GRADE 8 SCIENCE PROGRAM 2011-2012

Resources:

- **Science Explorer: Chemical Building Blocks – Prentice Hall**
- **Science Explorer: Chemical Interactions – Prentice Hall**
- **Science Explorer: Motion, Forces and Energy – Prentice Hall**
- **Scott Foresman – Addison Wesley *Science Insights – Exploring Earth and Space***
- **Class notes and handouts**

CALENDAR	LESSONS	OBJECTIVES	ACTIVITIES/PROJECTS/ LABS/TESTS
September	**Introduction to the Scientific method Procedure**	Students should be able to identify and apply the steps of the scientific method. Specifically, they should be able to • distinguish between qualitative and quantitative observations; • identify faulty reasoning; • identify cause and effect and its relationship with inference; • learn how to analyze information; • identify reliable sources; • apply scientific method vocabulary to real life situations.	**Activity:** Qualitative and quantitative observations **TEST**
September-October	**INTRO TO CHEMISTRY** **Unit 1 – Chemical Building Blocks** **Chapter 1** 1.1 Describing Matter	Students should be able to • identify physical and chemical properties of matter; • define elements and how they relate to compounds; • describe the properties of a mixture;	
	1.2 Measuring Matter	• measure matter; • identify the units of measurement and derive density;	
	1.3 Changes in Matter 1.4 Energy and Matter	• describe physical and chemical changes; • explain how changes in matter are related to energy.	**LABS / ACTIVITIES PER SECTION** **TEST**

October	**Chapter 2 Solids, Liquids, and Gases** 2.1 States of matter 2.2 Changes of State	Students should be able to • describe the characteristics of a solid, liquid and a gas; • explain state changes; • list measurements when working with gases; • explain how volume, temperature and pressure of a gas are related.	**LABS / ACTIVITIES PER SECTION** **TEST**
November	**Chapter 3 Elements of the Periodic Table** 3.1 Intro to Atoms 3.2 Organizing the Elements 3.3 Metals 3.4 Non-metals and metalloids 3.5 Elements from stardust	Students should be able to • describe the structure of an atom; • describe elements in term of their atoms; • describe atomic models; • draw the atomic structure of the first 18 elements of the periodic table; • learn chemical symbols of most of the elements; • understand the pattern Mendeleev discovered in the elements and how the periodic table may be used as an instrument to predict element properties; • list physical properties of metals, non-metals and metalloids.	**LABS / ACTIVITIES PER SECTION** **TEST** **PROJECT: ADOPT AN ELEMENT** **Documentary:** "The Story of Science-What the World is Made of" - BBC
December - January	**Unit 2 – Chemical Interactions** **Chapter 1 – Atoms and Bonding** 1.1 Elements and Atoms 1.2 Atoms, Bonding, and the Periodic Table 1.3 Ionic Bonds 1.4 Covalent Bonds 1.5 Bonding in metals	Students should be able to • explain the atomic theory; • the reactivity of atoms and how the periodic table may be used to understand element properties; • describe ionic, covalent and metallic bonds.	**LABS / ACTIVITIES PER SECTION** **TEST**
	Chapter 2 – Chemical Reactions 2.1 Observing Chemical Change 2.2 Describing	Students should be able to • state how changes in matter may be described; • explain how chemical reactions occur; • identify what information a chemical equation contains and explain what a	**LABS / ACTIVITIES PER SECTION** **TEST**

	Chemical Reactions	balanced chemical equation must show; • name three categories of chemical reactions.	
January - March	**Full Science Fair Preparation Period**	During the Science Fair preparation students will learn how to follow the scientific method procedure. Specifically, they should be able to • learn how to plan an experiment in detail; • do appropriate background research; • identify appropriate resources (including internet websites); • collect data and interpret experimental information in a discussion so that proper conclusions may be drawn; • work independently on their science fair project, using class time wisely when given, respecting deadlines and continuing their grade 8 science program.	A calendar of deadlines and science fair work expectations will be given to each individual student at the end of January.
January - April	**Science Fair preparation + ASTRONOMY** **Chapter: Earth and the Moon** Earth's shape; Moon; system Earth-Moon	Students should be able to • describe the rotation and revolution of Earth; • interpret data based on time zones; • explain how the tilt in the Earth's axis affects season change; • recognize moon phases and explain how the moon's motion affects moon phases; • distinguish between solar and lunar eclipse; • infer about the theories explaining the moon's formation; • list some major events in moon exploration;	**PROJECT:** **Observing the night sky** **Activity: sundial** **LABS / ACTIVITIES PER SECTION** **TEST**
	Chapter: The Solar System The Sun; Planets; Asteroids; Meteoroids; Comets	Students should be able to • make a model of the Sun's layers and identify the layers in the sun's atmosphere; • explain sun activity and its effect on Earth's magnetosphere • use the sun to tell time; • describe the solar system formation; • define the inner and outer planets and their movement around the sun; • define asteroids, meteoroids, comets and locate the asteroid belt; • predict how a comet changes over time;	**LABS / ACTIVITIES PER SECTION** **TEST** **Documentaries:** **"**Hubble Space Telescope"/"Spirit and Opportunity" **Field trip to the Planetarium**
	Chapter: Stars and	Students should be able to	**LABS / ACTIVITIES**

	Galaxies Telescopes; characteristics of stars; star life cycle; galaxies	• describe the electromagnetic spectrum; • explain how reflecting and refracting telescopes work; • relate temperature to star color; • interpret data from the H-R diagram; • explain the life cycle of a star; • define galaxies and star groups.	**PER SECTION TEST** **Documentaries:** "When We Left Earth"/ "Stephen Hawking's Universe"-Discovery Channel
April - June	**INTRO TO PHYSICS** **Unit 3 – Motion, Forces and Energy** **Chapter 1 - Motion**	Students should be able to • demonstrate when an object is in motion; • calculate an object's speed and velocity; • graph motion; • explain the movement of Earth's plates through the theory of tectonic plates and calculate an Earth plate's speed; • describe the motion of an object in acceleration; • calculate acceleration; • use graphs to display acceleration.	**LABS / ACTIVITIES PER SECTION TEST**
	Chapter 2 – Forces	Students should be able to • define what a force is and explain how balanced and unbalanced forces relate to an object's motion; • describe friction and factors that determine friction between two objects; • identify factors that affect gravitational pull between two objects; • explain why objects accelerate during free fall; • state Newton's three laws of motion; • determine the momentum of an object; • state the law of conservation of momentum.	**LABS / ACTIVITIES PER SECTION TEST**

QUIZZES: Depending on length of chapter and student responsiveness, quizzes may be done in the middle of a chapter to assess if students are assimilating concepts correctly.
STUDENT ASSESSMENT: Homework, class notebooks, tests/quizzes, activities, projects

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