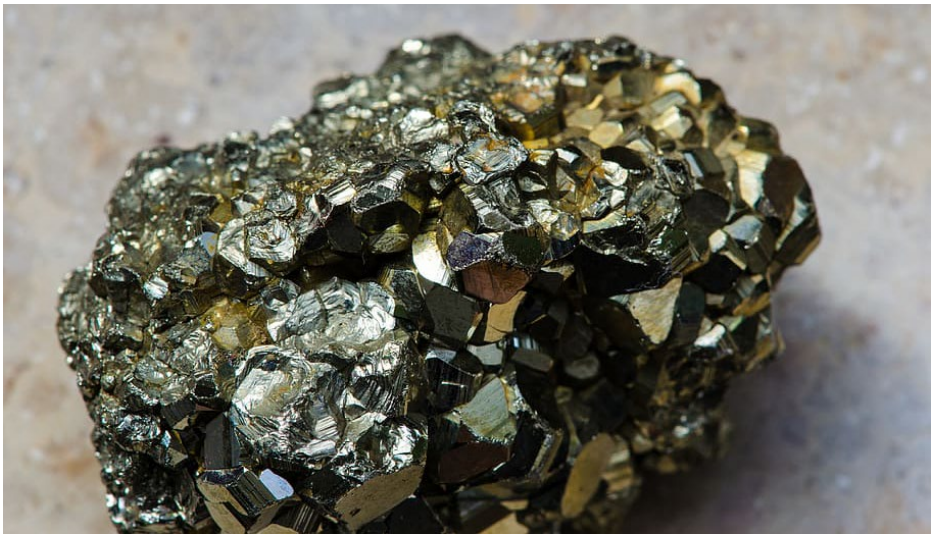
What is the best place to mine in Idaho?

Synopsis: In this five week unit students determine how geological processes determine the location of valuable minerals and how the molecular structure of a substance determines its physical properties. After hands-on simulations and gathering data from several sources, students evaluate competing claims to determine the best location to mine for a mineral in Idaho.

This unit has been designed for 9th - 12th grade students.



Essential Questions:

- How can we figure out what's in the ground beneath our feet?
- Why is there so much gold in the Sierra Nevada mountains?
- What are the economic and environmental factors that must be considered before mining?

Standards Bundle:

- **HS-ESS-2.3** Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
- **HS-ESS-2.1** Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
- **HS-PSC-1.1** Students who demonstrate understanding can: Develop models to describe the atomic composition of simple molecules and extended structures. (not fully addressed in this unit)
- **HS-ESS-3.1** Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- **HS-ESS-3.2** Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

Teacher Narrative

Lesson 1 Introduce Performance Task

SEP: Asking questions and defining problems

Materials:
- Video: Resource Issues | Mining (Outdoor Idaho)
- Mining in Idaho - Driving Questions.pdf
- Mining in Idaho slideshow, slides 1-8

Driving Question: What is the best place to strike it rich by mining in Idaho?

What students are doing:
1. Show the video Resource Issues | Mining (Outdoor Idaho) (26 min).
2. Introduce the scenario for the performance task to students. Idaho is offering grants to new prospectors. Prompt students to think about what questions they would want answered before they begin their grant application. Students work individually for 2 minutes.
3. With their lab groups, students share questions, turn closed questions into open questions, and then rank their questions. Each group should write their top 3 questions on sticky notes (one question per sticky note) and post them on the front board. These form the driving question board for the unit. Option: have students organize the questions by categories they create.
4. Keep sticky notes for the duration of the unit and revisit as students answer their questions. Can keep them on a piece of foam board or similar so questions can be kept out of the way until the class period needed.

Lesson 2 What's Inside

SEP: Asking questions and defining problems, planning and carrying out investigations

Materials:
- Solid ball, such as baseball, golf ball, billiard ball (one per group). Eggs would work also.
- Mining in Idaho slideshow
- What's Inside.pdf group worksheet
- Tools such as calipers, balances, rulers, magnets, large beakers, stethoscopes, flashlights, etc.

What students are doing:

Driving Question: How do you figure out what the rock under your claim is made of?

What students are doing:

1. Ask students what is beneath their feet, then what is below that, then below that. Students can create their own list with their lab groups, then share out. Record answers on the board (see example to right).
2. Ask students what evidence they have that the material under their feet is what they expect. (This could be a good time to have a discussion about what evidence is, and what makes it valid.) Students may reference digging holes or going into caves. Explain that to find out what is under us we can not dig. You can show images of the Koala hole dug in Russia (over 7 miles deep), and explain that the diameter of the Earth is over 7000 miles across.
3. To think about how to tell what is inside of the Earth, design an investigation on a smaller scale. Give each group a ball, and ask them how they could figure out what is inside the ball without cutting it open. Have groups record their thoughts on the What's Inside.pdf worksheet. As students work ask:
    a. What information does that measurement give you?
    b. What could you compare your results to?
    c. Do you think your object is the same material the whole way through, or is it made of different materials?
4. Have students share what action they would want to take and what type of evidence this would give them. Introduce the terms homogeneous and heterogeneous. Discussion should lead toward using waves - sound and light. The teacher could demonstrate these techniques by tapping on solid and hollow objects (such as a full and empty soda can) or holding a strong flashlight up to an egg.

Formative Assessment: Students suggest appropriate technology and investigations.

Students have figured out: Evidence is information about the natural world that is used to support a claim. In a scientific argument, evidence often consists of data, which can be measurements and observations. Sound and light (EM) waves can be used to determine the composition of solid objects.

Lesson 3 Earth's Interior

SEP: Analyzing and Interpreting Data
CCC: Stability and Change

Materials:

- Determining and Measuring Earth's Layered Interior worksheets available at this site
- Protractors
- Rulers

What students are doing:

1. Have students complete the lessons at Determining and Measuring Earth's Layered Interior from IRIS. The lesson as written has each half of the class perform different investigations, but it may be beneficial for students to complete both sections over two days to fully understand the concepts. Set up videos are on the website, which will talk you through how to complete the modeling portion of the lessons.

Formative Assessment: Model of seismic data shows that Earth is not homogeneous.

Students have figured out: The internal structure of Earth (concentric layers of different density and composition) is inferred through the analysis of seismic data.

Lesson 4 Comparing Two Descriptions

SEP: Engaging in Argument from Evidence
CCC: Structure and Function

Materials:
- Comparing Two Descriptions of Earth's Interior Structure.pdf
- (print pages 1 and 2 separately so students don't have to flip back and forth)
- Evidence Card Sort.pdf (cut out the cards on page 2, put into an envelope)

What students are doing:
1. Explain to students that hikers found a tooth in a rock while hiking in the mountains in Utah. One hiker thinks the tooth came from a prehistoric shark, the other thinks it came from a prehistoric mountain lion. The hikers gather evidence to support their claim. Students take turns drawing cards from Evidence Card Sort.pdf, and deciding if the evidence supports, maybe supports, or does not support the claim. They should explain to their partner why they made that choice. Circulate, prompting students to explain their evidence. After, have a whole group discussion asking students:
    a. Does the hiker have enough evidence to support their claim?
    b. What would be enough evidence to convince you that this is the correct claim?
2. Give direct instruction on S and P Body earthquake waves. Students should understand why the waves travel at different speeds, and the types of materials each will transmit through.
3. Students read the two short articles (printed side by side) and compare the evidence in each by answering the guiding questions in Comparing Two Descriptions of Earth's Interior Structure.pdf.
4. Exit ticket: Remind students of the guiding question "What is the best location to mine in Idaho?" Students write two pieces of information they could learn from seismic waves that could help them answer this question.

Formative Assessment: Students correctly identify the claim, and explain how scientists use data to support a claim.

Students have figured out: In a scientific argument, evidence often consists of data, which can be measurements and observations.

Lesson 5 Seismic Waves

SEP: Analyzing and Interpreting Data
CCC: Stability and Change

Materials:
- Graphing Seismic Waves.pdf
- Colored pencils

What students are doing:
1. Have students create a double line graph of the data and answer the analysis questions to determine the relationship between S & P waves.

Students have figured out: The rock under Idaho is not homogeneous, the difference in arrival times between P and S waves is information that can help determine the composition of the material in the Earth.

Lesson 6 Density Investigation

Standard: HS-ESS-2.3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
SEP: Planning and carrying out investigations
CCC: Energy and Matter

Materials:

- Lesson phenomenon video: Plate Tectonics in a Nutshell (23 sec)
- Density Probe: Floating Blocks .pdf student worksheet
- Layering of Materials Investigation.pdf student worksheet
- Graduated cylinders
- Isopropyl alcohol
- Water
- Vegetable oil
- Two colors of food coloring
- Scale that measures in grams (one per group)

What students are doing:

1. Teacher prep: color the water and isopropyl alcohol two different colors with food coloring.
2. Show North America Plate Tectonics animation: Plate Tectonics in a Nutshell (23 seconds). Have students make observations. Lead discussion towards the movement of the North American plate, and that the Farallon and Juan de Fuca plates seemed to disappear. Ask students about their ideas about where these plates went. Students should notice that these places seem to move beneath the North American plates.
3. Density probe: Floating Blocks .pdf Show students the image of the blocks, and have them write down or check the one statement from the checklist that they are most confident about and explain their thinking. Have students partner up with someone across the room from them, and explain their thinking to their partner. Have each pair of students form a group of 4 with another pair, and share their thinking. Then students go back to their lab groups and share the idea of someone else they heard in the room.
4. Have students complete the Layering of Materials Investigation.pdf activity. As students work ask:
    a. Which liquid is layering at the bottom? Which liquid is layering at the top? Is the order of layering affected by the sequence in which you poured the liquids? What data do you have that might explain the order in which the liquids layer?

Students have figured out: Materials with greater density sink, and those with lesser density rise.

Credit: This lesson was modified from Earth's Interior and Plate Tectonics | New Visions - Science

Lesson 7 Model of Earth's Interior

Standard: HS-ESS-2.3 Develop a model based on evidence of Earth's interior to describe the cycling of

matter by thermal convection.
SEP: Developing and Using Models
CCC: Energy and Matter

Materials:
- Large white paper (11 x 18 or piece of butcher paper)
- Colored pencils
- A Model of Earth's Interior.pdf

What students are doing:
1. Lead direct instruction and have students take notes around the relationship between relative density and buoyancy of materials and introduce formal vocabulary terms by referring to their experience during the layering materials lab.
2. Have students complete the questions, then direct students to the data table of Common Materials in Earth's Interior. Have students work with their group to collaboratively create a model (diagram) of Earth's interior based on their learning so far on a large piece of paper. Confer with students as they complete their models to make sure they are using evidence (labeling) to explain why they are including pieces in their model. Note, these models do not need to be totally accurate. The important thing is that students demonstrate their understanding of relative density and buoyancy here.
3. Students can replicate the group model in their notes, or the posters can be kept to modify later.

Formative Assessment: Model shows materials in Earth's interior layered by density.

Students have figured out: The Earth's core must be composed of iron & nickel, and the crust composed of silicic rocks, andesite, and basalt.

Credit: This lesson was modified from Earth's Interior and Plate Tectonics | New Visions - Science

Lesson 8 Convection Investigation

Standard: HS-ESS-2.3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
SEP: Planning and carrying out investigations
CCC: Energy and Matter

Materials:
- What's Driving the Plates.pdf
- Hot plates
- Beakers
- Vegetable oil
- Dried oregano
- Clear plastic containers (such as shoebox containers)
- Ice cubes made from blue water
- Red food coloring
- Small dropper bottles (or glass dropper)

What students are doing:
1. Explain to students they will be working on a series of activities that will help them collect more evidence to add to their model of how Earth's plates are moving. Emphasize that they will be

looking for patterns as they complete the different activities.

2. Guide students through the series of activities, monitoring for safety with the hot plates and candles. As they work ask:
    a. What do you notice about the movement of the materials?
    b. What seems to be causing this movement?
    c. What effect do you think the heating and cooling has on the colored water and oil? Why does a temperature change affect its movement?
    d. How does what you are observing relate to what you observed and learned from your density column?
3. When students have completed the activities, they should work on recording patterns they observed and making inferences. They should work independently for 3 minutes, then share their ideas with their lab group.
4. To close the activity, ask students which patterns they think are most relevant to add to their model for what is causing plate motion. Have students share out and ask them to justify their responses.

Formative Assessment: Student responses in group discussion about which observations are most relevant to include in the model.

Students have figured out: Relationship between temperature and density.

Credit: This lesson was modified from Earth's Interior and Plate Tectonics | New Visions - Science

Lesson 9 Reading Data

Standard: HS-ESS-2.3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
SEP: Developing and Using Models
CCC: Energy and Matter
Materials:

- Inferred Properties of Earth's Interior.pdf (print page 3 separately)
- Revise model A Model of Earth's Interior.pdf
- Colored pencils

What students are doing:

1. Have students color code the diagram of Earth's interior to highlight the relationships between pressure, density, and temperature. Next, they should respond to the prompts.
2. Have students work with their lab groups to discuss what evidence they collected about temperature and pressure should be added to their models of Earth's interior (on posters), then share out. As students are revising their models ask:
    a. How are you indicating density on your model? Temperature? Pressure?

Formative Assessment: Revised model shows patterns of temperature and pressure.

Students have figured out: Temperature and pressure increase as depth increases.

Lesson 10 Evidence of Seafloor Spreading

Standard: HS-ESS-2.1 Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
SEP: Developing and Using Models
CCC: Stability and Change

Materials:
- Evidence of Seafloor Spreading.pdf notecatcher
- Seafloor Spreading video (14 min)

What students are doing:
1. Show Seafloor Spreading video to students. They will collect each piece of evidence from the video on the Evidence of Seafloor Spreading.pdf notecatcher by writing with words and drawing a labeled diagram.
2. Pause video at 4:21, 6:10, 7:48, and 12:25 for students to have time to write and draw. Teacher modeling drawing on the board could help students who struggle with how to represent these processes in a diagram.

Formative Assessment: Diagrams and explanations that support the theory of seafloor spreading.

Students have figured out: Oceanic crust forms along mountain zones, known as mid-oceanic ridges and spreads out laterally.

Lesson 11 Sierra Nevada Formative Assessment

Standard: HS-ESS-2.1 Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
HS-ESS-2.3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.
SEP: Developing and using models
CCC: Stability and Change

Materials:
- DBI Phase I Documents.pdf - one per lab group, in a folder
- DBI Phase II video.pdf
- DBI Phase III Documents.pdf - one per lab group, in a folder
- Presentation Project instructions.pdf
- Sierra Nevada DBI Notecatcher.pdf

What students are doing:
1. Read the scenario in the Presentation Project instructions.pdf to students.
2. Pass out the Sierra Nevada DBI Notecatcher.pdf to each student. Pass out the folder with the DBI Phase I Documents.pdf to each lab group. Have students work silently for 5 minutes reading and taking notes in section 1 of the notecatcher. Let students know that they might not have time to read all of the texts, but that they will share ideas with their lab group later.
3. After the 5 minutes, let students share ideas for 3 minutes, then share out with whole class.
4. Show the video DBI Phase II video.pdf (1 min) while students take notes. You may need to show the video 2 times.
5. Pass out the folder with the DBI Phase III Documents.pdf to each lab group. Have students work silently for 7 minutes reading and taking notes in section 1 of the notecatcher. After the 5 minutes, let students share ideas for 3 minutes, then share out with whole class.
6. Pass out the Presentation Project instructions.pdf and remind students of the scenario. Have

students work in small groups to create a model that explains the formation of the Sierra Nevada mountains and why so much gold has been found in the area. They can do this by creating a poster, a slideshow, a storyboard, or some other form of presentation.

Lesson 12 Plate Tectonics in Idaho

Standard: HS-ESS-2.1 Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
CCC: Stability and Change

Materials:
- Idaho Timeline Articles for Jigsaw.pdf print one set for each group
- 3-2-1 Jigsaw.pdf notecatcher - print one for each student

What students are doing:
1. Give groups a set of Idaho Timeline Articles for Jigsaw.pdf and each student a 3-2-1 Jigsaw.pdf notecatcher. Each student should choose one of the articles and fill out the first page of the notecatcher.
2. When all students are finished, they should share their 2 sentence summary with their group members. The group should determine how to turn the 2 sentence summary into a 1 sentence summary (let students know that adding a semicolon between the sentences does not count).

Formative Assessment: One sentence summary of article.

Students have figured out: Present Idaho is composed of batholiths from ancient volcanoes.

Lesson 13 Mining Document Based Inquiry

Standard: HS-ESS-2.1 Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.

Materials:
- Mining Maps.pdf - copy 1 per group.
- Finding Mineral Deposits.pdf notecatcher - copy 1 per student
- Mineral Articles.pdf - copy 1 per group

What students are doing:
1. Pass out maps 1-4 to each group of students (the world view maps). Have groups observe the maps and answer the prompts to Part 1 on the Finding Mineral Deposits.pdf notecatcher.
2. Pass out the Mineral Articles.pdf to each group. Have students take notes on Part 2 of the notecatcher.
3. Pass out maps 5-8 to each group (the Idaho maps). Have groups observe the maps and answer the prompts to Part 3. Students can use the internet as a resource to answer question 13.

Formative Assessment: Students correctly identify patterns between regions of volcanic activity and mineral deposits.

Students have figured out: Valuable minerals can be found in different regions of the world depending on geographical events.

Lesson 14 Idaho's Cobalt Supply

SEP: Obtaining, evaluating, and communicating information
CCC: Systems and system models

Materials:
- Cobalt Notecatcher.pdf
- IDAHO IS SITTING ON ONE OF THE MOST IMPORTANT ELEMENTS ON EARTH.pdf

What students are doing:
1. Read the statements in the Cobalt Notecatcher.pdf one at a time and have students predict if the statement is true or not. They should document their reasoning. Allow lab groups to confer and discuss during this section.
2. Students read the article IDAHO IS SITTING ON ONE OF THE MOST IMPORTANT ELEMENTS ON EARTH.pdf, then document whether or not their prediction was correct.

Formative Assessment: Student answers on notecatcher

Students have figured out: Minerals besides gold and silver can be a valuable natural resource.

Article is excerpted from: Idaho Is Sitting on One of the Most Important Elements on Earth

Lesson 15 Mining for Ore Simulation

Standard: HS-ESS-3.1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
SEP: Developing and using models
CCC: Cause and Effect

Materials:
- Mining for Ore.pdf student worksheet
- Shoebox containers
- Forceps
- Toothpicks
- Sand
- Peanuts with shell (if students have allergies, another material can be substituted)
- Sticks, rocks, etc. to create a landscape

What students are doing:
1. Provide each group with a shoebox container to create a landscape. They should fill it with about 5 cm of sand, then add 5-7 peanuts scattered over the surface. After documenting the location of their peanuts on the Mining for Ore.pdf student worksheet, they cover the peanuts with another layer of sand and use sticks, rocks, etc. to create a "landscape" of trees, streams, towns, etc.
2. Switch the shoebox containers between groups. Give each group toothpicks to "drill" and forceps

to “excavate” the peanuts from the land. Students are not allowed to touch the peanuts with their hands. They must then remove the nut from the shell and find a way to dispose of the shell underground in the landscape.
3. Return shoeboxes to the original owners. Students evaluate the landscape and determine how much damage was done. Lead a class discussion about the resources needed to restore the landscape.

Lesson 16 Modern Prospecting Video

Standard: HS-ESS-3.1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
SEP: Obtaining, evaluating, and communicating information
CCC: Cause and effect

Materials:
- Modern Prospecting Video Notes.pdf
- Modern Prospecting | Nevada Mining Documentary (27 minutes)

What students are doing:
1. Show the Modern Prospecting | Nevada Mining Documentary and have students fill out the Modern Prospecting Video Notes.pdf as they watch. It will be helpful to pause every 10 minutes to discuss the answers.

Students have figured out: Mining costs include equipment, labor, and reclamation of the ecosystem.

Lesson 17 Mining in a Nutshell

Standard: HS-ESS-3.1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
SEP: Mathematical and computational thinking, analyzing and interpreting data
CCC: Cause & Effect

Materials:
- Mining in a Nutshell handout
- Roasted peanuts in the shell
- Assorted colors of paint & brushes
- Graph paper

What students are doing:
1. Students will demonstrate the steps that are taken to find, extract, process & use mineral resources using this activity from Nevada Mining. If students have allergies, painted rocks or styrofoam peanuts can be used in place of peanuts.
2. Teacher hint: have students make base map of classroom the day before so you have enough time for the actual exploration phase.

Students have figured out: Determine whether each group has a profit or loss for the activity.

Lesson 18 Summative Assessment

Standard: HS-ESS-3.2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
SEP: Engaging in argument from evidence

Materials:
- Decision Matrix template.pdf
- Final Project Instructions and Rubric.pdf
- Final Project Planning Doc 3_ comparing proposals.pdf
- Final Project Planning Document 1_ mineral.pdf
- Final Project Planning Document 2_ location.pdf
- Mine Proposals (comparison data).pdf
- Mining Locations_(1).pdf
- Mining Waste Vocabulary.pdf
- Resource Mining Data Task.pdf

What students are doing:
In this summative assessment students are choosing a location to mine in, and explaining why they made this decision using evidence. The assessment is broken into several sections, and 5 class periods. Students will do the research in chunks over 3 class periods with their lab groups, and then write their proposal over 2 class periods as an individual project.

Option: To introduce using quantitative data to support a claim and review the CER fromat, use the Resource Mining Data Task.pdf

Day 1: Students choose a mineral to mine. To keep the organization and amount of data simplified, the instructor gave students the choice of 4 minerals: gold, silver, phosphate, and cobalt. Students work with their lab groups to make a decision and research their mineral, following the prompts on Final Project Planning Document 1_ mineral.pdf**.**

Day 2: Give students the two locations in Idaho that match the mineral they chose. Sample locations with GPS coordinates for the four minerals can be found here: Mining Locations_(1).pdf. Students begin to research the two locations using Google Earth, the Idaho Geological Survey, and the EPA How's My Waterway websites. You may need to model how to use the Idaho Geological Survey site by demonstrating how to limit the mines shown on the map by county or by mineral. Students document their research about the two sites on the Final Project Planning Document 2_ location.pdf.

Day 3: Give students the Mine Proposals (comparison data).pdf and Final Project Planning Doc 3_ comparing proposals.pdf. They will be able to calculate the costs associated with each site using this data. However, they will not be able to calculate profits, and this will frustrate students. Have a class discussion about why this is not possible, and what data given would help them predict which site has a better chance of making a profit. The Mining Waste Vocabulary.pdf is a handout you can use to remind students of some of the vocabulary they have been hearing throughout the unit. Some groups may benefit from using the Decision Matrix template.pdf to organize their thoughts about which site should be chosen.

Days 4-5: Students write their final proposal explaining what mineral and which location they would choose to mine. A rubric is attached.

Calendar

	Day 1	Day 2	Day 3	Day 4	Day 5
Week 1	**Introduce Performance Task** • Video: Resource Issues | Mining (Outdoor Idaho) • Driving question board	**What's Inside** • What's Inside group worksheet	**Earth's Interior** • Determining Earth's Layered Interior • Editable version of student worksheet: Determining Earth's Interior	**Earth's Interior** • Continue lesson from day before	**Comparing Two Descriptions** • Evidence Card Sort • Comparing Two Descriptions of Earth's Interior Structure
Week 2	**Seismic Waves** • Graphing Seismic Waves	**Density Investigation** • Lesson phenomenon video: Plate Tectonics in a Nutshell • Density Probe: Floating Blocks • Layering of Materials	**Model of Earth's Interior** • Students create initial model Model of Earth's Interior	**Convection Investigation** • What's Driving the Plates	**Reading Data** • Inferred Properties of Earth's Interior • Revise model Model of Earth's Interior
Week 3	**Evidence of Seafloor Spreading** • Evidence of Seafloor Spreading note catcher • Seafloor Spreading video	**Sierra Nevada Formative Assessment** • DBI Phase I Documents.pdf • DBI Phase II video.pdf • DBI Phase III Documents.pdf • Sierra Nevada DBI Notecatcher.pdf	**Sierra Nevada Formative Assessment** • Presentation Project instructions.pdf	**Sierra Nevada Formative Assessment** • Presentation Project instructions.pdf	**Sierra Nevada Formative Assessment** • Presentation Project instructions.pdf
Week 4	**Idaho's Cobalt Supply** • Worksheet Cobalt Notecatcher • Article on Idaho's Cobalt Supply	**Mining for Ore Simulation** • Student worksheet Mining for Ore	**Modern Prospecting Video** • Watch Modern Prospecting Video • Include notes to go along with video	**Mining in a nutshell** • Introduction to mining • Have students make base map before starting project	**Summative Assessment ~ Grant Proposal** • Resource Mining Data Task.pdf • Final Planning Document 1 (Minerals)
Week 5	**Summative Assessment ~ Grant Proposal** • Final Planning Document 2 (Location) • Mining Locations	**Summative Assessment ~ Grant Proposal** • Final Project Planning 3 Comparing proposals • Mine Proposals (Comparison Data)	**Summative Assessment ~ Grant Proposal** • Final Project Instructions & Rubric	**Summative Assessment ~ Grant Proposal** • Final Project Instructions & Rubric	