COURSE: **General Science – 15:1**
GRADE LEVEL: **10/11**

MAIN/GENERAL TOPIC:	SUB-TOPIC:	ESSENTIAL QUESTIONS:	WHAT THE STUDENTS WILL KNOW OR BE ABLE TO DO:	SKILLS:	WHEN STUDENT DOES IT:	ASSESSMENTS:
UNIT 1 INQUIRY/PROBLEM SOLVING	• Scientific Method	• What are the steps in the Scientific Method? • How do we observe and collect data? • What data do we use to determine a hypothesis?	• How to use Scientific method to formulate a hypothesis • How to determine if the hypothesis is valid or invalid?	• Use senses to make observations • Use tools to measure	Sept.	• Observation quiz • Observation lab • Scientific Method Quiz
	• Scientific Process	• How do we make meaningful explanations for our observations?	• How to design, implement, and analyze a controlled scientific experiment	• Design a controlled experiment • Identify controls • Analyze data through graphs and tables • Compare results to references	Sept.	• Lab Reports • Observations and conversations during labs
UNIT 2 OUR UNIVERSE: ASTRONOMY	• Universe Theory	• How did the Universe evolve? • What are the evidences of the big bang theory? • Ptolemy vs. Copernicus	• Know expanding universe, black holes, pulsars, H-R diagram, constellations, Big Bang • Explain heliocentric vs. geocentric	• Students will place stars on a chart that classifies them • Watch Fantasia as part of the Big Bang Theory	Sept.	• HR diagram • Astronomy test • Design a model of the solar system
	• Galaxies	• What is the organization of the universe? • How do we know celestial bodies are moving?	• Identify our galaxy as the Milky Way • Understand red shift as evidence of receding galaxies	• The students will understand the Red/ Blue shift	Sept.	• Worksheets

	• Planets	• How do the planets differ?	• Obtain dimensions and data from reference table • Describe the main features • Model retrograde motion	• Students will use the ESRT to obtain data for the different planets	Oct.	• Dimensions of the solar system lab • Solar System Quiz
	• Moon	• What causes the moon to change shape? • How long for each cycle of the moon? • What causes the different eclipses?	• Model phases and eclipses • Diagram the moon's effect on tides • Know the length of rotation and revolution • Describe characteristics of the moon due to the lack of atmosphere • Discuss human exploration	• Students will diagram and match pictures of the phases of the moon • Students will diagram Lunar and Solar eclipses		• Lunar cycles lab
UNIT 3 OUR PLANET: EARTH'S MOTION, EARTH'S SURFACE	• Rotation	• What does rotation cause?	• Explain earth's daily motions • Explain the day/night cycle over the course of a year • Foucault's pendulum	• The students will understand that as the earth rotates it causes specific events to occur	Oct.	• Earth motions worksheet • Time Zones worksheet • Earth motions test
	• Revolution	• What does the revolving of the earth around the sun cause?	• Know the Earth's motion around the sun • Topics include: constellation changes, Kepler's Laws of planetary motion	• The students will understand as the position of the earth in its orbit changes observations made from earth will change	Oct./Nov.	• Revolution lab • Quiz on earth motions • Demonstrate rotation vs. revolution
	• Tilt	• How does the change in angle cause the change in the length of day?	• Know the effects of the Earth's tilt on the sun's angle, duration, and how it affects the seasons	• Students will demonstrate as angle changes temperature changes • Students will demonstrate that as duration changes energy changes	Nov.	• Chart the location of the sun at various times of day, temperature changes as the tilt changes
	• Seasons	• What causes Seasons?	• Know that both angle and revolution together cause the change in seasons • Know that the change in the length varies by latitude and causes seasons	• □emonstrate how the changes in position of the earth on its orbit create the changes in seasons		• Modeling the season's lab • Path of the sun lab • Unit test

UNIT 4 INSIDE OUR PLANET: GEOLOGY	• Minerals • Types	• How can minerals be identified? • What causes minerals to have different properties?	• Group by elemental composition: silicates, sulfates, oxides, etc.; crystal structure, arrangement and bonding	• Students will understand mineral properties • Students will understand that the arrangement of atoms creates many mineral properties	Nov./Dec.	• Mineral properties worksheet
	• Properties	• Given different minerals and an ESRT, what series of tests can you use to identify them?	• Know cleavage and fracture, hardness, luster, streak, color, heft	• The students will be given twelve different minerals to identify	Dec.	• Mineral identification lab
	• Rocks • Rock Cycle	• How are the three types of rocks formed?	• Know origins, types and methods of formation and texture	• Using the ESRT the students will understand how to follow the Rock cycle	Dec./Jan.	• ESRT worksheet
	• Igneous	• What are properties of igneous rocks?	• Recognize intrusive/ extrusive using reference table chart, cooling rate and crystal size	• Students will understand the difference between intrusive and extrusive igneous and how to use the ESRT to identify them	Jan.	• Rock Identification lab
	• Metamorphic	• What are the properties of metamorphic rocks?	• Understand formation, banding, temperature and pressure, contact and regional	• The students will use the ESRT to identify metamorphic rocks	Jan.	• Rock Identification lab
	• Sedimentary	• What are the properties of Sedimentary rocks?	• Understand formation, particle size and cements, properties, horizontal layering • Understand how fossils are made	• The students will use the ESRT to identify Sedimentary rocks and fossils	Jan.	• Rock Identification lab • Rock Test • Fossil Identification
UNIT 4 EARTH'S DYNAMIC CRUST	• Earth's Interior	• How is the interior of the Earth subdivided? • Where does the evidence for the composition of the core come from?	• Understand, lithosphere, mantle, inner core- pressures, densities, temperature • Recognize meteorite evidence of core's	• Using the ESRT students will identify the different divisions and properties of the earth's interior		• Journey to the center of the earth worksheet

			composition			
	• Plate Tectonics	• What are plates and how do they move? • What evidence do we have to prove the theory of Plate Tectonics?	• Understand evidence fit of continents, sea floor spreading, plate boundaries • Describe plate movement direction according to reference tables	• Students will assemble and label a map of the different plates • Students will assemble Gondwanaland and understand the fit of the continents	Jan./Feb.	• Earthquake and Volcanic cutout lab • Piercing the continents lab
	• Earthquakes	• What causes Earthquakes?	• Understand seismic waves, seismographs • Drive wave arrival time according to reference tables and locate an epicenter • Understand tsunamis, prediction, fault types, and Richter scales	• Students will use the ESRT to determine distance and locate earthquakes by drawing tables	Feb.	• Earthquake lab • Worksheets
	• Volcanoes	• What causes the difference in volcanoes and eruptions? • Can eruptions be predicted?	• Understand three main types and formation, types of magma, eruptions, locations • Use earthquake information to predict eruption pattern	• Students will plot volcanoes and interpret differences from their locations on the plates	Feb.	• Volcano chart • Volcano lab • Unit test
UNIT 5 AROUND OUR PLANET: METEROLOGY	• Factors that Affect Climate	• What factors affect the climate of an area?	• Study prevailing winds effect on climate • Study the effect of altitude, latitude on climate • Study the effect of mountain barriers on climate • Study how the closeness to large water bodies affects the climate of an area	• The students will identify and understand the factors that change climate	Feb./ March	• Latitude • Effects on Climate Lab • Global Climates worksheet

	• Atmospheric Layers	• What are the properties of the atmosphere?	• Interpret a reference table chart of different properties of the atmosphere	• Using the ESRT students will read charts and graphs associated with the atmospheric properties	March	• Layers of the atmosphere lab
	• Related Weather Factors	• When properties change in the atmosphere how do they affect other properties?	• Know how the following are related: temperature and humidity, temperature and pressure and humidity, humidity and dew point temperature, and dew point temperature and precipitation	• Using graphs students will find correlations between weather factors	March	•
	• Measurement and Description	• What factors determine weather? • How do we observe weather properties?	• Understand the daily temperature cycle (maximum and minimum), humidity, pressure, dew point, and wind direction and magnitude	• The students will understand what factors determine weather and how to collect data	March	• Read weather maps • Interpret data • Plot weather maps
	• Clouds and Precipitation	• How do clouds form? • How do the properties of the atmosphere change as you go up in the atmosphere?	• Explain how clouds form • Recognize the different cloud types	• The students will understand cloud formation and create clouds using pressure changes	March	• Cloud project • Internet weather interpretation
	• Frontal Systems	• How do fronts develop and what type of weather is associated with each?	• Identify the four different fronts • Explain the types of weather they bring	• The students will diagram the different fronts and understand the weather associated with each	March	• Interpret weather charts • Predict weather
	• Air Masses	• What are air masses and where do they form?	• Predict characteristics based on source areas and prevailing winds	• Using the ESRT students will understand the characteristics associated with the source regions for air masses	March/ April	• Prevailing winds diagram
	• Forecasting	• How can we use weather data to make predictions?	• Construct station models • Read weather isolines • Use current data (satellite maps, air patterns) to make	• The students will use their ESRT to draw station models and interpret information from	April	• Station models lab • Weather Data Collection Lab

			general weather predictions	weather maps		
	• Hazardous Weather	• What factors create the different forms of hazardous weather?	• Study hurricanes, tornadoes, thunderstorms – the causes and the effects	• The students will graph the different factors that occur as hurricanes pass	April	• Hurricane lab • Tornado lab • Severe weather videos • Weather test
	• Greenhouse Effect	• What does the atmosphere do? • What causes the greenhouse effect?	• Know the wavelengths of energy, gases, and conditions that cause this effect	• The students will diagram the greenhouse effect and understand its properties	April	• Greenhouse diagram
UNIT 6 ENVIRONMENTAL SCIENCE	• Introduction	• Why should we all learn about the environment?	• Definition of ecology • Understanding of "environmentally aware"	• Perspective of "home"	April	• Personal drawings • Outline sheet
	• Ecosystems	• How do living organisms interact with each other and the physical environment?	• Key terms relating to ecosystems • Biotic and abiotic factors	• Ability to analyze biotic and abiotic factors • Use identification keys	April/ May	• Lab: Identification keys • Writing samples • Quiz
	• Endangered species	• How have plants and animals become endangered or extinct?	• The meaning of threatened, endangered, extinct • Human impact on habitats	• Group work rating animals close to extinction • Research an extinct animal	May	• Power point presentations on endangered species
	• Global Warming	• How are humans contributing to the warming of the earth's climate?	• Up to date specifics on global temperature changes • How global warming has affected the earth's surface, oceans, wildlife, etc.	• Ability to graph worldwide temperatures	June	• Ways to decrease global warming
	• Chemicals that pollute the air	• How are air pollution gases affecting the earth and its atmosphere?	• Types of pollution gases • How air pollution gases react to form more toxic pollutants • Health effects	• Chart summarizing air pollution gases • Ability to organize data and make predictions	May	• History's worst air pollutions disasters • Ways to reduce amount of air

						pollution
	• Ozone Depletion	• How is the earth's atmosphere breaking down?	• Importance of ozone layer • How ozone protects the earth • Causes of depletion • Health effects	• Charts showing changes in the hole in the ozone layer	May	• Research on uses and effects of CFCs
WATER	• Water quality	• What factors determine water quality	• Key terms relating to water quality • Importance of dissolved oxygen	• Chart to interpret levels of dissolved oxygen	June	• Outline of water quality factors
	• Hazardous wastes	• Why are hazardous wastes so destructive to the environment?	• Key terms relating to hazardous wasters • How they are polluting the environment • Industries and politics surrounding hazardous waste removal	• Original articles on discovery of hazardous waste sites	June	• Graphic organizer comparing two problem areas
	• Water pollution	• How does water pollution affect different water ecosystems?	• Key terms relating to water pollution • Ways water becomes polluted	• Water of water pollutants	June	• Outline water pollution sources
CARBON FOOTPRINT	• Human population	• How is the population growth causing environmental problems?	• Changes in population • Causes of population shifts • Affects of population growth on natural resources • Connection between world wide food shortages and population growth	• Graph world of population growth throughout history	June	• Articles regarding human population growth • response to effect of overpopulation on global resources