microscopic organism, which may exist in its single-celled form or in a colony of cells.</p> <p>Pathogen is a disease causing microbe.</p> <p>Prokaryotic microbes do not have a nucleus.</p>	<p>Antibody, antibodies are produced by white blood cells, they recognize and latch onto antigens on the surface of pathogens.</p> <p>Antigen is a protein usually on the surface of a pathogen that triggers the immune system.</p> <p>Immune system is the organs and processes of the body that provide resistance to infection and toxins.</p> <p>Lymphocyte is the type of white blood cell that produces antibodies.</p> <p>Macrophage is the type of white blood cell that engulfs and destroys pathogens.</p> <p>Non-specific defence mechanisms are the physical barriers that your body has to infection e.g skin, scabs, tears and stomach acid.</p> <p>Phagocytosis is the process by which white blood cells engulf and destroy pathogens.</p>	<p>Immunity is the ability to resist a particular disease especially through preventing development of a pathogenic microorganism.</p> <p>Immunisation is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine.</p> <p>Inoculation is the introduction of a serum, a vaccine, or an antigenic substance into the body of a person or an animal, in order to produce immunity to a specific disease.</p> <p>Vaccine triggers the body to acquire immunity to a pathogen.</p> <p>White blood cell is the type of cell that produces antibodies and antitoxins.</p>

1. Energy	2. Electricity generation	3. Space and gravity
<p>Key ideas:</p> <p>There are different forms of stored energy, thermal energy - the energy stored in the movements of the particles within a substance, chemical energy – the energy stored in fuels and foods, kinetic energy, gravitational potential energy, elastic potential energy and nuclear energy.</p> <p>Energy resources are not the same as types of energy. Energy resources are used to generate electricity. For example fossil fuels are an energy resource but the type of energy they have is called chemical energy. Wind, geothermal, wave and solar are all types of energy resource.</p>	<p>Key ideas:</p> <p>Electricity is produced when a turbine spins an electromagnetic generator. Electricity is the transfer of electrical energy, the amount of electrical energy transferred depends on voltage and current. Power is the amount of electrical energy in joules (j) that is transferred per second it is measured in watts (w). You can calculate the amount of energy used by a variety of appliances using the following equation</p>  <p>The diagram shows the flow of energy from a boiler to a turbine, then to a generator, and finally to a transformer. Labels include: Heat Energy (Conversion in boiler, nuclear reaction), Kinetic Energy (Movement of steam molecules as they are pushed and expand from high to low pressure), Kinetic Energy (Movement of turbine and generator), Electrical Energy (Transformed to grid), Chemical Energy (Based on fuel from gas, nuclear), and Transformer.</p>	<p>Key ideas:</p> <p>Gravity is the force by which a planet or other body draws objects toward its centre, gravity is a non-contact force. The force of gravity keeps all of the planets in orbit around the sun. On Earth, gravity gives weight to physical objects, and the Moon's gravity causes the ocean tides. Objects with greater mass exert more gravity, the gravity on moon is approximately 1/6 of that on Earth because the mass of the moon is about 1/6 of the mass of the Earth.</p>
<p>Key words</p>	<p>Key words</p>	<p>Key words</p>
<p>Energy transfer: energy can be stored or moved from place to place in different ways. Energy can be transferred by light, sound, electricity, forces and heating. Energy transfer diagrams show each type of energy, whether it is stored or not, and the processes taking place as it is transferred.</p>  <p>The diagram shows a box labeled 'Chemical Energy Stored in A Cell' with an arrow labeled 'Electrical Energy' pointing to a light bulb. From the bulb, two arrows point outwards: one labeled 'Light Energy' and one labeled 'Thermal Energy'.</p>	<p>Current is a measure of how much electric charge flows through a circuit.(amps/A) Electricity: the presence and flow of electrical charge. Electromagnetic generator: is a device that converts mechanical energy into electrical energy by spinning a magnet inside a coil of wire Power is a measure of how quickly energy is transferred. (watts/W) Electricity transferred (Kw/hr) = power (kilowatts) x time (hours)</p>  <p>The diagram is a triangle with 'W Work' at the top, 'P Power' at the bottom left, and 't time' at the bottom right.</p>	<p>Mass is a measurement of the amount of matter something contains. Mass is measured in Kilograms Newton is the unit of force. Weight is the measurement of the pull of gravity on an object. Weight is measured in newtons. The Solar System is the gravitationally bound system of the Sun and the objects that orbit it. Our solar system consists of our star, the Sun, and everything bound to it by gravity — the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune, dwarf planets such as Pluto, dozens of moons and millions of asteroids, comets and meteoroids.</p>

3. Reactivity Series	
Key ideas:	
<p>potassium most reactive K</p> <p>sodium Na</p> <p>calcium Ca</p> <p>magnesium Mg</p> <p>aluminium Al</p> <p>carbon C</p> <p>zinc Zn</p> <p>iron Fe</p> <p>tin Sn</p> <p>lead Pb</p> <p>hydrogen H</p> <p>copper Cu</p> <p>silver Ag</p> <p>gold Au</p> <p>platinum least reactive Pt</p>	<p>The most reactive element is placed at the top and the least reactive element at the bottom.</p> <p>More reactive metals have a greater tendency to lose electrons and form positive ions.</p>
Key words	
<p>Reactivity: the impetus by which a chemical substance will take part in a chemical reaction.</p> <p>Reactivity series: arrangement of metals by their reactivity from highest to lowest</p> <p>Ion – particle formed when an atom loses or gains outer electrons, in chemical reactions metals form positive ions by losing electrons.</p> <p>Periodic table: chemical elements arranged in order of atomic number, in rows, so that elements with similar atomic structure and hence similar chemical properties appear in vertical columns or groups.</p> <p>Alkali metal: reactive metals found in group 1 of the periodic table</p>	
<p>Reactions with water/steam, oxygen and acid are used to organise the metals into the order of reactivity</p>	
<p>Watch the video https://www.youtube.com/watch?v=83eq5HyG-tl Research metal reactivity and explain why it is useful for metal extraction. Describe and explain the reactivity of the group 1 metals.</p>	

4. Chemical reactions	1. Acids and Alkalis
Key ideas	Key ideas:
<p>In chemical reactions total mass is always conserved because mass cannot be created or destroyed. This means that you have the same number of atoms after the reaction as you did before the reaction; they have just been rearranged to make new substances. This is why we have to balance equations.</p> $2\text{Fe}_2\text{O}_3 + 3\text{C} \longrightarrow 4\text{Fe} + 3\text{CO}_2$ <p>Fe = 4 Fe = 4 O = 6 O = 6 C = 3 C = 3</p>	<p>pH scale</p>
Key words	Keywords
<p>Atom: An atom is the smallest unit of matter</p> <p>Compound: Two or more different atoms chemically joined together e.g. H₂O, CH₄, CO₂</p> <p>Element: A substance made of only one type of atom e.g. O₂, Mg, S₈</p> <p>Molecule: Two or more atoms chemically joined together e.g. O₂, HCl, NH₃. Some elements are made of molecules, all compounds are made of molecules.</p> <p>Product: is a substance that is formed as the result of a chemical reaction</p> <p>Reactant: are the starting materials in a chemical <u>reaction</u></p>	<p>Acid: pH six and lower. Range in colour from yellow to red when using universal indicator. Hydrochloric and sulfuric acid are both common examples.</p> <p>Alkali: pH eight and higher. Range in colour from blue to dark purple. Often cleaning products or substances which contain hydroxide, e.g sodium hydroxide.</p> <p>Indicator: a substance that will change colour to tell us whether something is an acid or an alkali.</p> <p>Neutralisation: a chemical reaction between an acid and an alkali which forms a neutral solution.</p>
<p>Exothermic reactions give out energy and endothermic reactions take in energy from the surroundings. Catalysts can be used to speed up reactions</p>	
<p>Watch the following videos https://www.youtube.com/watch?v=VikhvjkKu_8 https://www.youtube.com/watch?v=6td9NZ-YRjE Research and identify different types of chemical reactions, explain each one and give examples</p>	<p>Watch the following videos https://www.youtube.com/watch?v=Hzk2nU7uBw4 https://www.youtube.com/watch?v=63IG_6JmCes Describe what is shown by the pH scale and explain how acids can be neutralised, include equations for neutralisation reactions.</p>