CAISTER ACADEMY
Creative Education Trust

Curriculum Overview – Science

Year	Overview	Autumn 1 (Weeks 1 – 7)	Autumn 2 (Weeks 8 – 14)		Spring 1 (Weeks 15 - 20)	Spring 2 (Weeks 21 - 25)	Summer 1 (Weeks 26 - 32)	Summer 2 (Weeks 33 - 38)		Student Resources
7	**Students will begin with <u>Introduction to Caister Science</u> followed by the three units on a rotation:**	**Ecosystems:** Students will link the structure and function of plants to the environment and the impact on the organisms living there. Students will discover how all organisms are interdependent and one small change to the ecosystem can have far ranging consequences. **Foundations of Chemistry:** Students will develop an understanding of the particle model of matter and how particle behaviour changes during changes of state. Students will need to make accurate measurements from practical work to support their ideas. **Introduction to Physics:** Students will define what a force is and will explore different systems that involve forces. They will learn that mass and weight are not the same and will be able to describe how energy is stored and transferred.	**Ecosystems:** Students will link the structure and function of plants to the environment and the impact on the organisms living there. Students will discover how all organisms are interdependent and one small change to the ecosystem can have far ranging consequences. **Foundations of Chemistry:** Students will develop an understanding of the particle model of matter and how particle behaviour changes during changes of state. Students will need to make accurate measurements from practical work to support their ideas. **Introduction to Physics:** Students will define what a force is and will explore different systems that involve forces. They will learn that mass and weight are not the same and will be able to describe how energy is stored and transferred.	**Key Stage 3 Summative Assessments – Assessing the knowledge retained over the first term and previous terms. (Classroom assessment)**	**Students will study the three units on a rotation:** Cells and Movement: Students will learn that all multicellular organisms have a hierarchy of organisation. They will learn what the different organelles do and will view cells from plants and animals under a microscope. Students will explain how the skeleton and muscles work together to provide movement, as well as protecting our internal organs. **Earth Structure and Rock Cycle:** Students will be able to describe the internal structure of the Earth and will explain how different rock types are formed and the impact of the conditions they are created in affects their properties. **Sound and Light:** Students will explore the nature of light and sound as waves. They will be able to explain how light and sound are reflected and will understand how white light can be split to form an infinite number of colours that can be mixed.	**Students will study the three units on a rotation:** Cells and Movement: Students will learn that all multicellular organisms have a hierarchy of organisation. They will learn what the different organelles do and will view cells from plants and animals under a microscope. Students will explain how the skeleton and muscles work together to provide movement, as well as protecting our internal organs. **Earth Structure and Rock Cycle:** Students will be able to describe the internal structure of the Earth and will explain how different rock types are formed and the impact of the conditions they are created in affects their properties. **Sound and Light:** Students will explore the nature of light and sound as waves. They will be able to explain how light and sound are reflected and will understand how white light can be split to form an infinite number of colours that can be mixed.	**Students will study the three units below on a rotation:** **Digestion and Gas Exchange:** Students will be able to describe what happens to our food when it enters our digestive system and explain why the conditions inside us are so important to keep constant. They will explain how the body obtains oxygen and excretes carbon dioxide. **Periodic table and elements:** Students will be able to use the universal language of the periodic table to describe how atoms, elements, compounds, and mixtures interact with each other. They will learn how group 1 and group 7 elements interact with each other to create ionic compounds. **Quantifying Energy:** Students will build upon the work in the autumn term to describe how energy is transferred and the importance of energy efficiency, power rating and the National Grid's role in our national infrastructure.	**Students will study the three units below on a rotation:** **Digestion and Gas Exchange:** Students will be able to describe what happens to our food when it enters our digestive system and explain why the conditions inside us are so important to keep constant. They will explain how the body obtains oxygen and excretes carbon dioxide. **Periodic table and elements:** Students will be able to use the universal language of the periodic table to describe how atoms, elements, compounds, and mixtures interact with each other. They will learn how group 1 and group 7 elements interact with each other to create ionic compounds. **Quantifying Energy:** Students will build upon the work in the autumn term to describe how energy is transferred and the importance of energy efficiency, power rating and the National Grid's role in our national infrastructure.	**Key Stage 3 Summative Assessments – Assessing the knowledge retained over the second term and previous terms. (Classroom assessment)**	**Further Reading:** ➢ What If by Randall Munroe ➢ Curious Minds by Jordan Moore ➢ Ready Player 1 by Ernest Cline ➢ Horrible Science series by Nick Arnold **Student extra-curricular opportunities** ➢ **Trip to the National Science Museum in London** ➢ **KS3 Science Club – Caister's own science Taskmaster**
	Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.**		**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 22/01/2024– 26/01/2024**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 22/01/2024– 26/01/2024**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 2: 24/06/2024 – 28/06/2024**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 2: 24/06/2024 – 28/06/2024**		

8	**Students will begin with <u>Science in the Media</u> followed by the three units on a rotation:** **Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.**	**Genetics and Evolution:** Students will explore Darwin's theory of evolution and how it occurs through inheriting characteristics. This will be pupils first introduction into how genetic makeup are is determined. **Earth structure and Rock Cycle:** Students will investigate how weathering effects coastal Norfolk areas. Pupils learn the different types of rock, how they are formed and conditions required to change rocks. **Sound and Light:** Students will explore the nature of light and sound as waves. They will be able to explain how light and sound are reflected and will understand how white light can be split to form an infinite number of colours that can be mixed. **Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.**	**Genetics and Evolution:** Students will explore Darwin's theory of evolution and how it occurs through inheriting characteristics. This will be pupils first introduction into how genetic makeup are is determined. **Earth structure and Rock Cycle:** Students will investigate how weathering effects coastal Norfolk areas. Pupils learn the different types of rock, how they are formed and conditions required to change rocks. **Sound and Light:** Students will explore the nature of light and sound as waves. 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Pupils build on their knowledge from KS2 and will be able to articulate how Earth's tides are affected by our moon and why planets constantly move. **Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 15/01/2024 –19/01/2024**	**Reproduction:** Students will state the different between variation and reproduction – Understanding the biological processes of reproduction and variation. Pupils learn why variation is important and how reproduction plays a key part. **Climate and resources:** Pupils have their first exposure to dangers that face the modern world and how our climate is changed with our use of finite resources. How will can limit our production of greenhouse gases for a more sustainable future. **Space:** Students will discover the wonders of space and planet orbits. Pupils build on their knowledge from KS2 and will be able to articulate how Earth's tides are affected by our moon and why planets constantly move. **Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 15/01/2024 – 19/01/2024**	**Photosynthesis and Respiration**: Students will explore the processes of respiration and photosynthesis and how they are vital for life on Earth. Pupils learn the difference between beathing and respiration and how we use oxygen in chemical reaction. **Metals and Non-metals, acids and alkalis:** Students will investigate the properties of metals, acids and alkalis. Pupils will predict reactions and salts formed when acids react with specific metal. **Electricity and Electromagnetism:** Students will describe the key properties of electricity and magnetism. Students learn the uses of permanent magnets and the difference between series and parallel circuits. This understanding will be applied to practical skills. **Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 2: 17/06/2024 – 21/06/2024**	**Photosynthesis and Respiration**: Students will explore the processes of respiration and photosynthesis and how they are vital for life on Earth. Pupils learn the difference between beathing and respiration and how we use oxygen in chemical reaction. **Metals and Non-metals, acids and alkalis:** Students will investigate the properties of metals, acids and alkalis. Pupils will predict reactions and salts formed when acids react with specific metal. **Electricity and Electromagnetism:** Students will describe the key properties of electricity and magnetism. Students learn the uses of permanent magnets and the difference between series and parallel circuits. This understanding will be applied to practical skills. **Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 2: 17/06/2024 – 21/06/2024**	**Further Reading:** ➢ What If by Randall Munroe ➢ Curious Minds by Jordan Moore ➢ Ready Player 2 by Ernest Cline **Student extra-curricular opportunities** ➢ **Trip to Natural History Museum in London** **KS3 Science Club – Caister's own science Taskmaster**
9	**Students study the three units on a rotation:**	**Health:** Students will understand the different forms of disease that can affect humans and how our bodies fight the infections. Pupils will be able to state key components of a healthy diet and how food is digested. **Types of reactions.:** Students will investigate the different types of chemical reaction and the energy changes associated with them. This will form a foundation for future chemical reactions seen at GCSE such as combustion or thermal decomposition.	**Health:** Students will understand the different forms of disease that can affect humans and how our bodies fight the infections. Pupils will be able to state key components of a healthy diet and how food is digested. **Types of reactions.:** Students will investigate the different types of chemical reaction and the energy changes associated with them. This will form a foundation for future chemical reactions seen at GCSE such as combustion or		**Students study the three units on a rotation:** **Electricity introduction:** Students will learn how to construct circuits and calculate current, resistance and voltage. This unit build upon previous learning in year and prepares students for GCSE terminology. **Chemical energy:** Students will explore the details of the different chemical reactions and the processes that are required to facilitate them. Students will use data to inform types	**Students study the three units on a rotation:** **Electricity introduction:** Students will learn how to construct circuits and calculate current, resistance and voltage. This unit build upon previous learning in year and prepares students for GCSE terminology. **Chemical energy:** Students will explore the details of the different chemical reactions and the processes that are required to facilitate them. Students will use data to inform types	**Students study the three units on a rotation:** **Cell Biology core concepts Ecosystems:** Students will investigate the internal structures of cells and how materials are transported across the cell membrane. Pupils will improve their understanding of ecology and how all organisms interact with one another. **Atomic Structure :** Students will explore the evidence for atomic structure and radioactivity. Pupils will learn the basic	**Students study the three units on a rotation:** **Cell Biology core concepts Ecosystems:** Students will investigate the internal structures of cells and how materials are transported across the cell membrane. Pupils will improve their understanding of ecology and how all organisms interact with one another. **Atomic Structure :** Students will explore the evidence for atomic structure and radioactivity. Pupils will learn the basic	**Further Reading:** ➢ *To Kill a Mockingbird* by Harper Lee ➢ *Mortal Engines* by Philip Reeve ➢ *Nineteen Eighty-Four* by George Orwell ➢ *The Knife of Never Letting Go* by Patrick Ness *Brother in the Land* by Robert Swindells ➢ Royal Shakespeare Company: https://www.rsc.org.uk/ ➢ *Journey's End* by R.C. Sheriff ➢ *Private Peaceful* by Michael Morpurgo ➢ *Between Shades of Gray* by Ruta Sepetys

		Energy- heating and cooling: Students will explore the energy transfers associated with heating and cooling. This unit will build upon pupils understand of states of matter in year 7 and prepare of KS4 knowledge. Simply put… will do things melt.	thermal decomposition. **Energy- heating and cooling:** Students will explore the energy transfers associated with heating and cooling. This unit will build upon pupils understand of states of matter in year 7 and prepare of KS4 knowledge. Simply put… will do things melt.		of reactions and construct graphs. This will be the foundation of future topics such as rates of reaction. **Waves Interactions:** Students will investigate the properties of waves including the electromagnetic spectrum. Students will use previous knowledge from year 7 & 8 to understand how waves transfer energy and how to calculate wave speed.	of reactions and construct graphs. This will be the foundation of future topics such as rates of reaction. **Waves Interactions:** Students will investigate the properties of waves including the electromagnetic spectrum. Students will use previous knowledge from year 7 & 8 to understand how waves transfer energy and how to calculate wave speed.	properties of alpha, beta & gamma. Links are made to real life example such Chernobyl disaster and radiation from everyday objects. **Forces and their effects**: Students will investigate the different types of forces and how they act. Students will calculate the forces applied to objects and compare objects weights on different planets. Students will make links to energy and ways to reduces effects of friction.	properties of alpha, beta & gamma. Links are made to real life example such Chernobyl disaster and radiation from everyday objects. **Forces and their effects**: Students will investigate the different types of forces and how they act. Students will calculate the forces applied to objects and compare objects weights on different planets. Students will make links to energy and ways to reduces effects of friction.		➢ *Once* by Morris Gleitzman ➢ *The Book Thief* by Markus Zusak

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10	**Students study the three units on a rotation:**	**Cell Biology & Infection and response:** Students will explain the different forms of disease that can affect humans and how our bodies fight the infections. Pupils will be able to distinguish between a virus, bacteria and protist. Students will also build upon their KS3 cell knowledge and learn the benefits of cell differentiation. **Atomic structure review** **Bonding:** Students will Investigate how compounds form and the properties compounds. Pupils will explain how ionic, covalent and metallic bonds form and represent the compounds via diagrams. pupils will learn how and why models change and use the atomic model as an example. **Energy:** Students will Investigate the energy transfers that take place in the world around us and the impact they have on our society. Students will use their knowledge and apply to practical skills to gather data for equation practice. **Electricity**: Students will explore electricity in terms of resistance, energy transfer and power. Students will	**Cell Biology & Infection and response:** Students will explain the different forms of disease that can affect humans and how our bodies fight the infections. Pupils will be able to distinguish between a virus, bacteria and protist. Students will also build upon their KS3 cell knowledge and learn the benefits of cell differentiation. **Atomic structure review** **Bonding:** Students will Investigate how compounds form and the properties compounds. Pupils will explain how ionic, covalent and metallic bonds form and represent the compounds via diagrams. pupils will learn how and why models change and use the atomic model as an example. **Energy:** Students will Investigate the energy transfers that take place in the world around us and the impact they have on our society. Students will use their knowledge and apply to practical skills to gather data for equation practice. **Electricity**: Students will explore electricity in terms of resistance, energy transfer and power. Students will use their knowledge and apply to practical skills to gather data for equation practice.	**KS4 Formal Assessment**	**Organisation:** Students will develop on previous knowledge of large-scale organisation of the key organ systems in our bodies and how they work. Pupils will link previous learning and apply to a whole scale with both animals and plants internal systems. This can be linked to chemistry and chemical reactions within a system. **Bioenergetics - Respiration**: Students will explore in detail the processes of photosynthesis and respiration with reference to limiting factors, aerobic and anaerobic respiration. Pupils will make links to chemistry when understanding how our body used oxygen to produce energy. **Quantitative Chemistry** **Chemical changes:** Students will understand the industrial process of electrolysis and the calculations that underpin chemistry. We will predict salts and write a comprehensive	**Organisation:** Students will develop on previous knowledge of large-scale organisation of the key organ systems in our bodies and how they work. Pupils will link previous learning and apply to a whole scale with both animals and plants internal systems. This can be linked to chemistry and chemical reactions within a system. **Bioenergetics - Respiration**: Students will explore in detail the processes of photosynthesis and respiration with reference to limiting factors, aerobic and anaerobic respiration. Pupils will make links to chemistry when understanding how our body used oxygen to produce energy. **Quantitative Chemistry** **Chemical changes:** Students will understand the industrial process of electrolysis and the calculations that underpin chemistry. We will predict salts and write a comprehensive method for pupils practical skills. **Particle model:** Students will understand the particular nature of matter and how it relates to material design.	**Ecology**: Students will explore the biological processes that go on in ecosystems and how they can be evaluated. We evaluate human impact on our environment and understand how to make estimate for population and its importance to monitor. **The rate and extent of Chemical change:** Students will Investigate the factors that can affect the rate of reaction and how associated energy changes can be calculated. This will be linked to industry in the real world and former topics such as chemical energy. Students will gather data and improve their ability to interpret data and contract data table or graphs. **Forces** Students will investigate how forces act and their impact on everyday life in great depth than KS3. We link Newton's laws to learning and provide practical experience to show motion. With this understanding we justify predictions with calculation practice.	**Ecology**: Students will explore the biological processes that go on in ecosystems and how they can be evaluated. We evaluate human impact on our environment and understand how to make estimate for population and its importance to monitor. **The rate and extent of Chemical change:** Students will Investigate the factors that can affect the rate of reaction and how associated energy changes can be calculated. This will be linked to industry in the real world and former topics such as chemical energy. Students will gather data and improve their ability to interpret data and contract data table or graphs. **Forces** Students will investigate how forces act and their impact on everyday life in great depth than KS3. We link Newton's laws to learning and provide practical experience to show motion. With this understanding we justify predictions with calculation practice.	**KS4 Formal assessments**	**Further Reading:** ➢ KS4 Homework support guide ➢ Current 'Science journals for kids ➢ **Zoo ecology trip at Banham**

		use their knowledge and apply to practical skills to gather data for equation practice.			method for pupils practical skills. **Particle model:** Students will understand the particular nature of matter and how it relates to material design. Atomic structure: Explore the evidence for atomic structure and radioactivity in great depth than KS3.	Atomic structure: Explore the evidence for atomic structure and radioactivity in great depth than KS3.				
	Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support. **Trust-wide Assessment Window 1: 07/11/2022- 18/11/2021, Exam based on Paper 1 content**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 07/11/2022- 18/11/2021, Exam based on Paper 1 content**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 07/11/2022- 18/11/2021, Exam based on Paper 1 content**		**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 2: 3/07/2023- 14/07/2023- Full Paper 1**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 2: 3/07/2023- 14/07/2023- Full Paper 1**		
11	Extending and Preparing – In Year 11 students complete their final units of GCSE English Literature, looking at the two poetry units. Following this, students are then taken through an extended period of revision, bespoke to the needs of individuals and/or classes. Revision focuses on both GCSE English Language and Literature skills.	**Chemistry of the atmosphere & Using resources: Evaluate the use of finite and renewable resources and create LCA's for products.** Students will use data to determine how the early Earth went from a volcanic inhabitable land to the living ecosphere it is today. Pupils will link previous learning of combustion of fuel and state its effect on climate changes and its impact on industry leading LCA's being completed for every product around the world. **Exam prep** Question level analysis of mock exams used to design and deliver bespoke targeted intervention program	**Exam prep** Question level analysis of mock exams used to design and deliver bespoke targeted intervention program targeted to the need at academy, class and pupil level. Targeted to the need at academy, class and pupil level.		**Exam prep** Question level analysis of mock exams used to design and deliver bespoke targeted intervention program targeted to the need at academy, class and pupil level. Targeted to the need at academy, class and pupil level.	**Exam prep** Question level analysis of mock exams used to design and deliver bespoke targeted intervention program targeted to the need at academy, class and pupil level. Targeted to the need at academy, class and pupil level.	**Exam prep** Question level analysis of mock exams used to design and deliver bespoke targeted intervention program targeted to the need at academy, class and pupil level. Targeted to the need at academy, class and pupil level.	**Exam prep** Question level analysis of mock exams used to design and deliver bespoke targeted intervention program targeted to the need at academy, class and pupil level. Targeted to the need at academy, class and pupil level.		**Further Reading:** ➢ KS4 Homework support guide ➢ Current 'Science journals for kids

		targeted to the need at academy, class and pupil level. Targeted to the need at academy, class and pupil level.								
	Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support. **Trust-wide Assessment Window 1: 5/12/2022- 16/12/2022, (Full Paper 1 exam)**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 5/12/2022-16/12/2022, (Full Paper 1 exam)**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 5/12/2022-16/12/2022, (Full Paper 1 exam)**		**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 5/12/2022-16/12/2022, (Full Paper 1 exam)**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 5/12/2022-16/12/2022, (Full Paper 1 exam)**	**Each unit has a short test-based assessment, which will be marked by the teacher. Students will receive feedback on successes and areas requiring further support.** **Trust-wide Assessment Window 1: 5/12/2022-16/12/2022, (Full Paper 1 exam)**			