Integrated Physics and Chemistry
PISD Curriculum: Year at a Glance

Bundle	*Title* Big Ideas/Enduring Understandings	Guiding Questions
1	***Safety, Scientific Methods, Measurements, & Models*** ▪ Scientific methods are used to problem-solve, communicate, acquire new knowledge, and evaluate information to get answers to questions. ▪ Safety procedures will be followed when using equipment and taking measurements.	▪ Why will we have 180 safe days in IPC? ▪ How can I use scientific methods & problem solving skills the rest of my life? ▪ Why do scientists use the metric system of measurement?
2	***Motion & Forces*** ▪ Forces cause changes in motion.	▪ How do people, animals, automobiles, & rockets move? ▪ Why are forces essential to all living organisms & applicable to non-living objects?
3	***Energy & Momentum*** ▪ Energy in any form is the ability to do work and cause change. ▪ Momentum is a quantity of motion that is unchanged in any interactions of a system.	▪ Why is energy a fundamental concept taught in all science courses? ▪ How can energy be conserved if it is never created nor destroyed?
4	***Work, Power, and Simple Machines*** ▪ Machines make work easier and faster by manipulating force and distance. ▪ Work input will always exceed work output.	▪ How is the meaning of "work" different in science from the common definition? ▪ How do simple machines make work easier & humans more powerful?
5	***Electricity and Magnetism*** ▪ Electricity is a useful, yet sometimes dangerous form of energy with many different sources. ▪ Electromagnetic energy is a wave with electric and magnetic components.	▪ How do electricity & circuits improve your life? ▪ How is magnetism related to electricity?
6	***Waves and Sound*** ▪ All types of waves transfer energy. ▪ Waves interact with other waves and with matter.	▪ How do waves affect everybody's daily lives for good and for bad? ▪ What kinds of waves are fun and which can hurt you?
7	***Light and Optics*** ▪ Light is an electromagnetic wave and can be placed on a spectrum according to frequency or wavelength. ▪ The properties of light allow it to be manipulated with lenses, mirrors and other optical devices.	▪ Why is light the only form of energy that can be seen? ▪ How do optical instruments work?
8	***Properties of Matter*** ▪ Physical and chemical properties can be used to classify matter.	▪ How are physical changes different from chemical changes? ▪ What chemical & physical properties should students be able to measure?

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9	***Atoms, Molecules, and Compounds*** ▪ Molecules and compounds are composed of atoms bonded together in various combinations.	▪ How do scientists know so much about something that can't be seen? ▪ How can atoms combine to form a new & different substance?
10	***Chemical Reactions*** ▪ Atoms combine and recombine to form different compounds. ▪ These combinations and recombinations are made possible through the exchange of energy. ▪ Atoms form bonds to acquire a stable arrangement of electrons.	▪ How are chemical reactions different from nuclear reactions? ▪ Why does the law of conservation of mass require balancing chemical equations?
11	***Water and Solutions*** ▪ Solutes dissolve in solvents to produce solutions with many uses.	▪ How do the properties of water allow it to be the "universal solvent"? ▪ Why is solution chemistry essential to your being alive, happy, and intelligent?
12	***Heating and Cooling*** ▪ Thermal energy can be transferred by conduction, convection and radiation. ▪ Temperature does not measure thermal energy, but there is a relationship between the two.	▪ How can a vehicle on a hot summer day illustrate the 3 forms of thermal energy transfer? ▪ How would you measure the thermal energy of your favorite snack?