KESTEVEN AND SLEAFORD HIGH SCHOOL

Science Scheme of Learning

Year 8 – Term 5/Units 11

Intent – Rationale

Students will gain an understanding of the four different types of drugs; stimulants, depressants, painkillers and hallucinogens. They will learn about both legal and illegal drugs of these four types. They will also gain an understanding of the impact of various factors, such as additives in food, on our health. The structure of the Earth, from the inner core all the way to the crust, will be explored to allow students to gain a deeper understanding of the planet they live on. Students will also embark on a quest for understanding the atmosphere and global warming. They will reflect on their own role to sustainability by learning about recycling. Convection, conduction and radiation will be taught to students, allowing them to have a deep understanding of the way heat is transferred. Learning about insulation and vacuum flasks will allow students the opportunity to link these three core concepts together.

Sequencing – what prior learning does this topic build upon?	Sequencing – what subsequent learning does this topic feed into?
Topic P7.1 Phys Energy Transfer	Biology – Leads to GCSE Topic B6 Preventing and treating disease GCSE Topic B7 Non-communicable diseases Chemistry – Leads to GCSE Topic 9 Chemistry of the Atmosphere GCSE Topic 10 Resources Physics – Leads to GCSE topic P2 Energy Transfer by Heating
What are the links with other subjects in the curriculum?	**What are the links to SMSC, British Values and Careers?**
• Links to PSHE through learning about types of drugs	B8.11 L1 Medicines and Health GB4h GB4i B8.11 L2 Legal recreational drugs BV2 M1 M2 B8.11 L3 Illegal drugs M2 BV2 M1 M2 C8.11 L1 The Earth and It's Atmosphere C8.11 L3 Human Activity SO3 M1 M2 C8.11 L4 Recycling SO3 M1 M2
What are the opportunities for developing literacy skills and developing learner confidence and enjoyment in reading?	**What are the opportunities for developing mathematical skills?**
• Research task for Biology L1 involves researching through use of books. FROM THE LIBRARY *Drugs;* Emma Houghton-362.29 *How Do Drink and Drugs Affect Me*; Emma Houghton-615.78 *Alcohol*; S Connoly-363.29 *Drugs and the Law*; Craig Donnellan-362.2 *Illustrated Reference Book of the Earth*; J Mitchell-551 *Global Climate Change*; A dawson- 363 *Human Impact on the Environment*; A Goudie-363.7 *Fuels For the Future*; S Parker-620	•

Waste, Recycling and Re-use; S Parker-363.73 *Energy Alternatives;* C Acred- 305 *Radiation;* Kathryn Whyman-539 *Energy;* Louise Spilsbury-530 *Energy;* Chris Oxlade-531	

Science Scheme of Learning

Year 8 – Term 5/Units 11

Intent – Concepts

What knowledge will students gain and what skills will they develop as a consequence of this topic?

Know

List the risks associated with buying illegal drugs
State that the atmosphere has different layers and that weather systems are found in the lower atmosphere
State that the upper atmosphere contains ozone, which protects us from harmful UV rays from the Sun

Apply

Describe the four types of drugs and their effects
Describe the effects of stimulants, depressants, painkillers and hallucinogens
Describe the stages in liver disease
Describe how some illegal drugs such as cannabis, cocaine and heroin affect us
Describe the dangers and health risks associated with illegal drugs
Describe the structure of the Earth using a labelled diagram
Describe the three types of rock and identify them from given information
Describe the greenhouse effect and its role in sustaining life on Earth
Describe the carbon cycle and identify processes that increase and decrease the amount of CO_2 in the atmosphere
Define the term carbon footprint
Describe the process of conduction using ideas about particles
Describe how energy can be transferred through some substances and through a vacuum by radiation
Describe the reflection and absorption of infrared radiation
Describe how insulators often trap still air to prevent conduction and convection
Describe how radiation can be prevented using reflective surfaces

Extend

Explain the effects of smoking, including the effects of both tar and carbon monoxide
Explain the effects of nicotine on the body
Explain the effects of drinking alcohol including reaction times, people's behaviour, relationships and job security

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Explain how each type of rock is formed by referring to the rock cycle
Explain why recycling is important
Explain why gases are such poor conductors of heat
Explain how convection currents occur and transfer energy in liquids and gases
Explain how drugs are tested using both laboratory testing and clinical trials.
Use ideas about density to explain convection currents
Explain how human activity is causing global warming and describe some of the effects

What subject specific language will be used and developed in this topic?

Word	Definition
Atmosphere	The layers of gases that surround the Earth
Cementation	Crystallised minerals that sticks, or cements, pieces of rock together.
Combustion	A reaction where a substance burns and reacts with oxygen.
Compaction	Pieces of rock being squeezed together by the weight of sediment above.
Convection current	The pattern of circulation produced when hot, less dense fluid rises and colder, denser fluid sinks
Core	The central part of the Earth
Crust	The solid outer layer of the Earth
Crystalline	Made up of crystals
Decomposition	The process of breaking down organic material such as dead plants or animals.
Erosion	The removal and transportation of rocks by wind or water
Evolution	A gradual change in a species usually over a long period of time.
Fossil	A preserved remain or imprint of an organism from a past geological age. Fossils can be found in sedimentary rock or encased in amber or ice.
Fossil fuel	Any naturally occurring carbon or hydrocarbon fuel, such as oil, coal and natural gas, formed from the remains of plants and animals.
Geology	The study of the origin, history, structure and composition of the Earth
Global warming	The increase in average temperature of planet Earth
Greenhouse effect	When heat from the Sun is trapped by the gases atmosphere
Igneous rock	Rock formed from the cooling and hardening of magma, on or below the Earth's surface
Lava	Magma that has reached the surface of the Earth through a crack or volcano
Magma	Molten rock under the Earth's surface
Mantle	The layer of the Earth between the core and the crust
Metamorphic rock	Rock that has been altered from its original structure by heat and pressure
Methane	A flammable gas used as a fuel. It is produced when bacteria break down plant and animal waste
Ozone	A chemical substance, O_3, which absorbs ultraviolet radiation

What opportunities are available for assessing the progress of students?

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Word	Definition
Antibiotic	A chemical that is used to kill bacteria or stop them growing. Viruses are not affected by antibiotics, so viral diseases cannot be treated with antibiotics.
Carbon monoxide	A compound in which the molecules consist of one carbon atom covalently bonded to one oxygen atom. Carbon monoxide is a poisonous gas that binds strongly to the haemoglobin in red blood cells. This prevents the cells from carrying oxygen, so breathing in carbon monoxide can cause death.
Depressant	A drug that slows down the nervous system and reduces arousal levels and excitability.
Drug	A chemical that affects how the body works but is not a food. Drugs can be consumed by mouth, injected, breathed in or absorbed through mucous membranes.
Hallucinogen	A drug that affects perception, emotion, consciousness and your understanding of reality.
Medicine	A drug that is used to treat or prevent disease.
Nicotine	A stimulant drug that is found in tobacco and thus in cigarette smoke. Nicotine is addictive, which means that it is hard to give up smoking once you have started.
Recreational drug	A drug that people take because they like the effect it has on them.
Stimulant	A type of drug that speeds up the nervous system and makes you feel more alert.
Tar	A thick, poisonous substance that is found in cigarette smoke. It is carcinogenic, which means that it causes cancer.
Withdrawal symptoms	The symptoms that someone experiences when they stop taking a drug that they are addicted to.
Radiation	The transfer of energy from a central point
Recycling	Changing waste materials into new products
Rock cycle	The Earth's process of turning one type of rock into another type of rock.
Sediment	Solid fragments that come from the weathering of rocks and have been carried and deposited by water or wind.
Sedimentary rock	Rocks formed when sediment is deposited and becomes tightly compacted
Ultraviolet radiation	In the electromagnetic spectrum just beyond visible light
Weathering	The breaking down of rocks into smaller pieces

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Word	Definition
Cavity wall insulation	A foam or fibre filling placed in between the outer and inner layers of a building's outer wall, which reduces heat loss through the wall.
Conduction (of heat)	The transfer of thermal energy due to vibrations of particles or collisions of free electrons
Conductor (of heat)	A substance that allows heat to pass through it easily by conduction.
Convection	Heat transfer through a fluid (a liquid or gas) as a result of changes in density caused by heating.
Convection current	The pattern of circulation of a liquid or gas in a particular direction as a result of changes in density caused by heating.
Double glazing	A window made from two panes of glass separated by a gap containing air or another gas, thus reducing heat loss by convection and conduction.
Emitter	Something that gives off (heat) radiation.
Free electrons	Electrons that are free to move within metals, making them good conductors both of electricity and of heat.
Heat	The transfer of energy from a hot object to a cold one. Heat energy is the *total* amount of energy possessed by an object as a result of its particles vibrating.
Infrared radiation	Heat transfer by an electromagnetic wave, just outside the visible spectrum, beyond red.
Insulator (of heat)	A substance that does not let heat pass through it very easily.
Loft insulation	A thick layer of loose fibre that is placed on the floor of loft spaces in buildings to trap air for insulation.
Radiant heater	A heater that gives off heat as radiation, rather than by convection.
Radiation	The transfer of energy from a central point.
Thermal store	The energy of a substance due to the random motion of its particles.
Vacuum flask	A flask made of a double-walled bottle with a vacuum between its walls, which will keep hot drinks hot and cold drinks cold.

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Intent – Concepts

Lesson title	Learning challenge	Higher level challenge	Suggested activities and resources
B8.11 L1 Medicines and Health	Can I describe the four types of drugs and their effects? Can I describe the effects of stimulants, depressants, painkillers and hallucinogens?	Can I explain how drugs are tested using both laboratory testing and clinical trials?	
B8.11 L2 Legal recreational drugs	Can I explain the effects of smoking, including the effects of both tar and carbon monoxide? Can I describe the stages in liver disease?	Can I explain the effects of nicotine on the body? Can I explain the effects of drinking alcohol including reaction times, people's behaviour, relationships and job security?	
B8.11 L3 Illegal drugs	Can I describe how some illegal drugs such as cannabis, cocaine and heroin affect us? Can I list the risks associated with buying illegal drugs?	Can I describe the dangers and health risks associated with illegal drugs?	
C8.11 L1 The Earth and It's Atmosphere	Can I state that the atmosphere has different	Can I describe the structure of the Earth	

	layers and that weather systems are found in the lower atmosphere? Can I state that the upper atmosphere contains ozone, which protects us from harmful UV rays from the Sun?	using a labelled diagram?	
C8.11 L2 The Rock Cycle	Can I describe the three types of rock and identify them from given information?	Can I explain how each type of rock is formed by referring to the rock cycle?	
C8.11 L3 Human Activity	Can I describe the greenhouse effect and its role in sustaining life on Earth? Can I describe the carbon cycle and identify processes that increase and decrease the amount of CO_2 in the atmosphere?	Can I explain how human activity is causing global warming and describe some of the effects?	
C8.11 L4 Recycling	Can I define the term carbon footprint?	Can I explain why recycling is important?	
P8.11 L1 Conduction	Can I describe the process of	Can I explain why gases are such	

	conduction using ideas about particles?	poor conductors of heat?	
P8.11 L2 Convection	Can I use ideas about density to explain convection currents?	Can I explain how convection currents occur and transfer energy in liquids and gases?	
P8.11 L3 Radiation	Can I describe how energy can be transferred through some substances and through a vacuum by radiation?	Can I describe the reflection and absorption of infrared radiation?	
P8.11 L4 Insulation	Can I describe how insulators often trap still air to prevent conduction and convection?	Can I explain how radiation can be prevented using reflective surfaces?	