Science Core Knowledge:

Physics; Chemistry; Biology

These are the science topics taught in each year group:

Year 1- Seasonal Changes; Everyday Materials; Animals (Incl Humans); Plants

Year 2- Growing Plants; Uses of Everyday Materials; Animals (Incl Humans); Living Things and their Habitats

Year 3 - Forces & Magnets; Light; Plants; Animal nutrition; Rocks

Year 4 - Sound; Electricity; States of matter; Animals and Digestion; Habitats

Year 5 - Forces; Earth & Space; Materials & Properties; Life Cycles; Human Development

Year 6 - Light; Electricity; Habitats; Evolution; Human Circulatory System

These are the types of questions your child should be able to answer after they've been taught a topic area

Year 1-

Seasonal Changes-

1. Describe the typical weather that you might see in the summer?
2. Where does rain come from?
3. Are days longer or shorter in the Winter than the Summer?
4. Is it safe to look directly at the sun?

Everyday Materials-

1.What precise, scientific word do we use to describe a material that will not let water pass through it? 2. Can you name something that is shiny? Flexible? Transparent?
3. What would be the best material to line a dog's basket with?

Animals-

1. Name some types of animals that live on the earth or fly in the air.
2. What is the precise, scientific name for animals that never eat meat?
3. Which 3 types of animals live in or near water?
4. What is the name of the body part that helps your leg to bend?
5. Which body part allows humans to smell?

Plants-

1. Can you name the main parts of a plant?
2. What is the precise, scientific name for trees that lose their leaves in the Autumn and Winter?
3. What things do plants grow from?
4. What do plants produce in place of the flower after it has withered?
5. Can you name the main parts of a tree?

Year 1 answers

Seasonal Changes 1. Sunshine. 2. It collects in the sky as clouds and then rain is released when they get heavy. 3. Shorter. Daylight is less in the winter months. 4. No! Never.
Everyday Materials 1. Waterproof 2.Foil or metal. Plastic. Glass. 3. Soft fabric that is washable.
Animals 1. Mammals, birds, 2. Herbivores. 3. Reptiles, amphibians, fish 4. Knee. 5. Nose.
Plants 1. Petal, flower, leaf, stem, roots 2. Deciduous 3. Bulb or seed 4. Fruit 5. Trunk, leaf, branch, roots

Year 2

Growing Plants

1. What do plants need to grow healthily?
2. What do seeds and bulbs have inside them that helps them to grow?
3. Name a typical plant you might find growing on a lawn?
4. Will a plant grow well if the temperature is very cold?

Uses of Everyday Materials

1. Should a spoon be made from glass? Why?
2. What would be a good material to use to make an umbrella?
3. Name 4 everyday objects made from metal.
4. What could you do to change the shape of a material like plastic?

Animals including humans

1. In what order are the 3 stages of growth for a chicken?
2. Name 5 adult animals and their babies
3. What do all animals need to survive?
4. What should humans do to live healthily?

Living Things and their Habitats

1. Name some creatures that might live in a woodland
2. What is the precise, scientific name for a place that something lives? (starts with h)
3. Describe what a 'food chain' is
4. Name something living, something dead and a thing that has never been alive

Year 2 answers

Growing Plants 1. Water and light. 2. They store food. 3. Daisy or clover. 4. No.
Uses of Everyday Materials 1. No. It will break too easily. Metal and plastic are better 2. A waterproof fabric. 3. Cars, coin, table legs, tools 4. Stretch, bend, twist, squash, melt
Animals including humans 1. Egg, chick, chicken 2. Sheep and lamb, cow and calf, chicken and chick, butterfly and caterpillar, cat and kitten, dog and puppy 3. Air, food, water 4. Eat a balanced diet, exercise, hygiene
Living Things and their Habitats 1. Deer, foxes, badgers, birds, adders, beetles, worms 2. Habitat 3. It is how animals obtain their food from plants and other animals 4. Human, withered leaf, a rock

Year 3

Forces and Magnets

1. What is a magnet made out of?
2. What are the two ends of a magnet called?
3. What word do we use when a magnet 'pushes' another magnet away?
4. What word do we use when a magnet 'pulls' another magnet towards it?
5. Do magnets need to be touching certain materials to pull them?
6. Can you name a material that won't be 'pulled' by a magnet?
7. Can you name a material that will be 'pulled by a magnet?
8. How do you change whether a magnet 'pushes' or 'pulls' another magnet?

Light

1. What object in space gives light to the Earth?
2. What is the precise, scientific word for when light bounces off something?
3. What causes darkness? For instance, at night-time.
4. When light gets blocked by an object, what can we see behind that object?
5. What is the precise, scientific name for an object that blocks light?
6. In what two ways can light be bad for you?
7. Why is it warmer when it is sunny?

Plants

1. Name of the parts of a plant that anchor it in the ground
2. How can plants take in water?
3. Why do plants have seeds?
4. Name at least three things a plant needs in order to live.
5. What is the word for when an insect spreads one plant's pollen onto another plant?
6. Name at least two ways in which plants disperse their seeds.
7. What is the difference between a flower and a leaf?
8. What does a leaf on a plant need to have hit it so it can make food for the plant?

Animal Nutrition

1. What is the precise, scientific word for the energy an animal gets from its food?
2. What is the precise, scientific word for the foods an animal eats? (Hint: begins with a 'd')
3. Why do all animals eat?
4. Does my cat eat the same food as my gerbil?
5. What is the word for ALL of the bones in your body?
6. What is the word for the strong things attached to your bones that move your arms, legs, mouth, fingers and so on?
7. Why do animals need to move around to get their food?

Rocks

1. What are the three types of rock?
2. Which rock comes from volcanoes?
3. Which rock comes from being crushed or smoothed by the weather?
4. Which rock comes right out of the Earth itself?
5. What two things is soil made from?
6. How do we know that dinosaurs existed?
7. How are the answers from question 6 made?

8. What word do we have for animals, like dinosaurs or dodos, that aren't around anymore?

Year 3 Answers: Magnets: 1. Metals, normally iron and nickel 2. Poles 3. Repels 4. Attracts 5. No 6. Anything other than metal (and some metals) 7. Metals, specifically iron and nickel 8. Change which pole is pointing at the other; if they're the same they'll repel, if they're different they'll attract. Light: 1. The Sun 2. Reflect 3. When there is no light 4. A shadow 5. Opaque 6. It can damage your eyes and the heat can burn or damage your skin 7. The energy from the sun gives off heat Plants: 1. Roots 2. Through the stem (trunk in trees) 3. That's how they spread more plants 4. Three out of light, water, carbon dioxide, oxygen, nutrients from soil, nutrients from animals (if plant is carnivorous) and room to grow 5. Pollination 6. Two from fruit, exploding seeds, sticky seeds, seeds carried by wind and seeds carried by water 7. A flower has pollen and attracts insects, a leaf makes 'food' from sunlight 8. Sunlight Animal Nutrition: 1. Nutrition 2. Diet 3. To get energy 4. No. Different animals have different diets. 5. Skeleton 6. Muscles 7. They cannot make their own food so need to go and find it. Rocks: 1. Igneous, metamorphic and sedimentary 2. Igneous 3. Sedimentary 4. Metamorphic 5. Rock and organic matter 6. From their fossils 7. Animals die and leave behind their bones. Soil layers over the bones leaving a 'cast'. Eventually the bones rot away leaving hollow shapes inside the rock. 8. Extinct.

Year 4

Electricity

1.Name at least ten things that use electricity as energy
2.What is the precise, scientific word for the circle/track we make that allows electricity to flow?
3.What do we call the metal 'string' that links these electrical bits together?
4.What do we call the object we can press/move which breaks the circle, making the electricity stop and start?
5.What do we call a material which really easily allows electricity to flow through it?
6.What do we call a material that is really hard or impossible for electricity to flow through?
7.What do we call the object that houses the electrical energy (hint: you put them into remote controls)?
8.Is electricity completely safe?

Sound

1.How does sound travel?
2.What is the precise, scientific word for the jiggling of the air particles?
3.Why can no-one hear you scream in space?
4.What is the precise, scientific word for the louder or quieter a sound is?
5.What is the precise, scientific word for when soundwaves get nearer together as you pull an elastic band tighter and tighter?
6.Why are things louder when you get nearer to them?
7.What is the Doppler Effect?
8.How do our ears allow us to hear?

States of Matter

1.What are the three states of matter called?
2.What is the precise, scientific word for when a liquid turns into a gas?
3.What is the precise, scientific word for when a gas turns into a liquid?
4.What do you have to do to a liquid to make it turn into a gas?
5.What role does the Sun have in the water cycle?
6.What is a cloud?
7.What unit do we measure temperature in?
8.What happens to the soil when it rains?

Animal Digestion

1. Name at least five parts inside our bodies that help us to eat food.
2. What is the precise, scientific word for when our bodies break down food into energy?
3. What is the difference between an incisor and a molar?
4. What do we call the individual parts of a body system (for instance; the stomach)? It begins with an 'o'.
5. What is the precise, scientific word for the 'journey' where plants are eaten by herbivores who are then eaten by carnivores/omnivores?
6. What do we call the animal that eats other animals? Begins with a 'P'
7. What do we call the animal which is eaten by other animals? Begins with a 'P'
8. What is the precise, scientific word for the plants that start the energy? Begins with a 'P'

Habitats

1. What is the precise, scientific word for a place where plants and animals live? (Begins with an 'h')
2. What is the precise, scientific word for the relationship the plants and animals have with each other; mostly eating each other? (Begins with an 'e')
3. What is the precise, scientific word for the way in which we put animals into groups?
4. What are the differences and similarities between a dog, a cat, a tortoise and a snail?
5. What is the precise, scientific word for an animal with a backbone/spine?
6. What is the precise, scientific word for an animal without a backbone/spine?
7. Why do forests, woods, meadows and jungles have more animals than a desert?
8. How are humans affecting animals through deforestation?
9. Why is having too many animals in one place a bad thing?

Year 4 answers

Electricity: 1. Parents' discretion 2. Circuit 3. Wire 4. Switch 5. Conductor 6. Insulator 7. Battery 8. No, it can be harmful, even deadly. Sound: 1. It collides with air particles, crashing from one to another 2. Vibrate 3. There are no air molecules so nothing to vibrate 4. Volume 5. Pitch 6. The vibrations haven't spread out as much so there are more that will hit your ears 7. As sound particles come toward you they bunch up into a 'mmmmMMMEEEE', as they move away they spread out in a 'EEEEEEMMMMmmm'. Like a racing car. 8. The outside of your ear 'catches' the sound waves and channels them into the ear where they strike your ear drum. States of Matter: 1. Solid, liquid and gas 2. Evaporation 3. Condensation 4. Heat it 5. The sun's light also gives heat which evaporates water 6. Water molecules which have become a gas, risen up but then started to cool down and condense into water 7. Degrees Celsius 8. It can erode/weather due to the water molecules striking it. Animal digestion: 1. Any five from tongue, teeth, throat/oesophagus, stomach, small intestine, large intestine and mouth 2. Digestion 3. An incisor is sharp and designed to cut and rip meat; a molar is flat and rough, designed to crush and chew plants 4. Organs 5. Food chain 6. Predator 7. Prey 8. Producer Habitats: 1. Habitat 2. Ecosystem 3. Classification 4. Parent's judgement 5. Vertebrate 6. Invertebrate 7. There are more plants in those regions and these provide more food at the start 8. Humans remove animals' 'homes' and food 9. They will eat too much of a certain type of food and run the risk of wiping out that plant/animal. If this starts to happen, the large number of animals will either begin to leave or starve, reducing their number.

Year 5

Forces

1. If you throw an object into the air, it will come back down. What is this force called?
2. If the Earth is spherical, why do people on the bottom not fall off?
3. Which has more of this force: a heavy planet or a lighter moon?

4. What is the precise, scientific expression for air molecules hitting into a moving object and slowing it down?
5. What is the precise, scientific word for an object designed to slip through these air molecules?
6. What is the precise, scientific expression for when water molecules slow you down or make it hard to dive deeply?
7. What is the precise, scientific word for when the ground slows an object down or you 'burn' your knee on a carpet?
8. Name three simple machines that humans have invented which allows a small force to become stronger

Earth and Space

1. Name the eight planets of the solar system.
2. What is the name of the star in the middle of that solar system?
3. What is the difference between a planet and a moon?
4. Why doesn't the Moon crash into the Earth? 5. What shape are orbits of planets around stars; or moons around planets?
6. Why are the rules of movement different in space from Earth; why does the Earth or moon never slow down?
7. What causes daytime and night-time?
8. Why does the moon change 'shape' throughout a month?
9. What causes the seasons? (Remember that the Earth is nearest our star in January yet that's winter in Britain.)

Materials and their Properties

1. What is the precise, scientific word for an object which light can pass through and not create a shadow?
2. What is the precise, scientific word for 'heat'?
3. What is the precise, scientific expression for when an object allows heat to move through it?
4. What is the precise, scientific word for two different materials (solids or liquids) which are combined but don't dissolve; easily being sieved or separated without much effort?
5. If a solid dissolves in a liquid, what do we call this new thing?
6. How would you get the solid and liquid to separate out again?
7. What is the precise, scientific word for turning a solid into a liquid?
8. What is the precise, scientific word for turning a liquid into a solid?
9. How does adding or taking away heat (cold) change a material's state of matter?
10. What is the precise, scientific word for when you change an object chemically but can then change it back?
11. What is the precise, scientific word for when you change an object chemically but can't then change it back?

Life Cycles

1. What is the precise, scientific word for the reproduction in certain plants and bacteria where they can simply grow new 'babies'?
2. What is the precise, scientific word for the reproduction in certain plants and most animals where they need a female and male to have 'babies'?
3. Name the only type of animal that gestates its babies inside its body (they don't lay eggs)
4. Name the type of animal that spends its 'childhood' in water and then changes its body completely to come out to live on land.
5. Name the type of animal that lays eggs in a nest, hatches blind and featherless young and takes care of them until they are developed enough to leave this nest.
6. Name the type of animal that sometimes change from a 'baby' to an adult by using a cocoon.

7. Why do frogs stay near water sources?

Human Development

1. What two things are inside the womb to help the embryo eat and breathe in the womb?
2. How do babies fit inside the womb?
3. Name at least two things which change as a new-born baby gets older into a toddler
4. What are the three-letters responsible for the 'recipe' of how you look, which you get from your mum and dad?
5. Why do we get wrinkled and grey as we get older?
6. How does a human develop in the womb?
7. What is the precise, scientific word for when human bodies change as they become teenagers (for instance more hair, stronger, voice changes)?

Year 5 answers

Forces: 1. Gravity 2. The Earth's gravity pulls objects towards its centre 3. A heavy plant (it's not about the size of an object, it's about the mass/density of it) 4. Air resistance 5. Aerodynamic 6. Water resistance 7. Friction 8. Lever, pulley and cogs (other exist such as wedges and inclined planes) Earth and Space: 1. (In order from nearest to Sun) Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune 2. The Sun 3. A planet's movement is only affected by stars; a moon's movement can be affected by other planets, large objects and so on (this is why Pluto was de-listed as a Planet) 4. The moon is always falling into the Earth but because of the lack of air resistance and friction in space, it never slows down. The gravity of the circular Earth always changes where 'down' is 5. Circular (or elliptical) 6. No air resistance nor friction 7. The Earth's rotation means the Sun's light only hits us 'half' the time 8. The moon is in the darkness of space and the 'shape' of the moon results from the angle of the Sun's light striking it from where we can see it on Earth 9. The Earth is tilted slightly on its axis and the UK is towards the top, at an angle. When the tilt is facing the Sun, we get more light (longer days) and heat. When the tilt is facing away from the Sun we get less light (short days) and less heat. Materials and their Properties: 1. Transparent 2. Thermal energy 3. Conductor 4. Mixture 5. Solution 6. Heat the solution so the water and solid molecules separate from each other 7. Melting 8. Freezing 9. It gives the molecules energy so they jiggle around and break apart from each other. The more heat, they spread out into gas. When there isn't much heat, there isn't much energy and they bunch together into a solid. 10. Reversible 11. Irreversible. Life Cycles: 1. Asexual 2. Sexual 3. Mammal 4. Amphibian 5. Bird 6. Insect 7. Because they need the water to lay their eggs and have their young develop. Human Development: 1. Placenta and umbilical cord 2. They grow from single-celled life to many-celled. They squeeze into the foetal position 3. Some of their bones fuse together, they lose their brown fat, their hair-colour and eye-colour can change, their muscles strengthen, they lose some of their reflexes 4. DNA (deoxyribonucleic acid) 5. Every time our cells copy themselves they get weaker and weaker, losing colour and strength 6. The mother's body and blood allows the baby to grow and develop safely over 9 months until it is ready to survive outside her body. 7. Puberty.

Year 6

Electricity

1. How could you make a bulb shine more brightly in an electrical circuit?
2. What happens to the electrical energy when it goes into a bulb?
3. What happens to the electrical energy when it goes into a buzzer?
4. Draw at least three symbols for some components of an electrical circuit.
5. Why do batteries run out?
6. What is the precise, scientific word for the electricity 'molecules'?
7. How can I create a fast circuit?

8. How does electricity move? Does it always need wires?
9. What kind of energy do you get in a battery before it turns into electrical energy? This is how lemons can act as batteries.

Light

1. In which direction does light travel?
2. Which organ do animals have that takes in light?
3. How can we see the sun's light, even if we can't see the sun?
4. How does a sun-dial work?
5. Why are periscopes built at right-angles rather than looped?
6. Why do objects 'bend' when placed in water?
7. What's a rainbow?

Evolution and Inheritance

1. What scientific proof do we have in rocks that some animals have changed over time?
2. What is the precise, scientific word for animals changing their bodies over a very long period of time?
3. Why do I look a bit like my dad/mum?
4. What is the precise, scientific word for the DNA you get from your mum and dad?
5. What happens when a poodle and a Labrador have a baby?
6. Why do brothers and sisters not look exactly the same (apart from some twins!)?
7. Why do chaffinches in different parts of Madagascar have different beaks?
8. What is the precise, scientific word for animals' bodies changing to suit where they live?
9. Why will animals who are better at getting food and staying alive have more offspring?
10. Would an eye have developed overnight?

Habitats

1. What is the precise, scientific word for the grouping of animals and plants?
2. What is the precise, scientific word for a single-celled animal?
3. What is the precise, scientific word for a multi-celled animal?
4. What is the precise, scientific word for animals we cannot see with the naked eye?
5. What are some differences and similarities between a lobster and a scorpion?
6. What are some differences and similarities between a dog and a cat?
7. What are some difference and similarities between a salmon and a whale?

Human Circulatory System

1. What is the precise, scientific expression for the heart, blood and blood vessels in a human?
2. Why is the heart made mostly of muscle?
3. Why do red blood cells have no nucleus?
4. How does blood help us to get energy and nutrients?
5. What happens if you eat more food than you expend energy?
6. What is a drug?
7. Which drugs can we legally eat or drink?

Year 6 answers

Electricity: 1. You add more batteries (or take away another component of the circuit) 2. It changes into heat/thermal and light energy 3. It changes into sound energy 4. Check on internet 5. The stored energy in the battery is lost through heat, light and sound until it runs out 6. Electrons 7. Increase batteries, decrease components, have better conductors for wires 8. Electrons move through the circuit, carrying a charge. Electricity can move without 'solid' conductors such as lightning and static electricity. 9. Chemical energy Light: 1. A straight line 2. Eyes (of varying designs) 3. Light reflects off

surfaces so can 'bounce' around until we see it 4. The angle of the sun in relation to the opaque dial moves the shadow around 5. Light reflects in straight lines so a periscope needs to be straight with right-angled mirrors 6. The water molecules refract the light, causing an illusion 7. The sun's white light broken into the six constituent parts (red/orange/yellow/green/blue and indigo; there is no real difference between indigo and violet) by air and water molecules in the atmosphere. Evolution and Inheritance: 1. Fossils 2. Evolution 3. You get your DNA from both of your parents so will share similarities to both 4. Genes 5. They will have a mixture between the two; a cockapoo. All dogs are the same species and can have mixed babies. 6. The genes we get from our parents is not always exactly the same each time so one child may have a nose like their mum and the other child like their dad 7. They have adapted to get to different food sources 8. Adaptation 9. They are much more likely to mate and will be more desirable to a partner 10. No; it would have taken millions of years. Habitats: 1. Classification 2. Prokaryote 3. Eukaryote 4. Micro-organism 5. 6. and 7. Adults' discretion. Human Circulatory System: 1. Circulatory system 2. It needs to be strong to pump all that blood 3. To maximise the amount of oxygen and carbon dioxide they carry 4. Blood cells carry oxygen and take away waste gases. The plasma delivers glucose energy from our food. 5. The body stores this energy as fat 6. A drug is a substance which affects/changes your body in some way when it gets into your circulatory system 7. Adults' discretion but likely to be medicines, caffeine, alcohol and nicotine (although the last two are obviously age-related). Chocolate potentially.