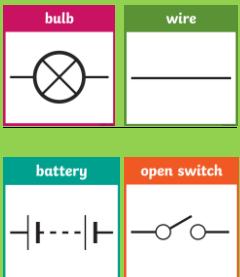
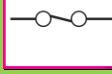


Holme Community School – Long Term Curriculum Planning

Subject	Science	Cycle	B
What themes/ golden threads weave through the curriculum?	<ul style="list-style-type: none"> ➤ To link learning to four key conceptual models to support deeper understanding. (The particle model, the force-arrow model, the energy transfer model, the big picture model(advanced organiser) ➤ Biology: Plants, Animals Including Humans, Living Things and their habitats, Seasonal Changes, Evolution and Inheritance, Rocks and Soils ➤ Physical Processes (Physics): Everyday Materials, Forces and Magnets, Light, Sound, Electricity, Earth and Space ➤ Chemical Processes (Chemistry): States of Matter 		
Why were these themes chosen?	<p>These are the aims of the national curriculum.</p> <p>The four conceptual models allow children to connect learning from across the science curriculum and supports them to communicate abstract conceptual ideas.</p>		
What are the overall aims of this curriculum?	<ul style="list-style-type: none"> ➤ To ensure that content taught is underpinned by high quality and applicable scientific enquiry. ➤ To embed working scientifically skills within each unit taught, not taught in isolation. ➤ To embed clear vocabulary progression across each topic taught. ➤ To link learning to four key conceptual models to support deeper understanding. (The particle model, the force-arrow model, the energy transfer model, the big picture model) ➤ To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics ➤ To develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them ➤ To ensure children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future 		

Year Group		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	Topic Heading: Discovery in Design What are the building blocks for this subject to ensure children are KS1 ready?	<u>Understanding the World ELG</u> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.					
Year 1/2	Topic Heading:	Animals including humans	Electricity	Use of Everyday Materials		Plants	Living things and their habitats

	Link to themes/key concepts	Biology	Physics	Chemistry	Biology	Biology
	Health and Growth	Building circuits		Suitability and changing shapes of materials	Growth conditions for seeds and bulbs	Suitable habitats and simple food chains
Key Knowledge (This is what they will learn over the topic sessions and what they will be assessed on)	<p>What happens to our bodies as we grow? Humans have offspring which grow and develop into adults. The life-cycle of a human is baby – toddler – child – teenager – adult.</p> <p>Do other animals grow in the same way as us? Different animals have different types of offspring. Some animals give birth to live young (mammals and fish.) Some animals lay eggs which the young hatch from (birds, amphibians, reptiles and fish.) Some offspring look like their adults when they are born (mammals, reptiles and birds,) some offspring do not (fish and amphibians.)</p> <p>What do we need to live and be healthy? All animals need air, water and food to survive. Carnivores only eat meat, herbivores only eat plants and omnivores eat both. Human offspring are fed milk from their mothers and are looked after by their adults. (Fish, reptiles and amphibians do not look after their young.) We need a balanced diet to be healthy.</p> <p>Why is it important to exercise? Exercise makes our muscles and bones stronger and helps our lungs to work better. It is good for your brain and makes you feel happy.</p> <p>Why is it important to keep clean?</p>	<p>Where do we use electricity in our home? Various appliances in our home use electricity. The electricity can come from a battery, a solar source or the house mains supply.</p> <p>How do we use electricity safely? At high levels, electricity can be dangerous and even kill. Therefore, it needs to be used safely. This involves (but is not limited to) not putting fingers into plug sockets, not using electricity near water, not pulling electrical wires and staying clear from power lines.</p> <p>What is a circuit? An electrical circuit involves a power source (battery) transferring energy to a bulb via a wire. A closed circuit has no break in the energy transfer. An open circuit has a break, usually a switch.</p> <p>What are the parts of a circuit? Can you remember the symbols we use? Wire, bulb, battery, open switch and closed circuit.</p> 	<p>What are things made from? Everything is made from a material and different materials have different properties (link to cycle A.)</p> <p>Do different materials have different properties? Different materials have different properties and most materials have more than one property. A property of a material helps us to decide its usefulness for a particular job. For example, a coat needs to be warm and waterproof.</p> <p>Can we change the shape of materials? Some materials can change shape by bending, twisting and squashing - sponge and rubber. Some cannot – metal and wood.</p> <p>What are solids, liquids and gases? A solid has a fixed shape, cannot flow and cannot be squashed. A liquid has no fixed shape, can flow and cannot be squashed. A gas has no fixed shape, can flow and can be squashed.</p>	<p>How do plants grow? A plant is grown from a seed or bulb, which is planted into soil. The seed germinates (when conditions are right) and a sprout begins to grow. Roots usually grow underground. From the sprout, a stem and leaves form. The plant then flowers to make further seeds so it can reproduce.</p> <p>What conditions do plants need to grow? Plants need sunlight, air, water, warmth and time to grow.</p>	<p>What makes something living? There are 7 processes to determine if something is alive:</p> <ul style="list-style-type: none"> M – movement R – respiration S – sensitivity G – growth R – reproduction E – excretion N – nutrition <p>Can you identify living, dead and non-living things? Living things have life processes (a tree.) Dead things were once part of a living thing (an apple, once it has been picked.) Some things have never been alive (an inanimate object – plastic toy.)</p> <p>What is a habitat? A habitat is the natural home or environment of a plant or animal.</p> <p>How are living things suited to their own habitat? A habitat will provide a living thing with everything they need to survive, including food, water, air and a space to live and grow. Living things are therefore suited to their habitat.</p> <p>What is a food chain? A food chain shows how each animal gets its food. It begins with a producer (a green plant that produces its own food) – consumer (an animal consuming the producer) – predator (animals that eat other animals.) The direction of the arrow in a food chain indicates it is being eaten by.</p> 	

		<p>Keeping clean helps to stop the spread of germs, which can cause us to be ill. Staying clean helps us to stay healthy.</p>	<p>closed switch</p>  <p>Can you build a circuit?</p> <p>Pupils follow instructions/diagram to build a closed circuit.</p>		
National Curriculum Objectives to be covered	<ul style="list-style-type: none"> - Notice that animals, including humans, have offspring which grow into adults - Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) - Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene 	<ul style="list-style-type: none"> - Identify appliances that run on electricity - Recognise the need for a power source (mains, battery, rechargeable, renewable, etc) and a circuit to make an appliance work - Identify both the component and its symbol in a simple circuit - Build simple closed circuits - Know electrical safety 	<ul style="list-style-type: none"> - Identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching 	<ul style="list-style-type: none"> - Observe and compare how seeds and bulbs grow into mature plants - Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy 	<ul style="list-style-type: none"> - Explore and compare the differences between things that are living, dead, and things that have never been alive - Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other - Identify and name a variety of plants and animals in their habitats, including microhabitats - Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food
Key Subject Specific Vocabulary to be taught	Growth, reproduction offspring, life-cycle, water, breathing, nutrition, diet, exercise and fitness.	Electricity, circuit (open/closed), appliance, main supply, battery, wire, bulb, and flow/transfer.	Material, wood, metal, plastic, glass, rock, paper, squishing, bending, twisting, waterproof/non, hard/soft, stretching, solid, liquid and gas.	Seed, bulb, root, stem, flower, water, sunlight, temperature, germinate and reproduction.	Living, dead, non-living, respiration, excretion, movement, senses, grow, reproduction, nutrition, habitat, micro-habitat and food chain.
Areas of working scientifically covered	Explaining Science Data, Tables and Graphs	Classification Designing experiments	Designing experiments Classification	Designing experiments Analysis and Evaluation	Classification Explaining Science

	Assessment Activities/ Key knowledge	Design a 'health lifestyle' poster.	Children to independently build a circuit.	Children to produce a picture advert selling a material of choice, describing its features and uses.	Multiple choice quiz.	Children to independently create a pictogram showing the 7 life processes, a simple food-chain and an example of something alive, dead and non-living.
Year 3/4	Topic Heading:	Rocks and Soils	Animals including Humans	Forces and Magnets	States of Matter	Living things and their Habitats
	Link to themes/ key concepts	Biology Soil properties, fossils and rocks. Model: Particle	Biology Skeletons. Model: Energy Transfer & AO	Physics Friction, how things move on different surfaces and magnets. Model: Force Arrow	Biology Solids, liquids, gases, heating and cooling, water cycle. Model: Particles	Biology Grouping and simple classifying/ changes to habitats can pose dangers. Model: AO: Classification
	Key Knowledge (This is what they will learn over the topic sessions and what they will be assessed on)	<p>Are there different types of rock? There are 3 types of naturally occurring rocks: Igneous – Formed from molten rock when it cools and hardens. Intrusive = hardened underground. Extrusive = hardened over ground. Sedimentary – formed under the sea from rocks on the bottom of the sea (sediment) that are built up into layers (compaction) and compounded together so they form a solid layer (cementation.) Metamorphic – formed when sedimentary and igneous rocks experience intense heat and pressure as a result of seismic activity in the Earth's crust. Rocks can be human made as well, such as concrete or bricks.</p> <p>Rocks have lots of uses The properties of rocks can aid in defining its use; hard, soft, durable (or not), permeable, impermeable and dense. Most rocks have more than one property resulting in many uses. Some examples include using concrete to make pavements, motorways and bridges, bricks to build buildings (both now and throughout history,) chalk for ceramics, crayons and cosmetics and marble for buildings, monuments and</p>	<p>What do animals need to eat to stay healthy? Animals need to eat a healthy and balanced diet to stay healthy. The correct diet for each animal will provide all the nutrients needed to stay alive and healthy.</p> <p>What is a balanced diet? A balanced diet for a human is made from 5 food groups; Fruit and vegetables, carbohydrates, protein, dairy and fats.</p> 	<p>What is a force? A force is a push or pull influence on an object to put it into motion.</p> <p>How can we show and measure contact forces? A contact force occurs when 2 objects contact each other. Children can use the force arrows science model to predict cause and effect.</p> <p>What is gravity? Gravity is an invisible force that pulls objects toward the ground.</p> <p>How do magnets behave? All magnets have a north and south pole. The opposite pole is attracted to each other, while the same poles repel each other.</p> <p>Are all magnets the same? Different magnets have different magnetic strength. A stronger magnet has more magnetism.</p> <p>Which materials are magnetic? Metal materials are magnetic and non-metal materials are not magnetic.</p>	<p>What makes something a solid, liquid or a gas? A solid has a fixed shape, cannot flow and cannot be squashed. A liquid has no fixed shape, can flow and cannot be squashed. A gas has no fixed shape, can flow and can be squashed.</p> <p>What are solids, liquids and gases made of? Materials are made of particles. In a solid, the particles are close together and cannot move. In a liquid the particles are close together, but can move around easily. In a gas, the particles are spread out and can move around very easily and quickly.</p> <p>What happens when substances change state? When water and other liquids reach a certain temperature, they change state into a solid or a gas. When a solid reaches its melting point, it melts into a liquid.</p> <p>What is evaporation and condensation? Evaporation occurs when water turns into a water vapour. Condensation is when</p>	<p>Can you group living things in different ways? Animals and plants can be classified into groups based on life processes (MRS GREN). For example, habitats they can be found in, how things move (wings, legs etc.), how animals reproduce (to live young or eggs.), the nutrition they consume to produce energy etc.</p> <p>Can you use a classification key? A classification key can be used to create a flow chart resulting in animal or plant identification.</p> <p>What living things can we find in...habitat? Living things depend upon their habitats to give them everything they need, including food, water, air and a space to live and grow. Suggest to explore a local habitat to identify animals and plants. Compare to a different habitat of choice.</p> <p>Recognise habitats can change. Habitats can change for many different reasons, some of which are natural, and some of which are man-made. Some species can only survive in a particular habitat, whilst other species are very good at adapting.</p>

	<p>interior decoration.</p> <p>Know how fossils are made</p> <p>Step 1 - An animal or creature dies gets covered by a layer of sediments (e.g. plant material and tiny parts of rock or soil etc). Over time, through compaction and cementation (solidifying), these form a layer of rock.</p> <p>Step 2 - More layers of rock are formed which cover it. Over time the only thing to remain of the organism would be the hard parts such as bones, shells and teeth.</p> <p>Step 3 - Over thousands of years the mould fossil might become a cast fossil with sediment entering the mould. In the case of replacement fossils, the original bone matter changes to mineral matter but this does not affect the shape of the bones.</p> <p>Step 4 - Over time, the sea will recede in certain places. The sea level could also be changed quickly through earthquakes and volcanic eruptions.</p> <p>Step 5 - As erosion and weathering takes place, the fossils become exposed.</p> <p>Soils are made from rocks and organic matter</p> <p>Soil is made up of tiny particles of rock, dead and decaying plants and animals, air and water. Different types of rocks will form different soils; clay soil comes from clay, sandy soil comes from sandstone, chalky soil comes from chalk etc.</p>	<p>can compress so the animal can use it to change shape worm. An exoskeleton (on a crab) is hard, stiff and has joints or bendable sections allowing the animal to move. An endoskeleton is found inside the body of vertebrate animals. It is held together by joints and surrounded by muscles allowing for movement.</p>		<p>a water vapour is cooled down and turns into a water.</p> <p>What happens in the water cycle?</p> <p>Water from lakes, puddles, rivers and seas is evaporated by the sun. The water vapour rises and then cools down to form water droplets in clouds (condensation.) When the droplets get too heavy, they fall back to Earth.</p>	
National Curriculum	<ul style="list-style-type: none"> - Compare and group together different kinds of rocks on the 	<ul style="list-style-type: none"> - Identify that animals, including humans, need the right types and amount of 	<ul style="list-style-type: none"> - Compare how things move on different surfaces 	<ul style="list-style-type: none"> - Compare and group materials together, according to 	<ul style="list-style-type: none"> - Recognise that living things can be grouped in a variety of ways

	Objectives to be covered	basis of their appearance and simple physical properties. - Describe in simple terms how fossils are formed when things that have lived are trapped within rock. - Recognise that soils are made from rocks and organic matter.	nutrition, and that they cannot make their own food; they get nutrition from what they eat - Identify that humans and some animals have skeletons and muscles for support, protection and movement.	- Notice that some forces need contact between two objects and some forces act at a distance - Observe how magnets attract or repel each other and attract some materials and not others - Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.	whether they are solids, liquids or gases - Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C) - Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	- Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - Recognise that environments can change and that this can sometimes pose dangers to living things
	Key Subject Specific Vocabulary to be taught	Rock (types), smooth, rough, crumbly, grainy, crystals, fossil (types), sediment, layers, pressure, organic matter, vegetation and compost.	Nutrition, nutrients, diet (balanced/unbalanced), sugar, protein, fat, vitamins, minerals, energy, skeleton, vertebrate, invertebrate, support, protection	Force, push, pull, contact force, distance force, gravity, force arrow, magnetic/magnetism, attract, repel and non-magnetic.	State, solid, liquid, gas, property, particle, bond/attraction, heating, cooling, melting, freezing, evaporating, condensing and water cycle.	Environment, habitat/micro-habitat, key, classification (genus, species), vertebrate, fish, amphibian, reptile, bird, mammal, invertebrate, insects, plants and trees.
	Working scientifically focus	Explaining Science Classification	Explaining Science Data, Table and Graphs	Explaining Science Designing Experiments	Explaining Science Designing Experiments	Classification Data, Tables and Graphs
	Assessment Activities/Key Questions	To create a poster/presentation that reflects all the key knowledge that has been covered and what the children can independently recall.	Following an investigation, create a detailed bar chart to show results collected.	A plan, do & review investigation involving magnets and a variety of materials.	A plan, do & review investigation demonstrating the water cycle.	Multiple choice or T/F with explanations quiz.
	Topic Heading:	Electricity	Light	Evolution and Inheritance	Animals including humans	Living things and their Habitats
Year 5/6	Link to themes/ key concepts	Physics What affects bulb brightness, buzzer volume, voltage and symbols. Model: Energy Transfer	Physics How we see things, light travelling in a straight line. Model: Energy Transfer	Biology Fossils and adaptation. Model: AO (Human Life Cycle)	Biology Circulatory system, function of heart blood vessels and blood. Model: Big-Picture	Biology Classifying including micro-organisms. Model: AO: Classification

<p>Key Knowledge (This is what they will learn over the topic sessions and what they will be assessed on)</p>	<p>Can you make a working series circuit? An electrical circuit involves a power source (battery) transferring energy to a bulb via a wire. A series circuit is closed and has one component after another. Pupils follow instructions/diagram to build a simple series circuit.</p> <p>How can we change the amount of energy in a circuit? The amount of energy in a circuit can vary depending on the store of energy (battery), the push transfer of energy (voltage) and the amount of resistance in the circuit.</p> <p>What is electrical resistance? Resistance is the difficulty that electric current faces when flowing around a circuit. More resistance results in less energy.</p> <p>What happens to the energy as it flows around a circuit? Energy flowing around a circuit will be shared amongst the number of components in the circuit, resulting in less power. Electrons will meet more resistance in longer wires (less in shorter), further reducing the amount of energy available.</p> <p>Can you make...? Plan, do and review an interesting series circuit. Test the effectiveness to make improvements.</p>	<p>How does light travel? Light travels as a wave from its source in straight lines called rays.</p> <p>What happens when light hits an object? Light waves travel from their source in straight lines (rays) until they hit an object. The light rays are then reflected off the object and travels in a straight line to our eyes, enabling us to see the object.</p> <p>How can we see around corners? Light bounces off a surface at the same angle that it hits at. Therefore, uneven surfaces scatter light more than smooth surfaces. When light is scattered off an object, we describe it as a diffused reflection. When light is not scattered we get a mirror image. Mirrors can be used to bounce light from different directions (including from around corners) into our eyes.</p> <p>How do shadows form? A shadow is formed when an opaque object blocks light travelling from a light source, while the rest of the light continues to travel. A shadow is always the same shape as the object that casts it.</p>	<p>Why are fossils so important? Fossils provide important evidence for evolution and the adaptation of plants and animals to their environments.</p> <p>How are we different? How are we the same? In science, inheritance is the process of passing characteristics from adult parents to their offspring. These characteristics are passed on through genes. Characteristics are inherited from both parents, but the way they combine makes each offspring unique.</p> <p>How are living things adapted to their environment? Living things have adapted over time to make it easier for them to survive in their environment. These many adaptations are influenced by the environment in which the living thing resides. They occur accidentally, and are usually as a result of random DNA mutation. Over time, this process is known as evolution. Adaptive traits enable a living thing to survive better in its habitat or environment.</p> <p>How do living things change? The process, whereby certain inherited and adaptive traits allowed living things to live and reproduce while others became extinct, is called natural selection.</p>	<p>Do you know where your main organs are in the body? Some of the main human body organs include the brain, the liver, bladder, kidneys, heart, stomach and intestines. All organs/muscles need nutrients, oxygen and make waste. The role of the blood system therefore, is vital.</p> <p>Why do we have blood? Blood transports oxygen, carbon dioxide, nutrients and waste products around the body. Blood platelets help you to stop bleeding when you get hurt and white blood cells fight infection when you're sick.</p> <p>How does blood get around our body? The heart pumps deoxygenated blood to the lungs to get oxygen. It then pumps the oxygenated blood around the rest of the body.</p> <p>What happens when we exercise? Exercise helps to strengthen muscles (including the heart,) improve circulation, increase the amount of oxygen around the body, releases brain chemicals which help you feel calm and relaxed, helps you sleep more easily and strengthens bones. It can even help to stop us from getting ill.</p> <p>What are the effects of diet, drugs and lifestyle? A healthy diet involves eating the right types of nutrients in the right amounts. A drug is any substance that has an effect on your body when it enters your system. Legal drugs (such as those available on prescription) are mostly considered harmless if used properly (but not always -</p>	<p>How are animals and plants classified? Review MRS GREN. Scientists use the Linnaeus System (created by Carl Linnaeus in 1735) to classify living things by eight levels, each level getting smaller until the one animal is left: Domain – kingdom – phylum – class – order – family – genus – species.</p> <p>What types of living things are there in ...? Children to observe/research a species diversity list for a specific habitat.</p> <p>Can you make a key to classify? A classification key can be used to create a flow chart resulting in animal or plant identification.</p> <p>Where can we find microbes? Microorganisms are viruses, bacteria, moulds and yeast. Some animals (dust mites) and plants (phytoplankton) are also microorganisms. Microorganisms are very tiny living things that can only be seen using a microscope. They can be found in and on our bodies, in the air, in water and on objects around us.</p>
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					consider effects of cigarettes and/or alcohol.) Illegal drugs are linked to many serious physical and mental health problems and can be highly addictive.	
National Curriculum Objectives to be covered	<ul style="list-style-type: none"> - Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches - Use recognised symbols when representing a simple circuit in a diagram 	<ul style="list-style-type: none"> - Recognise that light appears to travel in straight lines - Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye - Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes - Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them 	<ul style="list-style-type: none"> - Recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago - Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents - Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution 	<ul style="list-style-type: none"> - Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood - Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function - Describe the ways in which nutrients and water are transported within animals, including humans 	<ul style="list-style-type: none"> - Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals - Give reasons for classifying plants and animals based on specific characteristics. 	
Key Subject Specific Vocabulary to be taught	Cell, battery, positive/negative terminal, voltage (V), Amps (A), current, wire, insulator, resistance, resistor, filament, lamp, motor and switch,	Luminous/non-luminous, absorbed, reflected, transmitted, scattered, shiny, opaque, reflective, transparent, translucent, concave, convex, mirror and shadow.	Fossil, extinction, variation, inheritance, feature, adaptation, species, natural selection, adaptation and evolution.	Organs (various), circulatory system/ circulation, blood, plasma, red blood cells, exchange, artery, vein, heart, pulse, alcohol, nicotine and tar.	kingdom (phylum, class, order, family, genus, species), microorganisms, bacteria, fungi, virus, (protist)	
Working scientifically focus	Explaining Science Designing Experiments	Explaining Science Making Conclusions	Explaining science Data, Tables and Graphs	Explaining Science Designing Experiments	Explaining Science Classification	
Assessment Activities/Key Questions	To create a plan, do & review investigation on an interesting series circuit.	To create a scientific diagram (with relevant labels) explaining how light travels.	Independently (in groups) prepare a script for a National Geographic documentary on evolution and inheritance.	Following an investigation into the circulatory system, independently create a table and graph to show the results.	Multiple choice or T/F with explanations quiz.	