

Year 8 Scheme of Work

Half Term 1

Week	Topic Studied
Topic 1	Organisms – the respiratory system
Topic 2	Organisms– understanding breathing and gas exchange
Topic 3	Organisms– the digestive system
Topic 3	Organisms – understanding a healthy diet
Topic 5	Forces – understanding how forces interact
Topic 6	Forces – investigating Hooke’s law
Topic 7	Forces – Understanding pressure

- During this autumn term, students will be learning about the topics outlined above.
- The scheme of work below is what students would follow if they were in school and is based on the Oxford University Press 5 year curriculum and the Collins Key Stage 3 science books that they use in school.
- We will aim to set tasks following this lesson by lesson structure however many of the activities will be different for home learning however they may give you some ideas on how to take your learning further.
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- Pupils should make sure they know the meanings of all the keywords in the topic.

Student Book 2 Chapter 8 Organisms Breathing and Digestion

What should students have learnt at KS2?

- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- describe the simple functions of the basic parts of the digestive system in humans
- identify the different types of teeth in humans and their simple functions
- 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.

Scheme of Work 2019 - 2020

Subject: KS3 Science Student Book 2 Chapter 8 Organisms: Breathing and Digestion

Year Group: 8

Specification: AQA Science Collins

Skill Focus: 1a,b 3a,b,c,d 4a,b,c 17a,b,c,d,e,f, 19a,b,c,d,e 20d,e

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary)	Planned Assessment	Homework or flipped learning resources DODDLE resources	Lit Num SMSC Codes
2.8.1 Understanding how we breathe	□ Describe the mechanism of breathing in and out.	Describe the changes in the volume of the chest as you	Use the torso model to describe the parts of the breathing system and to show that the lungs are in a cavity, surrounded by the ribcage and diaphragm. Ask the students to feel their ribs move up and out as they	To complete and correctly complete the text using key words to show their	Doddle- the breathing system.	Lit So 1, So 3, So 4,

	<input type="checkbox"/> Explain how changes in pressure help us to breathe. <input type="checkbox"/> Evaluate a model of breathing.	breather in and then out again?	<p>breathe in, and down and in as they breathe out. At this point, you could ask the students to discuss why we breathe, and dispel any myths about breathing and respiration if these arise.</p> <p>Keywords: Breathing Trachea Bronchi Bronchioles Diaphragm Alveoli Ribs</p>	<p>understanding on how we breathe. Write on WS that can be self-assessed.</p> <p>Mini Quiz</p> <p>RAG</p>	Doddle-Breathing mini quiz.	So 6.
2.8.2 Measuring breathing	<input type="checkbox"/> Describe what is meant by lung volume and identify some simple methods to measure it. <input type="checkbox"/> Identify independent, dependent and control variables in a lung volume investigation. <input type="checkbox"/> Interpret and evaluate data linked to lung volume.		<p>Arrange the students in groups of five or six, and ask them to discuss factors that might affect lung volume. Explain that they are going to plan and carry out an investigation into lung volume. Support the groups in choosing one factor to investigate, such as student height or shoulder width</p> <p>Keywords: Lung volume Vital capacity Claim Hypothesis Independent Dependent Control Variable</p>	<p>Lung volume practical write up using scientific language and key words.</p> <p>Input data into a graph to show their findings.</p>	Doddle-Respiration mini quiz.	Lit Num So 1, So 3, So 4, So 6.
	<input type="checkbox"/> Describe the features of the		Collins 2.8.3 Explaining gas exchange in humans			Lit Num

2.8.3 Explaining gas exchange in humans	human gas exchange system. <input type="checkbox"/> Explain how the features enable gases to be exchanged.	What is the name of the gas that is passed back into the alveoli after respiration in the cells of the body?	A classroom based demonstration to use model alveoli structures using balloons. Discuss how attitudes to, and evidence about, smoking have changed over time. Emphasise that smoking was not always thought to be bad for health (or for those around us). Use the word 'bias' in other contexts (for example, 'I think you are the best class in the school, but I am biased'), and ask the students to explain its meaning. Explain the possible role of bias in us understanding the health dangers of smoking. Resources: BBC Bitesize Doodle – power points and quick quizzes You tube: 'Free science lessons' Keywords: Alveoli Respiration Capillary Diffusion	Scientific method write up using scientific language and key words. Collins 2.8.3 Write on WS can be completed to show progression and understanding.	Doddle- Gas exchange systems quiz.	So 1, So 3, So 4, So 6.
	<input type="checkbox"/> Distinguish between breathing and respiration.					
2.8.4 Exploring the effects of disease and lifestyle	<input type="checkbox"/> Describe the physical effects of disease and lifestyle on the breathing system.	Can you name a lifestyle choice that can affect the breathing system?	Discuss how attitudes to, and evidence about, smoking have changed over time. Emphasise that smoking was not always thought to be bad for health (or for those around us). Use the word 'bias' in other contexts (for example, 'I think you are the best class in the school, but I am biased'), and ask the students to explain its meaning. Explain the possible role of bias in	To design a Smoking poster to show the dangers and health effects of smoking. Key words and facts must be used.	Doddle- The breathing system revision.	Lit Num So 1, So 3, So 4, So 6.
	<input type="checkbox"/> Explain the physical effects of disease and lifestyle on the breathing system.					

	<ul style="list-style-type: none"> Describe how our understanding about the effects of smoking has changed over time. 		<p>us understanding the health dangers of smoking.</p> <p>Keywords: Asthma Nicotine Tar Cilia Bias</p>	Complete the text using key words WS to show understanding.		
2.8.5 Exploring a healthy diet	<ul style="list-style-type: none"> Describe the components of a healthy diet. Examine the importance of each component of a healthy diet. 	<p>Can you explain the uses the different types of food groups have on the human body: Carbohydrates ? Protein? Lipids? Minerals?Vita mins?Dietary Fibre? Water?</p>	<p>Present the students with examples of different foods, and ask them to suggest which of the food groups (listed in Table 2.8.5 in the Student Book) they fit into. You could use food labels to inform discussion. Introduce the word 'lipids' for fats and oils.</p> <p>Ask the students to devise ways of remembering the seven food groups, such as a mnemonic or a story that includes each group.</p> <p>Keywords: Food group Nutrient Carbohydrate Protein Lipids Vitamin Dietary fibre Balanced diet Kilojoules</p>	<p>To design and make a healthy diet/plate WS.</p> <p>WS stating the food groups and what they include.</p> <p>T-P-S</p> <p>Exam questions</p>	Doddle- A balanced diet revision	Lit Num So 1, So 3, So 4, So 6.
	<ul style="list-style-type: none"> Compare the energy requirements of different healthy diets. 					
2.8.6 Understanding the effects of an unbalanced diet	<ul style="list-style-type: none"> Describe the physical effects of eating too much and eating too little. 	<p>What is BMI?</p> <p>What can cause starvation?</p>	<p>Provide the students with information about the deficiency diseases rickets, vitamin K deficiency and anaemia. As a class, read the information. Ask the students to work individually to devise questions based on the information.</p>	<p>To hold a debate on healthy eating in schools. Why is it important? Why should schools have healthy meals? Do</p>	Doddle- Dietary imbalances quiz.	Lit So 1, So 3, So 4, So 6.
	<ul style="list-style-type: none"> Identify the causes and effects of 					

	some deficiencies in the diet.		Keywords: Obesity Starvation Malnutrition Deficiency disease	you think our school has healthy meals? Complete a healthy eating campaign to get students around the school to eat healthier.		
2.8.7 Understanding the human digestive system	<input type="checkbox"/> Identify the organs of the human digestive system.	List the organs in the digestive system? And what they do?	Ask students divided into groups of three to construct a mind map about digestion using a large sheet of paper and three pens. Students test the liquids for starch and glucose, and record the results on Practical sheet 2.8.7. They explain the results using prompts on the worksheet, and say whether their prediction was correct or incorrect	To successfully complete a digestive system labelling WS, use key words and self-assess to show understanding. Whiteboard quiz Exam questions	Doddle- a balanced diet revision.	Lit So 1, So 3, So 4, So 6.
	<input type="checkbox"/> Describe the process of digestion.					
	<input type="checkbox"/> Evaluate a model of the digestive system.					
2.8.8 Understanding the roles of the digestive organs	<input type="checkbox"/> Describe the importance of enzymes and gut bacteria in digestion.	Where does chemical and physical digestion take place?	Collins 2.8.8 Understanding the roles of the digestive organs A model demonstration that allows students to see a visibly record the digestion of food, from beginning to end, using a range of resources. The students work in pairs to apply their knowledge by discussing whether trees growing in hot and cold environments will photosynthesise at the same speed. For example, they know that heating up chemicals makes a reaction happen faster – or is it just that plants grow faster in summer than winter?	Complete Collins Write on WS 2.8.8 using key words. RAG Extended response	Doddle- Nutrition quiz.	Lit Num So 1, So 3, So 4, So 6.
	<input type="checkbox"/> Describe the role of the organs in the digestion system	Why cannot food pass through the pancreas?				
	<input type="checkbox"/> Explain how the structure of each of					

	the organs is adapted to its function.		Keywords: Enzymes Physical digestion Chemical digestion Gut bacteria			
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Student Book 2 Chapter 1 Forces: Contact Forces and Pressure

What should students have learnt at KS2?

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Scheme of Work 2019 – 2020

Subject: KS3 Science Student Book 2 Chapter 1 Forces: Contact Forces and Pressure

Year Group: 8

Specification: AQA Science Collins

Skill Focus: 2a,b 3c,d 24a,c,e 26a

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary	Planned Assessment	Homework or flipped learning resources DODDLE resources	Lit Num SMSC Codes
	□ Analyse situations to identify the		Show a mass suspended from a newtonmeter. Point out that there is no	Worksheet		Num

<p>2.1.1 Analysing equilibrium</p>	<p>various forces that are acting.</p> <p>□ Explore static situations in which objects are held in equilibrium and the nature of the forces involved.</p>	<p>How would you describe the type of force that the Earth produces on the bungee jumper?</p>	<p>movement, and ask the students if any forces are acting. They should identify the downward force of weight and the upward force through the newtonmeter.</p> <p>Pair talk The students explain what the lack of movement tells them about the forces acting on the newtonmeter. (They are balanced – they are in equilibrium.)</p> <p>Keywords: Contact force Non-contact force Balanced forces Equilibrium Resultant force Newton</p>	<p>Class discussion RAG</p>	<p>Doddle – Balanced and unbalanced forces</p>	<p>Lit So 1, 3, 4, 6 So 6, 7, 8 C 3, 6 Sp 2, 5</p>
<p>2.1.2 What a drag!</p>	<p>□ Describe the effects of drag and other forces on objects as they move.</p> <p>□ Describe factors which affect the size of frictional and drag forces.</p> <p>□ Evaluate how well sports or vehicle technology reduces frictional or drag forces.</p>	<p>Why is it an advantage for birds to have a streamlined shape?</p>	<p>Show students pictures of situations in which an object or animal is streamlined, and ask them to identify key features of the shape and suggest why they are there.</p> <p>Show the students picture of objects in which drag has been maximised; ask them to describe features of the shape and suggest why they are there.</p> <p>Keywords: Fluid Drag Streamlined Friction Energy</p>	<p>Worksheet Tug-o-war Quick quiz</p>	<p>Doddle - Friction</p>	<p>Num Lit So 1, 3, 4, 6 So 6, 7, 8 C 3, 6 Sp 2, 5</p>
<p>2.1.3 Understanding</p>	<p>□ Explain the relationship between an applied force and the</p>	<p>Name some materials or</p>	<p>Perform some demonstrations (see Technician’s notes 2.1.3 for details, including safety precautions) that allow</p>	<p>Worksheets</p>	<p>Doddle – Stretching</p>	<p>Num</p>

		Explain how a camel's feet allow it to walk on soft sand.	the area of a stiletto heel is less than 1 cm ² .) Keywords: Pressure area			C 3, 6 Sp 2, 5
2.1.6 Exploring pressure in a fluid	<input type="checkbox"/> Describe how pressure in a liquid alters with depth.	Why would you experience more pressure at the bottom of a swimming pool than at the surface?	Show the students a can with three holes in its side at different heights. Before they see the Student Book, ask them to predict the outcome of filling the can with water. Ask the students to attempt to explain why the water squirts furthest from the lowest hole. Keywords: Depth Molecules Atmospheric pressure Height	Worksheet Class discussion Exam questions	Doddle - Pressure	Num Lit So 1, 3, 4, 6 So 6, 7, 8 C 3, 6 Sp 2, 5
	<input type="checkbox"/> Describe how pressure in a gas varies with height above the Earth.					
	<input type="checkbox"/> Explain pressure changes in relation to particles and gravity.	What causes the atmosphere to have pressure?				
2.1.7 Calculating pressure	<input type="checkbox"/> Identify the factors that determine the size of pressure on a solid.	What is the unit for pressure?	Ask pairs of students to compare the pressure exerted on modelling clay by two wooden blocks with masses on top – one block should have twice the surface area of the other. The students should see that, when the force on the larger block is twice that on the smaller block, the depth of the indent is the same in each case. They should attempt to explain this. Keywords: Pascal	Worksheet Practical Assessment	Doddle - Pressure	Num Lit So 1, 3, 4, 6 So 6, 7, 8 C 3, 6 Sp 2, 5
	<input type="checkbox"/> Calculate the size of pressure exerted.	an engineer wants the floor of a car to be able to take a total force of 12,000N from all the seats. The floor can take a pressure of 24,000 Pa.				

		what area must the seat supports be?				
2.1.8 Explaining floating and sinking	<input type="checkbox"/> Explain why some objects float and others sink.	Name three materials that are denser than water and three that are less dense. Explain why people feel heavy when they get out of the water after a long swim?	Check the students' understanding of density from earlier work by asking them to explain why steel and wooden blocks of equal volume have different weights, and why wood floats but steel sinks. Suspend a piece of wood from a forcemeter, and note its weight. Identify the students' prior knowledge by asking them to predict how the forcemeter reading will change when the wood is lowered slowly into water. Repeat with an object that sinks. Keywords: Density Buoyancy Up thrust Displaced	Worksheet Practical Assessment Marksheet	Doddle – Pressure mini quiz	Num Lit So 1, 3, 4, 6 So 6, 7, 8 C 3, 6 Sp 2, 5
	<input type="checkbox"/> Relate floating and sinking to density, displacement and upthrust.					
	<input type="checkbox"/> Explain the implications of these ideas.					

Half Term 2

Week	Topic Studied
Topic 1	Earth – The atmosphere and carbon cycle
Topic 2	Earth – Global warming and climate change
Topic 3	Earth – Using the Earth's resources
Topic 3	Earth – Extracting and obtaining metals
Topic 5	Earth – Reactivity series of metals
Topic 6	Revision

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Student Book 2 Chapter 7 Earth: Climate and Earth Resources

Scheme of Work 2019 – 2020

Subject: KS3 Science Student Book 2 Chapter 7 Earth: Climate and Earth Resources

Year Group: 8

Specification: AQA Science Collins

Skill Focus: 1a,b,d 13a,b,c,d,e 20c 21a,b,c

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary)	Planned Assessment	Homework or flipped learning resources DODDLE resources	Lit Num SMSC Codes
2.7.1 Understanding our atmosphere	<input type="checkbox"/> Describe the composition of our atmosphere. <input type="checkbox"/> Describe how the atmosphere has changed over time.	What gases do you think are in our atmosphere? Why do	Do now/ Starter: Discussion on big questions Tasks: Pie chart of Earth's atmosphere to label Evolution of the Earth's atmosphere worksheet https://scijinks.gov/menu/games/atmosphere/	T-P-S Mini quiz	Doodle: Earth's atmosphere lesson Research how the atmosphere developed over time	So 6,7,8 C3,6 Sp2,5

	<p>□ Explain why the atmosphere has changed.</p>	<p>you think our atmosphere is important?</p>	<p>Thinking frame -describing/ brainstorming, class discussion Atmosphere made up of air. Example of gases e.g. oxygen and carbon dioxide Constructing their own pie chart. Research into history of the Earth's atmosphere</p> <p>Plenary: Mini quiz</p> <p>Keywords: Atmosphere; Combustion</p>			<p>Literacy link – written task</p> <p>Numeracy link – pie charts</p>
<p>2.7.2 Understanding how carbon is recycled</p>	<p>□ Describe the carbon cycle</p>	<p>What other objects contain Carbon? Where does the Carbon come from/go? Why is it called a sink?</p>	<p>Do now/ Starter: 60 second challenge – write down as many things that you know of that have carbon in it.</p> <p>Tasks: Carbon cycle information sheets and runner reader activity Carbon cycle information sheets https://bpes.bp.com/resources/list/secondary?ageGroup[]=4&topic[]=22 Graph analysis - Class discussion. Sequencing thinking frame – extended writing</p> <p>Plenary: verbal football</p> <p>Keywords: Carbon cycle; Carbon sink; Minerals</p>	<p>T-P-S</p> <p>RAG</p> <p>Extended writing tasks</p>	<p>Doddle: Carbon cycle lesson</p> <p>Homework: Song/Rap/Poem on Carbon cycle</p>	<p>So 6,7,8</p> <p>C3,6</p> <p>Sp2,5</p> <p>Numeracy link – graph analysis</p> <p>Literacy link – extended writing</p>
<p>2.7.3 Exploring how humans</p>	<p>□ Understand that human activities affect the carbon cycle.</p>	<p>How do humans affect the</p>	<p>Do now/ starter: T-P-S. How do humans affect the carbon cycle?</p> <p>Tasks:</p>	<p>T-P-S</p>	<p>Homework:</p>	<p>So 6,7,8</p> <p>C3,6</p>

affect the carbon cycle	<input type="checkbox"/> Appreciate the scale of this impact. <input type="checkbox"/> Explain how the impact relates to carbon stores as well as carbon dioxide producers.	carbon cycle? What would happen if...? How would...? Evaluate the use of..?	Scenarios Class discussion Scenarios Cause and effect thinking frame Vehicles cause pollution and use fuel/ fossil fuels. Diesel and petrol will run out. Write a letter/ produce a leaflet to suggest how to reduce carbon footprints Plenary: Mini quiz Keywords: Fossil fuel; Combustion; Vegetation; Photosynthesis	Peer assessment Mini quiz	BP education services: research/project on biofuels BPES: Carbon footprint toolkit https://bpes.bp.com/carbon-footprint-toolkit	Sp2,5 Literacy link – persuasive writing M7 – link to industry
2.7.4 Understanding global warming	<input type="checkbox"/> Describe the effects of global warming. <input type="checkbox"/> Explain the consequences of global warming for living things. <input type="checkbox"/> Evaluate the arguments for human activity impacting on global warming.	What is...? Explain the difference between global warming and climate change.	Do now/Starter: T-P-S on big question student can put forward opinions on twitter posts Global warming image to describe Global warming video: https://www.youtube.com/watch?v=oJAbATJcUgs https://www.youtube.com/watch?v=oJAbATJcUgs https://www.connect4climate.org/initiatives/events-and-competitions Thinking frames: Sequencing, cause and effect, compare and contrast. Class discussion Students would have heard about global warming from discussions and news e.g. Donald trump, Greta Thunberg Science Museum UNESCO project Connect4Climate competitions Plenary: Progress pass Keywords:	T-P-S Speech bubbles Progress pass Extended writing task	Homework: Write an action plan/ letter to Donald Trump (POTUS) to help reduce the effects of global warming and climate change. https://bpes.bp.com/resources/list/secondary?ageGroup[]=4&topic[]=22	So 6,7,8 C3,6 Sp2,5 Literacy link-extended writing

			Concentration; Greenhouse effect; Global warming			
2.7.5 Exploring damage to the Earth's resources	<input type="checkbox"/> Describe resources that the Earth provides.	How many different types of materials are there in this classroom? What are the materials made from? Where does each material come from? Why do we use the Earth's resources	Do now/ starter: word wheel. Discussion of big questions. Renewable and non-renewable energy information sheets. Building a power station project https://www.independent.co.uk/news/earth-overshoot-day-natural-resources-humans-planet-nature-damage-global-footprint-a8460756.html Class discussion Cause and effect thinking frames Students will have ideas about different types of materials. Some students may be able to state where materials come from e.g. wood Plenary: Quick quiz/ Progress pass Keywords: Natural resource; Renewable; Non-renewable; sustainable	T-P-S RAG Presentations Exam questions	Jaimie Garcia Project – BP Educational Services Doodle: Earth's Resources lesson	So 6,7,8 C3,6 Sp2,5 Literacy link-spellings
	<input type="checkbox"/> Explain how human activity limits these resources.					
	<input type="checkbox"/> Justify decisions about making changes to the environment.					
2.7.6 Considering the importance of recycling	<input type="checkbox"/> Describe examples of recycling.		DO now/Starter: consider a pringle can, can it be easily recycled and why? Tasks: Items to sort into recyclable or non-recyclable Recycling presentations Recycling video: https://www.recyclenow.com/what-to-do-with/cardboard-0 Video questions worksheet https://www.veolia.co.uk/southwark/tour-facility-21-september-2019	T-P-S Exam Questions	Homework: How many different types of items can you recycle in your home? Research why some household items cannot be recycled	So 6,7,8 C3,6 Sp2,5 M7 – link to careers in recycling
	<input type="checkbox"/> Explain the benefits and limitations of recycling schemes.					
	<input type="checkbox"/> Compare the efficiency of recycling methods.					

			<p>Class discussion Cause and effect thinking frame</p> <p>Recycling should be familiar to students with use of recycling bins and may have an idea of some materials that can and can't be recycled</p> <p>Veolia Southwark Recycling centre Tour</p> <p>Plenary: mini quiz</p> <p>Keywords: Recycling; Landfill; Down-cycle</p>			ng plants
2.7.7 How to extract metals	<input type="checkbox"/> Understand that most metals are found as ores. <input type="checkbox"/> Understand how less reactive metals can be extracted. <input type="checkbox"/> Understand how more reactive metals can be extracted.	<p>How can we extract metals? Are all metals extracted in the same way?</p>	<p>Do now/ starter: Discussion on big questions.</p> <p>Tasks: Extracting copper practical: Electrolysis https://www.youtube.com/watch?v=L_BjGKdM2Bk&t=105s Extracting copper practical: extracting with carbon https://www.youtube.com/watch?v=FjjZvFb0tAo https://www.youtube.com/watch?v=R7acplDDd7k https://www.ncm.org.uk/</p> <p>Students will be able to give some examples of metals. Students who play mine craft may know terms such as "ore" and where metals may come from</p> <p>National Coal mining museum</p> <p>Plenary: assessed question</p> <p>Keywords: Extraction; Reactive; Ore; Electrolysis</p>	<p>T-P-S</p> <p>Questioning</p> <p>Scientific enquiry</p> <p>Assessed Questions</p>	<p>Doddle: Reactivity of metals lesson</p>	<p>So 6,7,8</p> <p>C3,6</p> <p>Sp2,5</p>