Be a Scientist!
Course Syllabus

Big Idea: Scientists use many different tools, skills, and practices to investigate the world around them.

<table>
<thead>
<tr>
<th>Day</th>
<th>Focus and Goals/Objectives</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Be a Scientist! Introduction</td>
<td><strong>Morning Block</strong>&lt;br&gt;● Icebreaker- Common Card Tower&lt;br&gt;● Icebreaker- Unfinished Art&lt;br&gt;● Establish classroom norms&lt;br&gt;● Complete pre-assessment&lt;br&gt;● Branches of Science- open sort and disc.&lt;br&gt;● Lab Safety</td>
</tr>
<tr>
<td></td>
<td>• Establish a classroom community&lt;br&gt;• Share prior knowledge and topics of interest&lt;br&gt;• Identify and describe the three branches of science&lt;br&gt;• Identify expectations for lab safety&lt;br&gt;• Identify Science and Engineering Practices and describe their application</td>
<td><strong>Homework- Three Sciences</strong></td>
</tr>
<tr>
<td>2</td>
<td>Be a Chemist!&lt;br&gt;EQ: What is the structure of matter and how can it be changed?</td>
<td><strong>Morning Block</strong>&lt;br&gt;● Introduction to matter and its structure (text)&lt;br&gt;● Rotations:&lt;br&gt;  ○ Atomic Structure&lt;br&gt;  ○ Element Scavenger Hunt&lt;br&gt;  ○ Cracking the Code: Chemical Formulas&lt;br&gt;<strong>Afternoon Block</strong>&lt;br&gt;● Physical/Chemical Change Labs&lt;br&gt;  ○ Slime&lt;br&gt;  ○ Pancake Science&lt;br&gt;<strong>Homework- Chemistry of Fireworks</strong></td>
</tr>
</tbody>
</table>
|     | • Describe the structure of matter, differentiating between atoms, elements, molecules, and compounds.<br>• Describe how physical and chemical changes impact matter | **Be a Forensic Scientist!**
|     | Be a Geneticist!<br>EQ: How are traits passed on to new generations?<br>• Describe how traits are passed from one | **Morning Block**<br>● Intro. Sticky Fingers Lab<br>● Forensic Science Mini-Labs:<br>  ○ Strawberry DNA Extraction<br>  ○ Fingerprint Analysis<br>  ○ Hair Evidence Analysis<br>**Afternoon Block**<br>● Introduction to Phenotypes w/ Spongebob<br>● Family Phenotypes<br>● Text- Mendelian Inheritance and Punnett Squares<br>● Monster Genetics Activity<br>**Homework- Fingerprint Analysis (Sticky Fingers Lab Conclusion)**
| 3   | individual? | **Be a Forensic Scientist!**
|     | Identify different types of fingerprints, making observations about their characteristics and analyzing patterns.<br>• Carry out an investigation to extract and analyze DNA.<br>• Collect data from a hair sample and make observations about each of its three primary structures. | **Be a Geneticist!**
|     | **EQ: What is the structure of matter and how can it be changed?** | **EQ: How are forensic scientists able to identify an individual?** |
| 4 | **Be a Biologist!**  
EQ: What is a cell, and how is it important to an organism?  
- Describe a cell and its purpose.  
- Identify the structures within a cell and describe their functions.  
- Differentiate between plant and animal cells. | **Morning Block**  
- Battlefield Cell Video- Notice and Wonder, Discussion  
- What Are Cells?- Text, Discussion  
- What’s Inside of a Cell?- Student research project and art piece or comic strip about one cell structure  
**Afternoon Block**  
- Cheek Cell and Onion Cell Lab  

*Homework- Plant vs. Animal Cell Text/Puzzle* |
|---|---|
| 5 | **Be a Physiologist!**  
EQ: How do the systems in your body allow it to function?  
- Students will identify the structures of the cardiovascular, musculoskeletal, digestive, and respiratory systems in order to explain their functions. | **Morning Block**  
- Digestive System- Brain Pop video and Digestion in a Bag Activity  
- Cardiovascular System- Heart Rate Lab  
- Respiratory System- Balloon Lung  
- Musculoskeletal System- DK Find Out and text, discussion; Give Me a Hand Activity  
**Afternoon Block**  
- Body Systems Amusement Park Challenge  

*Homework- Lab Follow-Up Questions* |
| 6 | **Be an Ecologist!**  
EQ: What is the connection between living things and their environment?  
- Identify biotic and abiotic factors within a given ecosystem.  
- Describe the relationships that exist within an ecosystem.  
- Describe the relationships between organisms using food chains and food webs.  
- Describe how change impacts an ecosystem. | **Morning Block**  
- What is an Ecosystem?  
  - Terrestrial and Aquatic  
  - Biotic and Abiotic Factors  
- Food Chain- Producers, Consumers, and Decomposers  
- Owl Pellet Dissection Lab  
- Food Web- collaborative model  
**Afternoon Block**  
- Changes in Ecosystems- Invasive Species  
  - Newsela Article  
  - Invasive Fish Game, reflect  
- Changes in Ecosystems- Human Activity  
  - Flip-book and mini-research  

*Homework- Food Chain Sheet* |
| 7 | **Be a Zoologist!**  
EQ: How does an animal’s traits and behavior influence its ability to survive?  
- Differentiate between inherited and acquired traits. | **Morning Block**  
- Inherited and Acquired Traits  
  - Flounders and Camouflage  
  - Katydid “Hunting” (outside) |
**acquired traits.**
- Describe the relationships between traits and survival.
- Differentiate between innate and learned behaviors.

**Darwin’s Survival Game** (computer lab)
**Amazing Animals- Research** (Ology website)
**Advantages and Disadvantages to Group Living**
  - Fire Ants in the Amazon
  - Growing Up Wild- Chimpanzees and Macaques

**Afternoon Block**
- Innate and Learned Behaviors- text/discussion
- Animal Behavior Lab- Earthworms

**Homework- Acquired Traits (Nat Geo)**

| 8 | **Be a Zoologist! (cont.)**
|   | **Be a Botanist!**
|   | EQ: How are plant and animal life cycles alike and different?
|   |  - Compare and contrast plant and animal life cycles.
|   |  - Describe various ways plant reproduction can occur.
|   | EQ: How do plants meet their needs?
|   |  - Describe the process of photosynthesis.
|   |  - Describe the relationship between photosynthesis and plant pigments.

**Morning Block**
- Jalapeno Plants, Ladybugs, and Leopard Frogs- Comparing/contrasting life cycles
- The Koa Tree Mystery- Mystery Science video and text
- Seedy Travelers Lab

**Afternoon Block**
- Photosynthesis Text/Brain Pop/Discussion
- Plant Pigments Lab

**Homework- Vegetative Reproduction (read and respond)**

| 9 | **Be a Geologist!**
|   | **Be a Paleontologist!**
|   | EQ: How do geologists and paleontologists help us understand the history of the Earth?
|   |  - Analyze and describe the impact of plate tectonics and continental drift.
|   |  - Describe and differentiate between the processes of weathering, erosion, and deposition.
|   |  - Use fossils to draw conclusions about what the Earth was like long ago.

**Morning Block**
- Newsela article- “Earth Keeps Changing”
- Plate Tectonics and Continental Drift- Text and Kids Discover Infographics
- Oreo Plate Tectonics Model
- Weathering, Erosion, and Deposition Lab Rotations

**Afternoon Block**
- Newsela article- Carbon Dating
- Finding Fossils (video clip)
- Fossil Lab
- Fossils Around the World

**Homework- Finish “Fossils Around the World”**

| 10 | **Be a Meteorologist!**
|    | EQ: How are meteorologists able to make predictions about the weather?
|    |  - Identify and use weather tools to collect data.
|    |  - Analyze weather data in order to make

**Morning Block**
- What is the atmosphere? (textbook)
- Climate Map- See, Think, Wonder
- Reading Weather Maps, Making Predictions
- Weather Tools: Then and Now
  - Make Anemometers! Collect Data
| 11 | **Be a Meteorologist! (continued)**  
**Be an Astronomer!**  
**EQ:** What are stars, and how are they significant to our place in the universe?  
- Differentiate between the universe, galaxies, and our solar system.  
- Describe the relationship between stars and our solar system, our galaxy, and the universe.  
- Describe the life cycle of a star. | **Afternoon Block**  
- Extreme Weather Research Project and Presentations  
**Homework- Weekend Forecast** |
|---|---|
| **12** | **Be a Physicist!**  
**EQ:** How can we use patterns to predict the future motion of an object?  
- Use Newton’s Laws of Motion to describe the movement of an object. | **Morning Block**  
- Newton’s First Law  
  - Physics of Soccer text and reading from textbook, discuss  
  - Jenga and Cup Towers  
- Newton’s Second Law  
  - Physics of Soccer text and reading from textbook, discuss  
  - Textbook  
  - Egg Cars  
**Afternoon Block**  
- Newton’s Third Law  
  - Scholastic Study Jams Video  
  - Bottle Rockets  
**Homework- Physics of Soccer Questions** |
| **13** | **Be a Physicist!**  
**EQ:** What is the relationship between energy and motion?  
- Build a model of a roller coaster and carry out an investigation using marbles, with the goal of creating a roller coaster with the longest run using only paper and tape. | **Morning Block**  
- Roller Coaster Engineering video  
- Roller Coaster Science text  
  - Connections to Newton’s Laws  
  - Annotate  
- Introduce MENSA task and begin building roller coasters  
**Homework- Physics of Soccer Questions** |
<table>
<thead>
<tr>
<th>14</th>
<th>Be a Scientist! Closure</th>
<th>Afternoon Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ: How can I effectively communicate what I’ve learned with an audience?</td>
<td>Continue to build roller coasters ○ Stopping points for run trials and to record qualitative data, make adjustments</td>
<td></td>
</tr>
<tr>
<td>● Create a presentation that helps parents understand a particular field of science, using texts, visuals, and demonstrations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Speak at an appropriate volume and speed in order to be understood.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15</th>
<th>Be a Scientist! Closure</th>
<th>Morning Block</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQ: How can I effectively communicate what I’ve learned with an audience?</td>
<td>Finish roller coasters and share, reflect on engineering design process</td>
<td></td>
</tr>
<tr>
<td>● Create a presentation that helps parents understand a particular field of science, using texts, visuals, and demonstrations.</td>
<td>SEPs</td>
<td></td>
</tr>
<tr>
<td>● Speak at an appropriate volume and speed in order to be understood.</td>
<td>Post-assessment</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Afternoon Block</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Open house for parents</td>
</tr>
</tbody>
</table>