CHAPTER	LESSON	DESCRIPTION
I. Life Processes and Cell Functions	**Animal and Plant Cells**	This lesson explores the similarities and differences between animal and plant cells. Students will learn about the cell membrane, cytoplasm, and nucleus in both animal and plant cells. They will also explore the functions of chloroplasts and cell walls in plant cells and specialized animal cells. The lesson also details levels of organization, including the way animal and plant cells form tissues, tissues form organs, and organ systems form the complex levels of organization in the human body.
	Human Organ Systems	This lesson describes key functions of the human organ systems. Students will learn major organs that belong to each system and functions of specific organs.
	Life Processes	Description: This lesson details seven life processes required by living organisms: respiration, nutrition, excretion, growth, sensitivity, movement, and reproduction. Students learn how these life processes distinguish living things from non-living things.
	Specialized Cells	This lesson describes ways in which cells are specially adapted to their functions. Students will explore examples of specialized cells in both animals and plants. They will also learn some of the features of the red blood cell, cilia cell, sperm cell, and other specialized cells.
	Structure of Flowering Plants	This lesson describes the four main plant organs: the stem, leaves, roots, and flower. Students will learn that the male sex cells, called pollen grains, fertilize female sex cells, called ova. They will also learn ways in which seeds develop after fertilization and are dispersed by plants.
II. Humans as Organisms	**Absorption and Waste**	This lesson describes how the products of digestion are absorbed into the bloodstream and transported throughout the body. Students will learn the role of the kidneys in the removal of waste as well as the process of solid waste remove in humans.
	Adolescence	This lesson describes physical and emotional changes that occur during puberty. Students will learn some of the key changes take place in girls and boys during adolescence.
	Breathing	This lesson discusses the role of lung structure in gas exchange. Students will learn the role of the lungs and the structure of the lungs. They will also learn about the mechanism of breathing and the differences between inhaled and exhaled air.
	Development of the Fetus	This lesson describes the development of a baby from cell division to birth. Students will learn about implantation, the role of the placenta, the stages of development of the fetus, and the stages of birth.
	Digestion	This lesson outlines the principles of digestion, including the role of enzymes in breaking large molecules into smaller ones. Students will learn how food is used as fuel during respiration to maintain the body's activity and as a raw material for growth and repair. They will also learn how to describe the role of the main organs of the human digestive system.
	Drugs and Health	In this lesson, students will learn the main types of legal and illegal drugs. Students will review the dangers of the most commonly abused drugs, and consider how drug abuse can affect human health.
	Fighting Disease	This lesson describes how the growth and reproduction of bacteria and the replication of viruses can affect human health. Students will learn how the body's natural defenses can be enhanced by immunization and medications.

CHAPTER	LESSON	DESCRIPTION
	Human Reproduction	This lesson covers the male and female reproductive systems. Students will learn about the human sex organs, about the stages of the menstrual cycle, and about how fertilization takes place in humans.
	Human Respiration	This lesson describes the difference between the two types of respiration: aerobic respiration and anaerobic respiration. Students will learn how to summarize aerobic respiration and anaerobic respiration in word equations. They will also learn how substances involved in respiration are transported through the bloodstream and how energy is obtained from respiration.
	Nutrition	This lesson defines a balanced diet and provides examples of good sources of carbohydrates, proteins, fats, vitamins, minerals, and fiber. Students will learn the importance of each of these nutrients, as well as how vital water is to human health.
	Smoking	This lesson covers the effects of smoking on the human body. Students will learn about the chemicals found in cigarette smoke and the health problems associated with them. They will also learn how smoking affects a fetus.
	The Skeleton and Movement	This lesson describes the role of the skeleton and joints. Students will learn the principle of antagonistic muscle pairs and how movement is produced in the body.
III. Green Plants as Organisms	**Factors Affecting Photosynthesis**	This lesson explores factors that affect photosynthesis, including light, water, temperature, and carbon dioxide. Students will learn about the importance of these factors as well as how to test for them.
	Photosynthesis and Food Production	This lesson explains the important role of plants as food and as oxygen producers. Students will learn about photosynthesis, including what plants need for photosynthesis and how the process can be summed up in an equation.
	Plant Growth	This lesson details what plants need to be healthy, including the minerals nitrates, phosphates, and potassium. Students will learn the role of roots and root hairs in absorbing water and minerals from the soil. They will also learn how nutrients can be added to soil that lacks them.
	Respiration in Plants	In this lesson, students will learn the importance of the products of plant respiration and the key role of water in a plant's life processes. The lesson describes aerobic respiration in plants, including the word equation for plant respiration. It also describes how photosynthesis and respiration are related.
IV. Variation, Classification, and Inheritance	**Causes of Variation**	This lesson explores environmental and inherited causes of variation. Students will learn examples of human variation that can be attributed to genetic and to environmental factors. They will also learn the main causes of variation in plants.
	Classification	In this lesson, students will learn how to classify organisms into taxonomic groups. They will also learn examples of organisms from each taxonomic group.
	Inheritance	This lesson defines inherited characteristics and explains the role genes play in inheritance. Students will explore several examples of inherited characteristics, as well as the usefulness of selective and cross-breeding techniques.
	Variation	The lesson defines the term species, and explores the nature of variation between organisms. Students will learn about variation between species and within a species, including human variation. They will also learn the difference between continuous and discontinuous variation.

CHAPTER	LESSON	DESCRIPTION
	Properties of Non-Metals	In this lesson students will learn how to describe the appearance, state at room temperature, magnetic properties, and thermal and electric conductivity of non-metals. They will also learn other properties of non-metals, such as strength and density.
	Separating Mixtures	This lesson explores several ways in which mixtures can be separated into their parts. Students will learn how distillation, filtration, evaporation, and chromatography can be used to separate different types of mixtures.
	Solids, Liquids, and Gases	This lesson explores the states of matter of solids, liquids, and gases. Students analyze the properties of each state, and learn how the particle theory explains the differences between the states. They also observe experiments to learn what happens when substances change from one state of matter to another.
VII. Changing Materials	**Chemical Reactions**	This lesson focuses on the roles of reactants and products in a chemical reaction. Students will learn that virtually all materials, including those in living systems, are formed by chemical reactions. They will also explore several different types of chemical reaction, and learn how some chemical reactions are useful to humans and others are harmful.
	Geological Changes	This lesson describes three ways in which the weathering of rock takes place: physical, chemical, and biological. Students will learn how the forces generated by expansion, contraction, and the freezing of water can cause weathering. They will also learn how gases dissolved in precipitation can break down rocks. Then they will see examples of how plants and animals can cause weathering, and learn the types of materials that make up soil.
	Physical Changes in Materials	This lesson describes how mass is conserved when physical changes take place. Students learn how a material's temperature changes as it is heated or cooled enough to melt, boil, condense, or freeze. Students will also learn what energy transfers occur during changes of state and how materials expand and contract as they change temperature.
	Rock Formation	In this lesson students will learn the processes by which igneous, sedimentary, and metamorphic rocks are formed. They will see how the mode of rock formation affects the texture and mineral content of the rock. They will also learn characteristics and examples of each type of rock. The lesson ends with a discussion of how rocks are commonly used for building and other purposes.
	Solutions	This lesson details what happens when one substance dissolves in another. Students will learn how solubility varies with temperature, what a saturated solution is, and the differences between the solubility of solutes in different solvents. They will also learn how solvents and solutes are used in everyday life.
	The Effects of Combustion	This lesson describes how fossil fuels form. Students will learn the effects of fossil fuels on the environment, including global warming and acid precipitation. They will also see how the amount of pollution from combustion can be reduced.
VIII. Patterns of Behavior	**Acid Reactions**	This lesson explains how acids react with metals, bases, and carbonates, and describes the products of these reactions. Students will also learn how acids can corrode metal and cause the chemical weathering of rocks.
	Acids and Bases	This lesson describes the properties of acids and bases. Students will learn how to use indicators and the pH scale to classify solutions as acidic, basic, or neutral. They will also learn everyday examples of acids and bases.
	Displacement Reactions	This lesson explains displacement reactions. Students will learn examples of displacement reactions between metals and solutions of a salt or another metal. They will also learn the order of metals in the reactivity series and how metals are extracted from their ores.

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	Neutralization	This lesson explains the process of neutralization. Students will learn how to make salts using a neutralization reaction and some everyday applications of neutralization.
	The Reactivity of Metals	This lesson describes the reactivity of metals with oxygen, water, and acids. Students will learn that substances are produced by these reactions. They will also learn how to name the products of these reactions.
IX. Electricity	**Electric Current**	This lesson explores how the current in a circuit depends on the number of cells and the number and nature of other components. Students will learn that current is not 'used up' by components. They will also see that the resistance of wires depends upon their material, length, and thickness.
	Electrical Circuits	This lesson begins by describing the source of static electricity. Then students learn how to measure current and voltage. They also explore how energy is transferred from batteries and other sources to the components in electric circuits. Students demonstrate their understanding by interpreting and drawing electric circuit diagrams.
	Electromagnets	This lesson describes how an electric current in a wire produces a magnetic field. Students will learn how electromagnets are constructed, and what factors affect their strength. They will also learn some uses of electromagnets, including electric bells, relay switches, and appliances.
	Magnets	In this lesson, students will learn what it means for an object to be magnetic. They will explore magnetic fields and how they affect magnetic materials. Students will also explore how magnets interact with each other.
	Series and Parallel Circuits	This lesson details how to design and construct series and parallel circuits. As students analyze and build circuits, they learn how current flows in different types of circuits and what causes a short circuit.
X. Forces and Motion	**Balanced and Unbalanced Forces**	In this lesson, students will learn how unbalanced forces change the speed or direction of motion of objects. They will also see that balanced forces do not cause a change in the motion of an object. Students will explore several examples of these balanced and unbalanced forces in action.
	Force and Rotation	This lesson shows how levers can make work easier. Students learn how forces cause objects to turn around the pivot of a lever. They then learn the three basic types of levers, how to draw force arrows on diagrams that show how levers work, and everyday examples of levers.
	Friction	This lesson describes how frictional forces such as air resistance affect motion. Students will learn how the balance between frictional forces affects the movement and direction of an object. They will explore the concepts using specific examples.
	Pressure	This lesson explores the concept of pressure. Students will learn the quantitative relationship between force, area, and pressure. They will then learn how to solve problems for force, area, or pressure. In addition, they will learn applications of increased and decreased pressure.
	Speed	This lesson describes how to determine the speed of a moving object. Students will learn how to use the triangular relationship between speed, distance, and time to solve problems. They will also learn units of speed and how to show speed data in graphical form.

CHAPTER	LESSON	DESCRIPTION
	Torque	This lesson introduces the principle of torque. Students will learn how to measure torque and balance torques. Advanced students will find opportunities for calculating torque.
	Weight	In this lesson, students will learn the difference between weight and mass. They will see how the weight of an object results from the gravitational attraction between the object and the Earth. Students will learn how to measure mass and weight. They will also explore how the weight of an object depends on its mass, the mass of the Earth, and how far the object is from the center of the Earth.
XI. Light and Sound	**Color**	This lesson describes how white light can be dispersed to give a range of colors. Students will learn how colored filters affect white light. They will also learn how to describe the appearance of colored objects in white light and other colors of light.
	Hearing	This lesson explains how sound travels and how sound is caused by vibration. Students will learn how sound causes the ear drum to vibrate and why different people have different audible ranges. They will also learn the effects of loud sounds on the ear.
	Light	In this lesson, students will learn that light traveling in a uniform medium moves in a straight line at a finite speed. They will observe the difference between opaque and transparent objects. They will also see what happens during eclipses of the sun and moon. They will learn the difference between the speed of light and sound, and consider how that difference affects our perception of events. They will also explore how we see objects.
	Reflection	This lesson helps students understand how mirrors work and how they are used. Students will learn what path light follows when it is reflected and how a periscope works. They will also learn to draw a reflection diagram, and describe how light is reflected off different types of surfaces.
	Refraction	This lesson explains that light travels at different speeds in different materials, depending on the density of the materials. Students will learn the principle of refraction: how a light ray bends when it passes from one medium to another. They will explore several examples of refraction and learn how to draw a refraction diagram.
	Sound	This lesson compares the ways in which sound and light travel, including their speeds. Students will learn how to explain the relationship between the loudness of a sound and the amplitude of the vibration causing it. They will also explain the relationship between the pitch of a sound and the frequency of vibration causing it.
XII. The Earth and Beyond	**Satellites**	This lesson focuses on satellites. Students will learn about the moon and other natural satellites of planets. Then they will explore artificial satellites and probes to learn about their various purposes and processes, including weather monitoring, communication and navigation, observation of the Earth, and observation of outer space.
	The Night Sky	This lesson explains why the sun and other stars are light sources. Students will learn how the planets and other bodies can be seen by reflected light in the night sky. They will also become familiar with some of the major constellations and the Horsehead Nebula.
	The Rotating Earth	This lesson describes how the movement of the Earth causes the apparent daily movement of the sun and stars. Students will learn how long it takes the Earth to orbit the sun. They will also explain the phenomena of the seasons.
	The Solar System	In this lesson students will learn how to describe the relative positions of the Earth, sun, and planets in the solar system. They will describe the movements of the planets around the sun and relate these to gravitational force. They will also learn to explain how the movement of the earth causes the apparent movement of other bodies.

CHAPTER	LESSON	DESCRIPTION
XIII. Energy Resources and Energy Transfer	**Energy Conservation**	This lesson explains what is meant by the conservation of energy. Students will learn how energy is always conserved, and how energy can be given out as useful energy and wasted energy.
	Energy Resources	This lesson covers different forms of energy resources. Students will learn how to describe a variety of energy resources, and classify them as renewable or non-renewable. They will also learn how to compare the strengths and weaknesses of different energy resources.
	Generating Electricity	This lesson describes how electricity is generated. Students will learn the differences between renewable and non-renewable energy sources in terms of electricity generation.
	Heat and Temperature	This lesson describes the difference between temperature and heat. Students will learn how differences in temperature can lead to the transfer of energy.
	The Sun's Energy	This lesson describes the sun's role as the ultimate source of most of the Earth's energy. Students will learn the sun's role in the formation of fossil fuels and explain how the sun's energy is transferred to renewable energy resources.
	Transfer of Energy	In this lesson, students will learn how energy can be transferred and stored. They will be able to describe how heat energy is transferred directly by radiation and indirectly by conduction, convection, and evaporation.