# Science High Level Plan

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|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| Year 1 | **Chemistry** Big Question:  Why are our coats waterproof? Powerful Knowledge: Properties of materials that repel water. Themes:  Materials, Technological Advancement, Innovation and Technology. Concepts: Everyday Materials. Summative Assessment: Practical activity testing material waterproofing. | **Physics** Big Question: Why do leaves change color in autumn? Powerful Knowledge:  Observing and understanding seasonal changes. Themes:  Environment, Change over Time, Observation. Concepts:  Evidence of Change, Seasons. Summative Assessment:  Record a weather and leaf-color change journal. | **Biology** Big Question:  Are humans animals? Powerful Knowledge: Animal needs for survival. Themes:  Living Things, Survival and Interdependence. **Concepts:** Growth, Nutrition, Shelter. **Summative Assessment:**  Compare needs of humans and other animals using visual aids. | Biology Big Question:  What makes a perfect home for animals? Powerful Knowledge:  How animals adapt to different habitats. Themes:  Habitat, Adaptation, Survival. Concepts:  Interdependence, Environmental Interaction. Summative Assessment:  Create and explain a model of a suitable habitat. | Biology Big Question: What grows in our garden? Powerful Knowledge:  Understanding plant growth and reproduction. Themes:  Plants, Sustainability, Observation. Concepts:  Life Cycles, Growth. Summative Assessment:  Grow a seed and document its stages. | Physics Big Question:  Why do seasons change? Powerful Knowledge: The cycle of seasons and their impact on life. Themes:  Environment, Cycles, Observation. Concepts:  Seasons, Environmental Interaction. Summative Assessment:  Create a poster showing seasonal changes and their effects. |
| Year 2 | Chemistry Big Question:  Why did the third little pig’s house not collapse? Powerful Knowledge: Properties of materials and their strength. Themes:  Innovation, Material Culture, Technological Advancement. Concepts: Everyday Materials.  Summative Assessment:  Test and compare material durability. | Physics Big Question:  Why do puddles disappear? Powerful Knowledge: Phase changes between solids, liquids, and gases. Themes:  Processes, Environment, Change over Time. Concepts:  States of Matter. Summative Assessment:  Observe and explain water evaporation. | Biology Big Question:  What makes the perfect habitat for animals? Powerful Knowledge: Understanding local and global habitats. Themes: Environment, Adaptation, Survival. Concepts:  Habitats, Ecosystems. Summative Assessment:  Match animals to their habitats and explain why. | Biology Big Question:  What do animals eat? Powerful Knowledge:  Food chains and the relationships between predators and prey. Themes: Interaction, Energy Flow, Interdependence. Concepts:  Food Chains, Energy Transfer. Summative Assessment:  Draw and explain a food chain. | Biology Big Question:  How do plants grow? Powerful Knowledge:  Life cycles of plants from seed to flowering. Themes: Sustainability, Growth, Observation. Concepts:  Life Cycles, Photosynthesis. Summative Assessment: Present a plant life cycle diagram. | Biology Big Question:  How do seasons affect plants? Powerful Knowledge: Comparing plant growth across seasons. Themes: Environmental Cycles, Observation, Change Over Time. Concepts:  Adaptation, Seasonal Growth. Summative Assessment:  Reflect on and compare plant growth in different seasons. |
| Year 3 | Biology Big Question:  How do skeletons support our bodies? Powerful Knowledge: Structure and function of skeletons and muscles. Themes:  Structure, Movement, Health. Concepts:  Anatomy, Function.  Summative Assessment:  Label and compare skeletal diagrams of humans and animals. | Chemistry Big Question:  Why are rocks so hard? Powerful Knowledge: Properties of rocks and how they are formed. Themes: Materials, Change Over Time, Evidence. Concepts: Rock Types, Fossil Formation.  Summative Assessment:  Classify rocks and explain their uses. | Physics Big Question:  Where did my shadow go? Powerful Knowledge:  How light behaves and creates shadows. Themes:  Energy, Observation, Experimentation. Concepts:  Light, Reflection. Summative Assessment: Conduct an experiment tracking shadow changes. | Physics Big Question:  How can we see things in the dark? Powerful Knowledge: Reflection, refraction, and light paths. Themes: Investigation, Technological Advancement, Cause and Effect. Concepts:  Light, Energy Transfer.  Summative Assessment:  Create a diagram explaining how light reflects and refracts. | Physics Big Question: How do magnets work?  Powerful Knowledge: Magnetic forces and their effects. Themes: Interaction, Force, Experimentation. Concepts: Magnetism, Polarity. Summative Assessment:  Test the strength of magnets on various materials. | Physics Big Question:  How does friction affect movement? Powerful Knowledge: How friction impacts different surfaces and motion. Themes:  Motion, Force, Evidence. Concepts:  Friction, Energy Loss. Summative Assessment:  Write a conclusion based on friction experiments. |
| Year 4 | Chemistry  Big Question: Why do puddles disappear?  Powerful Knowledge: The properties and behaviors of solids, liquids, and gases.  Themes:  Processes, Change, Observation.  Concepts: States of Matter, Phase Changes.  Summative Assessment:  Conduct an experiment to observe evaporation and condensation. | Physics  Big Question: How does water travel around our planet?  Powerful Knowledge: The water cycle and its importance to life on Earth.  Themes: Environment, Energy Transfer, Sustainability.  Concepts:  Cycles, Processes.  Summative Assessment:  Create a labeled diagram and explanation of the water cycle. | Biology  Big Question:  What makes a habitat suitable for life?  Powerful Knowledge:  How living things depend on their environment and adaptations to habitats.  Themes:  Ecosystems, Balance, Survival.  Concepts:  Habitats, Biodiversity.  Summative Assessment: Compare two habitats and describe how organisms thrive in each. | Biology  Big Question:  How can we sort living things?  Powerful Knowledge: Classification of organisms based on observable features.  Themes: Organization, Evidence, Observation.  Concepts: Classification, Grouping.  Summative Assessment:  Design a classification key for plants or animals. | Physics  Big Question: How is sound created and heard?  Powerful Knowledge:  How vibrations travel through materials to create sound.  Themes:  Energy, Cause and Effect, Observation.  Concepts: Vibrations, Sound Waves.  Summative Assessment: Conduct an experiment to explore pitch and volume. | Physics  Big Question:  How can we control electricity?  Powerful Knowledge: Building circuits and understanding electrical conductors and insulators.  Themes:  Energy Transfer, Innovation, Experimentation.  Concepts:  Circuits, Conductivity.  Summative Assessment:  Design and test a working electrical circuit. |
| Year 5 | Physics  Big Question:  Why does the Earth spin?  Powerful Knowledge: The movement of the Earth, Moon, and Sun, and their impact on time and seasons.  Themes:  Systems, Observation, Sustainability.  Concepts:  Orbit, Rotation.  Summative Assessment:  Create a model showing the Earth's rotation and revolution. | Chemistry  Big Question:  How can materials change?  Powerful Knowledge: Reversible and irreversible changes in materials.  Themes:  Processes, Experimentation, Innovation.  Concepts:  Reactions, States of Matter.  Summative Assessment: Investigate material changes and present results. | Biology  Big Question:  How have living things evolved?  Powerful Knowledge: Evolution, inheritance, and fossil evidence.  Themes:  Time, Adaptation, Evidence.  Concepts:  Evolution, Natural Selection.  Summative Assessment:  Create a timeline of key evolutionary events. | Biology  Big Question:  Why do animals and plants look like their parents?  Powerful Knowledge: Inheritance and traits passed from one generation to the next.  Themes:  Genetics, Observation, Continuity.  Concepts: Inheritance, Variation.  Summative Assessment: Investigate inherited traits using visual examples. | Biology  Big Question: How does the circulatory system keep us alive?  Powerful Knowledge: Structure and function of the heart, blood vessels, and lungs.  Themes:  Systems, Health, Survival.  Concepts: Circulation, Function.  Summative Assessment: Measure and compare pulse rates before and after exercise. | Physics  Big Question: Can humans live sustainably?  Powerful Knowledge: Energy production, renewable resources, and environmental impacts.  Themes: Sustainability, Innovation, Energy Transfer.  Concepts:  Renewable Energy, Sustainability.  Summative Assessment: Create a presentation advocating for sustainable energy use. |
| Year 6 | Physics  Big Question: How does light travel?  Powerful Knowledge: Light travels in straight lines, reflection, and refraction.  Themes:  Observation, Energy, Experimentation.  Concepts:  Light, Energy Transfer.  Summative Assessment: Conduct an experiment to demonstrate reflection and refraction. | Biology  Big Question: How can we classify living things?  Powerful Knowledge: Grouping organisms based on complex classification systems.  Themes: Organization, Evidence, Adaptation.  Concepts: Classification, Diversity.  Summative Assessment: Create a detailed classification key for local wildlife. | Biology  Big Question: Why do some species survive while others go extinct?  Powerful Knowledge: Adaptation and environmental pressures leading to extinction or survival.  Themes:  Time, Interaction, Evolution.  Concepts: Survival, Adaptation.  Summative Assessment: Debate factors affecting the survival of species. | Biology  Big Question: How do humans affect the environment?  Powerful Knowledge: Human impacts on ecosystems, including deforestation and pollution.  Themes: Sustainability, Evidence, Interdependence.  Concepts: Ecosystems, Human Impact.  Summative Assessment: Analyze environmental case studies and propose solutions. | Physics  Big Question: How do circuits power our world?  Powerful Knowledge: Advanced electrical circuits and their uses in everyday life.  Themes:  Energy Transfer, Innovation, Experimentation.  Concepts: Circuits, Voltage.  Summative Assessment: Build and test a complex electrical circuit. | Biology  Big Question: Is it too late to save the planet?  Powerful Knowledge: Global efforts to combat climate change and preserve biodiversity.  Themes: Sustainability, Innovation, Interdependence.  Concepts: Conservation, Climate Change.  Summative Assessment: Create an action plan for reducing environmental impact. |