

Scope and Sequence
 Science - 8th Grade Gen Ed

Unit : Scientific Method

| Vocabulary Terms: | <i>Scientific Method, Research, Hypothesis, Data, Analysis, Observation, Conclusion, Inference, Metric System, Graduated Cylinder, Beaker, Mass, Volume, Density, Meter, Liter, Gram, SI Unit, Absolute Zero, Kelvin</i> | | | | |
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| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 1st Week | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Journal; complete in Google Docs, send to your teacher - 10 min |
| | <p><i>"Today's Scientist at Work", Dr. Benjamin Carson</i> - Read aloud and discuss: how can Dr. Carson be an inspiration to young people? When did he realize that he was intelligent? Who specifically is mentioned as believing in his abilities? Teacher to search for key information from the text to help build content skill understanding - 10 min</p> | <p><i>"Scientific Thinking Handbook", Predicting and Hypotheizing, Page R3</i> - Read aloud and discuss: what is the difference between a hypothesis and a prediction? Students in pairs, teacher to assign a topic (What liquid makes plants grow best?) and students will create a hypothesis and predictions about that topic; as a class, review responses and why - 20 min</p> | <p>Watch "Inference and Observation" on YouTube (4:36 min) and discuss: what is the difference between observations and inferences? Teacher to create a mock-experiment about a fake "Crime Science" and students to discuss potential observations and inferences from them; what may be seen that would lead to specific false conclusions? - 20 min</p> | <p><i>"Scientific Thinking Handbook", Identifying Cause and Effect, Page R5</i> - Read aloud and discuss: how does Cause and Effect relate to hypothesis? How about inferences? Teacher to review content understanding to create questions based upon the reading for review of material - 15 min</p> | <p>Watch "Science Project - 7. Create Graphs & Charts, then Analyze the Data" on YouTube (5:41 min) and discuss: why should you keep a journal (data log) when you conduct experiments? Why should you display data on a graph? How does this video recommend that you create your graphs? - 10 min</p> |
| | <p><i>"Scientific Thinking Handbook", Making Observations, Page R2</i> - Read aloud and discuss: what is the difference between quantitative observations and qualitative observations? Using Table 1, explain the differences; teacher to create examples and students will analyze which category they fit into - 10 min</p> | <p>Students in pairs, answer and discuss: Using Google Docs, answer and submit to your teacher the following - Review "More About Hypothesis" on page R3; students will respond via Google Docs why each of those three statements must be valid when conducting the experiment that they just discussed previously (liquid for plant growth); after students submit, teacher to discuss responses aloud - 10 min</p> | | <p><i>"Scientific Thinking Handbook", Identifying Cause and Effect, Pages R28-29</i> - Read aloud and discuss: why should you conduct research about your topic BEFORE you begin an experiment? Review the example experiment on pages R28-R29 and discuss hypotheses and inferences from it - 15 min</p> | <p>Teacher to create a mini-lab with stations; using "Scientific Thinking Handbook", pages R12-R19 as a guide, students will review the different equipment and gather measurements; they will create a data log in a journal of the measurements of the various</p> |

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| | Watch "Scientific Method for Kids Learn all about the Scientific Method Steps" on YouTube (9:26 min) and discuss: what is the purpose of the Scientific Method? What happens if one part of it isn't inline with the other parts? How is "observation" possibly the first step? What is a hypothesis? Why are they important to the rest of the scientific method? - 15 min | "Scientific Thinking Handbook", <i>Inferring, Page R4</i> - Read aloud and discuss: what are inferences? Why are they both helpful and harmful for experiments? What are observations? Teacher to use the previous mock-experiment and discuss possible observations and inferences - 15 min | Teacher-provided worksheet about five potential experiments or situations; students in pairs, reply in Google Docs to the scenarios by making hypothesis, predictions, and inferences about them; submit to your teacher, then review responses as a class - 20 min | Teacher to show lab equipment and discuss its use; teacher to review how to measure using beakers, scales, balances, and cylinders; students volunteer to assist in gathering data - 10 min | measurements of the various beakers, test tubes, weights of items on a scale, distance on a ruler, weights of items on a balance, etc. Teacher to collect data logs as students will graph this data later in this unit - 25 min |
| Daily Journal or Bell Work: | Write everything that you know about the Scientific Method | Define a hypothesis in your own terms | What are "observations" during a science experiment? How are they different than a final review? | What is an Inference? How are they helpful and harmful to science experiments? | In a science experiment, what is a data log and why is it important? |
| Daily Homework: | Written Response: How can the Scientific Method relate to everyday and real-life scenarios? Provide an example and use the steps to outline your thoughts (one paragraph or a list) | Written Response: How is a hypothesis different than a prediction? How much analyzing is done when making a hypothesis? Why is that? (one paragraph) | Written Response: Why are observations an important part of your science experiment? How can they be misleading? (one paragraph) | Written Response: Why is conducting research on your topic best to do before making a hypothesis? What would happen if you were uninformed about a general topic? (one paragraph) | Written Response: Why is keeping a data log important during an experiment? Why should experiments be done several times in order to ensure accuracy? How to data logs support accuracy? (one paragraph) |
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| 2nd Week | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Journal; complete in Google Docs, send to your teacher - 10 min |
| | Watch "Basic Chemistry Lab Equipment" on YouTube (14:41 min) and discuss: relate to your book and the previous lab, how did you do in using them? What inferences did you create when you used the materials? Did you use anything incorrectly? - 20 min | (Part I of III) Using Google Sheets, students will enter their data from their experiment last week into the columns to begin creating graphs; students will save their graphs and data, then submit it to their teacher when complete - 15 min | (Part II of III) Using Google Sheets, students will enter their data from their experiment last week into the columns to begin creating graphs; students will save their graphs and data, then submit it to their teacher when complete - 15 min | (Part III of III) Using Google Sheets, students will enter their data from their experiment last week into the columns to begin creating graphs; students will save their graphs and data, then submit it to their teacher when complete - 15 min | Watch "Metric Conversion Trick!! Part 1" on YouTube (6:27 min) and discuss: How is this video helpful? What tips are beneficial from it? Is the mnemonic easy to remember? - 10 min |
| | "Scientific Thinking Handbook", <i>Making Data Tables and</i> | | | | Teacher to create more conversion examples to review with the class; use the mnemonic to help solve - 10 min |

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| | <p>Making Data Tables and Graphs, Pages R23-R27 - Read aloud and discuss: what is a data table? How does the data table help you to create graphs? Review the different axis and titles for each, how does math relate to these? - 15 min</p> | <p>Teacher to create a lab using Spring Scales and balances; students to weigh various items using the equipment and enter the data into their logs - 25 min</p> | <p>Teacher to conduct a new lab using graduated cylinders, beakers, rulers, and scales; students to go to stations to correctly take measurements; turn in lab and data when complete - 25 min</p> | <p>"Scientific Thinking Handbook", <i>The Metric System and SI Units</i>, Pages R20-R21 - Read aloud and discuss: what are the SI Units for measuring the basic properties? What are the prefixes for the base units? What mneumonics can you think of to remember them in order? teacher to practice converting from one unit to another - 25 min</p> | <p>Students in pairs, answer and solve: teacher to create mini-lab of measuring items using beakers and spring scales; convert answers to different requested units per teacher descretion - 20 min</p> |
| Daily Journal or Bell Work: | <p>Why is it important to follow each step of the Scientific Method in order and correctly when conducting an experiment?</p> | <p>Write step-by-step how to use a graduated cylinder to take a measurement. Write at least five steps.</p> | <p>Which type of graph is easier for you to read, a pie graph or a bar graph? Why is that?</p> | <p>What is the metric system and why is it important in science?</p> | <p>What are SI Units and why are they important in all experiments?</p> |
| Daily Homework: | <p>Written Response: What did you do correctly in your previous use of the lab equipment? What did you do incorrectly? What can you do better? (one paragraph)</p> | <p>Written Response: Explain step-by-step how to take measurements from a spring scale and a graduated cylinder (min. five steps per tool)</p> | <p>Written Response: What are three benefits of a pie(circle) graph? What are three benefits of a bar graph?</p> | <p>Teacher-created worksheet about converting SI Units from one unit to another (ten problems)</p> | <p>Teacher-created worksheet about converting SI Units from one unit to another (ten problems)</p> |
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| 3rd Week | <p>Journal; complete in Google Docs, send to your teacher - 10 min</p> | <p>Bell Work; complete in Google Docs, send to your teacher - 5 min</p> | <p>Bell Work; complete in Google Docs, send to your teacher - 5 min</p> | <p>Bell Work; complete in Google Docs, send to your teacher - 5 min</p> | <p>Test on "Terms to Know" from Week One, Scientific Method, Metric System, and Lab Equipment - 30 min</p> |
| | <p>Watch "What is Absolute Zero Temperature" on YouTube (2:27 min) and discuss: what is Absolute Zero? What is Kelvin? Review "Scientific Thinking Handbook", <i>The Metric System and SI Units</i>, Page R21 about Temperature Conversions - 15 min</p> | <p>Teacher to review SI Units and conversions; students to seek help as needed - 15 min</p> | <p>Teacher to create a lab using meter sticks, graduated cylinders, balances, and spring scales; students to measure using each by rotating stations; convert results to other SI Units and unit measurements; Lab to include solving Kelvin conversions; students to create line or bar graphs of their measurements at each station when complete - 40 min</p> | <p>Review study guide on Scientific Method - 25 min</p> | |
| | <p>Students in pairs, answer and solve: teacher to create several problems converting Kelvin to Celsius, Celsius to Kelvin, and Fahrenheit to Kelvin; complete and discuss answers to review accuracy - 20 min</p> | <p>Teacher to create lab using meter sticks to measure distance of items/objects; teacher to request conversions of measurements into other SI Units as part of the lab - 25 min</p> | | <p>Using Google Docs, students will define each of the "Terms to Know" from Week One and submit them to their teacher - 20 min</p> | <p>Quick Write: Via Google Docs, write down anything that you know about this topic that was not on your test; submit to your teacher - 15 min</p> |

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| Daily Journal or Bell Work: | Teacher-created SI Unit conversions (three problems) | Teacher-created SI Unit conversions (three problems) | Teacher-created SI Unit conversions (three problems) | Teacher-created SI Unit conversions (three problems) | None |
| Daily Homework: | Teacher-created worksheet about converting Kelvin to Celsius, Celsius to Kelvin, and Fahrenheit to Kelvin (ten problems) | Teacher-created worksheet converting Kelvin and other SI Units (fifteen problems) | Teacher-created worksheet on converting to different units in the metric system (fifteen problems) | Study for your Test on the Scientific Method, the Metric System, Lab Equipment, and the "Terms to Know" from Week One! | None |

Unit : Astronomy (Research Project: planets and other celestial bodies)

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| Project Theme: | <i>Students will use Google Slides to create a minimum 10-slide presentation about a celestial body in our solar system. Students will choose one option from the list provided and are to work individually. Students are to answer the following questions and include the following requirements in their presentation: How many Astronomical Units away from the sun is your object? Approximately how large (in miles and kilometers) is your object? What is it mostly made out of? Does your object support life to live on it? Does your object have water or ice on it? How many moons does your object have? According to mythology, what is your object named after? How many planets away from the sun is your object? How many days does it take for your object to revolve around the sun? How does days (or hours) does it take for your object to rotate completely one time on its axis? Include a photo of your object. List three important or interesting features of your object that are not already including as a requirement of this project.</i> | | | | |
| Project Options: | <i>Mercury, Venus, Earth, Mars, Ceres, Jupiter, Saturn, Uranus, Neptune, Pluto, Eris, Makemake, Haumea</i> | | | | |
| Vocabulary Terms: | <i>Astronomy, Astrology, Planet, Star, Solar System, H-R Diagram, Luminosity, Dwarf Planet, Constellation, Galaxy, Eclipse, Astronomical Unit, Nova, Supernova, Big Bang Theory, Universe, Intelligent Design, Moon, Satellite, Kuiper Belt, Rotation, Revolution, Asteroid Belt, Comet</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Journal; complete in Google Docs, send to your teacher - 10 min |

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| 4th Week | <i>ML Science, Space Science, Pages 2-3</i> - Read aloud and discuss the photo; teacher to show images of the Barringer Crater in Arizona on Google; how large was the object that created this crater? What would happen if that same object hit a major city, such as New York or Chicago, today? - 15 min | Mini-lab: <i>MS Science, Space Science, Page 5</i> - Review and complete the mini-lab about space objects compared to potatoes; how are potatoes similar to space objects? Illustrate the flat map (like how we have Mercator Maps of Earth) of your potato; Try your best to accurately place objects in the correct location; create names for your craters and volcanoes - 25 min | <i>MS Science, Space Science, Pages 9-11</i> - Read aloud and discuss: what patterns do we see in the universe? How does the moon orbit Earth? What is a solar system? What is a galaxy? How are Earth, the Solar System, the Milky Way, and the Universe all related? What are other parts of each that you may know? Review the images on page 11, how are they similar and different? - 20 min | <i>MS Science, Space Science, Page 9, Explore Distance mini-lab</i> - Students to complete each section of the lab and answer the questions accordingly - 25 min | Teacher to download a star wheel (there are several free ones online) and provide to students; students in pairs, complete mini-lab on page 13 together with one paper per group; answer all questions - 20 min |
| | <i>ML Science, Space Science, Pages 4-5</i> - Read aloud and discuss the risk of asteroids hitting the Earth; Teacher to Google images of impact craters on Earth and other planets in our solar system - 20 min | Teacher to visit " https://solarsystem.nasa.gov/asteroids-comets-and-meteors/overview/ " and show images of asteroids and meteors; how do they resemble your space object and map? How are they different? - 15 min | Teacher to go to "classzone.com" and locate this book; locate the simulation "Levels of the Universe" and display the difference between the Earth, Solar System, and other areas of the galaxy/universe; discuss aloud the relationship of each to one another - 15 min | <i>MS Science, Space Science, Pages 12-14</i> - Read aloud and discuss; Use a Concept Map to link important information together; What are constellations; How do they relate to orbit? What are many constellations named after? 15 min | Using Chromebooks, students will locate a constellation that is seen in their night sky currently; students will use computer paper and a ruler (or straight edge) to line up the stars approximately correct and illustrate it; students should use the Internet to Google the constellation and locate the names of each star in the constellation; students to correct label their constellation and provide it's name; students should also research what the story of their constellation is and write a sentence or two about that story - 25 min |
| | <i>ML Science, Space Science, Unit Projects, Page 5</i> - Discuss "Map a Space Object", students will complete this mini-lab next class - 10 min | | Students in pairs, using a Main Idea Web students should write the main idea of the section at this point and four supporting statements of that idea - 15 min | Teacher to go to "classzone.com" and locate this book; locate the visualization "Night Sky Throughout the Year"; find today's date and observe how the constellations has changed from a few months ago and how it will change a few months from now - 10 min | |
| Daily Journal or Bell Work: | What do you know about "outer space"? Write at least one paragraph | Presume an asteroid is headed towards Cleveland; how may we appropriately respond? Come up with three ideas | What are some things that you can see in the night sky? Create a list of at least five items. | Using Google Docs, define Universe, Milky Way, Solar System, and orbit; submit to your teacher | What is a constellation? Name any constellations that you know currently |
| Daily Homework: | Written Response: How do you think the world would respond to a meteor or asteroid like the one in Arizona hitting New York? (one paragraph) | Written Response: Why do you think asteroids look the way that they do? What factors may contribute to their appearance? (one paragraph) | Written Response: What is the relationship between the solar system and the Milky Way? | Written Response: What causes constellations to change positions during the night? Explain your answer (one paragraph) | <i>MS Science, Space Science, 1.1 Review, #'s 1-6, page 14</i> - Complete each question in complete sentences; due tomorrow! |
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| | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Journal; complete in Google Docs, send to your teacher - 5 min |
| 5th Week | <i>MS Science, Space Science, "Seasonal Star Maps", R54-R58</i> - Read the following section and view each of the maps on these pages; How do these maps relate to the constellation mini-lab that you conducted in the previous lesson? Can you find the constellation that you explored and illustrated? - 10 min | Teacher to visit "classzone.com" and locate this book; locate the vizualization "Virtual Flight Through the Solar System"; what is the solar system mostly made up of? How close are the planets to each other? What happens to the planets as you travel farther out? - 10 min | Teacher to go to "www.nasa.gov/mission_pages/stat ion/main/index.html" and find "Space Station Tour" on the left scroll down bar; watch a tour of the ISS on YouTube and discuss the living and testing quarters; what are some things that you see in the video that are abnormal? - 15 min | <i>MS Science, Space Science, Pages 31-34</i> - Read aloud and discuss; Use a frame game diagram to record important information as your read; what is an impact crater? How do they form? What have scientists learned about Earth's past from studying bodies in space? What can impacts on other planets tell us about them? - 20 min | <i>MS Science, Space Science, Pages 15-19</i> - Read aloud; use a Venn Diagram as you read to compare/contrast types of telescopes; what are radio telescopes? What is the function of the dish in a radio telescope? How is visible light different from other forms of electromagnetic radition? What is the color spectrum in order? Why is the sky on Earth blue? - 25 min |
| | <i>MS Science, Space Science, Pages 22-25</i> - Read aloud and discuss: Use a Reading Wheel to help record important information as you read; What are satellites? What are satellites of Earth? What is Earth a satellite of? What are the ISS or other space stations? - 15 min | <i>MS Science, Space Science, Pages 26-29</i> - Read aloud and discuss: what is the main difference between a flyby craft verses an orbiter? What are landers? What is a probe? What planet in our solar system currently has two rovers on it? - 20 min | <i>MS Science, Space Science, Page 25</i> - Students in pairs, conduct the Mini-Lab and answer all questions; one paper per group - 15 min | <i>MS Science, Space Science, Page 33</i> - Students in groups of 3 or 4, conduct the Mini-Lab on page 33 about impact craters and how weather effects them; create predictions before checking them next class - 25 min | Teacher to go to "www.spacetelescope.org/images /" and explore images taken by the Hubble Space telescope; why are these images more clear and colored than those taken from Earth? What prohibits good vision of outer space on Earth? - 15 min |
| | <i>MS Science, Space Science, Page 22</i> - students in pairs, complete the Mini-Lab together and answer all questions; turn in both drawings and resposnes to your teacher together - 15 min | Students in pairs, create a Concept Map of what you have read so far; have at least twelve bubbles, one map per group; share with the class - 15 min | Introduce Google Slides project and review the requirements; students may begin conducting research if time permits - 20 min | | Students in pairs, compare and contrast a reflecting telescope verses a refracting telescope; what are the benefits of each? What are disadvantages to each? Discuss with the class - 15 min |
| Daily Journal or Bell Work: | How does the orbit and rotation of Earth appear to make things move in the night sky? What are the items that actually move? What are the items that don't move but appear to move? | What are five objects that are satellites of the Sun? | What are some reasons why researchers may want to conduct certain experiments in space rather than on Earth? | List three things from last class about being on the ISS or another space craft | What are telescopes? What types of telescopes are there? |

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| Daily Homework: | Complete the Mini-Lab again at home with a different object; how do the results compare to the practice done at school? Bring your two drawings and written thoughts to school tomorrow! | Written Response: Would you rather orbit a new planet and observe it from the atmosphere or land on it in an orbiter? Why? Provide at least two reasons for your response (one paragraph) | <i>MS Science, Space Science, 1.3 Review, #'s 1-6, page 29</i> - Complete each question in complete sentences; due tomorrow! | <i>MS Science, Space Science, 1.4 Review, #'s 1-6, page 34</i> - Complete each question in complete sentences; due tomorrow! | <i>MS Science, Space Science, 1.2 Review, #'s 1-6, page 19</i> - Complete each question in complete sentences; due tomorrow! |
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| 6th Week | <i>MS Science, Space Science, Page 37</i> - Students in pairs, complete #'s 1-21 together via Google Docs and submit to your teacher; one page per student - 25 min | Bell Work; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Journal; complete in Google Docs, send to your teacher - 10 min |
| | | <i>MS Science, Space Science, Pages 115-119</i> - Read aloud and discuss: what are the different parts of the Sun? what are solar prominences and sun spots? - 25 min | (Part II of II) Illustrate, color, and correctly label our Sun as depicted on Page 117; include the six layers of the Sun as well as a prominence, sun spot, and solar wind - 20 min | Students in pairs, using a description wheel (page 114) list six facts about stars or our Sun; one page per group; share with the class - 15 min | Teacher to review the H-R Diagram, specifically luminosity and temperature; what are Main Sequence stars? What are the brightest stars found? What about the dimmest? What type of star is our Sun? - 15 min |
| | In-class workday for Google Slides project - 25 min | (Part I of II) Illustrate, color, and correctly label our Sun as depicted on Page 117; include the six layers of the Sun as well as a prominence, sun spot, and solar wind - 20 min | <i>MS Science, Space Science, Pages 125-128</i> - Read aloud and discuss: Create a chart to record important information as you read: what is the "Life of a Star"? What is a supergiant? What is a Red Giant? What is a black hole? - 25 min | Teacher to visit "www.enchantedlearning.com/subjects/astromy/stars/lifecycle/" and review the life cycle of Supergiants, Red Giants, Main Sequence, and Dwarf stars; what will eventually happen to our Sun? - 15 min | |
| | | | <i>MS Science, Space Science, Pages 122-124</i> - Read aloud and discuss: what is a light-year? What is parallax? What factors affect how bright a star appears from Earth? - 20 min | <i>MS Science, Space Science, Page 123</i> - Students in pairs, complete Mini-Lab on page 123; one paper per student, answer all questions; discuss results as a class - 10 min | <i>MS Science, Space Science, Page 129</i> - Read aloud and discuss the "Example"; Answer #'s 1-3 and "Challenge" - 15 min |
| Daily Journal or Bell Work: | None | <i>MS Science, Space Science, Page 39</i> - Complete #'s 1-5 | What are the six parts of a star? | How does a star's temperature effect its appearance? | What is parallax? Provide an example to show your understanding. |
| Daily Homework: | <i>MS Science, Space Science, Page 38</i> - Complete #'s 25 and 27 in complete sentences for tomorrow! | <i>MS Science, Space Science, Page 38</i> - Complete #'s 29 and 30 in complete sentences for tomorrow! | <i>MS Science, Space Science, 4.1 Review, #'s 1-6, page 119</i> - Complete each question in complete sentences; due tomorrow! | <i>MS Science, Space Science, 4.2 Review, #'s 1-6, page 128</i> - Complete each question in complete sentences; due tomorrow! | Illustrate, color, and label the H-R Diagram as indicated on page 129 for tomorrow! |
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| 7th Week | <i>MS Science, Space Science, Pages 130-133</i> - Use a Concept Map to record important information as you read; Read aloud and discuss: What are the different shapes of galaxies? What are two ways that they differ from each other? What is a Quasar? - 25 min | Students in pairs, using Chromebooks go to " http://cas.sdss.org/dr4/en/obj/basic/galaxies/ " and complete the activity on identifying galaxies; complete all questions and answer questions on a separate piece of paper - 20 min | <i>MS Science, Space Science, Pages 135-139</i> - Read aloud and discuss: What is the Doppler Effect? What is the Big Bang Theory? What direction are most of the other galaxies moving? How does this movement display our location in the universe? - 25 min | <i>MS Science, Space Science, Page 138</i> - Students in pairs, complete Mini-Lab and answer all questions; one paper per student; discuss how this example resembled the expansion of the universe - 20 min | <i>MS Science, Space Science, page 141</i> - Using Google Docs, students will answer #'s 9-20 privately and share their results with their teacher - 20 min |
| | | | Teacher to relate the Theory of the Big Bang to Intelligent Design (Creation by God); how are the two similar? Is it possible that God intended things to go according to the Big Bang? What evidence is there of God starting the Big Bang? How does the early universe match the Big Bang Theory? - 20 min | Teacher to go to " https://apod.nasa.gov/apod/colliding_galaxies.html " to display and discuss images of galaxies colliding; click on individual images for more information - 15 min | |
| | <i>MS Science, Space Science, Page 131</i> - Students in pairs, complete Mini-Lab of classifying galaxies; one paper per group - 15 min | In-class time to work on Google Slides Project - 30 min | <i>MS Science, Space Science, Page 141</i> - Students in pairs, using a concept map link together all of the choices in #'s 1-8 to show how they relate to each other - 15 min | | |
| Daily Journal or Bell Work: | Draw a rough sketch of the H-R Diagram including labels | Use a description wheel to provide information about the three types of galaxies | <i>MS Science, Space Science, Page 134</i> - Read individually and answer #'s 1 & 2; submit to your teacher | What is the Big Bang Theory? | Create a table showing creation according to the Big Bang and creation according to the Bible; how are they similar and different? |
| Daily Homework: | Written Response: Explain why we can't see all of the Milky Way from Earth? | <i>MS Science, Space Science, 4.3 Review, #'s 1-6, page 133</i> - Complete each question in complete sentences; due tomorrow! | Work on Google Slides project | <i>MS Science, Space Science, 4.4 Review, #'s 1-6, page 139</i> - Complete each question in complete sentences; due tomorrow! | Work on Google Slides project |
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| 8th Week | <i>MS Science, Space Science, Page 142</i> - Teacher-led discussion: review and answer #'s 21-33 together as a class; address any incorrect information and knowledge - 25 min | <i>MS Science, Space Science, Page 44</i> - Students in pairs, complete the Mini-Lab and answer questions on page 44 together; one person to work while the other guides them; one paper per student - 20 min | Watch "Endless Day & Endless Night" on YouTube (2:48 min) and discuss: what is causing the North Pole and South Pole to have periods of only day or only night? What do you think it is like to live here? - 10 min | <i>MS Science, Space Science, Pages 55-57</i> - Read aloud and discuss: what are Moon rocks made up of? Compare and contrast the Earth and the Moon; how did the Moon most-likely form? - 20 min | Illustrate, color, and label the Eight Phases of the Moon; specifically include in your illustration the Moon in relationship to the Earth and Sun - 25 min |
| | <i>MS Science, Space Science, Pages 43-45</i> - Read aloud and discuss: Use a Concept Map to link important information to each other as you read; what is orbit? How does gravity work? Complete the "Explore Time Zones" min-lab together on page 43; What is the difference between rotation and revolution? - 20 min | Watch "Why Do We Have Different Seasons? California Academy of Sciences" on YouTube (3:16) and discuss: does the Earth revolve around the Sun in a circle (no)? What is the orbit route properly called (ellipse)? What causes the four seasons on Earth? 10 min | <i>MS Science, Space Science, Pages 52-54</i> - Read aloud and discuss: what does the Moon look like? What is the Moon? What is maria? What is a satellite? What are the dark areas of the Moon? Why do you only see one side of the Moon? - 20 min | Watch "NASA Tour of the Moon" on YouTube (4:39 min) and discuss: what evidence is there that humans were on the Moon? Why caused most of the features on the Moon? Why are there areas of the Moon that have never seen sunlight? - 10 min | |
| | | <i>MS Science, Space Science, Pages 46-49</i> - Read aloud and discuss: Use a frame game diagram to note important information while you read; what causes day and night? What does Earth do as it revolves around the Sun? Why are seasons different in the Northern and Southern Hemispheres? - 20 min | <i>MS Science, Space Science, Page 52</i> - Students in pairs to complete Mini-Lab about the Moon revolving around Earth; Watch "Watch Neil Armstrong's first steps on the moon" on YouTube (3:52) and discuss: what does Neil Armstrong describe the surface of the Moon to feel like? - 20 min | <i>MS Science, Space Science, Pages 59-62</i> - Read aloud and discuss: Use a frame game diagram to note important information while you read: what creates the phases of the Moon? What is an eclipse? How does "waxing" and "waining" apply to the phases of the Moon? - 20 min | |
| Daily Journal or Bell Work: | Sketch the three types of galaxies | What is the difference between rotation and revolution? | What causes the four seasons on Earth? Explain your answer. | What are your thoughts about the Moon landing video from last class? | What are the eight phases of the Moon? |
| Daily Homework: | <i>MS Science, Space Science, Page 143</i> - Use the chart to answer #'s 1-6; due tomorrow! | <i>MS Science, Space Science, 2.1 Review, #'s 1-6, page 49</i> - Complete each question in complete sentences; due tomorrow! | Written Response: How did the lunar maria form? List the steps. | <i>MS Science, Space Science, 2.2 Review, #'s 1-6, page 57</i> - Complete each question in complete sentences; due tomorrow! | Work on your Google Slides Project! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | |

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| 9th Week | <i>MS Science, Space Science, Pages 63-66</i> - Read aloud and discuss; use a Main Idea Web to record important information while you read; what is an eclipse? Where is the umbra and penumbra? What is a lunar eclipse verses a solar eclipse? - 25 min | Watch "Normandy, France: Mont St-Miche" on YouTube (4:07 min) and discuss: how do the tides protect but hinder this city? What may life be like there? What may be difficult for people there? Would you like to visit there? Why or why not? - 10 min | Watch "3 moons and a planet that could have alien life James Green" on YouTube (10:39 min) and discuss: what are the three things needed for life to exist? Where do scientists think life exists off of Earth? Why do they believe this? - 15 min | Watch "Phases of the Moon: Astronomy and Space for Kids - FreeSchool" on YouTube (5:41 min) and discuss the eight phases and how they appear to us - 10 min | Test on Astronomy and Terms to Know - 40 min |
| | Watch "How Do Tides Work?" on YouTube (3:38 min) and discuss: what creates the high tide? What creates low tide? What three factors effects the tides? Which one effects it most? - 10 min | <i>MS Science, Space Science, Page 69</i> - Using Google Docs, students will answer #'s 7-18 and submit to their teacher - 15 min | <i>MS Science, Space Science, Page 71</i> - Using Google Docs, students will individually answer #'s 1-9 and submit to their teacher - 15 min | Review study guide on Astronomy - 25 min | |
| | In-class workday for Google Slides project - 20 min | In-class workday for Google Slides project - 20 min | In-class workday for Google Slides project - 20 min | In-class workday for Google Slides project - 20 min | |
| Daily Journal or Bell Work: | <i>MS Science, Space Science, Page 61</i> - Reread this page & diagram; why are only some areas of the Moon visible to us throughout the month? | Why does a cycle of tides take about 24 hours? Explain your answer. | Sketch a lunar eclipse; label the Sun, Earth, Moon, Umbra, and penumbra | Is it possible for life to exist on other planets or moons? Why or why not? | None |
| Daily Homework: | <i>MS Science, Space Science, 2.3 Review, #'s 1-6, page 66</i> - Complete each question in complete sentences; due tomorrow! | <i>MS Science, Space Science, Page 70</i> - Students will complete #'s 25, 26, 27, 28, 29, and 30; due tomorrow! | Work on Google Slides project! | Study for Test tomorrow on Astronomy; Review all Vocabulary Terms | Complete Google Slides Presentation; it is due tomorrow! |

Unit : Cellular Biology

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| Vocabulay Terms: | <i>Biology, Biologist, Cell, Organelle, Nucleus, Mitochondria, Vacuole, Chloroplast, Photosynthesis, Cellular Respiration, Krebs Cycle, Biotic, Abiotic, DNA, Double-Helix, mRNA, Nucleic Acid, Osmosis, Active Transport, Virus</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |

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| | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | |
| 10th Week | <i>ML Science, Cells and Heredity, Pages 9-12</i> - Read aloud and discuss: use a Main Idea Web to diagram the basic concepts of a cell: what are the characteristics of life? What are needs of life? Define unicellular and multicellular - 20 min | <i>ML Science, Cells and Heredity, Pages 13-15</i> - Read aloud and discuss: what is bacteria? Who is Louis Pasteur? How did his experiment help mankind's overall health? How do bacteria show each of the four characteristics of living things? - 20 min | <i>ML Science, Cells and Heredity, Pages 18-21</i> - Use a Main Idea Web to explain the importance of a microscope; What is the difference between a prokaryotic cell vs a eukaryotic cell? What features are found in both? Teacher to use a Venn Diagram on the board to compare and contrast both - 25 min | (Part I of III) Students individually, go to the website " https://jeopardylabs.com/ " and create a jeopardy game about the types of cells, their organelles, and each organelles' functions; include Eukaryotic and Prokaryotic cells and how to tell them apart; include the differences between plant and animal cells; students should ultimately list and define all organelles listed on page 22 and explained in this section - 45 min | <i>ML Science, Cells and Heredity, Pages 16-17</i> - Using these pages as a guide, students will take a drop of pond water and look under a microscope to see unicellular life; students should illustrate what they see and compare it to those on page 17; answer #'s 1-5 under "Conclude" on page 17; make sure to classify each organism seen by movement, sketch, and what magnification power that you used to see it - 30 min |
| | Discuss a microscope and the proper method to use one; Watch "Using a microscope The parts and how to focus" on YouTube (5:51 min) and discuss the parts of the microscope and their importance - 15 min | <i>ML Science, Cells and Heredity, Pages 13-15</i> - Review "Pasteur's Experiments" on page 15; How did he follow the Scientific Method in each step? Teacher to review the six steps and relate to Pasteur's experiment - 20 min | Teacher to Google images of "Prokaryotic Cells" and "Eukaryotic Cells" to show the students; note the differences in each and how some move on their own; why do you think they are so diverse? - 10 min | | |
| | <i>ML Science, Scientific Thinking Handbook, R14</i> - Provide students with a microscope; students to use this page as a reference as to the parts of the microscope and how to properly view items under the lens; if prepared slides are available, students may view them - 15 min | Watch "Introduction to Cells: The Grand Cell Tour" on YouTube (9:26 min) and discuss: what is the cell theory? What is unicellular? What is multicellular? What are some things that are found inside a cell? What are some ways that all cells are the same? - 15 min | <i>ML Science, Cells and Heredity, Pages 22-24</i> - Read aloud and discuss: What are chloroplasts? What are mitochondria? What are the ribosomes, cytoplasm, ER, and nucleus? What is the purpose of each organelle? - 15 min | Teacher to prepare students for the microscope lab tomorrow; provide instructions about what to do and why; explain to not dispose of the pond water down the drain as life should be returned to nature (not the drain) - 5 min | (Part II of III) Continue working individually on your " https://jeopardylabs.com/ " game about cells and organelles; play against other students when complete - 25 min |
| Daily Journal or Bell Work: | What do you know about cells? Try to think of five things to list | Name three parts of a microscope and their purpose | What does unicellular mean? What does multicellular mean? | What are organelles? List three that you know without using your book | None |

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| Daily Homework: | Written Response: What four characteristics are common to all living things? | <i>ML Science, Cells and Heredity, 1.1 Review, #'s 1-6, page 15</i> - Complete each question in complete sentences; due tomorrow! | Define cell membrane, cytoplasm, eukaryotic cell, nucleus, organelle, and prokaryotic cell for tomorrow! | <i>ML Science, Cells and Heredity, 1.2 Review, #'s 1-6, page 24</i> - Complete each question in complete sentences; due tomorrow! | Written Response: Reflect upon your lab today; what did you do well? What could you have done better? Why? |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 11th Week | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 10 min | Journal; complete in Google Docs, send to your teacher - 10 min |
| | <i>ML Science, Cells and Heredity, Pages 26-28</i> - Read aloud and discuss: use a Main Idea Web to diagram how organisms can be classified; what are Archaea, Bacteria, and Eukarya? What are paramecium? How do they move? 20 min | (Part III of III) Finish your "https://jeopardylabs.com/" game of cells, organelles, plant cells and animal cells, and Prokaryotic/Eukaryotic cells; play against other students when complete; share with your teacher as well - 30 min | <i>ML Science, Cells and Heredity, Page 31</i> - Students in pairs, complete the Mini-lab on page 31 by creating a model of a cell; using the poster board as a base, label each organelle clearly with a marker; answer the questions and "Challenge" via Google Docs and submit to your teacher - 35 min | <i>ML Science, Cells and Heredity, Page 35</i> - Students in pairs, using Google Docs complete #'s 6-17 and submit to your teacher; one page per student - 20 min | <i>ML Science, Cells and Heredity, Page 44</i> - Students in pairs, complete Mini-lab on page 44; answer questions via Google Docs and submit to your teacher; how does this lab demonstrate how cells function? - 20 min |
| | Watch "How a Paramecium Eats!" on YouTube (1:46 min) and discuss: how does a paramecium eat? How does it move? What do the cilia do? Is a paramecium unicellular or multicellular? - 10 min | | | | |
| | <i>ML Science, Cells and Heredity, Pages 29-32</i> - Read aloud and discuss: how do cells work together for a common purpose? What is tissue? What is an organ? What is the relationship between tissue and organs? - 20 min | Discussion: Teacher to review each organelle and their function; teacher to review tissue, organs, and how they work together; teacher to review Prokaryotic cells vs Eukaryotic cells; what are parameciums? - 15 min | Students in pairs, create a Venn Diagram comparing and contrasting Prokaryotic Cells vs Eukaryotic Cells; have at least three statements in each section (total of nine statements); one diagram per group - 15 min | <i>ML Science, Cells and Heredity, Pages 41-45</i> - Read aloud and discuss: use a Word Triangle diagram for each vocab word; Define carbohydrates, lipids, proteins, and nucleic acids; how much of every cell is made up of water? Why are our bodies made up of 75% water? 20 min | Students in pairs, using computer paper make a table comparing how carbohydrates, lipids, proteins, and nucleic acids are similar; include a drawing similar to the one used in the Word Triangle Diagram in the previous class on your table; present your table to the class; what features are in all four molecular groups? - 25 min |
| Daily Journal or Bell Work: | Think of the lab from our previous class, what life was visible under the microscope? What does that tell you about God in our world? Where can you find God's work in our world? | Define tissue and organ; how do they relate to each other? | What is DNA? What does it have contained within it? Where do we find DNA in a cell? | <i>ML Science, Cells and Heredity, Page 33</i> - Read the comparison and draw connections; complete "Make Comparisons" | <i>ML Science, Cells and Heredity, Page 36</i> - Complete #'s 26-27 |

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| Daily Homework: | Written Response: Reflect upon the paramecium seen in the video; in what ways does it show the four characteristics of life? | <i>ML Science, Cells and Heredity, 1.3 Review, #'s 1-6, page 32</i> - Complete each question in complete sentences; due tomorrow! | <i>ML Science, Cells and Heredity, Chapter One Review, Page 35</i> - Complete #'s 1-5; due tomorrow! | <i>ML Science, Cells and Heredity, Page 36</i> - Complete #'s 21-25, due tomorrow! | <i>ML Science, Cells and Heredity, 2.1 Review, #'s 1-6, page 45</i> - Complete each question in complete sentences; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 12th Week | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Test on Plant and Animal Cells - 30 min |
| | <i>ML Science, Cells and Heredity, Pages 47-52</i> - Read aloud and discuss: Teacher to assist in creating an outline of important information in this section (use the format typically seen in MS Word with numbers and letters); what is photosynthesis? What is glucose? Why do all cells need energy? - 25 min | (Part II of II) Discussion: Teacher to compare the organelles of a cell to the features of a city or parts of a castle (king is the nucleus, city walls are the cell wall, cytoplasm is the courtyard, etc); students to assist in the comparison and illustrate, label and color - 25 min | <i>ML Science, Cells and Heredity, Page 53</i> - Students in pairs, complete the Mini-Lab and answer the questions via Google Docs, submit to your teacher and discuss what occurred within the bottle; teacher to note how the balloon slightly inflated due to cellular respiration in the yeast - 30 min | Students in pairs, create a T-chart comparing and outlining how cellular respiration and photosynthesis are similar; note that glucose (C ₆ H ₁₂ O ₆) and Oxygen (6O ₂) are used in each; notice that energy are used in each (sun and ATP); students to list differences such as which organelle they occur within; review with the class - 20 min | |
| | (Part I of II) Discussion: Teacher to compare the organelles of a cell to the features of a city or parts of a castle (king is the nucleus, city walls are the cell wall, cytoplasm is the courtyard, etc); students to assist in the comparison and illustrate, label and color - 25 min | Students to review their castle or city; where does cellular respiration fit into your city? Label where photosynthesis or cellular respiration occurs - 10 min | Students in pairs, using a Venn Diagram compare & contrast cellular respiration and photosynthesis in three ways for each section (nine total ways); discuss with class - 15 min | Teacher to review Study Guide for Test tomorrow on Plant and Animal Cells - 25 min | |
| Daily Journal or Bell Work: | What are lipids used to create? What do carbohydrates give to cells? | Teacher to list three organelles on the board; students indicate their purpose in the cell | Teacher to list three different organelles on the board from yesterday; students indicate their purpose in the cell | How are cellular respiration and photosynthesis similar? How are they different? | None |
| | | Watch "Cellular Respiration and the Mighty Mitochondria" on YouTube (7:48 min) and discuss the similarities to photosynthesis and cellular respiration; review the process and compare & contrast the two processes - 15 min | <i>ML Science, Cells and Heredity, Page 55</i> - Read aloud and discuss together as a class; review the X-axis (horizontal) and Y-axis (vertical) results; answer questions together as a class and review results - 10 min | | Go to the following website " https://codecombat.com/ " and click "I'm a Student"; create an Individual Account and begin playing - 20 min |

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| Daily Homework: | Make a list of five things at your home that could be compared to the parts of a cell? Who/what would be the nucleus? Who/what is the mitochondria? Etc | Students to compare the organelles of the cell to our school; who/what is the nucleus? Who/what is the nucleolus? Have at least ten organelles described | <i>ML Science, Cells and Heredity, 2.2 Review, #'s 1-6, page 54</i> - Complete each question in complete sentences; due tomorrow! | Study for Test on Plant and Animal Cells tomorrow! Review your "Terms to Know" from Week Four! | Written Response: Explain how cellular respiration and photosynthesis are similar yet different in three ways (one paragraph) |
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Unit : Life Stages

| Vocabulary Terms: | <i>Mitosis, Cellular Division, Chromosomes, DNA, Parent Cell, Daughter Cell, Diffusion, Passive Transport, Active Transport, Osmosis, Endocytosis, Exocytosis, Asexual Reproduction, Budding, Regeneration</i> | | | | |
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| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 13th Week | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 10 min |
| | Teacher to review the formula for photosynthesis; students MUST know this formula and be able to compare it to cellular respiration for their AIR tests - 10 min | <i>ML Science, Cells and Heredity, Page 56</i> - Conduct the mini-lab in pairs, every minute record the changes that you see for ten minutes; relate to diffusion and concentration - 15 min | <i>ML Science, Cells and Heredity, Pages 64-65</i> - Students in groups of three or four, complete the lab together with each student completing a chart of the results and answering questions; use Google Sheets to make the chart and answer questions; while there are "waiting periods" in the lab, students will complete a Venn Diagram comparing and contrasting Active Transport and Passive Transport with three distinct statements for each section (nine total statements) - 50 min | Watch "What is Diffusion?" on YouTube (2:05 min) and explain the examples; think of other examples in which diffusion is noticeable (ex. weather changes, cooking smells) - 10 min | (Part II of II) Complete your illustration of the difference between Active Transport and Passive Transport and "what is osmosis?"; should be neat and colored to the best of your ability - 10 min |
| | <i>ML Science, Cells and Heredity, Pages 56-59</i> - Using a Word Triangle, read aloud and explain what is diffusion, concentration, and passive transport; think of examples of diffusion and how we notice it - 20 min | <i>ML Science, Cells and Heredity, Pages 60-63</i> - Read aloud and discuss: focus upon the images in the text, what is active transport? How are endocytosis and exocytosis related? How are they related to diffusion? - 20 min | | <i>ML Science, Cells and Heredity, Page 68</i> - As a class complete together and explain the correct responses for #'s 23-33; relate to diffusion, cellular respiration, and energy use - 20 min | <i>ML Science, Cells and Heredity, Page 69</i> - As a class, complete and review the chart / graphs; review the X-axis (horizontal) and the Y-axis (vertical) titles; complete #'s 1-5 and review - 15 min |
| | Review passive transport and that it requires no energy; students in pairs, hypothesize two things that would happen if photosynthesis, cellular respiration, osmosis, and diffusion required energy; share your thoughts with the class - 10 min | Make comparisons of Active Transport, Endocytosis, and Exocytosis to a factory and shipping; how would workers prepare items to ship? How would they accept them upon arrival? Compare similarities to these processes - 10 min | | (Part I of II) Illustrate, color, and label NEATLY two things: the difference between active transport and passive transport, as well as osmosis; label the parts in your illustration, identifying energy use and molecule types - 20 min | Go to the following website " https://codecombat.com/ " and click "I'm a Student"; log into your Individual Account and begin playing - 20 min |

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| Daily Journal or Bell Work: | What is the formula for photosynthesis? How is it similar to cellular respiration? | Define: diffusion, concentration, glucose, osmosis | What is osmosis? Does it use passive transport or active transport? How do you know? | <i>ML Science, Cells and Heredity, Page 67</i> - Complete #'s 1-8 and review as a class | <i>ML Science, Cells and Heredity, Page 68</i> - Complete #34 and discuss |
| Daily Homework: | Written Response: How does the formula for photosynthesis show diffusion? Explain your response (one paragraph) | <i>ML Science, Cells and Heredity, 2.3 Review, #'s 1-5, page 63</i> - Complete each question in complete sentences; due tomorrow! | Written Response: How did today's lab help you to understand diffusion better? Think of two ways | <i>ML Science, Cells and Heredity, Page 67</i> - Complete #'s 11-22; due tomorrow! | <i>ML Science, Cells and Heredity, Page 69</i> - Complete #'s 6-7, due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 14th Week | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min |
| | <i>ML Science, Cells and Heredity, Pages 73-75</i> - Using a Frame Game graphic organizer, read aloud and discuss what DNA and Chromosomes are; review the pictures, how is DNA organized within the cell? - 15 min | <i>ML Science, Cells and Heredity, Pages 76-78</i> - Read aloud and review the principles of cell division; give two examples of specialized cells; how does a multicellular organism change as it grows? - 20 min | Teacher to conduct the "DNA in a Blender" experiment for the class as described on "The Gene Scene" website as visited in the prior class; note the use of a control; teacher to model appropriate lab techniques - 20 min | Lab: Students to create a DNA double-helix from mini-marshmallows and toothpicks. Use magic markers to color each nucleic acid a different color (A = blue, G = red, C = green, T = yellow); students must pair them up correctly - 25 min | <i>ML Science, Cells and Heredity, Page 84</i> - Students in pairs, complete the lab together and make a model of mitosis; one model per pair; answer all questions in Google Docs and submit to your teacher; one "paper" per child - 30 min |
| | Watch "What is DNA and How Does it Work?" on YouTube (5:24 min) and discuss how DNA leads to other life structures - 10 min | Teacher to go to " www.amnh.org/explore/ology/genetics " and review the website with the class; click on "DNA Detective" and any other section that you desire; Review how the DNA nucleic acids pair up with each other (G and C, A and T); - 25 min | Watch "Cell Cycle and Mitosis [3D Animation]" on YouTube (6:21 min) and discuss the stages of mitosis as shown - 10 min | <i>ML Science, Cells and Heredity, Pages 83-85</i> - In pairs, read together and discuss the stages of mitosis; teacher to review as a class - 15 min | |
| | <i>ML Science, Cells and Heredity, Page 76</i> - Students in pairs, complete the mini-lab together and answer the questions via Google Docs; Explain how this model resembles DNA - 20 min | | <i>ML Science, Cells and Heredity, Pages 80-82</i> - Read aloud and discuss the cycles of cell division; what is Interphase? What are the four steps in cellular division? - 15 min | Students in pairs, using a "Following a Sequence" graphic organizer students will complete boxes indicating which events occur in the correct order during mitosis; review as a class when complete - 10 min | Go to the following website " https://codecombat.com/ " and click "I'm a Student"; log into your Individual Account and begin playing - 20 min |
| Daily Journal or Bell Work: | Name as many organelles of a cell and their job in the cell in five minutes | What is DNA? Why is it important to the cell? | What letters are used to symbolize the four nucleic acids of DNA? How do they correctly pair up? | What are the four phases of mitosis? | Briefly describe each of the four phases of mitosis |

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| Daily Homework: | Written Response: How did the lab activity today help you to understand DNA better? | <i>ML Science, Cells and Heredity, 3.1 Review, #'s 1-6, page 78</i> - Complete each question in complete sentences; due tomorrow! | Teacher-created worksheet of DNA pairings and matching correctly | <i>ML Science, Cells and Heredity, 3.2 Review, #'s 1-6, page 85</i> - Complete each question in complete sentences; due tomorrow! | Define each of the four phases of mitosis and explain what Interphase is |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 15th Week | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min |
| | Illustrate, color, and label the four stages of mitosis as well as Interphase; students may chose if they want to illustrate a plant or animal cell; work must be completed to the best of their ability - 25 min | <i>ML Science, Cells & Heredity, Pages 90-92</i> - Read aloud and compare the two types of reproduction back to budding and regeneration; which process creates offspring faster? - 15 min | Illustrate, color, and label the three types of asexual reproduction discussed (binary fission, budding, regeneration); illustrate to the best of your ability; write a sentence under each illustration explaining what is happening in each situation - 30 min | Teacher to use shaving cream as a medium; give each child a small blob that they spread out onto their surface top; teacher to review content and students illustrate the answers in the shaving cream; wipe out previous answers when new questions arise; teacher to review specifically mitosis stages, asexual reproduction (binary fission, budding, regeneration), and DNA - 20 min | <i>ML Science, Cells & Heredity, Page 97</i> - Read and analyze the chart; complete together as a class #'s 1-6; teacher to review answers together and explain why each answer is correct - 15 min |
| | <i>ML Science, Cells & Heredity, Pages 88-90 (stop at "Asexual Reproduction...")</i> - Using a concept map, make notes while reading and discuss asexual reproduction and binary fission; What is budding? What is regeneration? What types of organisms use these types of asexual reproduction? - 20 min | Students in pairs, students will create TWO Venn Diagrams; the first Venn Diagram will compare and contrast Asexual & Sexual Reproduction; the second Venn Diagram will compare & contrast Budding and Regeneration; share your results with the class when complete - 25 min | Teacher to review as a class and make a T-Chart of the advantages and disadvantages of each type of reproduction (asexual and sexual); explain why each type is beneficial to life on Earth but that each type has its drawbacks - 10 min | Students in pairs, create two concept maps - one to discuss the stages of mitosis and what occurs in each stage; the other concept map to discuss the types of asexual reproduction and examples of each including organisms that use each type; share with the class when complete - 20 min | <i>ML Science, Cells & Heredity, Page 96</i> - Students in pairs, answer #'s 19-25 via Google Docs and submit to your teacher; one paper per student although they may work together - 15 min |
| | Watch "Asexual Reproduction" on YouTube (3:36 min) and discuss the three types displayed - 10 min | Quick Write: Using Google Docs, answer and submit to your teacher - Imagine that we (as humans) could reproduce by regeneration; if your hand was cut off, you could grow a new one AND your hand would grow into a new person... what would be some pros and cons to this? Why do you think that? - 10 min | Students to use Chromebooks, students will play a "Kahoot!" game on "Asexual and Sexual Reproduction"; choose the game with a chick and egg in the opening photo with ten questions at 30-seconds each; teacher to review responses when the game is complete - 10 min | <i>ML Science, Cells & Heredity, Page 95</i> - Individually, students will complete #'s 5-15 via Google Docs and submit to their teacher - 10 min | Go to the following website " https://codecombat.com/ " and click "I'm a Student"; log into your Individual Account and begin playing - 20 min |

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| Daily Journal or Bell Work: | Define: cytokinesis, Interphase, daughter cells | What is budding? What is regeneration? | What are two major differences between sexual and asexual reproduction? | How does Mitosis relate to Asexual Reproduction? | <i>ML Science, Cells & Heredity, Page 96</i> - Complete # 26 |
| Daily Homework: | <i>ML Science, Cells & Heredity, Page 95</i> - Complete #'s 1-4; due tomorrow! | <i>ML Science, Cells and Heredity, 3.3 Review, #'s 1-6, page 92</i> - Complete each question in complete sentences; due tomorrow! | What are two advantages and two disadvantages of asexual reproduction? | Written Response: Imagine that humans reproduced by budding; what would this be like? What steps do you think we would have to do to facilitate this as humans? (one paragraph) | <i>ML Science, Cells & Heredity, Page 97</i> - Complete #'s 7-8; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 16th Week | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Test on Cellular Stages of Life (Mitosis) and Asexual Reproduction - 30 min |
| | Using Google Docs, define the "Terms to Know from Week Thirteen" in your own words; submit to your teacher when complete - 20 min | Teacher to review the images on pages 102-103; review the terms alleles, genes, and chromosomes - 5 min | Teacher to review how traits are passed along and how recessive traits are included; use the offspring chart on page 105 with the lines to illustrate traits being passed down to assist - 10 min | Teacher to review heredity and how traits are passed along to offspring - 10 min | |
| | <i>ML Science, Cells & Heredity, Pages 101-103</i> - Using a "Word Magnet" graphic organizer, read aloud and discuss heredity and genes; connect on the word magnet how heredity links to genes, chromosomes, alleles, and other concepts - 20 min | <i>ML Science, Cells & Heredity, Pages 104-107</i> - Teacher to assist students, outline this section using the "numbers & letters" form found in MS Word; start with Main Ideas and concepts, include important terms and names - 30 min | Students in pairs, work together but one copy per student; create a table listing your physical traits (phenotype) vs those of family members; now try to list what your family's genes (genotype) may be based upon common traits; think of as many similarities as possible between you and your family members FIRST, then think of the genes; share with the class if you would like - 20 min | Review study guide for cellular stages of life and asexual reproduction; how does heredity tie into this? How do traits become passed down to other organisms? - 20 min | |
| | Students in pairs, create a T-chart listing all traits that students feel are inherited verses learned (environmental) traits; share and discuss responses - 10 min | Watch "Mendel and Heredity" on YouTube (5:46 min) and discuss some traits that you think could be easily passed down by people (hair color, height, skin color) vs those that MAY BE passed down (weight, hygiene, or health quality) - 15 min | Using the table that you just created, illustrate using an offspring flow chart how you and your siblings received the traits that they received; it's okay to guess! Which traits do you think came from which parent? Grandparent? - 20 min | Using Play-Doh!, students will model the various stages of mitosis as requested by the teacher; students will show regeneration, budding, and binary fission - 15 min | |
| Daily Journal or Bell Work: | <i>ML Science, Cells & Heredity, Page 96</i> - Complete #'s 27-29 | How many pairs of chromosomes does every human cell have? Where do they obtain them from? | Define genotype and phenotype | Define alleles, heredity, and Gregor Mendel | None |

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| Daily Homework: | Written Response: What are three traits that you have that you believe are inherited from your parents? What are three that you believe you learned? | Written Response: Do unhealthy parents have unhealthy children? Or is that a learned trait? Why do you feel that way? (one paragraph) | <i>ML Science, Cells and Heredity, 4.1 Review, #'s 1-6, page 107</i> - Complete each question in complete sentences; due tomorrow! | Study for Test tomorrow on the Cellular Stages of Life; Review Vocabulary Terms to Know | Play "Code Combat" for 20 minutes at home tonight! |
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Unit : Genetics & Heredity (Research Project: To be completed in Google Docs)

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| Project: | <i>Teacher will provide students with the genetic make-up for a group of three different animals at the zoo. The genetic make-up will include six different genotypes for each animal. Students will simulate that the male and female "will have four children". Their offspring's genotypes will be discovered per the use of Punnett Squares. Students will use Punnett Squares to discover the genotype of each of the four offspring. After discovering their genotypes of the offspring, students must analyze each offspring's genotype to decide their phenotype. Students will then list each of the four offspring's six traits after analyzing their results. Students will provide their list of offspring traits and calculation of their Punnett Squares in Google Docs and submit their results to their teacher. Finally, students will illustrate and color a family portrait of each of their assigned animals with their offspring possibilities (three total colored illustrations). Ideas of animals to choose from include lions, tigers, elephants, rhinos, giraffes, ostriches, bears, wolves, kangaroos, gorillas, birds, koalas, reindeer, seals, leopards, cheetahs, or turtles.</i> | | | | |
| Vocabulary Terms: | <i>Geneology, Genetics, Heredity, Gregor Mendel, Phenotype, Genotype, Allele, Trait, Punnett Square, Offspring, Meiosis, Gamete, Fertilization, DNA, Mutation, Pedigree</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 17th Week | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min |
| | | <i>ML Science, Cells & Heredity, Pages 110-111</i> - Read aloud and discuss how a Punnett Square helps to calculate traits - 15 min | <i>ML Science, Cells and Heredity, Pages 112-115</i> - Read aloud and use a concept map to connect all similar terms and concepts - 20 min | (Part II of II) Complete the lab in pairs from the previous lesson - 20 min | Go to the following website " https://codecombat.com/ " and click "I'm a Student"; log into your Individual Account and begin playing - 20 min |
| | <i>ML Science, Cells & Heredity, Pages 108-109</i> - Students in groups of 3 or 4, complete the lab on these pages; create an offspring model chart in Google Sheets and record your data / | Teacher to create several Punnett Squares on the board and model how to calculate them; students to practice solving for the Punnett Squares together - 15 min | Review "Punnett Square and Probability" on page 113; integrate a third phenotype (red fur) into the mix, how could it alter the squares? 10 min | <i>ML Science, Cells & Heredity, Page 116</i> - Students in groups of three, complete "Math in Science" together; as a class discuss responses and check for accuracy - 15 min | <i>ML Science, Cells & Heredity, Pages 117-119 (stop at "Cells Divide Twice...")</i> - Read aloud and use a "Word Magnet" to links terms and concepts together for the word - 15 min |

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| | answers; type all responses from each question in Google Sheets under your chart; one chart per group - 45 min | <i>ML Science, Cells & Heredity, Page 110</i> - Students in pairs, complete the mini-lab; use your Chromebooks and the the website " https://justflipacoin.com/ " to flip the coin; write all responses to the questions in Google Docs and submit to your teacher - 20 min | (Part I of II) Students in pairs, go to the following website on their Chromebooks: " www.nlm.nih.gov/exhibition/sciencemagicmedicine/pdf/teachersmonstergeneticslab.pdf " and complete the mini-lab together; you may use the " justflipacoin.com " website from the previous lesson to assist - 20 min | Teacher to introduce project and provide in-class time to begin working on it - 15 min | Watch "MEIOSIS - MADE SUPER EASY - ANIMATION" on YouTube (5:33 min) and discuss the differences between meiosis and mitosis; teacher to make a T-chart to review the similarities and differences - 15 min |
| Daily Journal or Bell Work: | Explain how a recessive allele can appear when parents have dominant genes | List five of your phenotypes | Teacher to create a Punnett Square; students to solve for it and the four offspring | Teacher to create a Punnett Square; students to solve for it and the four offspring | Write the four stages of mitosis and what happens in each stage |
| Daily Homework: | Written Response: How did today's lab help you to better understand alleles, genotypes, and phenotypes? | Teacher to create four Punnett Squares that students will solve for; due tomorrow! | <i>ML Science, Cells and Heredity, 4.2 Review, #'s 1-5, page 115</i> - Complete each question in complete sentences; due tomorrow! | Work on your Punnett Squares Project! | Work on your Punnett Squares Project! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 18th Week | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Journal; complete silently and individually - 10 min |
| | <i>ML Science, Cells & Heredity, Pages 119-122</i> - Read aloud and create an outline using the "letters & numbers" format used earlier; note the major terms and concepts as well as major statements for each section - 25 min | (Part II of II) Complete your illustration, coloring, and labeling of each of the eight stages of meiosis; include a brief statement at each stage of what occurs - 20 min | Create a crossword puzzle using all of the "Terms to Know" from Weeks 13 and 17; you may create it on computer paper or at the following site: " www.puzzle-maker.com/CW/ "; share your puzzle with classmates to solve when complete - 30 min | <i>ML Science, Cells & Heredity, Pages 135-138 (stop at "RNA is Needed...")</i> - Read aloud and use a "Main Idea Sequence" graphic organizer; note the nucleotides, DNA code, and replication process - 25 min | <i>ML Science, Cells & Heredity, Pages 138-141</i> - Read aloud and discuss transcription, translation, and RNA; what is the role of RNA? How does RNA pair up with DNA during transcription? What are translations? - 20 min |
| | Students in pairs, using a Venn Diagram compare and contrast mitosis and meiosis in three ways each (nine total statements); share with the class when complete - 15 min | <i>ML Science, Cells & Heredity, Page 125</i> - Students in pairs, complete a "Frame Game" graphic organizer for #'s 1-4; share with the class - 20 min | | Teacher to create sample DNA chains and students to correctly pair-up the appropriate nucleotide to the chains - 10 min | Teacher to create sample DNA chains but synthesize the RNA strand transcribing it; students to correctly pair-up the appropriate nucleotide (GCAT) to the transcriber (GCAU) - 10 min |

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| | (Part I of II) Illustrate, color, and label the eight stages of meiosis; include a short statement at each stage of what happens at every interval - 10 min | <i>ML Science, Cells & Heredity, Page 125</i> - Divide the class in half with one student acting as the teacher for each group; review #'s 7-16 and discuss as a group what are the correct answers and why - 10 min | <i>ML Science, Cells & Heredity, Page 127</i> - Review the chart and discuss its components; complete #'s 1-8 together as a class and discuss why each answer is correct versus the others - 20 min | Watch "DNA Replication [HD animation]" on YouTube (5:46 min) and discuss how DNA splits or unzips to be replicated; review how the chains are paired-up with the appropriate nucleotides in each - 15 min | Go to the following website " https://bot.land/ " and click "Play Now in Browserland", watch the YouTube video beforehand if needed; compete as a "Guest Account" and begin playing - 15 min |
| Daily Journal or Bell Work: | What is meiosis? | How many stages are in mitosis and in meiosis? How many chromosomes are in each offspring in mitosis and meiosis? | <i>ML Science, Cells & Heredity, Page 125</i> - Complete #'s 5-6 | <i>ML Science, Cells & Heredity, Page 126</i> - Complete #'s 25-26 | <i>ML Science, Cells & Heredity, Pages 128-131</i> - Read about the progress in genetics over time silently to yourself |
| Daily Homework: | Work on your Punnett Square Project! | <i>ML Science, Cells and Heredity, 4.3 Review, #'s 1-6, page 122</i> - Complete each question in complete sentences; due tomorrow! | <i>ML Science, Cells & Heredity, Page 125</i> - Complete #'s 7-19; due tomorrow! | <i>ML Science, Cells & Heredity, Page 126</i> - Complete #'s 20-24 and 27-28; due tomorrow! | <i>ML Science, Cells and Heredity, 5.1 Review, #'s 1-6, page 141</i> - Complete each question in complete sentences; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 19th Week | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min |
| | <i>ML Science, Cells & Heredity, Pages 144-145</i> - Read aloud and discuss; use a "Supporting Main Ideas" graphic organizer; what is a mutation? What effects can they have on DNA? - 15 min | <i>ML Science, Cells & Heredity, Pages 146-148</i> - Read aloud and discuss Sickle Cell Disease and Cancer; How are some people more likely to have these diseases than others? What is a pedigree? Review the pedigree for Sickle Cell on page 147; complete it for each male offspring assuming that they marry a female with heterozygous alleles and that each marriage provides four children - 30 min | <i>ML Science, Cells & Heredity, Pages 142-143</i> - Students in groups of 3 or 4, use your Chromebooks (Google Sheets) to create a data table and answer the questions below it; one table PER STUDENT; each student to partake in the lab; answer all questions as following the scientific | <i>ML Science, Cells & Heredity, Pages 150-152 (stop at "There are Risks...")</i> - Read aloud and discuss the difference between selective breeding and genetic engineering; Is genetic engineering ethically okay? Is it considered "playing God"? What are GMO's? - 20 min | <i>ML Science, Cells & Heredity, Pages 152-154</i> - Read aloud and discuss genetically modified animals? Is it okay to bring back extinct animals? If yes, at what extent (dodos, mammoths, dinosaurs)? What is the name of the first cloned sheep? - 20 min |
| | <i>ML Science, Cells & Heredity, Page 144</i> - Students individually, complete the mini-lab on this page; answer the questions via Google Docs, submit to your teacher - 10 min | | | Watch "Are GMOs Good or Bad? Genetic Engineering & Our Food" on YouTube (9:03 min) and discuss; are you okay with eating genetically modified food? Would you rather eat natural food? Why or why not? - 15 min | Teacher to use Google Images to show images of the dodo, the woolly mammoth, and the thylacine; these are all animals that are reportedly extinct that scientists are trying to clone DNA to bring back to life; what are your thoughts about this? - 15 min |

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| | Students use Chromebooks to visit: "www.biologycorner.com/worksheets/DNA-sim.html: to complete an online DNA transcribing simulation; start by creating a mutation on the DNA strand to see how the strand changes; when complete, go to the box below titled "Investigation: DNA, Proteins, and Mutations" and complete #'s 1-14 via Google Docs - 25 min | Students go to "http://glencoe.mheducation.com/sites/dl/free/0078802849/383936/BL_26.html" to complete the mutation simulation lab; read the section on the left, complete Step #'s 1-4; refer to the Amino Acid Guide and Mutation Guide to help you as you go - 20 min | method - 50 min | | Work on Punnett Square Project - 20 min | Go to the following website "https://bot.land/" and click "Play Now in Browserland", watch the YouTube video beforehand if needed; compete as a "Guest Account" and begin playing - 20 min |
| Daily Journal or Bell Work: | Teacher to create two sample DNA strands to transcribe with RNA strands | What is a mutation? How can it effect DNA code? | What is Sickle Cell Disease? What is a Genetic Disease? | <i>ML Science, Cells & Heredity, Page 158</i> - Complete #'s 27 and 29 | What are GMOs? What are your thoughts about them? | |
| Daily Homework: | <i>ML Science, Cells & Heredity, Page 158</i> - Complete #'s 18-22; due tomorrow! | <i>ML Science, Cells and Heredity, 5.2 Review, #'s 1-6, page 148</i> - Complete each question in complete sentences; due tomorrow! | <i>ML Science, Cells & Heredity, Page 158</i> - Complete #'s 24-25; due tomorrow! | Look at the food in your cabinets or refrigerator; how much of it do you think is GMO? Do you have any items that are listed as "Non-GMO"? What are six of the products that you have that are either GMO or Non-GMO? | <i>ML Science, Cells and Heredity, 5.3 Review, #'s 1-6, page 154</i> - Complete each question in complete sentences; due tomorrow! | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" | |
| 20th Week | Journal; complete in Google Docs, send to your teacher - 10 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Bell Work; complete in Google Docs, send to your teacher - 5 min | Test on DNA, Sexual Reproduction, Meiosis, and Mutations - 30 min | |
| | <i>ML Science, Cells & Heredity, Page 155</i> - Read aloud and discuss the dodo bird; is what happened to this bird "fair" in your opinion? Or is this survival of the fittest? What if this were a tiger, lion, or elephant that we were discussing? - 20 min | <i>ML Science, Cells & Heredity, Page 159</i> - Students in pairs complete #'s 1-6 via Google Docs and submit to your teacher - 20 min | Debate the ethics behind cloning; is it a legit and acceptable practice? If so, under what regard? If it is not, why isn't it ethical? How does religion play into this? Would a cloned person have a soul? Would that person go to Heaven when they die? Should scientists be trying to clone? Are they "playing God" be doing this? Two groups to debate, each group has an introductory speaker, a closer, and the | Using Google Docs, define each of the "Terms to Know for Week Seventeen" and submit to your teacher - 20 min | | |
| | Watch "10 Extinct Animals Scientists Are Ready to Bring Back" on YouTube (10:09 min) and discuss the ethics behind bringing back each of these creatures - 15 min | Work on Punnett Square Project, | | Review Study Guide on Meiosis, Sexual Reproduction, DNA, and | | Go to the following website "https://bot.land/" and click "Play Now in Browserland", watch the YouTube video beforehand if |

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| | Work on your Punnett Square Project, it is due in five days - 20 min | it is due in four days! - 30 min | remainder of students are supporting arguments - 50 min | Sexual reproduction, DNA, and Mutations - 25 min | YouTube video beforehand if needed; compete as a "Guest Account" and begin playing - 20 min |
| Daily Journal or Bell Work: | Who was the first sheep to be successfully cloned? What is cloning? | Teacher to introduce the debate tomorrow and the theme | Prepare your notes for the debate | What are three topics that you have questions about regarding tomorrow's test? | None |
| Daily Homework: | <i>ML Science, Cells & Heredity, Page 155</i> - Complete #'s 1-2; due tomorrow! | Prepare your thoughts for the debate tomorrow; are you against or for cloning and GMOs? Why do you feel this way? | Work on Punnett Square project, it is due three days! | Study for test tomorrow on DNA, Sexual Reproduction, Meiosis, and Mutations | Finish your Punnett Square Project, it is due tomorrow! |

Unit : Intro to Organic Chemistry

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| Project Breakdown: | <i>Students will select any element on the Periodic Table of Elements to conduct research upon; however, it is advised to only select elements between the atomic numbers 1-103. Students will conduct research on their selected element and present their information into a Google Slides presentation that must be a minimum of 10-slides in length. Students will research and provide the following information about their element for their presentation: What is the Atomic Symbol of your element? What is the Atomic Number of your element? What is the Atomic Mass of your element? How many electrons are in the outermost orbital of your element? Approximately what year was your element discovered? Is your element a metal, non-metal, or metalloid? What Group on the Periodic Table is your element found in? What state-of-matter is your element most-often found in? What is your element frequently used for by humans on Earth? Include a photo of your element from online (do not draw it). List three interesting facts about your element that you have not already mentioned.</i> | | | | |
| Vocabulary Terms: | <i>Chemistry, Periodic Table, Element, Atomic Number, Atomic Mass, Symbol, Atom, Ion, Isotope, Ionic Bond, Covalent Bond, Proton, Neutron, Electron, Quark, Nucleus, Electron Cloud, Solution, Solute, Solvent, Suspension, Concentration, Dilute, Saturated, Solubility, Acid, Base, pH, Neutral, Alloy, Organic, Inorganic, Isomer, Carbohydrate, Lipid, Protein, Enzyme, Nucleic Acid, Hydrocarbon, Polymer, Monomer, Plastic,</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 10 min | Bellwork - 5 min | Bellwork - 10 min |

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| | Discussion: Teacher to review atoms and the parts of an atom; include proton, neutron, electron, and quark; explain that atoms are the smallest particle of any substance; Teacher to show Google Images or illustrate an atom - 10 min | Discussion: Teacher to review atoms and their components; discuss how atoms are the smallest particles on Earth; how are atoms similar to solutions and mixtures? - 10 min | Discussion: Teacher to review solutions, mixtures, solvent, solute, boiling point, and freezing point; what is the freezing point of water? What is the boiling point of water? Will other liquids have the same temperatures? Why or why not? - 10 min | Discussion: Review atoms, parts of atoms, and elements; how do different elements combine to make molecules and thus new substances; Teacher to provide examples of formulas of ammonia, methane, water, carbon dioxide, and vinegar; what atoms are in each of these substances? - 10 min | Watch "What is Solubility?" on YouTube (5:14 min) and discuss what solubility is; how does temperature effect solubility? Why is water called the "Universal Solvent"? How can this information be graphed? - 10 min |
| 21st Week | <i>ML Science, Chemical Interactions, Pages 111-113</i> - Read aloud and discuss solutions; use a "Word Wheel" to outline solutions; what is the difference between mixtures and solutions? Students in pairs, create a T-chart listing mixtures on the left and solutions on the right; share and discuss - 25 min | <i>ML Science, Chemical Interactions, Page 113</i> - Students in groups of 3 or 4, complete the mini-lab together; Teacher to circle the room to assist in pointing out parts of the solution; Students to answer questions via Google Docs and submit to their teacher - 20 min | <i>ML Science, Chemical Interactions, Pages 117-119</i> - Read aloud and use a "Mind Map" graphic organizer to outline solutions in regards to concentration; what is the difference between saturated and unsaturated? What are dilutes? Teacher to provide examples of each term as they apply; how do ammonia and oil dissolve in water? - 25 min | <i>ML Science, Chemical Interactions, Pages 120-123</i> - Read aloud and discuss things that can change solubility; Teacher to discuss direct and indirect relationships; how do pressure and temperature effect solubility? Teacher to review covalent and ionic bonds with atoms; what are polar molecules? Table salt (NaCl) and water are an example of polar - 20 min | Teacher to go to the following website " www.ivyroses.com/Chemistry/GCSE/Common-Chemicals-in-the-Home_Molecular-Formulae.php " and discuss the different solutions and chemicals commonly found in homes; students to use the periodic table to discover which elements make up each substance; what do the numbers next to each letter indicate? which items do you think are polar or nonpolar? Why do you think that? - 15 min |
| | Using a beaker full of water and food coloring, Teacher to place three drops of food coloring into the beaker; do NOT stir; let the solute disipate into the solvent; Watch "Solute, Solvent and Solutions class-4" on YouTube (5:02 min) and review the types of examples shown for solutes and solvents; check the beaker to review the spread of the food coloring - 15 min | <i>ML Science, Chemical Interactions, Pages 114-116</i> - Read aloud and discuss the different types of compounds; what makes an ionic bond, and therefore an ionic compound? What is a covalent bond, and therefore a covalent compound? Teacher to review ionic bonds as needed - 20 min | Teacher to use a beaker to model how water will dissolve some substances but not others; review "Terms to Know" during this review; use oil, apple cider vinegar, and ammonia; Teacher may use student helpers in demonstration; what can change to make these solutions saturated? - 10 min | Students will illustrate, color, and label an example of a diluted solution as displayed in the textbook; students should color and label the dilute, solvent, suspended particles, and describe the concentration of the solution or mixture; students will write a caption explaining what the illustration displays and what each part is in their drawing - 20 min | <i>ML Science, Chemical Interactions, Pages 125-127</i> - Read aloud and discuss what acids and bases are; what do the "+" and "-" signs next to the elements indicate? Review the Periodic Table to see the location of many elements that have the same signs; what do they have in common? - 20 min |
| Daily Journal or Bell Work: | What do you know about atoms? List any parts of the atom or charges of particles | Water is sometimes called the "Universal Solvent"; why do you think this is? | Students to go to "Gizmos" in the Explore Learning website and work for ten minutes | Define Solute, solvent, solution, and mixture | <i>ML Science, Chemical Interactions, "Connecting Sciences", Page 124</i> - Read privately and answer #'s 1-2; review and discuss together |

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| Daily Homework: | Create a list of five solutions; in each solution, write which is the solute and which is the solvent | Written Response: Salt water has a higher boiling point than regular water; would other items dissolved in water (such as sugar, Kool Aid, or sand) have the same effect? Why or why not? | <i>ML Science, Chemical Interactions, 4.1 Review, #'s 1-6, page 116</i> - Complete each question in complete sentences; due tomorrow! | Locate five different liquids at your home; do you think that they are polar or nonpolar? Why do you believe each is so? | <i>ML Science, Chemical Interactions, 4.2 Review, #'s 1-6, page 123</i> - Complete each question in complete sentences; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 22nd Week | Bellwork - 10 min | Bellwork - 5 min | Bellwork - 10 min | Bellwork - 5 min | Bellwork - 10 min |
| | Watch "How to draw IONIC BONDING of NaCl and MgO" on YouTube (7:09 min) and discuss how to draw ions bonding; Teacher to review what it makes to give or accept a Hydrogen Ion; Teacher to incorporate what makes a substance an acid or base? - 15 min | Discussion: Teacher to review various compounds (NH ₃ , NaOH, H ₂ O, NH ₄) and discuss how they combine to form new substances; for example, what MUST happen for Sodium to combine with Oxygen and Hydrogen? Illustrate this on the board to demonstrate; what makes a strong or weak acid / base? - 10 min | Students to use the Periodic Table to locate the elements in each of the following compounds: NH ₃ , NaOH, H ₂ O, LiCl, KCl, H ₂ S; Illustrate the bonding of each of these compounds; Teacher to circle the room to ensure accuracy - 20 min | <i>ML Science, Chemical Interactions, Pages 136-138</i> - Read aloud and discuss the uses of alloys; use a "Concept Map" graphic organizer to outline alloys and the three types of uses described in the text book; provide examples of how each alloy is used specifically - 20 min | Discussion: Teacher to review atoms, bonding, and how solutes dissolve in solvents; review what bonding looks like when illustrated - 10 min |
| | Teacher to use litmus paper to demonstrate the acidity of different solutions; use tap water, vinegar, ammonia, milk, and other safe liquids to demonstrate; students to assist the demonstration by using the litmus paper to help conduct testing - 10 min | <i>ML Science, Chemical Interactions, Pages 129-131</i> - Teacher to lead students in outlining these pages using the "letters & numbers format" commonly seen in MS Word; focus on main subjects and sub-topics; have at least one notation per paragraph - 25 min | <i>ML Science, Chemical Interactions, Pages 134-135</i> - Read aloud and review the alloys provided; where else do we see these alloys? Review the pie chart, which elements are used most frequently in each alloy? | <i>ML Science, Chemical Interactions, Page 137</i> - Students | <i>ML Science, Chemical Interactions, "Reviewing Vocabulary", Page 141</i> - Students in pairs, complete #'s 1-5 and review as a class when complete - 20 min |

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| | <p><i>ML Science, Chemical Interactions, Pages 128-131</i> - Read aloud and discuss pH and what makes water neutral; what would happen if water was NOT neutral? Review the diagrams and illustrates with different substances in the text, compare it to the Periodic Table; how does each element combine together to form a new substance? Where are they located on the Periodic Table? - 20 min</p> | <p>Students to illustrate NaCl and MgO bonding as shown in the video in the prior lesson, as well as NH₄ and CO₂; students to refer to their Periodic Table to assist; Teacher to point out that elements in the First Group give away one electron, Group Two gives away two electrons, Group Three gives away three electrons, Group Four can give away or accept four electrons, Group Five takes three electrons, Group Six takes two electrons, Group Seven takes one electron, and Group Eight is stable; Teacher to assist by circling the room to ensure accuracy - 15 min</p> | <p>Why do you think that is? Compare these elements to the Periodic Table, where are they located? What may that tell you about the properties of elements in these groups or periods? What makes one alloy harder than another alloy? What is Nitinol? Teacher to use Google Images to show examples of these alloy - 25 min</p> | <p>in groups of 3 or 4, complete the lab using the balance, graduated cylinders, and other materials; students to record their data tables and all answers in Google Sheets and share with their Teacher when complete - 30 min</p> | <p><i>ML Science, Chemical Interactions, Pages 147-149</i> - Read aloud and use a "Supporting Main Ideas" graphic organizer to outline organic compounds and inorganic compounds; what is the difference between each? What is a single bond? A double bond? A triple bond? How do you illustrate each? - 15 min</p> |
| Daily Journal or Bell Work: | Teacher to introduce project and the requirements of it | What are three safe methods for testing an acid or base? | Students to go to "Gizmos" in the Explore Learning website and work for ten minutes | What are alloys? Provide three examples | Students to go to "Gizmos" in the Explore Learning website and work for ten minutes |
| Daily Homework: | Work on your project! | <i>ML Science, Chemical Interactions, 4.3 Review, #'s 1-6, page 131</i> - Complete each question in complete sentences; due tomorrow! | Locate three examples of alloys found in your home; using the Periodic Table, list the elements found in each of them | Illustrate how CH ₃ , HCl, CO bond together; due tomorrow! | <i>ML Science, Chemical Interactions, 4.4 Review, #'s 1-6, page 138</i> - Complete each question in complete sentences; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 10 min | Bellwork - 10 min | Bellwork - 10 min | Bellwork - 10 min | Bellwork - 5 min |
| | Teacher to review how to illustrate single bonds, double bonds, and triple bonds; use CH ₂ , CH ₃ , and CH as an example; what are the factors that dictate something as organic or inorganic? - 10 min | Watch "Making Sense of Chemical Structures" on YouTube (8:59 min) and discuss how to illustrate different bonds based upon their valence electrons; Teacher to illustrate examples - 15 min | <i>ML Science, Chemical Interactions, Pages 154-157</i> - Read aloud and discuss how carbon combines to make four major molecules; using a "flow chart diagram" with carbon at the top, list the four types of carbon-based molecules and facts about each through the flow chart (save for the next lesson); discuss as you proceed - 25 min | <i>ML Science, Chemical Interactions, Pages 158-161</i> - Read aloud continuing to use the flow chart from the prior lesson to outline proteins and nucleic acids; Teacher to discuss how amino acids (proteins) are very complex and are the building blocks for your body; many proteins curl into balls or spirals, not chains or squares - 20 min | <i>ML Science, Chemical Interactions, Page 158</i> - Students in groups of 3 or 4, complete the lab using the iodine (DO NOT GET IT ON YOUR CLOTHES) to search for carbon-based molecules; answer the questions via Google Docs and submit to your teacher - 25 min |

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| 23rd Week | <i>ML Science, Chemical Interactions, Page 149</i> - Students in groups of 3 or 4, create the models of atoms as indicated; display the various bonds as directed; answer all questions via Google Docs and submit to your teacher - 15 min | Teacher to review isomers and how to illustrate carbon rings verses carbon chains; what is the difference between butane and isobutane? - 15 min | Teacher to Google Image "Carbon Ring Glucose" to show the image of glucose in a carbon ring; student to count the individual atoms to see how they are both in the formula and listed in the carbon ring; repeat this for sucrose and fructose; what pattern do you notice between these three sugars? - 10 min | <i>ML Science, Chemical Interactions, Page 160 (and page 157)</i> - Review the illustration of the DNA double-helix; review the chain of G-C and A-T patterns; What is on the outside holdint the nucleic acid together? Using Page 157 to diagram the phosphate group, illustrate the DNA chain as it proceeds atom-by-atom up the double helix; use computer paper for this with colored pencils for various atoms (ex. Carbon = blue, Hydrogen = red, Phosphorus = green, etc.); illustrate the amino acids are blocks - 25 min | <i>ML Science, Chemical Interactions, Page 162</i> - Read aloud "Math in Science" and discuss the daily needs of teen boys, teen girls, and young children; discuss how and potentially why each increases as they do; students to create the graphs of the data in Google Sheets and share with the Teacher; answer the questions in Google Sheets - 25 min |
| | <i>ML Science, Chemical Interactions, Page 150-152</i> - Read aloud and discuss carbon chains and carbon rings; what is the difference? How are they similar yet different to isomers? Teacher to illustrate on the board how they can be similar yet different - 20 min | <i>ML Science, Chemical Interactions, 5.1 Review, # 6, page 152</i> - Students in pairs, review "Challenge" and how to illustrate a molecule of naphthalene; students to attempt to illustrate the ring in the correct pattern using eight hydrogen and ten carbon atoms - 15 min | Students to go to the following website " https://dlc.dcccd.edu/biology1-3/lipids " and observe the difference between saturated fatty acids and unsaturated fatty acids; count the atoms and their placement to notice the differences; what is the major difference? Discuss how this difference in atom placement leads to heart disease, high cholesterol, and death in many humans - 10 min | | |
| Daily Journal or Bell Work: | <i>ML Science, Chemical Interactions, "Reviewing Key Concepts", Page 141</i> - Complete #'s 10-16, review as a class when complete | <i>ML Science, Chemical Interactions, "Interpreting Graphs", Page 143</i> - As a class, read aloud; answer #'s 1-5 and review | Students to go to "Gizmos" in the Explore Learning website and work for ten minutes | Students to go to "Gizmos" in the Explore Learning website and work for ten minutes | Prepare for lab today; help gather any needed materials |
| Daily Homework: | Illustrate a Carbon Ring for C ₁₅ H ₃₂ ; due tomorrow! | <i>ML Science, Chemical Interactions, 5.1 Review, #'s 1-5, page 152</i> - Complete each question in complete sentences; due tomorrow! | Students to write a carbon chain for Lauric Acid (oil found in coconuts); due tomorrow! | Teacher to provide a strand of DNA Nucleic Acids (ex. GCATGCAT) of twenty letters for students to practice decoding; due tomorrow! | <i>ML Science, Chemical Interactions, 5.2 Review, #'s 1-6, page 161</i> - Complete each question in complete sentences; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 10 min | Bellwork - 5 min | Bellwork - 10 min | |

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| 24th Week | <p><i>ML Science, Chemical Interactions, Pages 163-167</i> - Read aloud and use a "Main Ideas & Supporting Ideas" graphic organizer to outline; discuss hydrocarbons, what are examples of them? How do they exist in our world as a cycle? What makes some hydrocarbons different than others? - 20 min</p> | <p><i>ML Science, Chemical Interactions, Page 167</i> - Teacher to review polymers and monomers; referring to the "Building Polymers" box, review how the different monomers link together to form polymers; what atom do they connect at? What is polypropylene? What is it used to create? - 10 min</p> | | <p>Review study guide on Organic Chemistry - 25 min</p> | <p>Test on Organic Chemistry - 30 min</p> |
| | <p>Teacher to Google Images "carbon ring hydrocarbons" and show the images; what do they all have in common? Compare benzene to butane, what are their major differences? - 10 min</p> | <p><i>ML Science, Chemical Interactions, Pages 167-169</i> - Read aloud and discuss plastic and its uses; review the table on page 168 and how different types of plastic are categorized - 15 min</p> | <p><i>ML Science, Chemical Interactions, Pages 170-171</i> - Students in groups of 3 or 4, conduct the lab together and create a polymer in class; Teacher to ensure that the polymer is properly disposed of (NOT IN THE SINK) when the lab is completed; Students to answer all questions in Google Sheets including the creation of the chart; submit to your Teacher when complete - 50 min</p> | <p><i>ML Science, Chemical Interactions, Page 173</i> - Students in pairs, complete "Reviewing Vocabulary #'s 1-10" and "Reviewing Key Concepts #'s 11-17" via Google Docs and submit to your Teacher - 20 min</p> | <p><i>ML Science, Chemical Interactions, Page 175</i> - Individually read through the chart data in "Interpreting Tables" and answer #'s 1-5 via Google Docs; then use complete sentences to answer "Extended Response #' 6-7"; submit to your Teacher when completed - 25 min</p> |
| | <p>Students to illustrate using bubble letters, color, and link together in a carbon ring two hydrocarbons; they are to be illustrated beautifully and designed colorfully with serious and best effort; write a caption underneath about the difference between the two rings - 20 min</p> | <p><i>ML Science, Chemical Interactions, Page 168</i> - Students go to the following website "www.plasticboards.com/plastic-building-materials/" and cross-reference the different materials pictured verses their molecule composition; students in pairs, discuss and answer via Google Docs what is the molecular difference between the tems in each level pictured verses the next highest level? One paper per student - 20 min</p> | | | |
| Daily Journal or Bell Work: | <p>How many different types of bases make up the genetic code in DNA? Why is each base code important?</p> | <p>Students to go to "Gizmos" in the Explore Learning website and work for ten minutes</p> | <p>Gather lab materials; prepare for the lab today!</p> | <p>Students to go to "Gizmos" in the Explore Learning website and work for ten minutes</p> | <p>None</p> |

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| Daily Homework: | Complete your comparative illustration, coloring, and caption of two hydrocarbons; due tomorrow! | <i>ML Science, Chemical Interactions, Page 168</i> - Locate three plastics in your home; what monomer is in them? What formula is that monomer? Due tomorrow! | <i>ML Science, Chemical Interactions, 5.3 Review, #'s 1-6, page 169</i> - Complete each question in complete sentences; due tomorrow! | Study for your test tomorrow on Organic Chemistry! | Finish your project, it is due tomorrow! |
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Unit : Geology and Changes Within the Earth

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| Vocabulary Terms: | <i>Inner Core, Outer Core, Mantle, Crust, Lithosphere, Asthenosphere, Tectonic Plate, Continental Drift, Pangaea, Convection, Convection Current, Theory of Plate Tectonics, Mid-Ocean Ridge (Mid-Atlantic Ridge), Divergent, Convergent, Transform, Rift Valley, Magnetic Reversal, Hot Spot, Subduction, Collision</i> | | | | |
| Project Essay Breakdown: | <i>Students will research one of the following dinosaurs from the list below and write an essay in Google Docs. The essay must be a minimum of one-page in length, 12-font, Times New Roman, double-spaced, and include the following components. Students will research about their dinosaur and make the required connections to the content from this unit: What was the maximum height of this dinosaur? Was it an herbivore, carnivore, or omnivore? Was it more-often a predator or prey of other animals? What Period of the Mesozoic Era did it live in? Where on Earth today have fossils of your dinosaur been found? How does the finding of your dinosaur's fossils support the Theory of Continental Drift? How does the finding of your dinosaur's fossils support the Theory of Pangaea? What type of plate boundary exists in the area where your dinosaur's fossils were found? Describe what your dinosaur looked like. Include a photo of your dinosaur (not hand-drawn, from online is permissible). Lastly, include three interesting facts about your dinosaur that may be distinct to it.</i> | | | | |
| Project Themes: | <i>Tyrannosaurus Rex, Triceratops, Stegosaurus, Apatosaurus (Brontosaurus), Velociraptor, Spinosaurus, Diplodocus, Allosaurus, Ankylosaurus, Iguanodon, Pachycephalosaurus, Parasaurolophus, Styracosaurus, Troodon, Gallimimus, Stygimoloch, Protoceratops, Deinonychus, Suchomimus, Brachiosaurus, Baryonyx, Dilophosaurus, Titanosaur</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | <i>ML Science, The Changing Earth, Pages 2-5</i> - Read aloud about predicting volcanic eruptions, features of them, and how people study them; discuss some of the deadly volcanoes mentioned in the textbook - 15 min | <i>ML Science, The Changing Earth, Pages 11-13</i> - Read aloud and discuss what plates are; what are the lithosphere and asthenosphere? Where are they in relation to the crust? Describe them - 15 min | <i>ML Science, The Changing Earth, Pages 14-17 (stop at "Causes of Plate Movement")</i> - Read aloud and use a "Word Wheel" to outline the terms continental drift and Pangaea; how do current continents appear to link together to make Pangaea? What are the three different proofs of Pangaea? What are the Mid-Ocean Ridges? - 20 min | Watch "How Do We Know Pangea Existed?" on YouTube (3:29 min) and discuss how the plates and continents come together link puzzle pieces; what are evidences of Pangaea? How do fossils prove the existence of this supercontinent? - 10 min | <i>ML Science, The Changing Earth, Pages 22-25</i> - Read aloud and discuss the three different types of plate boundaries; students to outline these pages with Teacher guidance per the traditional "letters & numbers" method; include important terms, sea-floor spreading, and magnetic reversal evidence - 30 min |

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| 25th Week | <p>Watch "Layers of the Earth" on YouTube (6:27 min) and discuss the layers of the Earth and how they behave; how does the cake symbolize the layers? What is the asthenosphere and lithosphere? What are seismic waves? Teacher to illustrate the layers on the board to demonstrate - 15 min</p> | <p><i>ML Science, The Changing Earth, Page 12</i> - Students in groups of 3 or 4, complete the mini-lab together and discuss how this represents the Earth and its layers; answer the questions via Google Docs and submit to your Teacher - 20 min</p> | <p>Teacher to Google Image "Plate Tectonics Simulation" and see how the plates have moved over time; where do scientists predict that the plates will move to over extended time? How do you think the weather and climate will be different in Ohio based upon this movement? - 10 min</p> | <p><i>ML Science, The Changing Earth, Pages 16-19</i> - Teacher to review seafloor spreading; where are the youngest rocks found on Earth? How does seafloor spreading show a recycling motion of rocks on Earth? Read aloud about plate movement, what is the name of the current that transfers hot and cold pressure around? - 15 min</p> | <p><i>ML Science, The Changing Earth, Page 25</i> - Students in groups of 3 or 4, create a sea-floor model and use the bar magnet to demonstrate how different layers of rock formed with alternating poles; use the direction of the magnet as it faces north to indicate how all rock layers would point in the youngest layer; then assume the south end of the magnet now represents north because the poles flipped; illustrate the next layer based upon the direction that the magnet points; repeat the process three more times; answer questions via Google Docs and submit to Teacher; Teacher to ensure that groups are monitoring the bar magnet correctly - 20 min</p> |
| | <p><i>ML Science, The Changing Earth, Pages 9-11 (stop at "Lithosphere and Asthenosphere")</i> - Read aloud and use a "Supporting Main Ideas" graphic organizer to outline the makeup of the inner-Earth; what are the four main layers and their characteristics? Teacher to review and discuss - 20 min</p> | <p><i>ML Science, The Changing Earth, Page 9</i> - Teacher to demonstrate about denser materials floating or sinking; Teacher ONLY to show this as to not spread food coloring; afterwards, Teacher to show Google Images of "Plates of the Earth" to show how the Earth is broken into sections that move - 15 min</p> | <p>Teacher to pass out a print out of the Pangaea supercontinent; students to use different colored pencils to locate all seven continents plus India on Pangaea; students should then use arrows to label to direction that it appears that the plates are moving; Teacher to review and discuss - 15 min</p> | <p>Teacher to provide a blank Mercator world map of the continents and oceans; students will use colored pencils to locate, color, and label each of the twelve major plates; use your textbook or Google Images to provide all plates; Teacher to add the Juan de Fuca, Scotia, and Caribbean plates to those in the text - 20 min</p> | |
| Daily Journal or Bell Work: | <p>What is the Earth made up of? How many layers are in the Earth?</p> | <p>Which layer of the Earth do we live on? Which is the largest layer?</p> | <p>How does density and pressure effect the layers of the Earth?</p> | <p>What is the name of the supercontinent of all continents together? What are three evidences of it?</p> | <p>How does seafloor spreading help to prove the theory of plate tectonics?</p> |
| Daily Homework: | <p>What are three items that you can use to represent the Earth and its layers? How do these three items resemble the Earth and its layers?</p> | <p>Why do you see only the dry land areas of tectonic plates on a typical world map? What could have happened to the other land?</p> | <p><i>ML Science, The Changing Earth, 1.1 Review, #'s 1-6, page 13</i> - Complete each question in complete sentences; due tomorrow!</p> | <p>Explain how convection currents work; how do they move the plates of the Earth?</p> | <p><i>ML Science, The Changing Earth, 1.2 Review, #'s 1-6, page 19</i> - Complete each question in complete sentences; due tomorrow!</p> |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |

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| | <i>ML Science, The Changing Earth, Pages 26-28</i> - Read aloud and discuss how each different type of boundary has a different outcome when plates move; what are hot spots? How can they be used to track plate movement? Use Hawaii and Yellowstone as examples; what islands are formed atop volcanic chains (Iceland, Azores)? - 15 min | <i>ML Science, The Changing Earth, "Math in Science", Page 29</i> - Read about tectonic plates moving and how to calculate the distance between them; review the example, Teacher to remind students how large one centimeter is for reference; students in pairs, complete #'s 1-3 & "Challenge"; discuss and review as a class - 20 min | Teacher to review the names of the twelve major plates and where they're found; review the three types of plate boundaries and what they create; what is sea-floor spreading? What is the Mid-ocean (Mid-Atlantic) Ridge? Students should know BOTH NAMES; what are hot spots and provide examples; review layers of the Earth and convection currents - 15 min | <i>ML Science, The Changing Earth, Page 30</i> - Students in pairs, review the mini-lab and discuss how the motion of the napkins in various directions simulates the motion of the plates; what is subduction? How do the napkins simulate mountains forming? How do they simulate convergent boundaries with subduction? - 10 min | <i>ML Science, The Changing Earth, "Think Science", Page 37</i> - Read aloud as a class then complete "On Your Own" individually; students in groups of 3 or 4, complete "As a Group" and "Challenge" together; submit your answers via Google Docs to your Teacher; discuss your responses as a class - 20 min |
| 26th Week | Students in pairs, use a "Cause and Effect" graphic organizer to outline each of the three different types of plate boundaries; provide examples with each; share with the class when complete - 25 min | Students will illustrate, color, and label a nature scene depicting all three types of plate boundaries; students will include arrows indicating the motion of the plates; students should include nature aspects (trees, grass, animals, etc) to make their illustrate decorative and beautiful - 30 min | <i>ML Science, The Changing Earth, Pages 30-32</i> - Read aloud and use a "Word Wheel" for the term subduction; provide examples of this from the book and discuss; what is happening anywhere where mountains form? - 20 min | <i>ML Science, The Changing Earth, Pages 33-36</i> - Read aloud and discuss tectonic plate boundaries; what is a transfer plate? What happens at these boundaries? What is the outcome of convergent boundaries and divergent boundaries? What boundary type is found at the Mid-Atlantic Ridge? - 20 min | Teacher to introduce the Plate Tectonics and Dinosaur Project; Teacher to review requirements; students to have in-class work time to begin - 30 min |
| | <i>ML Science, The Changing Earth, Page 41</i> - Review the diagram and plate boundaries; as a class, answer #'s 1-9 and provide the reasoning for each; discuss what may occur at each plate boundary - 10 min | | Students to go to Google Maps and locate any three mountain chains in the world; students will write their continent, the plates as indicated in the text, and assumed plate boundary; then do the same with any three island chains, some may NOT be volcanic so Teacher will need to lead these discoveries; Teacher to review as students explore; submit your information via Google Docs to your Teacher - 15 min | <i>ML Science, The Changing Earth, Page 40</i> - Students in pairs, create a table similar to #'s 26-31 and write the type of plate boundary, but also provide an example of each type found on Earth; together, answer # 33 and color your map to better display the movement of plates - 20 min | |
| Daily Journal or Bell Work: | Where would you expect to find the newest rocks in the world? Why is that? | What are the three types of plate boundaries? What does each create? | What plate boundary would you expect to find where mountains are? How about at SOME island chains? | What is subduction? Where on Earth are you most likely to find it? | What type of plate boundary is the San Andreas fault? |

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| Daily Homework: | <i>ML Science, The Changing Earth, Page 41</i> - Complete "Extended Response #'s 10-11" in complete sentences; due tomorrow! | <i>ML Science, The Changing Earth, 1.3 Review, #'s 1-6, page 28</i> - Complete each question in complete sentences; due tomorrow! | What do you think would happen if the continental plates subducted under the oceanic plates instead of the oceanic subducting under continental? Why do you think that? What could eventually happen? | <i>ML Science, The Changing Earth, Page 39</i> - Complete "Reviewing Vocabulary #'s 1-6"; due tomorrow! | <i>ML Science, The Changing Earth, 1.4 Review, #'s 1-6, page 36</i> - Complete each question in complete sentences; due tomorrow! |
| Vocabulary Terms: | <i>Fault, Stress, Earthquake, Seismic Wave, Focus, Epicenter, Seismograph, Aftershock, Liquefaction, Tsunami, Richter Scale, Shadow Zone,</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 27th Week | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | <i>ML Science, The Changing Earth, Page 45-49</i> - Read in pairs and take seven notes about the content of this section; Share notes with the class when complete, Teacher to evaluate the notes and discuss the importance of them - 25 min | Students will illustrate, color, and label a nature scene depicting all three types of earthquake faults; students will include arrows indicating the motion of the plates; students should include nature aspects (trees, grass, animals, etc) to make their illustrations beautiful; students should include multiple layers of bedrock as well to show the movement of the rock - 30 min | <i>ML Science, The Changing Earth, Page 50</i> - Read aloud and review the table; students to analyze the data and review which plate most world earthquake activity occurs upon based upon location on a world map; as a class, complete "Explore #'s 1-2" - 15 min | Students to go to the following website " www.usgs.gov/natural-hazards/earthquake-hazards/lists-maps-and-statistics "; click on the link that says "Latest Earthquakes" on the left; which recent earthquake is closest to us? Which had the highest rating on the Richter Scale? Explore other locations and their data - 10 min | <i>ML Science, The Changing Earth, Pages 56-58</i> - Read aloud about how scientists monitor earthquakes; how do they locate one based upon seismograph stations? Refer to the diagram on page 57 to show how three stations are used to overlap at a central location - 20 min |
| | Watch "Earthquakes 101 National Geographic" on YouTube (2:57 min) and discuss what causes earthquakes to occur; what is subduction? How does it play a role in earthquakes? What is a tsunami? Describe the video of earthquakes, what was that like? - 10 min | | Using Google Sheets and the following website " www.usgs.gov/natural-hazards/earthquake-hazards/science/20-largest-earthquakes-world ", students will create a graph of the ten most destructive earthquakes in the world, then share with you Teacher; students will then go to this website " www.usgs.gov/natural-hazards/earthquake-hazards/lists-maps-and-statistics " and graph the number of earthquakes in Oklahoma, California, Wyoming, and Kansas; students may make individual maps for each state; share with Teacher when complete; discuss results, why do you think earthquakes are increasing in some areas? Which state in the USA has the most earthquakes? Why do you think that is? Which the second highest? - 30 min | <i>ML Science, The Changing Earth, Pages 51-55</i> - Read aloud and discuss the parts of an earthquake (fault, epicenter, focus) and how earthquake energy is transmitted; what are waves? - 20 min | Teacher to Google Image "finding an epicenter" and view the images; as a class, students will solve where the epicenter is of an earthquake based upon the three stations - 15 min |
| | <i>ML Science, The Changing Earth, Pages 32, 35, 46, 48, and 49</i> - Students in groups of 3 or 4, review the images on these pages and discuss the relationship between plate boundaries and earthquakes; what type of earthquake fault is found at each boundary? Where do the most number of earthquakes occur? Discuss as a class - 15 min | <i>ML Science, The Changing Earth, Page 47</i> - Students in pairs, complete the mini-lab and discuss plate movement; students to use paper cut triangularly or another physical means instead of wood if necessary; answer questions and submit to the Teacher via Google Docs; discuss as a class when complete - 20 min | | <i>ML Science, The Changing Earth, Page 55</i> - Watch "1999-ESPN Looks Back at 1989 Earthquake World Series" on YouTube (5:56 min) and discuss the earthquake that struck on national television; based upon the description of events and relation to the image on page 55, how do you think the waves traveled? This region is a strike-slip fault - 15 min | Teacher to Google Image "Shadow Zone" and display images of the shadow zone of an earthquake; what inside the Earth causes the shadow zone? What does this say about the interior of the Earth? Teacher to go to the following website " www.classzone.com/books/earth_science/terc/content/visualizations/es1009/es1009page01.cfm " to display an image of a shadow zone appearing after an earthquake - 15 min |

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| Daily Journal or Bell Work: | Have you even been in an earthquake? If so, what was it like? | What technically happens during an earthquake? | What are the three types of earthquake faults? | Why is it important to monitor earthquakes as they occur throughout the world? | What are the three types of Earthquake waves? |
| Daily Homework: | <i>ML Science, The Changing Earth, Page 39</i> - Complete "Reviewing Key Concepts #'s 7-15"; due tomorrow! | Why don't earthquakes happen commonly in Ohio? Include details about pressure in your answer | <i>ML Science, The Changing Earth, 2.1 Review, #'s 1-6, page 49</i> - Complete each question in complete sentences; due tomorrow! | Work on project! | Teacher created worksheet of finding an epicenter of an earthquake with examples; they are many good ones already online to use. |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 28th Week | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | Teacher to review Shadow Zone and seismic waves; Provide images for examples; what is a seismograph? Teacher to Google Image "Zhang Heng seismograph" to show the first seismograph built in 132 AD and how it operated in China - 15 min | Teacher to review seismic waves (P-waves, S-waves, L-waves); why do L-waves (surface waves) cause the most damage? Review how three seismographs are needed to obtain an epicenter; where is the focus? What is a tsunami? - 10 min | Teacher to review seismic waves; how do they lead to continental drift and plate tectonics? How do the motions of the plates and earthquakes overlap? Review layers of the Earth and convection currents; What other natural events do you predict to find at plate boundaries? - 10 min | Students and Teacher to go to the following website " www.worldvision.org/disaster-relief-news-stories/2004-indian-ocean-tsunami-facts " and discuss the disaster of this earthquake; review the image of the plate boundary; how did that motion lead to this deadly act? Could something like this happen in Ohio? Why or why not? - 15 min | Students in pairs, create a T-chart of things in your home that are not safe in the event of an earthquake (left side) and how to fix them (right side); discuss and share as a class when complete - 20 min |
| | <i>ML Science, The Changing Earth, "Math in Science", Page 59</i> - Read aloud about the earthquake magnitude scale, also called the Richter Scale; what is the range of energy calculated on this scale? Use the example to see how energy is calculated; students in pairs, complete #'s 1-3 and discuss as a class; complete "Challenge" together - 20 min | <i>ML Science, The Changing Earth, Pages 60-63</i> - Students in pairs, review this section and create an outline of the information within it; students will discuss the most important information from this section and why; Teacher to assist with outlines as they proceed; one outline per pair, submit to Teacher via Google Docs; review as a class when complete - 25 min | In-class time to work on your projects - 40 min | <i>ML Science, The Changing Earth, Pages 64-67</i> - Students in pairs, read together and discuss how scientists predict earthquakes; students to write eight notes on this material; as a class review notes from groups, Teacher to review and discuss pertinent information; why are seismic gaps indicators of something bad? - 25 min | <i>ML Science, The Changing Earth, Pages 68-69</i> - Students in groups of 3 or 4, complete the lab together and answer all questions in "Conclude #'s 1-6" via Google Sheets including the creation of the table in "Observe and Analyze"; do not |

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| | <i>ML Science, The Changing Earth, Pages 60-63</i> - Read aloud and discuss what aftershock and liquefaction is; explain that liquefaction is like quick sand (but isn't); what are tsunamis? How can they be extremely dangerous? - 15 min | Watch "5 Biggest Tsunami Caught On Camera" on YouTube (10:03 min) and discuss the impact of tsunamis when they strike; how do earthquakes cause these? Keep in mind when watching this video that some people may have died in this video - 15 min | | Teacher to review our school "Crises Plan" with students to review what we would do in the event of an earthquake; why do you think we would take these measures? Review other pertinent features and discuss - 10 min | complete "Challenge"; discuss results as a class when complete - 30 min |
| Daily Journal or Bell Work: | What is a Shadow Zone? What does it say about the interior of the Earth? | Who built the first seismograph? What did it look like? | What is a tsunami? Where in the world was the biggest one believed to have occurred? | How could plate tectonics lead to tsunamis? | What should you do during an earthquake? |
| Daily Homework: | <i>ML Science, The Changing Earth, 2.2 Review, #'s 1-6, page 58</i> - Complete each question in complete sentences; due tomorrow! | Written Response: What are your thoughts about the tsunami video from today? | Work on your project! | Look at your home or nearby businesses for any evidence of earthquake proofing; if so, what is it? If not, why do you think it isn't there? | <i>ML Science, The Changing Earth, 2.3 Review, #'s 1-6, page 67</i> - Complete each question in complete sentences; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 29th Week | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Test on Plate Tectonics, Continental Drift, and Earthquakes - 35 min |
| | <i>ML Science, The Changing Earth, Page 73</i> - As a class, review the tables of earthquake data; what type of earthquake is most common? As a class, answer #'s 1-8 and discuss - 15 min | Teacher to review parts of the earthquake, layers of the Earth, convection currents and pressure moving plates, Shadow Zone, seismic waves, and the relationship to plate tectonics - 10 min <i>ML Science, The Changing Earth, Page 71</i> - Students in pairs, complete "Flow Charts" or "Concept Maps" for #'s 1-4; share with the class and discuss - 25 min | In-class time to work on your projects - 50 min | Review study guide for test on Plate Tectonics, Continental Drift, and Earthquakes tomorrow - 20 min Play "Kahoot!" to review for test tomorrow; approved Kahoots are "Plate Tectonics Plate Tectonics! | |

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| | <i>ML Science, The Changing Earth, Pages 71-72</i> - Divide the class into three groups, teacher to create a game based upon #'s 5-22 in "Reviewing Key Concepts" and "Thinking Critically"; the winning team will earn bonus points on the upcoming test - 30 min | <i>ML Science, The Changing Earth, Page 72</i> - As a class, review and answer together #'s 23-27; teacher to go to Google Images to show photos of earthquake damage according to where they are located in the world, where does the most damage appear to occur? Why do you think that is? - 20 min | | 31 questions, 30 & 20 seconds", "Plate Tectonics & Plate Boundaries, 20 questions, 30 seconds", "Earthquakes, 19 questions, 20 seconds", and "Earthquakes, 30 questions, 20 seconds" - 30 min | Work on Project, it is due tomorrow! - 20 min |
| Daily Journal or Bell Work: | Do you think our school is earthquake-proofed? Why or why not? What evidence do you have to support your answer? | What is the Richter Scale? How does it display energy from an earthquake? | What type of earthquake wave is the most damaging? Why is that? | What questions do you have about earthquakes and / or plate tectonics? | None |
| Daily Homework: | <i>ML Science, The Changing Earth, Page 73</i> - Complete "Extended Response #'s 9-10"; due tomorrow! | Work on project, it is due in three days! | Work on project, it is due in two days! | Study for your test tomorrow on earthquakes and plate tectonics! | Work on project, it is due tomorrow! |

Unit : Volcanoes, Fossils, and the Rock Cycle

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| Terms to Know: | <i>Volcano, Crater, Dike, Sill, Vent, Caldera, Cinder Cone, Shield, Composite, Pyroclastic Flow, Ring of Fire, Lava, Magma, Intrusive, Extrusive, Geyser, Acid-Rain, Hot Spot,</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | <i>ML Science, The Changing Earth, Pages 77-79</i> - Read aloud and make connections to mountain ranges where earthquakes and faultlines exist; Review the map on page 78, what COULD have happened where the Alps, Appalachians, and Ural Mountains are? Summarize: what are three main ideas of this section? - 20 min | Walk through the school campus to find types of erosion caused by water; the church has a high amount due to its age; Teacher to point out different areas in brick, on the copper top of the church (it's now green), and in cracks within brick; how does erosion lead to the Rock Cycle? - 20 min | Review plate boundaries and earthquakes faults in conjuncture with mountain ranges; what previous knowledge do students have about volcanoes? Students to create a KWL about volcanoes (K = what you already Know, W = what you Want to know, L = what you Learned after the lesson); complete KWL tomorrow - 15 min | <i>ML Science, The Changing Earth, Page 86</i> - Teacher to present the mini-lab on page 86 and students discuss; Finish KWL from the previous lesson; Teacher to use Google Images to introduce parts of a volcano (dike, sill, caldera, crater, vent, magma chamber); students must know the various parts for this unit - 20 min | <i>ML Science, The Changing Earth, Pages 94-95</i> - Complete the lab by making your own volcano with gravel and plaster of paris; answer |

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| 30th Week | Teacher to review erosion; how do different types of erosion change rock? What is the Rock Cycle? Watch "3 Types of Rocks and the Rock Cycle: Igneous, Sedimentary, Metamorphic - FreeSchool" and discuss the rock cycle and how two of the three types have already been indirectly discussed - 15 min | <i>ML Science, The Changing Earth, Pages 80-84</i> - Read in pairs and write five important notes about this section; discuss and share your notes with the class; Teacher to review notes and why each pair thinks they're important; Teacher to review plate boundaries and how they lead to mountain and valleys forming - 20 min | <i>ML Science, The Changing Earth, Pages 86-89</i> - Read aloud and discuss the parts of a volcano and the difference between molten rock; incorporate the terms intrusive (magma) and extrusive (lava); what type of rocks are hardened molten rocks called? What are the three types of igneous rocks (Block, Aa, Pahoehoe)? - 20 min | <i>ML Science, The Changing Earth, Pages 90-93</i> - Teacher to review the Ring of Fire briefly, then students read aloud about the three shapes of volcanoes (shield, cone, composite); review the illustrations on pages 90-91, which type is the most explosive? How do crater lakes form? - 15 min | questions in "Observe and Analyze" and "Conclude" via Google Sheets; make the table in Google Sheets - 40 min |
| | Teacher to use Google Images to show different types of erosion "Water Erosion", "Wind Erosion", and "Ice Erosion"; how does each of these lead to the rock cycle? Teacher to display an image of the Rock Cycle and discuss where erosion and metamorphic rocks fit into it - 15 min | Teacher to Google Image "Fault Lines Nature" to show students many actual fault lines and how they appear within mountain ranges; do all fault lines appear as cracks? Why not? - 10 min | Students to go to the following website " www.nationalgeographic.com/science/earth/ring-of-fire/#close " to read more about the Ring of Fire and watch the Nat Geo video; students to go to Google Images to see additional images of the Ring of Fire and its importance - 15 min | Students in pairs, use a Venn Diagram to compare & contrast volcanoes with earthquakes and plate tectonics; have three statements for each section (nine total statements) and share with the class when completed - 20 min | Teacher to review parts of the volcano (dike, magma chamber, vent, sill, crater) and what parts are found in the students' models; review the Ring of Fire, layers of the Earth, convection currents in the mantle, types of volcanoes (shield, cone, composite), and crater lake - 10 min |
| Daily Journal or Bell Work: | Name three things that you know about volcanoes | What is the Rock Cycle? | How do fault lines relate to mountain ranges? | How are volcanoes helpful? | How many parts of the volcano can you correctly identify? |
| Daily Homework: | Is every mountain a volcano? Why or why not? | The Appalachian Mountains are not far from Ohio; we have earthquakes here but not volcanoes, why do you think that is? | <i>ML Science, The Changing Earth, 3.1 Review, #'s 1-6, page 84</i> - Complete each question in complete sentences; due tomorrow! | <i>ML Science, The Changing Earth, "Math in Science", Page 85</i> - Read and answer #'s 1-3; due tomorrow! | How did the lab today help you understand better the shape of volcanoes and how they function? |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | Students to paint or color with magic markers their volcanoes from the previous lab - 20 min | Students to erupt their volcanoes from the previous lab using either baking soda and vinegar - 20 min | <i>ML Science, The Changing Earth, Pages 100-102</i> - Read aloud and use a "Concept Map" to outline how volcanoes effect water inside the earth; provide examples; Teacher to show images on Google Images - 20 min | Teacher to review how continental drift and earthquakes relate to volcanoes; what are the parts of a volcano? How do hot spots relate to continental drift and volcanoes? How does pressure and convection currents in the mantle create volcanoes? - 20 min | <i>ML Science, The Changing Earth, Page 107</i> - As a class review the bar graph and material ejected from eruptions; complete #'s 1-8 together and discuss; answer #'s 9-10 privately via Google Docs and submit to your Teacher - 20 min |

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| 31st Week | Students to illustrate, color, and label the three shapes of volcanoes (cone, composite, shield); depict each as a nature scene, not just a drawing of one singular volcano; students will write a caption describing the characteristics of each volcano type - 30 min | <p><i>ML Science, The Changing Earth, Pages 96-100 (stop at "Volcanic activity affects water")</i> - Read aloud and use a "Main Ideas & Supporting Ideas" graphic organizer to outline information; what are six effects of volcanic eruptions? How do volcanoes effect the weather? - 20 min</p> | <p><i>ML Science, The Changing Earth, "Science on the Job", Page 103</i> - Read aloud and discuss Yellowstone National Park; as a class answer "Explore #'s 1-2" aloud and by illustrating on the Board - 20 min</p> | <p><i>(Part I of II) ML Science, The Changing Earth, Pages 105-106</i> - Students to use 4" x 6" notecards to complete; write the problem on the blank side and the answer on the lined side for each question from #'s 13-28 plus an additional five more that each student creates on their own; submit cards to Teacher to be used for a review game in the next lesson - 30 min</p> | <p><i>(Part II of II) ML Science, The Changing Earth, Pages 105-106</i> - Students to complete answering #'s 13-28 on notecards plus an additional five more with questions and answers; to be turned into Teacher when complete for review game - 10 min</p> |
| | | <p>Watch "Mt. St. Helens Eruption May 18, 1980 720p HD" on YouTube (6:28 min) and discuss the devastation it created; how did it first explode? What features that we learned about were included in this eruption? Why is this eruption special or unique? - 15 min</p> | <p>Watch "Yellowstone Super Volcano" on YouTube (4:03 min) and discuss the danger of the supervolcano that is Yellowstone National Park; how did other previous giant eruptions effect Earth? When did Yellowstone last erupt? - 15 min</p> | | <p>Divide the class into four groups; Teacher to lead review game of volcanoes and material submitted using notecards submitted by students from the previous two lessons - 20 min</p> |
| Daily Journal or Bell Work: | Gather painting or coloring materials | How do Hot Spots relate to volcanoes? | How do volcanoes effect the weather? What is acid rain? | <i>ML Science, The Changing Earth, Page 105</i> - Complete any one of the three problems in "Reviewing Vocabulary #'s 1-3" | <i>ML Science, The Changing Earth, Page 105</i> - Complete any one of the two problems in "Reviewing Vocabulary #'s 1-3" that wasn't completed in the prior lesson |
| Daily Homework: | Illustrate a cone, shield, or composite volcano with a dike, sill, vent, crater, and magma chamber labeled | <i>ML Science, The Changing Earth, 3.2 Review, #'s 1-6, page 93</i> - Complete each question in complete sentences; due tomorrow! | What are your thoughts about the supervolcano under Yellowstone National Park? Is this worrisome or scary? Why or why not? | <i>ML Science, The Changing Earth, Page 105</i> - Complete "Reviewing Key Concepts #'s 4-12"; due tomorrow! | <i>ML Science, The Changing Earth, 3.3 Review, #'s 1-6, page 102</i> - Complete each question in complete sentences; due tomorrow! |
| Project Breakdown: | <i>Students will use Google Slides to present their information about one volcano from the list below. Students will answer each required question or aspect of the project outlined below. There are three in-class days to complete this project and it will replace the test on this unit.</i> | | | | |
| Topics to Answer: | <i>Include a photo of your volcano. What continent, country, and state is your volcano located? How tall is your volcano in meters? What type of volcano is it? Is it located on the Ring of Fire or elsewhere? Does it have a caldera? When did your volcano last erupt and what destruction did it cause? Name one other major eruption other than the most recent eruption. Which of the twelve major plates of Earth is it located on? How do convection currents cause your volcano to erupt? Provide three additional facts about your volcano not already provided</i> | | | | |
| Volcano List: | <i>Mt. Vesuvius, Mt. Pinatubo, Mt. Krakatau, Mt. Etna, Yellowstone National Park, Mauna Loa, Mt. Shasta, Mt. Rainer, Mt. Mazama, Mt. Tambora, Mt. Saint Helens, Soufriere Hills</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |

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| 32nd Week | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | Students in pairs, create a concept map linking together plate tectonics, earthquakes, and volcanoes; include pressure, convection currents, the Ring of Fire, and evidence of Pangaea in your bubbles; must have at least fifteen bubbles; share and discuss with the class when complete - 30 min | In-class time to work on Google Slides project; due in three days! - 50 min | In-class time to work on Google Slides project; due in two days! - 50 min | In-class time to work on Google Slides project; due tomorrow! - 50 min | Presentations of Google Slides projects - 50 min |
| | Teacher to provide requirements for Google Slides project and review them; select volcanoes from list provided - 15 min | | | | |
| Daily Journal or Bell Work: | How do volcanoes relate to continental drift? | How do convection currents in the mantle effect earthquakes and volcanoes? | How do earthquakes and volcanoes occur together? | What is a Hot Spot and how does it cause volcanoes? | Open your Google Slides project and get ready to present it to the class |
| Daily Homework: | Explain how volcanoes, earthquakes, and plate tectonics all relate to each other (one paragraph) | Work on Google Slides Volcano Project, it is due in three days! | Work on Google Slides Volcano Project, it is due in two days! | Work on Google Slides Volcano Project, it is due tomorrow! | None |
| Vocabulary Terms: | <i>Fossil, Original Remains, Ice Core, Amber, Petrified Wood, Molds & Casts, Carbon Films, Trace Fossils, Relative Age, Index Fossil, Absolute Age, Half-Life, Uniformitarianism, Geologic Time Scale, Eon, Era, Period, Epoch, Law of Superposition</i> | | | | |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 0 min | Bellwork - 5 min |

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| 33rd Week | <p><i>ML Science, The Changing Earth, Pages 111-113</i> - Read aloud and discuss what fossils are; use a "Main Idea & Supporting Ideas" graphic organizer to assist in outlining notes; Teacher to discuss that a fossil isn't necessarily bones; what is amber? How did ice and tar help to preserve animal bones previously? - 20 min</p> | <p><i>ML Science, The Changing Earth, Pages 114-117</i> - Read in pairs and discuss; take eight notes about items that students feel are important to know; Teacher to review notes and discuss what elements are important for the upcoming test; How does each type of fossil display life on Earth differently? - 20 min</p> | <p>Students to go to the following website "https://scied.ucar.edu/dendrochronology-interactive" and complete FIRST the Standard Version about tree ring analysis, THEN complete the UK Version; students should notice that the width and color of the tree ring relates to temperature and water available; Teacher to travel to each child to assist directly and point out important features; students must be patient lining up the tree rings, the next step WILL NOT OCCUR if they don't line them up correctly - 20 min</p> | <p>Students to individually use small disposable plastic or styrofoam cups, mix Plaster of Paris in the container and stir is up consistently; this can be completed while watching the video during class; when the plaster is thick and beginning to harden, students will use a small item to create a mold; items can include small rocks (NOT FROM THE SCIENCE LAB) or personal materials; check back at the end of class for stability - 15 min</p> | <p><i>ML Science, The Changing Earth, Pages 119-122</i> - Read aloud and discuss relative age and index fossils; explain why igneous rocks are always younger than other rocks? What are index fossils? How can index fossils display the age of a fossil? Teacher to discuss the Law of Superposition (oldest rocks are usually at the bottom and youngest are usually at the top of rock layers) - 20 min</p> |
| | <p><i>ML Science, The Changing Earth, Page 111</i> - Students in groups of 3 or 4, examine the rock samples provided by the teacher to review fossil; answer the questions about fossils as a class and discuss what is seen in each example - 15 min</p> | <p>Students in pairs, create a "Concept Map" linking together the five different types of fossils (original remains, molds & casts, petrified wood, carbon films, and trace fossils); provide examples of each; include tar, amber, and ice; when complete share with the class and present - 20 min</p> | <p>Students to go to the following website "www.pbslearningmedia.org/resource/nvei.ci.earth.climate/ice-core-record-of-climate/#.XpBYcchKjIU" to learn about ice core deposits; read the paragraph and watch the video about the correlation between ice cores and past rates of gases on Earth; as CO2 increases, what other two things also increase? Why does this present a big problem for humans? - 15 min</p> | <p>Watch "www.dailymotion.com/video/x5vq2ej" about the wholly mammoth (42:01 min) and the search for bones and DNA in the ice; how are scientists hoping to create a clone of the wholly mammoth from the DNA found inside these bones? What do students think about the mammoth being cloned to bring back an extinct animal? - 45 min</p> | <p>Students to illustrate, color, and label index fossils found in a section of five layers of rock; make sure to label the oldest rocks at the bottom and the youngest layers at the top; include an igneous rock formation within the rock layers as well; make sure that the igneous rock layer is the YOUNGEST of all rocks; students to illustrate different fossils in each of the five layers and label them; ages of rock layers should be CLEARLY LABELED as this is the purpose of the activity - 30 min</p> |
| | <p>Watch "Most AMAZING Fossil Discoveries Ever!" on YouTube (12:40 min) and discuss the different fossils referred to? Do you think that dinosaurs had feathers? Why or why not? - 15 min</p> | <p>Teacher to share different fossils with the class and discuss; what makes each fossil distinct? What type of fossil is being displayed with each example? Students to assist in the presentation if available - 10 min</p> | <p><i>ML Science, The Changing Earth, "Timelines in Science", Pages 140-143</i> - Read aloud and discuss the discovery of fossils over time; how did each discovery alter science? Review and discuss - 15 min</p> | | |
| Daily Journal or Bell Work: | <p>What is a fossil? How can it be made?</p> | <p>What are three ways that original remains of organisms can be preserved?</p> | <p>Name three of the five types of fossils; provide an example of each of those three types</p> | <p>None</p> | <p>What are molds and casts? Provide an example of each</p> |
| Daily Homework: | <p>Written Response: Do you think that dinosaurs had features? Why or why not? What research did you discover during the dinosaur project that may have influenced your thoughts?</p> | <p>List the five different types of fossils and provide an example of each</p> | <p><i>ML Science, The Changing Earth, 4.1 Review, #'s 1-6, page 117</i> - Complete each question in complete sentences; due tomorrow!</p> | <p>Written Response: What are your thoughts about scientists cloning extinct animals? Should they bring back the wholly mammoth? Why or why not?</p> | <p><i>ML Science, The Changing Earth, "Connecting Sciences", Page 118</i> - Read and answer "Explore" questions; due tomorrow!</p> |

| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
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| 34th Week | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min |
| | <i>ML Science, The Changing Earth, Pages 123-125</i> - Students to read in pairs and write five notes that you think are important content; Teacher to review notes and discuss as a class; what is Absolute Age? What are half-lives and how do they relate to atoms? Which atom is important to half-lives (Carbon-14)? What is an isotope? - 25 min | Teacher to review half-lives and provide examples; use several examples of calculating math to solve for the half-life of Carbon-14; review what an isotope is; discuss the progression of Carbon-14 loss as time goes on - 15 min | Teacher to review half-lives and provide examples; students to come to the board to solve; provide several examples of calculating math to solve for the half-life of Carbon-14; review what an isotope is; discuss the progression of Carbon-14 loss as time goes on - 15 min | Teacher to go to Google Images to display rock layers; which layers appear to have the youngest rocks? Where are the oldest rocks? What is the Law of Superposition? How do Index Fossils display rock layer ages? - 10 min | (Project #1 - Part I of III) <i>ML Science, The Changing Earth, Pages 130-131</i> - Divide the class in half; one class will create a replica of the timeline on pages 130-131 in the textbook in order from the Hadean Era through today, complete with colored illustrations and labeling of eras and examples of life; the other half will use the "Terms to Know from Week Thirty-Three" to create a story about a time-traveler who personally witnesses each defined aspect throughout the story; the story should be about one hand-written page in length; timelines can be completed on poster boards; share with the class when complete - 50 min |
| | <i>ML Science, The Changing Earth, Page 124</i> - As a class, review the pictures of radioactive breakdown and dating rock layers; how is carbon dating displayed? Teacher to provide examples and students calculate together - 10 min | <i>ML Science, The Changing Earth, Pages 127-129</i> - Read aloud and discuss how Earth is changing; what is uniformitarianism? How does the calendar example of Earth's history explain how Earth and life upon it formed? Are humans relatively new to Earth? What life was here long before us? - 15 min | <i>ML Science, The Changing Earth, Pages 130-133</i> - Read aloud and discuss the different periods of time according to science, which is the largest? Smallest? What is the name of the Era we are in? What are major organisms found in the Eras mentioned in the text? Approximately what percentage of Earth's history existed PRIOR to humans arriving? - 15 min | <i>ML Science, The Changing Earth, Page 139</i> - As a class analyze the diagram and its data; how do the index fossils help display age? Which is the youngest rock? How do you know? As a class, answer #'s 1-5 together; students in pairs, answer "Extended Response #'s 6-7" together via Google Docs and submit to your Teacher - 20 min | |
| | <i>ML Science, The Changing Earth, "Math in Science", Page 126</i> - Read aloud and discuss carbon dating and half-lives; students in pairs, solve #'s 1-2 and "Challenge"; Teacher to review as a class and discuss - 15 min | <i>ML Science, The Changing Earth, Page 127</i> - Students to complete the mini-lab individually; discuss as a class potential events that could go at various parts of the school year - 15 min | Watch "A Brief History of Geologic Time" on YouTube (12:08 min) and discuss the major events of the different time frames; discuss the Precambrian Extinction called "The Great Dying" in which 96% of all life in water and 70% of all land life died - 15 min | <i>ML Science, The Changing Earth, Page 138</i> - Students in pairs, complete "Thinking Critically #'s 21-23" and "The BIG Idea # 26" together including the Concept Map; share maps and predictions with the class and discuss your reasoning for your thoughts - 20 min | |
| Daily Journal or Bell Work: | What are index fossils? Provide an example | What is absolute age? How is it different from relative age? | What is uniformitarianism? How does it relate to changes on Earth? | Name four of the five time frames in Geologic Time | How do Index Fossils display the ages of rocks? Provide an example |

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| Daily Homework: | <i>ML Science, The Changing Earth, Page 138</i> - Complete "Thinking Critically #'s 17-20"; due tomorrow! | <i>ML Science, The Changing Earth, 4.2 Review, #'s 1-6, page 125</i> - Complete each question in complete sentences; due tomorrow! | What do you think about "The Great Dying" of the Precambrian Extinction? What species do you think would survive if that happened today? Sharks, turtles, and crocodiles survived the last one | <i>ML Science, The Changing Earth, 4.3 Review, #'s 1-6, page 133</i> - Complete each question in complete sentences; due tomorrow! | <i>ML Science, The Changing Earth, Page 137</i> - Complete "Reviewing Key Concepts #'s 4-14"; due tomorrow! |
| Timeline: | Day "A" | Day "B" | Day "C" | Day "D" | Day "E" |
| 35th Week | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Bellwork - 5 min | Test on Fossils, Geologic Time, and Early Life - 30 min |
| | <i>(Project #2 - Part I of III)</i> Students in groups of 3 or 4, students will use an inflated balloon as a base with paper mache' to build a volcano or simulate an earthquake; students must include concepts from plate tectonics in their eruption (such as fossils at the top of the mountain) or their quake (such as massive pressure causing movement; students must create a crater & vent or an epicenter & focus; the crater (or focus) will hold the "magma or prssure" (this will be simulated by contained dry ice in an empty 20 oz soda bottle; students must include fossil features such as trace fossils, molds & casts, petrified remains, or original remains in their mountain; today will be just building and the paper mache' part of the assembly MUST BE COMPLETED TODAY - 50 min | <i>Project #1 - Part II of III)</i> - Students will work on their timeline or book, whichever they were assigned; when complete, provided to their Teacher and share with the class - 25 min | <i>Project #1 - Part III of III)</i> - Students will complete their timeline or book, whichever they were assigned; when complete, provided to their Teacher and share with the class - 20 min | Review study guide on fossils, geologic time, and early life - 25 min | |
| | | <i>(Project #2 - Part II of III)</i> Students will paint their volcano or earthquake mountain; students should paint features clearly to understand such as grass, mountain sides, ice at the top, trees, etc. - 25 min | <i>(Project #2 - Part III of III)</i> Students will go outside to erupt their volcanoes or demonstrate their earthquakes; when using dry ice, students MUST STAND BACK AS IT COULD LITERALLY EXPLODE; students to explain the parts of their volcano or earthquake, connect to fossils and plate tectonics, earthquakes, and the type of explosion or motion when it occurs - 30 min | Teacher to lead students in a "Kahoot!" game to review for the test tomorrow; approved and recommended games to play are "Fossils, 15 questions, 20 seconds", "Fossils, 11 questions, 10 seconds", and "Geologic Time, 22 questions, 20 seconds" - 25 min | |

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| Daily Journal or Bell Work: | <i>ML Science, The Changing Earth, Page 137</i> - Complete "Reviewing Key Concepts #'s 15-16" and discuss | Teacher to provide an example of a half-life of Carbon-14 and the time needed to deplete | What was the Cambrian Period? Why was it important? | What are three questions that you have about this unit? | None |
| Daily Homework: | <i>ML Science, The Changing Earth, Page 137</i> - Complete "Vocabulary #'s 1-3"; due tomorrow! | Work on your timeline or story, whichever you were assigned; due tomorrow in class! | Describe your thoughts on the volcano erupting today; how did it display the Cambrian Period? | Study for the Test tomorrow on Fossils, Geologic Time, and Early Life! | None |