Reading Focus: Literature  
Writing Focus: Narrative  

Unifying Concept: Life Science  
Our Genes/Evolution

<table>
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| The goal of science is to understand the natural world. Students must learn to use scientific practices and accumulated knowledge to better understand the world around them. All organisms reproduce either sexually or asexually by passing genes from parent to offspring. Both Heredity and environment play a role in determining the traits of an organism. Organisms adapt to their environment and natural selection is the process by which organisms favorably adapt and survive to reproduce. Difficult ethical issues can occur when using information obtained from biotechnology. | - How do organisms reproduce?  
- How are traits passed from one generation to the next?  
- In what ways do both heredity and environment determine an organism’s trait?  
- How does natural selection occur?  
- Why must a specie be able to adapt to their environment?  
- How can the processes of evolution be analyzed and described?  
- What are the pros and cons of the use of biotechnology? | Heredity  
Gene  
Allele  
Dominant  
Recessive  
Homozygous  
Heterozygous  
Punnett Square  
Codominant  
Incomplete dominance |

Academic Vocabulary: Environment  
Adaptation  
Variation  
Natural Selection

2004 AZ Standards

Highly-Leveraged Standards

PO1. Explain the purposes of cell division.  
- Growth  
- Reproduction  
PO2. Explain the basic principles of heredity using the human examples of:  
- Eye color  
- Widow’s peak  
- Blood type  
PO3. Distinguish between the nature of dominate and recessive traits in humans.

PO1. Explain how an organism’s behavior allows it to survive in an environment.

Supporting Standards

Strand 2: History and Nature of Science  
8.S2.C1 History of Science as a Human Endeavor: Identify individual, cultural and technological contributions to scientific knowledge.  
PO1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson ad Crick [scientists], supports Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).  
PO2. Evaluate the effects of the following major scientific milestones on society:  
- Mendelian Genetics  
- Newton’s Laws  
PO3. Evaluate the impact of a major scientific development occurring within the past decade.  
PO4. Evaluate career opportunities related to life and physical sciences.
**PO2.** Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.

**PO3.** Determine characteristics of organisms that could change over several generations.

**PO4.** Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).

**PO5.** Analyze the following behavioral cycles of organisms:
- Hibernation
- Migration
- Dormancy (plants)

**PO6.** Describe the following factors that allow the survival of living organisms:
- Protective coloration
- Beak design
- See dispersal
- Pollination

---

**Strand 3: Science in Personal and Social Perspectives**

**8.S3.C2 Science and Technology in Society:** Develop viable solutions to a need or problem.

**PO1.** Propose viable methods of responding to an identified need or problem.

**PO2.** Compare possible solutions to best address an identified need or problem.

**PO3.** Design and construct a solution to an identified need or problem using simple classroom materials.

**PO4.** Compare risks and benefits of the following technological advances:
- Radiation treatments
- Genetic engineering
- Airbags

---

**Strand 1: Inquiry Process (HLS – 35%)**

**8.S1.C1 Observations, Questions, and Hypotheses:** Formulate predictions, questions, or hypotheses based on observations.

**PO1.** Formulate questions based on observations that lead to the development of a hypothesis.

**PO2.** Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis.

**PO3.** Generate a hypothesis that can be tested.


**PO1.** Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

**PO2.** Design a controlled investigation to support or reject a hypothesis.

**PO3.** Conduct a controlled investigation to support or reject a hypothesis.

**PO4.** Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).

**PO5.** Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

**8.S1.C3 Analysis and Conclusions:** Analyze and interpret data to explain correlations and results; formulate new questions.

**PO1.** Analyze data obtained in a scientific investigation to identify trends.
PO2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

PO3. Interpret data that show a variety of possible relationships between two variables, including:
   - Positive relationship
   - Negative relationship
   - No relationship

PO4. Formulate a future investigation based on the data collected.

PO5. Explain how evidence supports the validity and reliability of a conclusion.

PO6. Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).

PO7. Critique scientific reports from periodicals, television, or other media.

PO8. Formulate new questions based on the results of a previous investigation.


PO1. Communicate the results of an investigation.

PO2. Choose an appropriate graphic representation for collected data:
   - Line graph
   - Double bar graph
   - Stem and leaf plot
   - Histogram

PO3. Present analyses and conclusions in clear, concise formats.

PO4. Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns).

PO5. Communicate the results and conclusion of the investigation.

Strand 2: History and Nature of Science


PO1. Apply the following scientific processes to other problem solving or decision making situations:
   - Observing
   - Questioning
   - Communicating
   - Comparing
   - Measuring
   - Predicting
   - Organizing data
   - Inferring
   - Generating hypotheses
   - Identifying variables
2019-2020 Science Curriculum Map, Grade 8

- Classifying
  PO2. Describe how scientific knowledge is subject to change as a new information and/or technology challenges prevailing theories.
  PO3. Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator’s credibility with other scientists and society.
  PO4. Explain why scientific claims may be questionable if based on very small samples of data, biased samples, or samples for which there was no control.

Strand 3: Science in Personal and Social Perspectives
8.S3.C1 Changes in Environment: Describe the interactions between human populations, natural hazards, and the environment.

PO1. Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:
- Waste disposal of industrial chemicals
- Greenhouse gases

PO2. Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.

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<td>Systems &amp; System Models</td>
</tr>
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<td></td>
</tr>
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</tr>
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Social Justice Standards

Identity 3 – I know that overlapping identities combine to make me who I am and that none of my group identities on their own fully defines me or any other person. (ID.6-8.3)

Diversity 6 – I interact with people who are similar to and different from me, and I show respect to all people. (DI.6-8.6)

Diversity 9 – I know I am connected to other people and can relate to them even when we are different or when we disagree. (DI.6-8.9)

Justice 12 – I can recognize and describe unfairness and injustice in many forms including attitudes, speech, behaviors, practices and laws. (JU.6-8.12)

Action 19 – I will speak up or take action when I see unfairness, even if those around me do not, and I will not let others convince me to go along with injustice. (AC.6-8.19)

Teaching Tolerance Anti-Bias Framework [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

Adopted Texts and Materials

Textbook:
- SEPUP Our Genes, Ourselves
- SEPUP Evolution

Multicultural Book aligned with Our Genes, Ourselves/Evolution Science Resource Kit:
The Evolution of Calpurnia Tate (2009) (IL:5-8  RL:5.3)  In central Texas in 1899, eleven-year-old Callie Vee Tate learns about love from the older three of her six brothers and studies the natural world with her grandfather which leads to an important discovery.

### Science Module Supplemental Resources

<table>
<thead>
<tr>
<th>Instructional and Assessment Guides</th>
<th>Additional Instructional Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Culturally Responsive Practices</strong> <em>(TUSD SPARKS, SPARKS Strategies)</em></td>
<td><strong>TUSD Science Module Supplemental Resources</strong></td>
</tr>
<tr>
<td>Pre/Post Unit Assessment:</td>
<td><strong>Science Spot Website – general science page</strong></td>
</tr>
<tr>
<td>- <a href="http://intranet/science/Kit_Asmts.html">http://intranet/science/Kit_Asmts.html</a></td>
<td><strong>Bill Nye videos</strong></td>
</tr>
<tr>
<td><strong>Formative/Performance Assessment Examples:</strong></td>
<td><strong>Mythbusters episodes to discuss scientific method</strong></td>
</tr>
<tr>
<td>- Complete a lab report that includes question, hypothesis, variables, procedure, table, graph, and conclusion.</td>
<td><strong>Flinn science safety contract</strong></td>
</tr>
<tr>
<td>- Write an original procedure to conduct a controlled experiment. (Black worm Activity)</td>
<td><strong>Southern Arizona Regional Science and Engineering Fair</strong> website has great resources to help create a science fair project</td>
</tr>
<tr>
<td>- Identify the parts of the scientific process within an episode of Mythbusters.</td>
<td><strong>The Great Fossil Find Activity to demonstrate the nature of science</strong></td>
</tr>
<tr>
<td>- Lab Safety Test</td>
<td><strong>Science Spot Website – Biology page</strong></td>
</tr>
<tr>
<td>- Identify independent and dependent variables given synopses of a scientific investigation.</td>
<td><strong>Brainpop</strong> (Subscription required)</td>
</tr>
<tr>
<td>- Draw Punnett squares to predict the possible genotypes of offspring from specific parent genotypes.</td>
<td><strong>Mendel Pea experiments simulation</strong></td>
</tr>
<tr>
<td>- Complete a mock crime scene investigation involving knowing how blood types are inherited.</td>
<td><strong>Click-n-Clone mouse simulation</strong></td>
</tr>
<tr>
<td>- Draw an evolutionary tree to show how whales evolved from land animals.</td>
<td><strong>YouTube: Explore more / Genetic Engineering</strong></td>
</tr>
<tr>
<td>- Use a model to simulate how natural selection works.</td>
<td><strong>TUSD Science Center</strong> – Genes, Ourselves / evolution resource module</td>
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### Reading Focus: Literature

**Writing Focus: Argumentative**

### Unifying Concept: Physical Science

**Chemical Building Blocks**

<table>
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| The goal of science is to understand the natural world. Students must learn to use scientific practices and accumulated knowledge to better understand the world around them. Everything in the universe is composed of matter and energy. Matter can be identified based on the chemical and physical properties. Interactions between matter cause chemical changes that produce new substances with different chemical properties. Energy transfers affect the physical and chemical properties of matter. The smallest unit of matter is the atom. Different types of atoms (elements) are organized on the periodic table in a predictable manner. Knowing the placement of an element on the periodic table can give information on its chemical properties. | - What are characteristic properties and how do they help identify unknown substances?  
- How do we measure physical and chemical properties?  
- How do physical and chemical changes affect matter?  
- How do we create models of something we can’t see?  
- How does atomic structure determine interactions of matter?  
- How is the organization of the Periodic Table of the Elements used to help us understand matter?  
- Who was involved in creating the Periodic Table of Elements? | - Solid  
- Liquid  
- Gas  
- Melting  
- Freezing  
- Vaporization  
- Condensation  
- Boiling point  
- Melting point  
- Volume  
- Mass  
- Density | - Precipitate  
- Mixture  
- Solution  
- Homogeneous  
- Heterogeneous  
- Element  
- Compound  
- Atom  
- Molecule |

### 2004 AZ Standards

<table>
<thead>
<tr>
<th>Highly-Leveraged Standards¹</th>
<th>Supporting Standards²</th>
</tr>
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</table>

#### Strand 5: Physical Sciences (HLS – 31%)

**8.S5.C1 Properties and Changes of Properties in Matter:** Understand physical and chemical properties of matter.

**PO1.** Identify different kinds of matter based on the following physical properties:
- States
- Boiling point
- Solubility

**PO2.** Identify different kinds of matter based on the following chemical properties:
- Reactivity
- pH
- oxidation (corrosion)

**PO3.** Identify the following types of evidence that a chemical reaction has occurred:

**Strand 2: History and Nature of Science**

**8.S2.C1 History of Science as a Human Endeavor:** Identify individual, cultural and technological contributions to scientific knowledge.

**PO1.** Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson ad Crick [scientists], supports Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).

**PO2.** Evaluate the effects of the following major scientific milestones on society:
- Mendelian Genetics
- Newton’s Laws

**PO3.** Evaluate the impact of a major scientific development occurring within the past decade.

**PO4.** Evaluate career opportunities related to life and physical sciences.
- formation of a precipitate
- generation of gas
- color change
- absorption or release of heat

**PO4.** Classify matter in terms of elements, compounds, or mixtures.

**PO5.** Classify mixtures as being homogeneous or heterogeneous.

**PO6.** Explain the systematic organization of the periodic table.

**PO7.** Investigate how the transfer of energy can affect the physical and chemical properties of matter.

### Strand 3: Science in Personal and Social Perspectives

**8.S3.C1 Changes in Environment:** Describe the interactions between human populations, natural hazards, and the environment.

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- Communicating
- Comparing
- Measuring
- Classifying
- Organizing data
- Inferring
- Generating hypotheses
- Identifying variables

PO2. Describe how scientific knowledge is subject to change as a new information and/or technology challenges prevailing theories.

PO3. Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator’s credibility with other scientists and society.

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- **Diversity 9** – I know I am connected to other people and can relate to them even when we are different or when we disagree. (DI.6-8.9)
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- **Action 19** – I will speak up or take action when I see unfairness, even if those around me do not, and I will not let others convince me to go along with injustice. (AC.6-8.19)

Teaching Tolerance Anti-Bias Framework [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

Teaching Toleran
cce Anti-

Textbook:
- Prentice Hall Chemical Building Blocks text book and teaching resource book

<table>
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<th>Science Module Supplemental Resources</th>
<th>Multicultural Inclusive Strategies</th>
</tr>
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</table>

Adopted Texts and Materials
### Instructional and Assessment Guides

**Culturally Responsive Practices** ([TUSD SPARKS](#), [SPARKS Strategies](#))

**Pre/Post Unit Assessment:**
- [http://intranet/science/Kit_Asmts.html](http://intranet/science/Kit_Asmts.html)

**Formative/Performance Assessment Examples:**
- Measure the mass and volume of different samples of the same substances to determine the densities.
- Complete multiple tests on unknown substances to determine their characteristic properties in order to identify them.
- Complete a variety of changes and determine whether each change is chemical or physical.
- Test the pH of a variety of household chemicals and arrange them from most acidic to most basic.
- Create an element advertisement that describes a specific element and discusses its uses.
- Use the periodic table to play bingo.
- Create a brochure providing information about climate change, hazardous wastes, or chemical spills.
- Draw diagrams of the greenhouse effect and explain how humans have influenced the effect.

### Additional Instructional Resources

- [TUSD Science Module Supplemental Resources](#)
- [Sciencespot – Chemistry page](#)
- [Brain Pop](#) (subscription required)
- [Bill Nye videos](#)
- [Alien Juice Bar pH activity](#)
- [Brainpop.com](#) (Subscription required)
- YouTube: Periodic Table/elements Song:
  - [Video 1](#)
  - [Video 2](#)
  - [Video 3](#)
  - [Video 4](#)
- [Toxmystery](#) (online activity about hazardous chemicals in the home)
- [A student’s guide to global climate change](#)
- [History of the Periodic Table](#)

### Resource Books:

- The Elements: A visual Exploration of Every Known Atom in the Universe
  - Author: Theodore Gray
### Unifying Concept: Physical Science Motion, Forces and Energy

<table>
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<td>How can we explain that everything in the universe is in motion?</td>
<td>Time</td>
</tr>
<tr>
<td>What are specific ways we can describe an object’s motion and the change in motion?</td>
<td>Distance</td>
</tr>
<tr>
<td>In what ways do forces occur?</td>
<td>Displacement</td>
</tr>
<tr>
<td>Where do we see examples of the laws of motion in our daily lives?</td>
<td>Speed</td>
</tr>
<tr>
<td>How do mass and force determine acceleration?</td>
<td>Velocity</td>
</tr>
<tr>
<td>How is energy conserved within a system?</td>
<td>Acceleration</td>
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</tbody>
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### 2004 AZ Standards

#### Highly-Leveraged Standards

**Strand 5: Physical Science (HLS – 31%)**

**8.SS.C2 Motion and Forces:** Understand the relationship between force and motion

- **PO1.** Demonstrate velocity as the rate of change of position over time.
- **PO2.** Identify the conditions under which an object will continue in its state of motion (Newton’s 1st Law of Motion).
- **PO3.** Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton’s 2nd Law of Motion).
- **PO4.** Describe forces as interactions between bodies (Newton’s 3rd Law of Motion).
- **PO5.** Create a graph devised from measurements of moving objects and their interactions, including:
  - position-time graphs

#### Supporting Standards

**Strand 2: History and Nature of Science**

**8.S2.C1 History of Science as a Human Endeavor:** Identify individual, cultural and technological contributions to scientific knowledge.

- **PO1.** Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson ad Crick [scientists], supports Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).

- **PO2.** Evaluate the effects of the following major scientific milestones on society:
  - Mendelian Genetics
  - Newton’s Laws

- **PO3.** Evaluate the impact of a major scientific development occurring within the past decade.

- **PO4.** Evaluate career opportunities related to life and physical science.
2019-2020 Science Curriculum Map, Grade 8

- velocity-time graphs

Strand 3: Science in Personal and Social Perspectives


PO1. Propose viable methods of responding to an identified need or problem.
PO2. Compare possible solutions to best address an identified need or problem.
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2004 Constant Standards

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PO3. Interpret data that show a variety of possible relationships between two variables, including:
   - Positive relationship
   - Negative relationship
2019-2020 Science Curriculum Map, Grade 8

- No relationship

PO4. Formulate a future investigation based on the data collected.

PO5. Explain how evidence supports the validity and reliability of a conclusion.

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   - Communicating
   - Comparing
   - Measuring
   - Classifying
   - Predicting
   - Organizing data
   - Inferring
   - Generating hypotheses
   - Identifying variables

PO2. Describe how scientific knowledge is subject to change as a new information and/or technology challenges prevailing theories.

PO3. Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator’s credibility with other scientists and society.

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## Strand 3: Science in Personal and Social Perspectives

### 8.S3.C1 Changes in Environment
Describe the interactions between human populations, natural hazards, and the environment.

**PO1.** Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:
- Waste disposal of industrial chemicals
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### Social Justice Standards

**Identity 3** – I know that overlapping identities combine to make me who I am and that none of my group identities on their own fully defines me or any other person. (ID.6-8.3)

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**Action 19** – I will speak up or take action when I see unfairness, even if those around me do not, and I will not let others convince me to go along with injustice. (AC.6-8.19)

### Teaching Tolerance Anti-Bias Framework
https://www.tolerance.org/frameworks

### Adopted Texts and Materials

- **Textbook:**
  - Prentice Hall Motion, Forces and Energy textbook
  - Prentice Hall Motion, Forces, and Energy Teaching Resources

### Science Resource Center

### Multicultural Inclusive Strategies

- TUSD Science Module Supplemental Resources
- Brain Pop (subscription required)
- Bill Nye videos
- Sciencespot – physics page

### Instructional and Assessment Guides

### Additional Instructional Resources

- Culturally Responsive Practices ([TUSD SPARKS, SPARKS Strategies](#))
- Pre/Post Scientific method assessment for 8th grade on School City

### Pre/Post Unit Assessment:

- Pre/Post Unit Assessment:
  - TUSD Science Module Supplemental Resources
  - Brain Pop (subscription required)
  - Bill Nye videos
  - Sciencespot – physics page
## Formative/Performance Assessment Examples:

- Complete a lab report that includes question, hypothesis, variables, procedure, table, graph, and conclusion.
- Write an original procedure to conduct a controlled experiment.
- **Lab Safety Test**
- Students create a Venn diagram comparing/contrasting three laws of motion.
- Designing and building a mousetrap car and then explaining the motion using Newton’s three laws of motion.
- Calculate the speed of different classmates walking, skipping, hopping, etc.
- Students calculate their acceleration as they run 20 meters.
- Complete activities that demonstrate each of the three laws and explain how they demonstrate the specific law.
- Build a paper model of a roller coaster to demonstrate kinetic verses potential energy.
- Find real life examples of each of Newton’s Laws and explain how each example demonstrates the specific law.

## Resource Books:

- **NASA Newton’s Laws of Motion**
- **Paper roller coaster templates and instructions**
- **Amusement Park Physics**
- **Physicsclassroom.com – Newton’s 3 laws. Contains a lot of background information on the three laws of motion.**
- **Stop Faking It! – Companion Classroom Activities for Force and Motion**  
  Author – William C. Robertson
- **Take-Home Physics: 65 High-Impact, Low-Cost Labs**  
  Author – Michael Horton
This quarter is an enrichment and enhancement quarter to engage your students in inquiry based projects. You may choose to use this time to extend material from previous quarters or provide inquiry based learning opportunities for your students. Quarter 4 map provides optional resources for enrichment activities.

<table>
<thead>
<tr>
<th>Enduring Understandings:</th>
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<th>Academic Vocabulary:</th>
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<td>The goal of science is to understand the natural world. Students must learn to use scientific practices and accumulated knowledge to better understand the world around them.</td>
<td>How do you use the inquiry process to understand the world around you?</td>
<td>Observation</td>
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<tr>
<td></td>
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<td>Independent variable</td>
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2004 AZ Standards

Highly-Leveraged Standards

**8.S1.C1 Observations, Questions, and Hypotheses:** Formulate predictions, questions, or hypotheses based on observations.

**PO1.** Formulate questions based on observations that lead to the development of a hypothesis.

**PO2.** Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis.

**PO3.** Generate a hypothesis that can be tested.


**PO1.** Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.

**PO2.** Design a controlled investigation to support or reject a hypothesis.

**PO3.** Conduct a controlled investigation to support or reject a hypothesis.

**PO4.** Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).

**Supporting Standards**

**8.S4.C2 Reproduction and Heredity:** Understand the basic principles of heredity.

**PO1.** Explain the purposes of cell division.

- Growth
- Reproduction

**PO2.** Explain the basic principles of heredity using the human examples of:

- Eye color
- Widow’s peak
- Blood type

**PO3.** Distinguish between the nature of dominate and recessive traits in humans.

**8.S4.C4 Diversity, Adaptation, and Behavior:** Identify structural and behavioral adaptations.

**PO1.** Explain how an organism’s behavior allows it to survive in an environment.

**PO2.** Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.

**PO3.** Determine characteristics of organisms that could change over several generations.
PO5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

8.S1.C3 Analysis and Conclusions: Analyze and interpret data to explain correlations and results; formulate new questions.

PO1. Analyze data obtained in a scientific investigation to identify trends.

PO2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

PO3. Interpret data that show a variety of possible relationships between two variables, including:
   - Positive relationship
   - Negative relationship
   - No relationship

PO4. Formulate a future investigation based on the data collected.

PO5. Explain how evidence supports the validity and reliability of a conclusion.

PO6. Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).

PO7. Critique scientific reports from periodicals, television, or other media.

PO8. Formulate new questions based on the results of a previous investigation.


PO1. Communicate the results of an investigation.

PO2. Choose an appropriate graphic representation for collected data:
   - Line graph
   - Double bar graph
   - Stem and leaf plot
   - Histogram

PO3. Present analyses and conclusions in clear, concise formats.

PO4. Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns).

PO4. Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).

PO5. Analyze the following behavioral cycles of organisms:
   - Hibernation
   - Migration
   - Dormancy (plants)

PO6. Describe the following factors that allow the survival of living organisms:
   - Protective coloration
   - Beak design
   - See dispersal
   - Pollination

Strand 5: Physical Science (HLS – 31%)


PO1. Identify different kinds of matter based on the following physical properties:
   - States
   - Boiling point
   - Solubility
   - Density
   - Melting point

PO2. Identify different kinds of matter based on the following chemical properties:
   - Reactivity
   - pH
   - Oxidation (corrosion)

PO3. Identify the following types of evidence that a chemical reaction has occurred:
   - Formation of a precipitate
   - Generation of gas
   - Color change
   - Absorption or release of heat

PO4. Classify matter in terms of elements, compounds, or mixtures.

PO5. Classify mixtures as being homogeneous or heterogeneous.

PO6. Explain the systematic organization of the periodic table.
PO5. Communicate the results and conclusion of the investigation.

PO7. Investigate how the transfer of energy can affect the physical and chemical properties of matter.

8.SS.C2 Motion and Forces: Understand the relationship between force and motion

PO1. Demonstrate velocity as the rate of change of position over time.

PO2. Identify the conditions under which an object will continue in its state of motion (Newton’s 1st Law of Motion).

PO3. Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton’s 2nd Law of Motion).

PO4. Describe forces as interactions between bodies (Newton’s 3rd Law of Motion).

PO5. Create a graph devised from measurements of moving objects and their interactions, including:
   - position-time graphs
   - velocity-time graphs

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### Strand 2: History and Nature of Science

#### 8.SS.C1 History of Science as a Human Endeavor: Identify individual, cultural and technological contributions to scientific knowledge.

**PO1.** Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson ad Crick [scientists], supports Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).

**PO2.** Evaluate the effects of the following major scientific milestones on society:
   - Mendelian Genetics
   - Newton’s Laws

**PO3.** Evaluate the impact of a major scientific development occurring within the past decade.

**PO4.** Evaluate career opportunities related to life and physical sciences.

#### 8.SS.C2 Nature of Scientific Knowledge: Understand how science is a process for generating knowledge.

**PO1.** Apply the following scientific processes to other problem solving or decision making situations:
   - Observing
   - Questioning
   - Communicating
   - Comparing
   - Predicting
   - Organizing data
   - Inferring
   - Generating hypotheses
2019-2020 Science Curriculum Map, Grade 8

- Measuring
- Classifying

**PO2.** Describe how scientific knowledge is subject to change as a new information and/or technology challenges prevailing theories.

**PO3.** Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator’s credibility with other scientists and society.

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Strand 3: Science in Personal and Social Perspectives

8.S3.C1 **Changes in Environment:** Describe the interactions between human populations, natural hazards, and the environment.

**PO1.** Analyze the risk factors associated with natural, human induced, and/or biological hazards, including:
- Waste disposal of industrial chemicals
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**PO2.** Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.

8.S3.C2 **Science and Technology in Society:** Develop viable solutions to a need or problem.

**PO1.** Propose viable methods of responding to an identified need or problem.

**PO2.** Compare possible solutions to best address an identified need or problem.

**PO3.** Design and construct a solution to an identified need or problem using simple classroom materials.

**PO4.** Compare risks and benefits of the following technological advances:
- Radiation treatments
- Genetic engineering
- Airbags

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**Teaching Tolerance Anti-Bias Framework**  [https://www.tolerance.org/frameworks](https://www.tolerance.org/frameworks)

### Culturally Responsive Practices (TUSD SPARKS, SPARKS Strategies)

### Instructional Resources

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<td>- Teenage Mutant Hero Project (Varies)</td>
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<td>- Can You Stand on Me? (14 days)</td>
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<td>- Thermal Insulators (7 days)</td>
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<td>- Fire Safety Impact Systems (12 days)</td>
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