


















Great Park Academy Science Curriculum Overview: Year 9

At GPA, year 9 science begins with a craters-themed investigation, where pupils will revisit and enhance some fundamental scientific skills. These scientific skills are then revisited at appropriate times across the year, within other topics. The **biology**, **chemistry** and **physics** topics have been carefully sequenced across the academic year to support pupil understanding and their long-term memory; learning is a change to long-term memory, so this is a crucial consideration. The year 9 topics carefully and thoughtfully build upon the foundations laid in Year 7, Year 8 and at KS2. Our year 9 course is a bridge between key stage 3 and key stage 4. In year 9 we revisit concepts from year 7 & year 8, building up knowledge to GCSE level. This supports our spiral curriculum and provides the foundations for success at key stage 4. The sequence starts with some transition topics covering "how to do experiments", plus aspects of biology (biological processes), chemistry (the earth) and physics (waves and space). For the rest of the year the topics allow pupils to develop towards GCSE level.

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	<p><u>1. Working scientifically investigation - Craters</u></p>  <p>(a) Safety in science (b) Planning experiments (c) Collecting data (d) Handling data (e) Conclusions (f) Evaluating data</p> <p><u>2. Year 9 Transition: Waves & space (Physics)</u></p>  <p><u>Key question of physics</u></p>	<p><u>5. B1 - Cell biology (Biology)</u></p>  <p><u>Key questions of biology</u> - What are living things made of?</p> <p>(a) Microscopy (b) Eukaryotic cells (c) Eukaryotic cell differentiation & specialization (d) Prokaryotic cells (e) Movement of substances into</p>	<p><u>6. Atomic structure & the Periodic Table (Chemistry)</u></p>  <p><u>Key questions of chemistry</u> - What is everything in the Universe made of?</p>  <p><u>Key questions of chemistry</u> - How do we make new substances?</p> <p>(a) Matter & chemical equations</p>	<p><u>7. P1 - Energy (Physics)</u></p>  <p><u>Key question of physics</u> - How can energy be used to explain what things can do?</p> <p>(a) Energy stores & systems (b) Energy transfers & conservation of energy (c) Energy & work done (d) Gravitational</p>	<p><u>8. C2 - Bonding, structure & properties of matter (Chemistry)</u></p>  <p><u>Key questions of chemistry</u> - What is everything in the Universe made of?</p>  <p><u>Key questions of chemistry</u> - How do we make new substances?</p> <p>(a) The particle model</p>	<p><u>9. Organisation (Biology)</u></p>  <p><u>Key questions of biology</u> - What are living things made of?</p>  <p><u>Key questions of biology</u> - How does life survive and thrive?</p> <p>(a) Principles of organisation (b) The human digestive system</p>

	<p>How can energy be used to explain what things can do?</p>  <p><u>Key question of physics</u> - From small things to big things, what is the structure of the Universe?</p>  <p><u>Key question of physics</u> - How do forces impact objects?</p> <p>(a) Waves & sound (b) Wave equation (c) Waves & light (d) Space</p> <p><u>3. Year 9 Transition: The Earth (Chemistry)</u></p>  <p><u>Key questions of chemistry</u> - How can we take care of our planet while also using it to</p>	<p>and out of cells - diffusion. (f) Movement of substances into and out of cells - osmosis. (g) Movement of substances into and out of cells - active transport. (h) Mitosis & growth (i) Stem cells</p>	<p>(b) Separating mixtures (Filtration, crystallization, distillation & chromatography) (c) History of the models of the atom (d) Atomic structure (e) Ions (f) Isotopes (g) Electronic structures (h) The history of the Periodic table (i) The modern Periodic table (j) Group 0 - The Noble gases (k) Group 1 - The alkali metals (l) Group 7 - The Halogens (m) Transition elements</p>	<p>potential energy (e) Kinetic energy (f) Elastic potential energy (g) Specific heat capacity (h) Power (i) Conduction & insulation (k) Efficiency (l) Renewable and non-renewable energy resources</p>	<p>(b) Principles of chemical bonding (c) Ionic bonding (d) Covalent bonding (e) Metallic bonding (f) Properties of giant ionic lattices (g) Properties of simple molecules & polymers (h) Properties of giant covalent structures - diamond, graphite, graphene & fullerenes (i) Properties of giant metallic lattices (j) Nanoparticles</p>	<p>(c) Nutrition and food biochemistry (d) Enzymes (e) Blood (f) Blood vessels (g) The heart (h) Cardiovascular disease (i) Breathing & gas exchange (k) Health & lifestyle (l) Cancer (m) Plant tissues, organs & organ systems (n) Plant transport systems (o) Transpiration</p> <p><u>12. P3 - Particle model of matter (Physics)</u></p>  <p><u>Key question of physics</u> - How can energy be used to explain what things can do?</p>  <p><u>Key question of physics</u> - From small things to big things, what is the structure of the Universe?</p>
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	<p>meet our needs?</p> <p>(a) Matter & reactions (b) Rocks & the rock cycle (c) The atmosphere</p> <p><u>4. Year 9 Transition: Organisms & biological processes (Biology)</u></p>  <p><u>Key questions of biology</u> - What are living things made of?</p>  <p><u>Key questions of biology</u> - How does life survive and thrive?</p> <p>(a) Life & levels of organisation (b) Respiration (c) Photosynthesis</p>					<p>(a) Density (b) Particle model & changes of state (c) Internal energy (d) Specific heat capacity (e) Specific latent heat (f) Gas pressure</p>
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