Science Scope and Sequence

Elementary:

- **Kindergarten**
  - Forces
    - Push vs pull on an object
    - Strong forces vs weak forces on an object
    - What is a machine?
    - Inventing a trap
  - Animals and Plants
    - Animal survival and habitats
    - Animal similarities and differences
    - Plant survival
    - Living vs nonliving things
  - Weather and Climate
    - Types of weather
    - Severe weather and preparation
    - Seasonal changes
    - Sun's effect on the Earth
  - Engineering Design
    - Designing a Problem
    - Generating Solutions
    - Plan and Carry out Tests
    - Measurment
    - Graphing
    - Data analysis

- **First Grade**
  - Sound and Light
    - Causes of sounds
    - Vibrations
    - Shadow movement
    - Transparent, translucent, opaque materials
    - Communication using sound and light
  - Plants and animals
    - Plant life cycle
    - Plant parts
    - Animal adaptation, hibernation, migration
    - Animal camouflage and external traits for survival
  - Space Patterns
    - Movement of the night sky and seasonal patterns
    - Moon phases and characteristics
    - Stars-basic constellations
    - Earth, moon, and sun movement patterns
  - Engineering Design

        - Designing a Problem
        - Generating Solutions
        - Plan and Carry out Tests
        - Measurment
        - Graphing
        - Data analysis

- **Second Grade**
    - Properties of Matter
        - Conductor vs insulator
        - States of matter
        - Transparent, opaque, translucent
        - Waterproof
        - Changes in matter when items are heated or cooled
    - Animals and Plants
        - Classifying animals (vertebrates and invertebrates)
        - Predator vs prey
        - Animal habitats
        - Animal species
        - Plant growth in different locations
        - Seed dispersal
    - Earth Surface Changes
        - Landformations
        - Erosion
        - Bodies of water
        - Steep and slope
    - Engineering Design
        - Designing a Problem
        - Generating Solutions
        - Plan and Carry out Tests
        - Measurment
        - Graphing
        - Data analysis

- **Third Grade**
    - Forces and Interactions
        - Balanced and Unbalanced Forces
        - Magnetic Interactions
        - Motion Patterns
    - Interdependent Relationships in Ecosystems
        - Group Survival
        - Habitats and Environments of Animals and Plants
    - Weather and Climate
        - Weather Patterns Based on Seasons
        - Climate in Different Regions
        - Weather-Related Hazards
    - Engineering and Design

        - Designing a Problem
        - Generating Solutions
        - Plan and Carry out Tests
        - Measurment
        - Graphing
        - Data Analysis
    - Inheritance and Variation of Traits: Life Cycles and Traits
        - Life Cycles of Plants and Animals
        - Environmental Influence on Life Cycles
        - Natural/Artificial Selection

- **Fourth Grade**
    - Energy
        - Relating Speed and Energy of an Object
        - Energy Transfer by Sound, Light, Heat, and Electric Currents
        - Change in Energy when Objects Collide
        - Converting Energy
        - Obtaining Energy and Fuels
        - Effect of Energy and Fuels on Environments
    - Structure, Function, and Information Processing
        - Light Reflection
        - Internal and External Structures in Plants and Animals
        - Animal Senses
    - Earth's Systems: Processes that Shape the Earth
        - Changes in Landscapes Due to Rock Formations and Patterns
        - Erosion
        - Earth's Features
        - Impacts of Natural Processes on Humans
    - Engineering and Design
        - Designing a Problem
        - Generating Solutions
        - Plan and Carry out Tests
        - Measurment
        - Graphing
        - Data Analysis
    - Waves: Waves and Information
        - Patterns on Amplitude and Wavelength Waves
        - How Waves Cause Objects to Move
        - Use Patterns to Transfer Information

Middle School:

- **Fifth Grade**
  - Structure and Properties of Matter
    - Matter Too Small to be Seen
    - Matter Conservation
    - Identifying Materials Based on Properties
    - Combining Substances
  - Matter and Energy in Organisms and Ecosystems
    - Transfer of Energy
    - Movement of Matter Through Plants, Animals, Decomposers, and the Environment
  - Earths Systems
    - Interaction between Geosphere, Biosphere, Hydrosphere, and/or Atmosphere
    - Water Distribution on Earth
    - Protecting Earth's Resources and Environment
  - Engineering Design
    - Designing a Problem
    - Generating Solutions
    - Plan and Carry out Tests
    - Measurment
    - Graphing
    - Data analysis
  - Space Systems: Stars and the Solar System
    - Gravitational Forces on Earth
    - Sun Brightness Based on Distance
    - Stars in the Night Sky
    - Changes in the direction of Shadows (Day/Night)

- **Sixth Grade**
  - Energy in the Atmosphere
    - Water cycle
    - How it works
    - Advanced vocab
    - Process
  - Human Impact on the Environment
    - Impact on land
    - Impact on Water
    - Impact on the atmosphere
    - Impact on the climate
  - Motion
    - Simple Machines
    - Energy, Matter
    - Atom, Molecules
    - Intro to solutions
  - Periodic Table
    - What it is
    - How to read it

        - Common elements

- **Seventh Grade**
    - Life
        - Chemistry of Life
        - Reproduction of Organisms
        - Cells and Life
        - Body Systems
        - Natural Selection and Adaptation
        - Evidence of Evolution

- **Eighth Grade**
    - Earth/Space
        - Geologic Time
        - Dynamic Earth
        - Natural Hazards
        - Weather and Climate
        - Sun-Earth-Moon System
        - The Universe

High School: -Must have 3 credits of science for graduation

- ***Biology**
    - 2 tri 9th grade
        - Central Dogma
        - Body System Organization & Interactions
        - Feedback Loops for Homeostasis
        - Mitosis & Cell Differentiation (stem cells)
        - Photosynthetic Energy Conversion
        - Organic Monomers & Polymers
        - Cellular Respiration Energy Conversion
        - Ecosystem Carrying Capacity
        - Ecosystem Populations & Biodiversity Maths
        - Ecosystem Matter Cycling & Energy Flow
        - Ecosystem Stability v Dynamics
        - Human Impact on the Environment
        - Chromosomal Coding & Inheritance
        - Meiotic Variation, Replication & Mutation
        - Evolutionary Ancestry
        - Diversity & Survival Fitness
        - Population Adaptation
        - Environmental Pressures on Populations

- ***Physical Science**
  - 2 tri 10th grade
    - Nature of Science
    - Motion
    - Forces and Newton's Laws
    - Work and Energy
    - Electricity
    - Magnetism and Its Uses
    - Wave Behaviors
    - Sound
    - Solids, Liquids, Gases
    - Classification of Matter
    - Properties of Atoms and the Periodic Table
    - Elements and Their Properties
    - Chemical Bonds
    - Chemical Reactions

- **Physics**
  - 2 tri
    - Science math
    - Motion
    - Accelerated Motion
    - Forces in One Dimension
    - Displacement and Force in Two Dimensions
    - Motion in Two Dimensions
    - Gravitation
    - Rotational Motion
    - Momentum and Its Conservation
    - Vibration and Waves
    - Fundamentals of Light
    - Reflection and Refraction
    - Interference and Diffraction

- **Forensic Science**
    - Intro to Forensic Science and the Law
    - Types of Evidence
    - The Crime Scene
    - Fingerprints
    - Hair
    - Blood
    - DNA Analysis
    - Human Remains

- **Microbiology**
    - Microbial Discovery History
    - Scientific Method in novel microbial discoveries
    - Microbial forms
    - Living vs Nonliving: Viral Classification–Revisiting Cell Theory
    - Pathogenicity Factors
    - Microscope Anat & Phys
    - Interior vs. Exterior scope imaging
    - Aseptic Technique-sterile v aseptic
    - Bacterial Morphology–Gram staining
    - Bacterial culture conditions
    - Common & Notable Pathogenic Bacterial Examples
    - Common & Notable Pathogenic Viral Examples
    - Variants & strains
    - Preventatives -vaccines
    - Cures v Treatments -antibiotics
    - Fermentation v Cellular Respiration -anaerobic v aerobic
    - Human Symbiosis-flora
    - Environmental Roles: nitrogen fixation, decomposers, bioremediation
    - Biotechnology
    - Viral Taxonomy–RNA v DNA-lytic v lysogenic reproduction
    - Parasitic nature of viruses
    - Innate Immunity
    - Adaptive Immunity
    - Immune disorders
    - Epidemic v Pandemic
    - Notable Epidemiological Agencies (scope & location)
    - National/Global Vaccine Programs
    - 1918 Influenza
    - Germ warfare

- **Environmental Science**
    - What is environmental science, and what is it not
    - Renewable and nonrenewable resources
    - Tragedy of the Commons
    - Ecological footprint
    - Economics and policy
    - Spheres of the Earth
    - Biotic vs abiotic factors
    - Organization of living things
    - Habitat vs niche
    - Organism relationships
    - Species
    - Populations and population growth
    - Urbanization and land use
    - Sustainable forestry
    - Sustainable agriculture

- **Anatomy & Physiology**
    - Dual Credit
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- **Chemistry**
        - Matter and Change
        - Scientific Measurement
        - Atomic Structure
        - The Periodic Table
        - Ionic and Covalent Compounds
        - Chemical Reactions
        - The Mole
        - Stoichiometry
        - States of Matter
        - Organic Chemistry
        - Chemistry in the Environment
        - Phases of Matter
        - Gases

- **Advanced Chemistry**
        - Chemical Reactions and Reaction Stoichiometry
        - Reactions in Aqueous Solutions
        - Thermochemistry
        - Electronic Structure of Atoms
        - Periodic Properties of the Elements
        - Basic Concepts of Chemical Bonding
        - The VSEPR Model
        - Gases
        - Liquids and Intermolecular Forces
        - Properties of Solutions
        - Chemical Kinetics
        - Chemical Equilibrium
        - Acid-Base Equilibria
        - Additional Aspects of Aqueous Equilibria