

## ONWARD Eighth Grade Science Year at a Glance and Storyline (below)

**\*Timing of Units Subject to Change**

Energy is the thread through all of the eighth grade science units. Connect the learning in each unit back to energy:

- where did the energy come from?
- where did the energy go?
- what forms of energy are present?

Unit	1: <a href="#">Building Community and Reviewing Learning</a>	2: Our Place in Space	3: Weather and Climate	4: Energy	5: Force and Motion	6: Matter and Its Interactions
<b>Timeline</b>	7-10 days	28-30 days	40-42 days	26-28 days	27-29 days	19-21 days
<b>Summary Statement</b>	Students and teachers will work together to build a positive classroom community and individual relationships in a remote learning setting. In this unit, students will also have an opportunity to <b>revisit significant skills that they learned in the spring of 2020</b> during the onset of COVID and the lockdown of our schools and communities.	A study of Earth's position in the Universe and its impact on our experience of many natural phenomenon.	A study of weather and climate and factors affecting global temperature.	A study of energy transformations, conservation, and the quantitative and qualitative relationships related to energy and waves.	A study of the physical forces that govern our universe.	A study of the properties of matter that allow its separation and conservation.
<b>40-Year Learning</b>			<i>"Weather is driven by the sun, climate is</i>	<i>"All of the energy in the universe has</i>	<i>"Our Universe is governed by physical</i>	<i>"Matter cannot be created or destroyed,</i>

			<i>determined by location and can be impacted by humans."</i>	<i>always been and will always be; it can only be stored, moved, or changed."</i>	<i>laws of force and motion."</i>	<i>it transforms due to its properties."</i>
<b>Focus Questions</b>		<ul style="list-style-type: none"> <li>• How do forces explain the movement of objects in the solar system and universe?</li> <li>• How do scientists use evidence to explain, develop, support, and discredit theories?</li> <li>• How do forces and motion create patterns on Earth?</li> </ul>	<ul style="list-style-type: none"> <li>• How does energy drive our weather?</li> <li>• How is climate impacted by energy on our planet?</li> </ul>	<ul style="list-style-type: none"> <li>• What is Energy?</li> <li>• How does energy move and how do I know?</li> <li>• What are the properties of waves? What are the relationships (mathematical representations)?</li> </ul>	<ul style="list-style-type: none"> <li>• How do we describe motion?</li> <li>• What is the relationship between force and motion?</li> <li>• How does energy affect the Laws of Force and Motion?</li> </ul>	<ul style="list-style-type: none"> <li>• How does energy drive changes in matter?</li> <li>• How do humans interact with energy and matter?</li> </ul>
<b>FLVS Supporting Modules</b> (All Lessons Unless Otherwise Denoted)	Middle School Comprehensive Science III: Getting Started	Middle School Comprehensive Science III: Module 5: The Universe  Middle School Comprehensive Science III: Module 6: Our Solar System	Middle School Comprehensive Science I: Module 3: The Atmosphere	*Middle School Comprehensive Science II: Module 1: Matter and Energy (Lessons 3-5, *Other lessons are taught in 6th grade)  Middle School Comprehensive Science II: Module 5: Energy Resources	Middle School Comprehensive Science I: Module 1: Force and Energy	*Middle School Comprehensive Science III: Module 1: Matter (Units 3-5, *Other lessons are taught in 6th grade)  *Middle School Comprehensive Science III: Module 2: Changes in Matter (Lessons 2-5, *Other lessons taught in 6th grade)
<b>Discovery Ed Science Techbook</b>		Course, Unit, & Concept Grade 8	Course, Unit, & Concept Grade 6	Course, Unit, & Concept Grade 6	Course, Unit, & Concept Grade 8	Course, Unit, & Concept Grade 6

<p><b>Supporting Modules</b></p>		<p>Unit 2: Moving Planets          Concept 2.1: Observing Planetary Objects          Concept 2.2: Planetary Forces          Concept 2.3: Orbital Forces          Concept 2.4: Energy in the Universe</p>	<p>Unit 2: Causes of Weather          Concept 2.1: Energy Transfer in the Water Cycle          Concept 2.2: Weather Patterns          Unit 4: Our Changing Climate          Concept 4.1: Causes of Climate Change          Concept 4.2: Climate Change Impacts          Organisms          Concept 4.3: Reducing Human Impacts on the Environment          Grade 8          Unit 4: Monitoring Biodiversity          Concept 4.1: Nature of Waves          Concept 4.2: Waves and Matter          Concept 4.3: Warming Earth</p>	<p>Unit 2: Causes of Weather          Concept 2.1: Energy Transfer in the Water Cycle          Grade 7          Unit 1: Matter All Around          Concept 1.1: Particles in States of Matter          Grade 8          Unit 1: Objects Move and Collide          Concept 1.1: Falling Objects          Concept 1.2: Energy for Launch          Concept 1.3: Colliding Objects          Unit 4: Monitoring Biodiversity          Concept 4.1: Nature of Waves</p>	<p>Unit 1: Objects Move and Collide          Concept 1.1: Falling Objects          Concept 1.2: Energy for Launch          Concept 1.3: Colliding Objects</p>	<p>Unit 4: Our Changing Climate          Concept 4.3: Reducing Human Impact          Grade 7          Unit 2: Matter Cycles and Energy Flow          Concept 2.1: How Matter Can Change          Unit 4: Sustaining Ecosystems          Concept 4.2: Synthetic</p>
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## 8th Grade Science Story

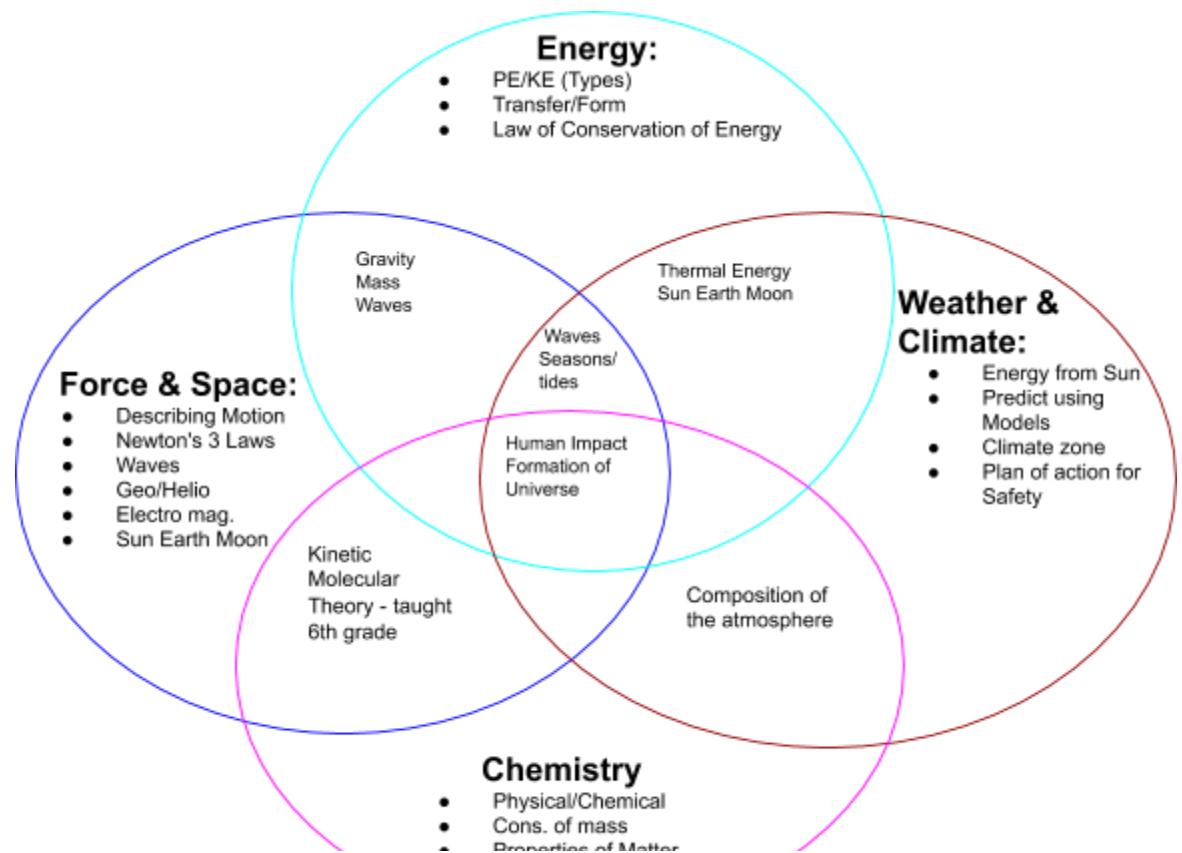
Energy provides the overarching topic for the year, all units of study tie back to Energy. Science practices should be embedded within the units of study throughout the year.

### Unit 1

Students will understand that there are two types of energy: potential and kinetic. Students will extend their understanding of the relationship between potential and kinetic energy to learn that energy can be transferred and transformed while being conserved.

### Unit 2

Students know that energy is the ability to cause change. Students combine this knowledge with their understanding of potential and kinetic energy, forms of energy and the law of conservation of energy to explain how and why things move. Mathematical formulas can



be used to reinforce this understanding. Using Newton's three Laws of Motion students apply their knowledge to objects in our solar system. Student understanding of the Sun/Earth/Moon system in this unit is key to their understanding of weather and climate. Students will apply their understanding of where we are in space to what we see and experience on Earth.

The linking concept between space and weather is the study of the Earth/Moon/Sun system. This includes seasons, moon phases, eclipses, and tides. The overarching concept is how energy impacts each of these relationships and the Earth's place in the universe.

### **Unit 3**

Once students have an understanding of the motion of the Earth in our solar system and the impacts of that motion, our focus returns to Earth. Here students will learn how radiant energy from the sun drives our weather and shapes different climate zones. Students pull forward their knowledge of states of matter, energy, and force to understand weather patterns.

### **Unit 4**

The Chemistry unit focuses on properties of matter (students study this in 6th grade) physical/chemical change and the Law of Conservation of Mass and human impact. Since students have mastered the Law of Conservation of Energy the transfer to matter should be natural. The importance of separation of matter is taught through the lens of environment. Human impact ties in beautifully here! If matter isn't created or destroyed during physical and chemical changes, it is always in the universe in some form. How do we ensure the combinations of matter are not adversely altering our environment? How do we use properties of matter to separate matter (including harmful forms). Students learn how to separate mixtures, why it's possible, and why it is important. The kids will learn how mass is conserved during both physical and chemical change. Again, bring back energy as the driving force behind these changes.