

**New Paltz Central School District
Earth Science**

	CONTENT	SKILLS	ASSESSMENTS
S E P T E M B E R	<p><u>UNIT 1: MEASUREMENT AND DENSITY</u></p> <ul style="list-style-type: none"> • How do you accurately measure length, weight, and volume? • How do you find the volume of a regularly shaped object, irregularly shaped object, and a fluid? • How do you determine the density of an object and how does density change with change in mass, volume, temperature (phase change) and pressure? • How do you determine the percent error (deviation) of a measurement? • How do you correctly graph information? 	<ul style="list-style-type: none"> • Measure volume, length, weight, and rate of change. • Determine density and percent error. • Make, read, and interpret graphs • Convert among metric units • Recognize and predict cycles 	<ul style="list-style-type: none"> • Practicum during exam • Full lab write-up of density determination of different minerals • Earth Science Resume • Tests and quizzes
O C T O B E R	<p><u>UNIT 2: MAPPING THE EARTH'S SURFACE</u></p> <ul style="list-style-type: none"> • What is the difference between latitude and longitude and how are they indicated on a map? • What are the different types of field maps and how are isolines drawn? • How is information conveyed from a topographic map, including contour lines, map symbols, and distance scales? • How is gradient determined? • How is the profile of a map drawn between two points? 	<ul style="list-style-type: none"> • Interpret and construct topographic maps. • Draw isolines and contour maps. • Calculate gradients and draw profiles of the Earth's surface • Find latitude and longitude from maps 	<ul style="list-style-type: none"> • Examination questions on map reading • Labs on reading topographic maps • Fantasy Map • Tests and quizzes

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N O V E M B E R	<p><u>UNIT 3: MINERALS AND ROCKS</u></p> <ul style="list-style-type: none"> • What features of a mineral are useful in its identification? • How does the cooling rate of magma effect the crystal size of the igneous rocks? • What is the significance of the rock cycle? How does the formation of one rock type differ from another? • What are the three types of sedimentary rocks and how do you identify them based on their characteristics? • What visual characteristics typify a metamorphic rock? • What are the two types of igneous rocks and how can you tell them apart? 	<ul style="list-style-type: none"> • Identify and classify common minerals and rocks using classification keys • Relate each rock to its genesis based on its visual characteristics 	<ul style="list-style-type: none"> • Mineral and Rock Practicum • Minerals for Sale • Tests and quizzes
D E C E M B E R ----- J A N U A R Y	<p><u>UNIT 4: PLATE TECTONICS</u></p> <ul style="list-style-type: none"> • What evidence supports continental drift? • What is the phenomenon that drives plate tectonics? • What are the differences between a divergent, convergent, and transform fault plate boundaries and what landform is created at each type of plate boundary? • What happens at a subduction zone and how do density differences between the ocean and continental plates effect what happens when the plates collide? • What are the different layers of the Earth and what are their defining characteristics? 	<ul style="list-style-type: none"> • Use a time/travel graph for P and S waves to compute the distance to an earthquake. • Triangulate earthquake distance data to locate the epicenter of an earthquake. • Identify the types of plate boundaries using patterns of landforms, volcanic and earthquake activity and information found in the Earth Science Reference Tables. • Interpret the properties of the Earth's interior using the Earth Science Reference Tables. 	<ul style="list-style-type: none"> • Lab on interpreting seismograph readings • Tests and quizzes • Midterm Examination

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F E B R U A R Y	<p><u>UNIT 5: EARTH'S HISTORY</u></p> <ul style="list-style-type: none"> • How do the ages of rocks change as you go deeper into the earth? • How do igneous intrusions, igneous extrusions, folding, faulting, and unconformities alter the relative ages of rocks? • What characteristics of an index fossil make it easy to match the relative ages of rocks? How do you identify an index fossil given a series of geologic cross sections. • What other phenomena can be used to correlate the ages of rocks? • How do the amount and rate of an isotope decay over time? What is the relationship between half-lives and the age of a rock or fossil. 	<ul style="list-style-type: none"> • Interpret the Geologic Time Scale in the Earth Science Reference Tables. • Read the Generalized Bedrock Geology map of New York in the Earth Science Reference Tables. • Calculate the age of a rock based on radioactive isotope data. • Correlate using fossil or rock types • Draw and interpret geologic profiles 	<ul style="list-style-type: none"> • Correlating fossil samples to geologic time scale • Geologic time line map • Tests and quizzes
	<p><u>UNIT 6: OBSERVING THE ATMOSPHERE</u></p> <ul style="list-style-type: none"> • What are the layers of the atmosphere and how do they differ in temperature, amount of water vapor and atmospheric pressure? • Where is the ozone located and why does its loss pose a threat to living things? • When matter changes state does it require a loss or gain of energy? Why isn't the temperature change constant during phase changes? • What are the three different types of energy transfer and how is each type of energy transfer exhibited in nature? • What causes wind? What is the relationship between barometric pressure differences, wind speed and weather conditions? • How do the differences in pressure influence the formation of storms? 	<ul style="list-style-type: none"> • Understand the heat energy involved in changes in state 	<ul style="list-style-type: none"> • Tests and quizzes • Convection short story

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M A R C H	<p><u>UNIT 7: METEOROLOGY</u></p> <ul style="list-style-type: none"> • How does air temperature affect the amount of water vapor it can hold? • How are dew point and relative humidity calculated and what is the relationship between dew point, relative humidity, and likelihood of rain? • How are clouds formed? • How do air masses obtain their characteristics and where do they originate? • How do you find temperature, wind direction and speed, degree of cloudiness, type of precipitation and dew point temperature data on a station model? • What are the four types of weather fronts and how do they form? • What information is recorded on a weather map and how can that be used to predict the change in air pressure, temperature, and storms over time? 	<ul style="list-style-type: none"> • Calculate dew point and relative humidity using wet and dry bulb temperatures and the Earth Science Reference Tables • Calculate the heights of clouds given wet and dry bulb temperature • Interpret a weather station model • Draw and interpret weather maps, including wind directions and fronts 	<ul style="list-style-type: none"> • Tests and quizzes • Weather Prediction Competition

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A P R I L	<p><u>UNIT 8: WATER CYCLE AND CLIMATE</u></p> <ul style="list-style-type: none"> • What is the role of the water cycle in distributing water on Earth? • What factors affect the amount of insolation that is received and reflected from the Earth's surface? • What effect will a change in the size of soil particles have on the porosity, capillary water retention and soil permeability? • How is the greenhouse effect created and how is it altering the conditions of our planet? • How is the climate of an area affected by its latitude, altitude, proximity to oceans, ocean currents, prevailing winds, and mountain ranges? 	<ul style="list-style-type: none"> • Determine the specific heat capacity of different materials using the Earth Science Reference Tables • Determine the porosity, capillary water retention, and permeability rate of different soil samples • Interpret water budget graphs (temperature/precipitation) • Predict climate based on altitude, latitude, and geographic features 	<ul style="list-style-type: none"> • Climate of an Imaginary Continent • Tests and quizzes
	CONTENT	SKILLS	ASSESSMENTS
A P R I L ----- M A Y	<p><u>UNIT 9: WEATHERING, EROSION, AND LANDFORMS</u></p> <ul style="list-style-type: none"> • What is the difference between physical and chemical weathering and what are the most common types? • What factors influence the rate of weathering? • How could you tell if rock was eroded by streams/waves, glaciers, wind, or gravity? • How does stream velocity change with gradient, stream channel shape, and stream discharge changes? How does the stream velocity affect the sediment size carried in it? • How does the rate of sediment deposition in a stream change with sediment size, density, and shape? • What are the main landscape regions of New York? • What are the factors that affect landscape development? 	<ul style="list-style-type: none"> • Determine the sediment size carried in different velocity streams using the Earth Science Reference Tables 	<ul style="list-style-type: none"> • Tests and quizzes • "Monumental Task" (Design a monument that won't weather.)

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<p>10 WEEK</p> <p>MINI- COURSE</p>	<p><u>ASTRONOMY</u> <u>PART 1: Near Astronomy</u></p> <ul style="list-style-type: none"> • What is the evidence for the shape of the Earth? • What is the relationship between longitude, time zones, and the rate of the Earth's rotation? • What is the evidence of the Earth's rotation? • How do asteroids, comets, and meteorites affect the Earth and moon? • How do the relative positions of the Earth, moon, and sun affect phenomena observed from the Earth? • What causes seasons? When is the Earth the closest and farthest from the sun? • How does the Sun's observed path change with the seasons? • What are the differences between the seasons in terms of their dates, length of daylight, location of sun's zenith, angle of sunlight (and length of shadow)? 	<ul style="list-style-type: none"> • Calculate time zones • Measure angles with an external protractor • Measure angles of direction and altitude • Interpret paths of the Sun on a plastic hemisphere and diagram 	<ul style="list-style-type: none"> • Tests and quizzes • Forecast tides and moon phases • Predict path of Sun in different months

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	<p><u>PART 2: FAR ASTRONOMY</u></p> <ul style="list-style-type: none"> • What is the difference between the Geocentric and Heliocentric models of the solar system? • How does the rate of revolution of a planet change with its proximity to the sun? • When is the gravitational attraction between two objects the greatest and how does this apply to planetary orbits? • Why does the sun shine? • Using the H-R diagram, how can you determine the temperature, color, and luminosity of specific stars? • What is the life cycle of a red dwarf, red giant, and yellow main sequence star? • What are the four types of galaxies? • How did the universe evolve and what evidence exists for the current models of the evolution of the universe? 	<ul style="list-style-type: none"> • Draw ellipses and calculate the eccentricity of a planet's orbit • Plot and interpret stars on an H-R diagram 	<ul style="list-style-type: none"> • Tests and quizzes • Compare Earth's eccentricity to other planets • Predict life cycle of stars based on their size and temperature