



# GANADO

*Unified School District*



## GANADO MIDDLE SCHOOL

(Ganado Unified School District No.20)  
Navajo Route 1, Highway 264, Ganado, AZ 86505

### PACING GUIDE FOR STEM

S.Y. 2021-2022

**(FIRST AND SECOND SEMESTER)**

**CHARO L. DOLOM**

STEM Teacher

Resources	AZ College and Career Readiness Standards	Essential Question (HESS Matrix)	Learning Goal	Vocabulary (Content/Academic)
"Science Explorer, Chemical Building Blocks", Prentice Hall  "Integrated Science", Glencoe	<b>Physical Science</b> P1: All matter in the Universe is made of very small particles.	What is a matter?  What are the properties of matter?	Students will be able to describe matter	Matter Atom Proton Electron Neutron

“ General Science”, AGS  
(American Guidance Service)

“Introduction to Matter”, Holt  
Science and Technology

“Science” Harcourt School  
Publishers

“Science”, ACCESS Building  
Literacy Through Learning

<https://meetedison.com/robot-programming-software/edscratch/>

<https://phet.colorado.edu/>

P2: Objects can  
affect other  
objects at a  
distance.

P3: Changing  
the movement of

What are the  
phases of matter?

What are the  
Properties and  
Characteristics of  
Matter?

What is force?

What are the kinematic  
quantities?

What are the different  
forces in nature?

Students will be able to  
identify properties of  
matter

Students will be able to  
explain the phases of  
matter and give  
examples of each  
phase.  
Students will be able to  
present a model of an  
atom using recyclable  
materials.

Students will be able to  
describe force using  
simple demonstration  
and examples in the  
laboratory

Students should be  
able to discuss  
kinematic quantities

Students should be  
able to give the  
different forces in  
nature using laboratory  
works and simple  
demonstration

Phases of Matter  
Solid Phase  
Liquid Phase  
Gas Phase  
Intrinsic/Extrinsic  
property  
Intensive/Extensive  
property

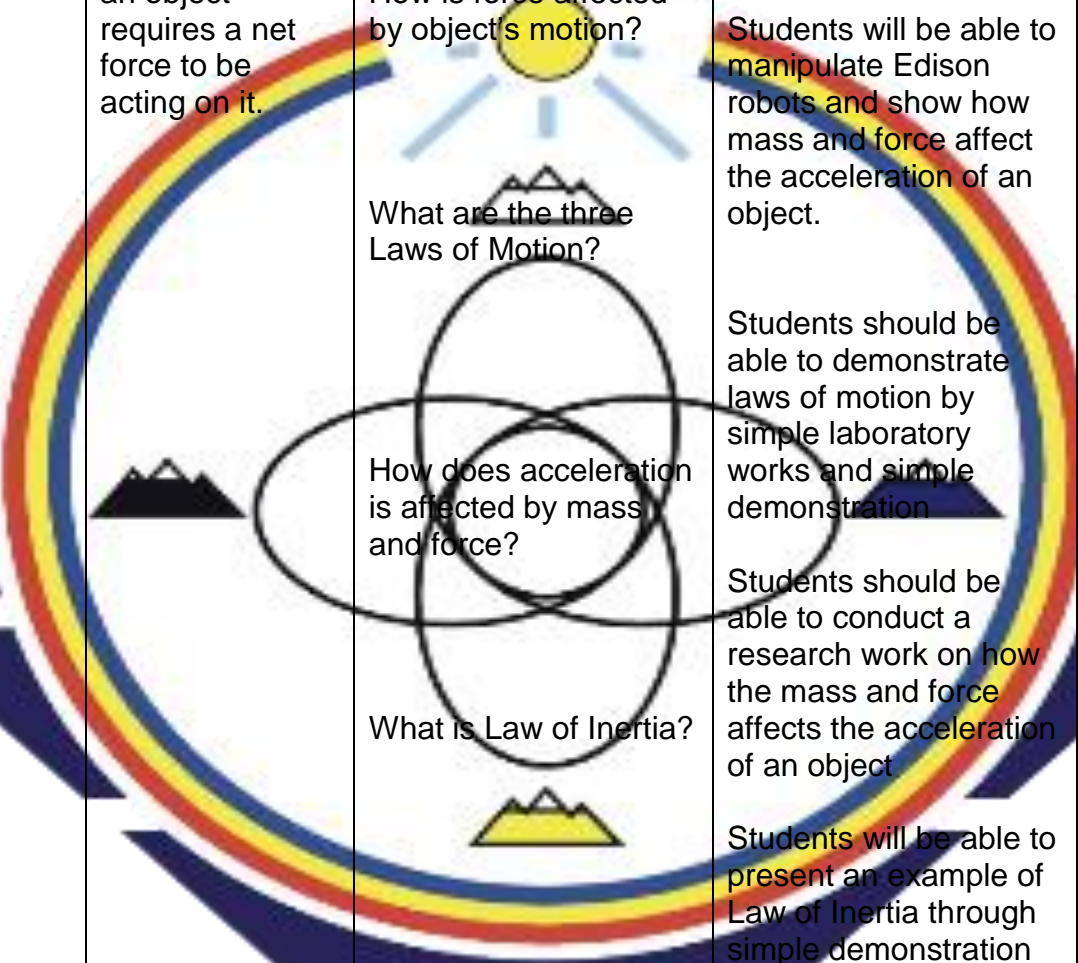
Kinematic Quantities Units  
of Measure

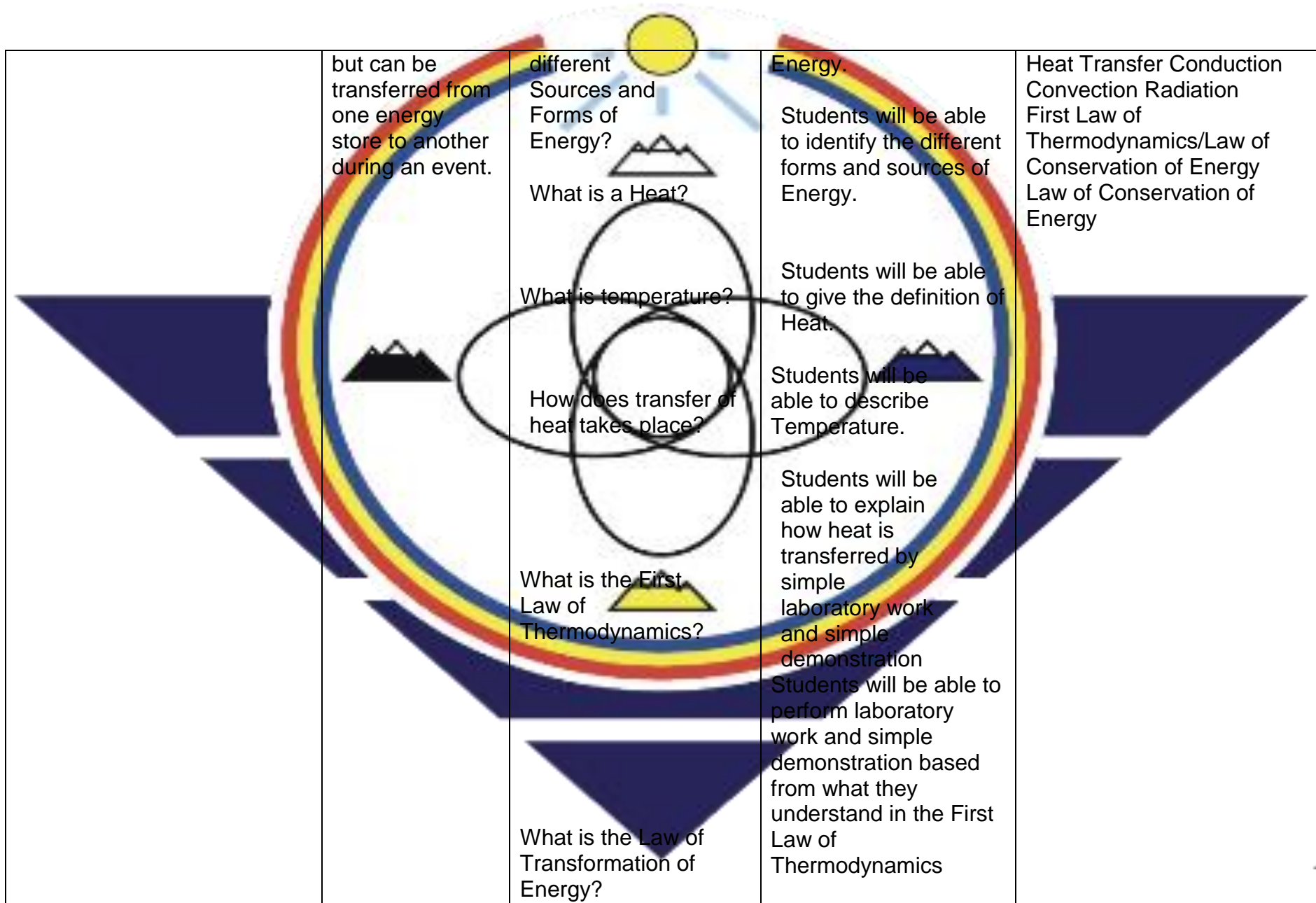
Distance


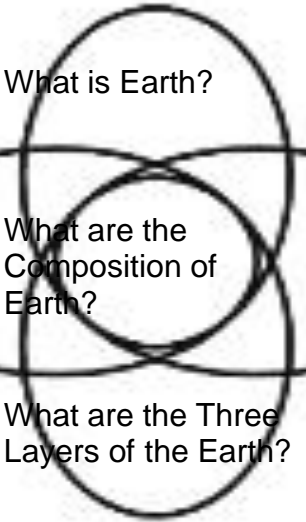
Edscratch programming

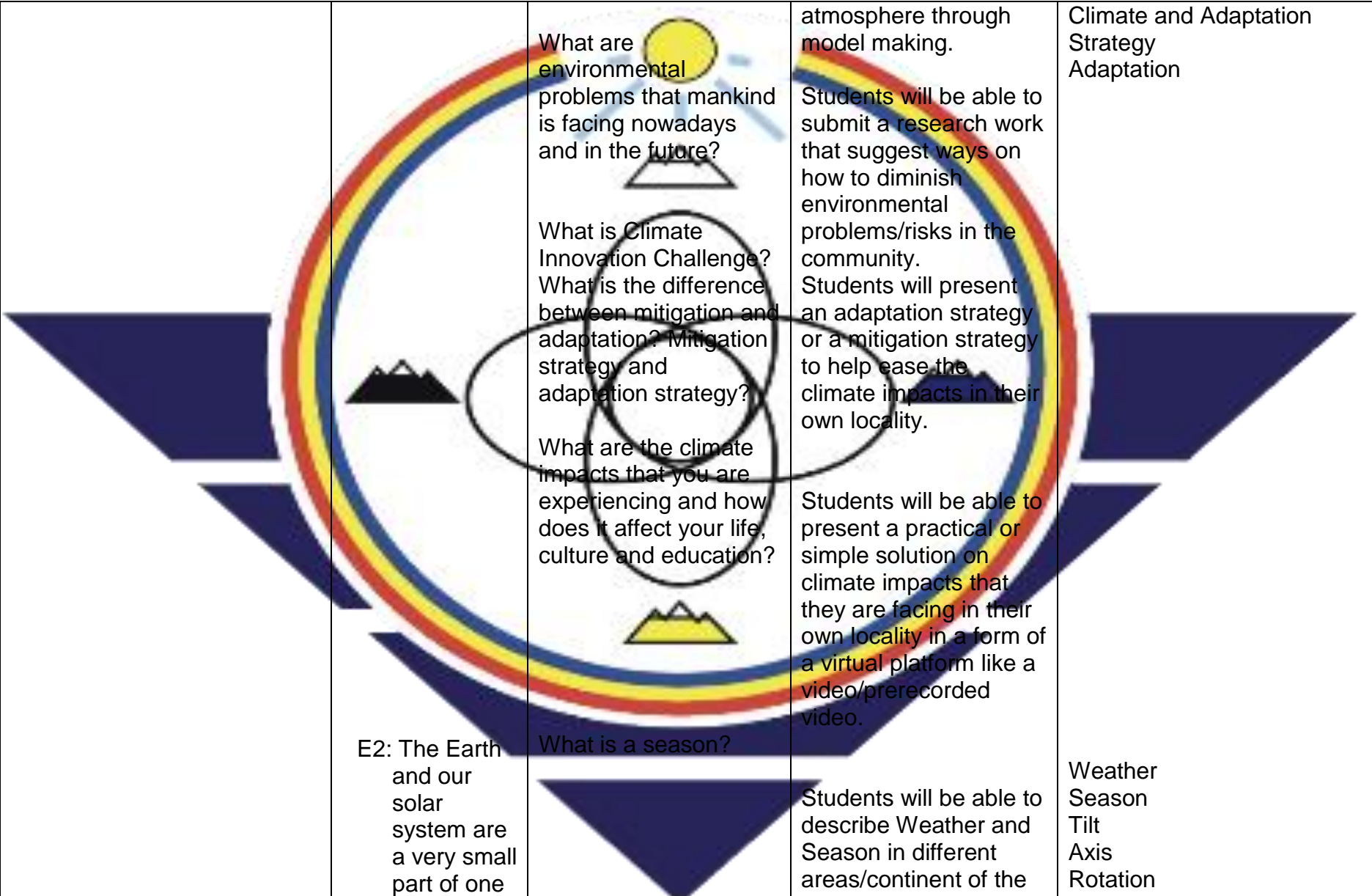
Speed  
Measuring Materials  
Metric System  
English System  
Triple Beam Balance  
Yardstick

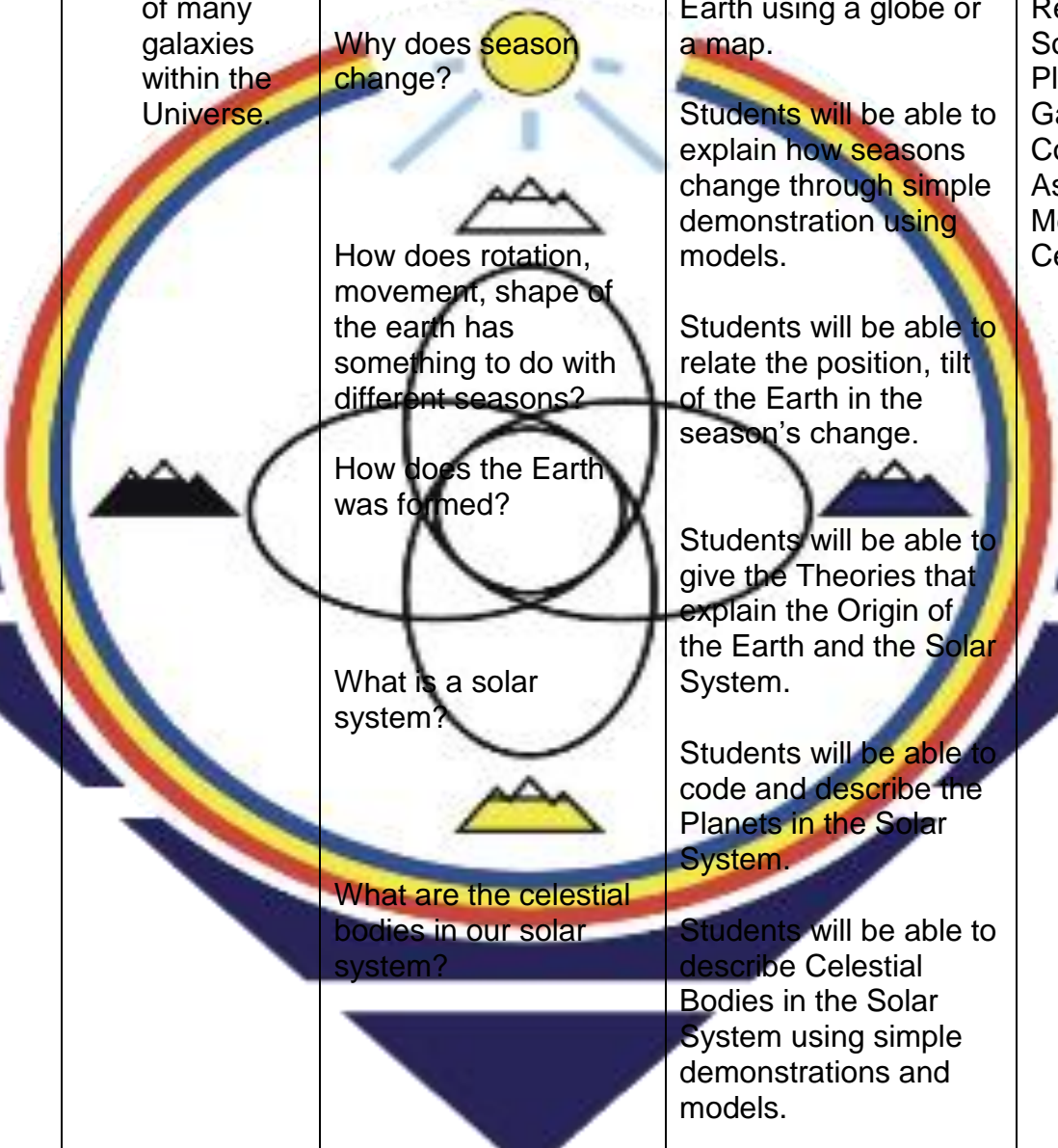
Force  
Tension  
Force  
Weight  
Acceleration  
Gravity  
Displacement  
Motion/Movement  
Inertia

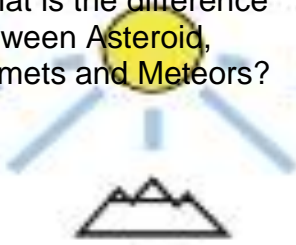
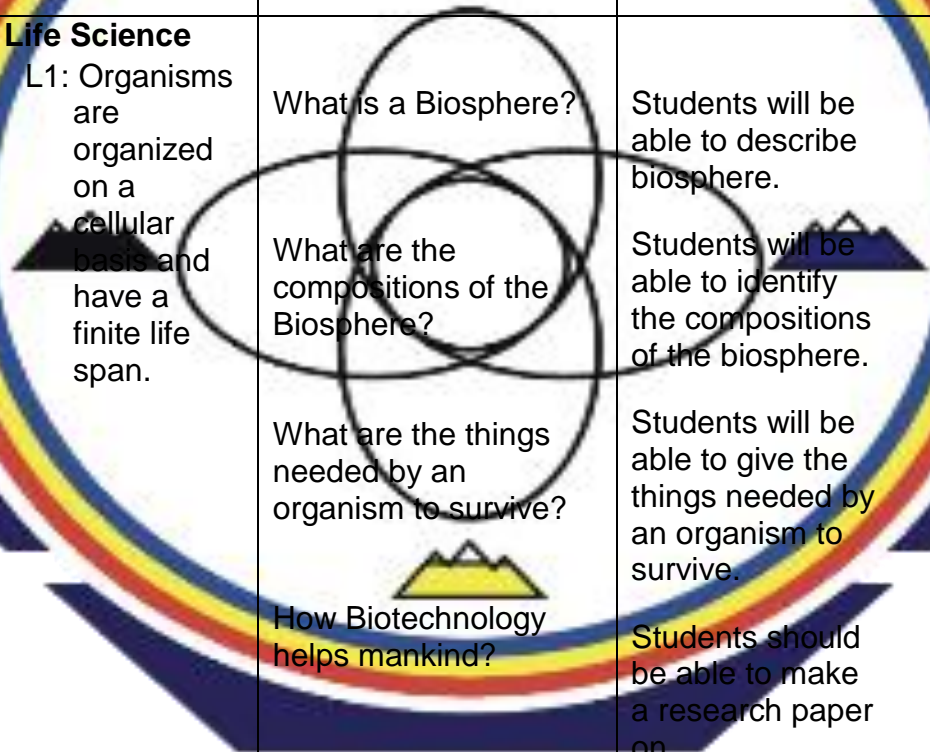
<p>an object requires a net force to be acting on it.</p>	<p>How is force affected by object's motion?</p>  <p>What are the three Laws of Motion?</p> <p>How does acceleration is affected by mass and force?</p> <p>What is Law of Inertia?</p>	<p>Students will be able to manipulate Edison robots and show how mass and force affect the acceleration of an object.</p> <p>Students should be able to demonstrate laws of motion by simple laboratory works and simple demonstration</p> <p>Students should be able to conduct a research work on how the mass and force affects the acceleration of an object</p> <p>Students will be able to present an example of Law of Inertia through simple demonstration and laboratory work</p>	<p>Mass</p> <p>Contact Forces</p> <p>Non-Contact Forces</p> <p>Weak Nuclear Force</p> <p>Strong Nuclear Force</p> <p>Buoyant Force</p> <p>Spring Force</p> <p>Tension Force</p> <p>Air Frictional Force</p> <p>Friction</p> <p>Laws of Motion</p> <p>Law of Inertia</p> <p>Law of Acceleration</p> <p>Law of Interaction/Action-Reaction Law</p>
<p>P4: The total amount of energy in a closed system is always the same</p>	<p>What is an Energy?</p> <p>What are the</p>	<p>Students will be able to describe</p>	<p>Energy Forms and Sources of Energy</p> <p>Heat</p> <p>Temperature</p>



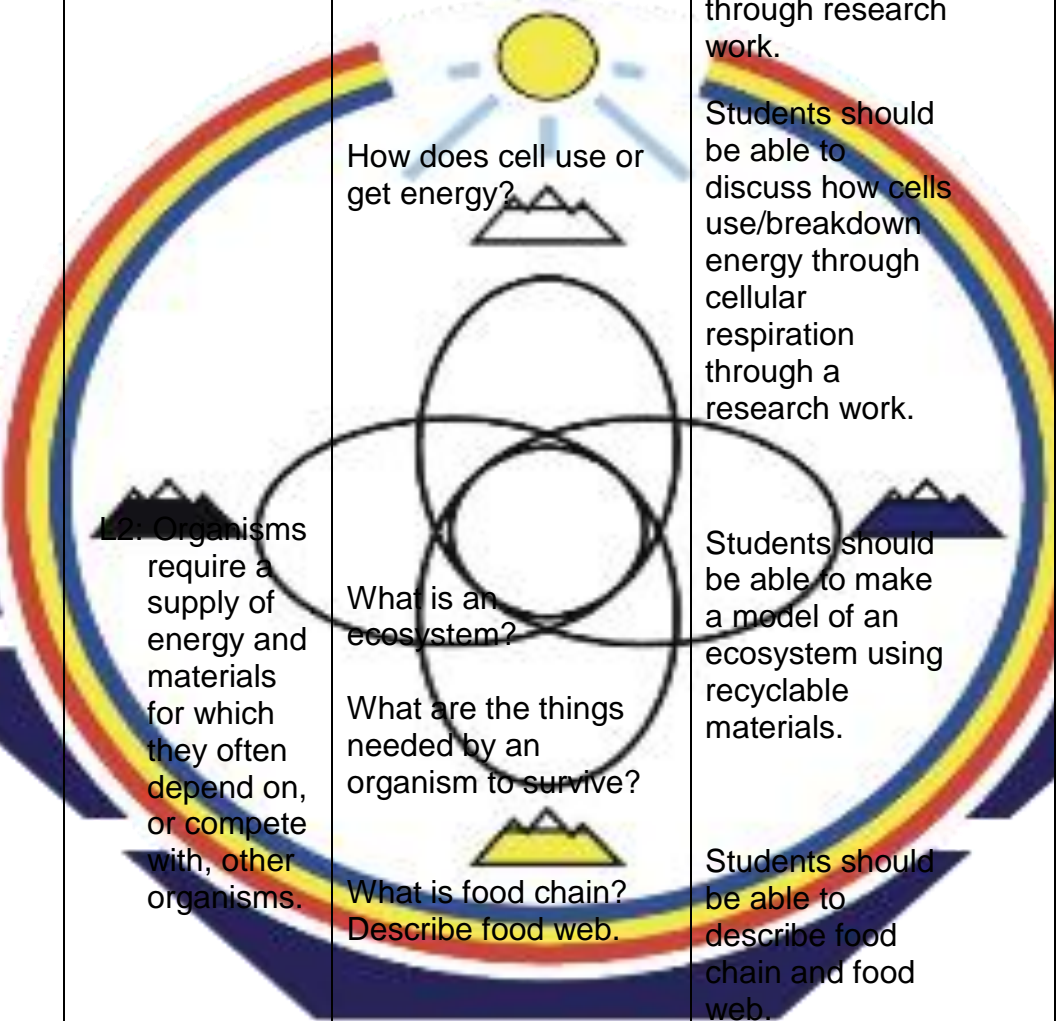
			Students will be able to show an example of the Law of Conservation of Energy through simple laboratory works	
<p>“ General Science”, AGS (American Guidance Service)</p> <p>“Science” Harcourt School Publishers</p> <p>“Science”, ACCESS Building Literacy Through Learning</p> <p>Cavu.org “Climate Innovation Challenge”</p>	<p><b>Earth and Space Science</b></p> <p>E1: The composition of the Earth and its atmosphere and the natural and human processes occurring within them shape the Earth’s surface and its climate.</p>	<p></p> <p>What is Earth?</p> <p>What are the Composition of Earth?</p> <p>What are the Three Layers of the Earth?</p> <p>What is an Atmosphere?</p> <p>What are the Layers of the Atmosphere?</p>	<p>Students will be able to describe Earth.</p> <p>Students will be able to give the composition of Earth.</p> <p>Students will be able to make a model of Three Layers of the Earth.</p> <p>Students will be able to propose ways on how to maintain a healthy atmosphere.</p> <p>Students will be able to describe and give the composition of each layer of the</p>	<p>Earth</p> <p>Crust</p> <p>Mantle</p> <p>Core</p> <p>Composition of the earth</p> <p>Atmosphere</p> <p>Troposphere</p> <p>Stratosphere</p> <p>Mesosphere</p> <p>Ionosphere</p> <p>Exosphere</p> <p>Ozone layer</p> <p>Climate Innovation Challenge</p> <p>Vulnerability</p> <p>Resilience</p> <p>Adaptation</p> <p>Mitigation</p> <p>Natural disaster</p> <p>Natural Calamities</p> <p>Climate Impact</p> <p>Adaptation strategy</p> <p>Mitigation</p> <p>Mitigation strategy</p>

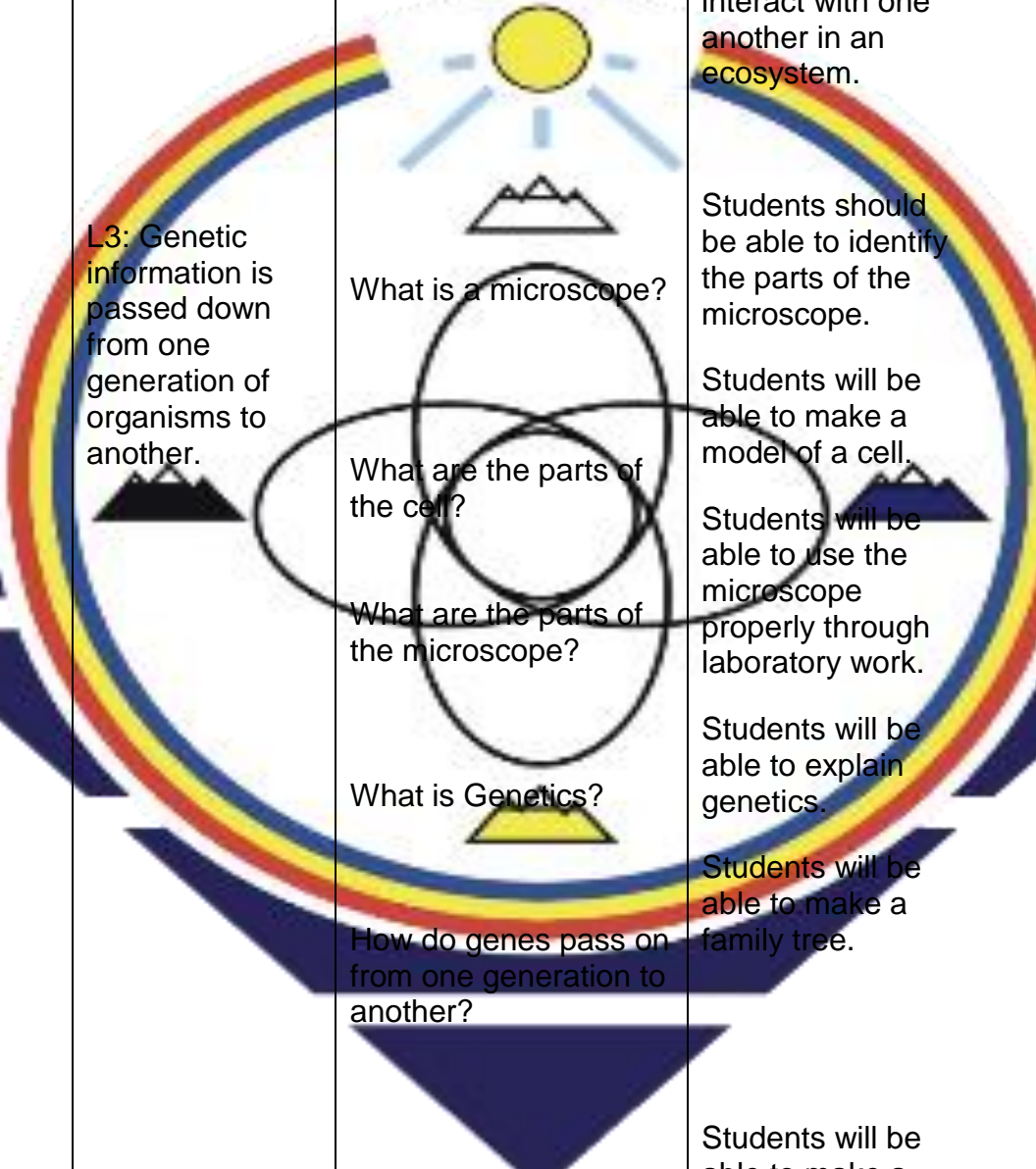
	 <p>E2: The Earth and our solar system are a very small part of one</p>	<p>What are environmental problems that mankind is facing nowadays and in the future?</p> <p>What is Climate Innovation Challenge? What is the difference between mitigation and adaptation? Mitigation strategy and adaptation strategy?</p> <p>What are the climate impacts that you are experiencing and how does it affect your life, culture and education?</p> <p>What is a season?</p>	<p>atmosphere through model making.</p> <p>Students will be able to submit a research work that suggest ways on how to diminish environmental problems/risks in the community. Students will present an adaptation strategy or a mitigation strategy to help ease the climate impacts in their own locality.</p> <p>Students will be able to present a practical or simple solution on climate impacts that they are facing in their own locality in a form of a virtual platform like a video/prerecorded video.</p> <p>Students will be able to describe Weather and Season in different areas/continent of the</p>	<p>Climate and Adaptation Strategy Adaptation</p> <p>Weather Season Tilt Axis Rotation</p>
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	<p>of many galaxies within the Universe.</p>	 <p>Why does season change?</p> <p>How does rotation, movement, shape of the earth has something to do with different seasons?</p> <p>How does the Earth was formed?</p> <p>What is a solar system?</p> <p>What are the celestial bodies in our solar system?</p>	<p>Earth using a globe or a map.</p> <p>Students will be able to explain how seasons change through simple demonstration using models.</p> <p>Students will be able to relate the position, tilt of the Earth in the season's change.</p> <p>Students will be able to give the Theories that explain the Origin of the Earth and the Solar System.</p> <p>Students will be able to code and describe the Planets in the Solar System.</p> <p>Students will be able to describe Celestial Bodies in the Solar System using simple demonstrations and models.</p>	<p>Revolution</p> <p>Solar system and universe</p> <p>Planets</p> <p>Galaxies</p> <p>Comets</p> <p>Asteroids</p> <p>Meteors</p> <p>Celestial Bodies</p>
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		<p>What is the difference between Asteroid, Comets and Meteors?</p> 	<p>Students will be able to make a research on Comets, Asteroids and Meteors.</p>	
<p>“Cells and Heredity”, Prentice Hall Science Explorer</p> <p>“Cells and Heredity”, Interactive Science</p> <p>“General Science”, AGS (American Guidance Service)</p> <p>“Science” Harcourt School Publishers</p> <p>“Science”, ACCESS Building Literacy Through Learning</p> <p><a href="https://www.globe.gov/">https://www.globe.gov/</a></p>	<p><b>Life Science</b></p> <p>L1: Organisms are organized on a cellular basis and have a finite life span.</p> 	<p>What is a Biosphere?</p> <p>What are the compositions of the Biosphere?</p> <p>What are the things needed by an organism to survive?</p> <p>How Biotechnology helps mankind?</p> <p>How do plants make food?</p>	<p>Students will be able to describe biosphere.</p> <p>Students will be able to identify the compositions of the biosphere.</p> <p>Students will be able to give the things needed by an organism to survive.</p> <p>Students should be able to make a research paper on Biotechnology.</p> <p>Students should investigate how plants make food</p>	<p>Biosphere</p> <p>Cell</p> <p>Tissue</p> <p>Organ</p> <p>Organ system</p> <p>Organism</p> <p>Population</p> <p>Community</p> <p>Biotechnology</p> <p>Genetically Modified Organism</p> <p>Tissue culture</p> <p>Cloning</p> <p>Genetic Engineering</p> <p>Bioremediation</p> <p>ATP (Adenosine triphosphate)</p> <p>Photosynthesis</p> <p>Cellular Respiration</p>



	 <p>L2: Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.</p>	<p>How does cell use or get energy?</p> <p>What is an ecosystem?</p> <p>What are the things needed by an organism to survive?</p> <p>What is food chain? Describe food web.</p> <p>How organisms interact with one another?</p>	<p>through research work.</p> <p>Students should be able to discuss how cells use/breakdown energy through cellular respiration through a research work.</p> <p>Students should be able to make a model of an ecosystem using recyclable materials.</p> <p>Students should be able to describe food chain and food web.</p> <p>Students should be able to explain how organisms</p>	<p>Ecosystem  Food chain  Food web  Producer/Autotroph  Consumer/Heterotroph  Decomposers  Omnivore  Carnivore  Herbivore  Adaptation  Commensalism  Predation  Mutualism  Survival of the fittest</p>
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	<p>L3: Genetic information is passed down from one generation of organisms to another.</p> 	<p>What is a microscope?</p> <p>What are the parts of the cell?</p> <p>What are the parts of the microscope?</p> <p>What is Genetics?</p> <p>How do genes pass on from one generation to another?</p>	<p>interact with one another in an ecosystem.</p> <p>Students should be able to identify the parts of the microscope.</p> <p>Students will be able to make a model of a cell.</p> <p>Students will be able to use the microscope properly through laboratory work.</p> <p>Students will be able to explain genetics.</p> <p>Students will be able to make a family tree.</p> <p>Students will be able to make a</p>	<p>Microscope Microscopy Mechanical parts of the microscope Optical parts of the microscope Genetics Gregor Mendel Heredity Mendelian Genetics Non-Mendelian Genetics Allele Homozygous Heterozygous Phenotype Genotype Monohybrid cross Dihybrid cross Offspring Probability Genetic Engineering Cloning Genetic counselling</p> <p>Biodiversity</p>
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	<p>L4: The unity and diversity of organisms, living and extinct, is the result of evolution.</p>	<p>What is the importance of biodiversity in an ecosystem?</p> <p>How does organism become extinct?</p>	<p>research on the flora and fauna in different continents and major regions of the Earth.</p> <p>Students should be able to propose ways/suggestions on how to avoid extinction of an organism.</p>	<p>Extinction Evolution Charles Darwin Theory of Natural Selection</p>
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