

Big Idea: Earth/Rock Cycle/Fossils/Weather

Grading Period 1

Inquiry Questions

Science:

- How does weather change? (Weather & Climate: Lesson 1)
- How do climates vary in different regions of the world? (Weather & Climate: Lesson 2)
- How do the properties of rocks and minerals determine how they can be used for tools, products, and/or building materials?
- How do fossils tell us about plants and animals and the environment? (Learn Past: Lesson 1-2)

Technology/Engineering:

- In what ways do humans use rocks and minerals?

Mathematics:

- How can we use charts and graphs to help us understand the properties of rocks and minerals?
- How is math involved in determining the properties of rocks?

Social Studies:

- How can you use labels and symbols to locate and identify the states within the Midwest region?
- What are some of the physical characteristics of Indiana?
- How can you compare Indiana's region to another region in the United States?

Content Area	Grade Level Standards
Science	3.ESS.1: Obtain and combine information to determine seasonal weather patterns across the different regions of the United States. 3.ESS.2: Develop solutions that could be implemented to reduce the impact of weather related hazards. 3.ESS.3: Observe the detailed characteristics of rocks and minerals. Identify and classify rocks as being composed of different combinations of minerals. 3.ESS.4: Determine how fossils are formed, discovered, layered over time, and used to provide evidence of the organisms and the environments in which they lived long ago.
Technology & Engineering	1C: Things that are found in nature differ from things that are human-made in how they are produced and used 1D: Tools, materials, and skills are used to make things and carry out tasks. 2H: Resources are the things needed to get a job done, such as tools and machines, materials, information, energy, people, capital, and time. 2I: Tools are used to design, make, use, and assess technology. 2J: Materials have many different properties. 2K: Tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing. 9E: Models are used to communicate and test design ideas and processes. 12E: Select and safely use tools, products, and systems for specific tasks. 12G: Use common symbols, such as numbers and words, to communicate key ideas. 13C: Compare, contrast, and classify collected information in order to identify patterns.

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- 3.OA.7: Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations.
- 3.NBT.1: Use place value understanding to round whole numbers to the nearest 10 or 100.
- 3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 3.MD.3: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*
- 3.MD.5: Recognize area as an attribute of plane figures and understand concepts of area measurement.
- 3.MD.6: Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
- 3.MD.7: Relate area to the operations of multiplication and addition.

Social Studies

- 3.3.1: Use labels and symbols to locate and identify physical and political features on maps and globes. Label a map of the Midwest, identifying states, major rivers, lakes and the Great Lakes.
- 3.3.2: Locate Indiana and other Midwestern states on maps using simple grid systems.
- 3.3.2: Identify the northern, southern, eastern and western hemispheres; cardinal and intermediate directions; and determine the direction and distance from one place to another.
- 3.3.4 : Explain that regions are areas that have similar physical and cultural characteristics. Identify Indiana and the local community as part of a specific region.
- 3.3.5: Observe and describe the physical characteristics of Indiana using words and illustrations and compare them to the characteristics of neighboring states.
- 3.3.6: Explain the basic Earth/sun relationship, including how it influences climate, and identify major climate regions of the United States.
- 3.3.7: Describe how climate and the physical characteristics of a region affect the vegetation and animal life living there.

ELA**Reading: Informational Text**

- RI.3.1:** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.
- RI.3.3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- RI.3.4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 3 topic or subject area*.
- RI.3.5: Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.
- RI.3.7: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).

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Grading Period 1

RI.3.8: Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).

Writing

3.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

3.10: Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

Speaking and Listening

SL.3.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

SL.3.2: Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

Science Process Standards

Standards for Mathematical Practice

Science Process Standards**The Nature of Science**

- Make predictions and formulate testable questions.
- Design a fair test.
- Plan and carry out investigations—often over a period of several lessons—as a class, in small groups or independently.
- Perform investigations using appropriate tools and technologies that will extend the senses.
- Use measurement skills and apply appropriate units when collecting data.
- Test predictions with multiple trials.
- Keep accurate records in a notebook during investigations and communicate findings to others using graphs, charts, maps and models through oral and written reports.
- Identify simple patterns in data and propose explanations to account for the patterns.
- Compare the results of an investigation with the prediction.

The Design Process

- Identify a need or problem to be solved.
- Brainstorm potential solutions.
- Document the design throughout the entire design process.
- Select a solution to the need or problem.
- Select the most appropriate materials to develop a solution that will meet the need.
- Create the solution through a prototype.
- Test and evaluate how well the solution meets the goal.
- Evaluate and test the design using measurement.

Mathematical Practices

- MP.1. Make sense of problems and persevere in solving them.
- MP.2. Reason abstractly and quantitatively.
- MP.3. Construct viable arguments and critique the reasoning of others.
- MP.4. Model with mathematics.
- MP.5. Use appropriate tools strategically.
- MP.6. Attend to precision.
- MP.7. Look for and make use of structure.
- MP.8. Look for and express regularity in repeated reasoning.

Plan of Work

Common Misconceptions

Rocks and minerals are the same thing.
 Dinosaur bones are the only fossils.
 All rocks are the same.
 Minerals aren't important.

Math: The use of terms like "round up" and "round down" confuses many students. For example, the number 37 would round to 40 or they say it "rounds up". The digit in the tens place is changed from 3 to 4 (rounds up). This misconception is what causes the problem when applied to rounding down. The number 32 should be rounded (down) to 30, but using the logic mentioned for rounding up, some students may look at the digit in the tens place and take it to the previous number, resulting in the incorrect value of 20. To remedy this misconception, students need to use a number line to visualize the placement of the number and/or ask questions such as: "What tens are 32 between and which one is it closer to?" Developing the understanding of what the answer choices are before rounding can alleviate much of the misconception and confusion related to rounding.

Suggested Activities

- Teacher creates a mock rock of a variety of materials. Students use "tools" like a nail and hand lens, to break apart the rock finding that rocks are made up of a variety of materials.
- Students will observe rocks creating a list of properties in which scientists may use to identify them.
- Using assorted rocks students perform a scratch test to test for hardness. Students can create a graph to show their results.
- Create a fossil using salt dough.
- Pretend that you have just purchased gravel and sand from the pet store. Once you left the store, the bags were punctured and now the sand and gravel is mixed up. Give students a baggie with sand/gravel mixture. Students are asked to find a way to separate the mixture. Materials available would be a plastic cup, rubber band, screen, and a plate. No other instructions provided.
- Have a "map walk" around the classroom to compare different types of maps. Compare and contrast the features of maps. Set up a grid system on the classroom ceiling or floor to map out the classroom.
- Students create a map using graph paper to show the classroom/bedroom/playground. Once they have created their map, have the students find the area and perimeter of the map.
- Ask students to estimate the area of certain rocks and minerals within a known mapped region.

Suggested Vocabulary

Rocks, Minerals, Properties, Fossils, Observations, Procedures, Graph, Round, Pattern, Table, Region, Characteristic, Text feature , Graphic feature, weather, air pressure, atmosphere, wind, precipitation, cloud, climate, axis, season,,endangered, extinct, fossil, paleontologist, skeleton

STEM Integrated Concepts: Earth and Space Science | 3rd Grade

Resources	<p>Books: <i>Everybody Needs a Rock</i> – Byrd Baylor <i>Magic School Bus- Inside the Earth</i>- Joanna Cole <i>Zion National Park</i>- Mike Graf <i>Mammoth Cave</i>- Mike Graf <i>Let's Go Rock Collecting</i>-Roma Gans</p> <p>http://www.sciencespot.net/Pages/kdzethsci3.html http://www.brainpop.com/search/search.weml?keyword=rocks http://www.fossweb.com/modules3-6/EarthMaterials/index.html http://www.rocksforkids.com/RFK/identification.html http://www.sciencekids.co.nz/sciencefacts/earth/rocksandminerals.html http://www.enchantedlearning.com/geology/ http://www.mineralogy4kids.org/ http://www.kidsloverocks.com/</p>
Assessment	
Type of Assessment	Example
<input checked="" type="checkbox"/> Observation	Are they using tools correctly? Are they using observations instead of inferences when taking apart the mock rock? Can they use a hand lens?
<input type="checkbox"/> Oral Questioning	
<input checked="" type="checkbox"/> Exit Slip	List and order from hardest to softest the minerals you tested in the scratch test
<input checked="" type="checkbox"/> Journal	Informal check of student notebook
<input type="checkbox"/> Graphic Organizers	
<input type="checkbox"/> Self-Assessment	
<input checked="" type="checkbox"/> Writing Prompt	Choose ANY of the inquiry questions and use as your writing prompt for the day.
<input type="checkbox"/> Presentation	
<input type="checkbox"/> Electronic media	
<input checked="" type="checkbox"/> Think Pair Share	Explain to your neighbor about how to round a number.
<input type="checkbox"/> Whiteboards	
<input type="checkbox"/> Experiment/projects	
<input type="checkbox"/> Quiz	
<input checked="" type="checkbox"/> Discussion	At the conclusion of each investigation whole class/ or group sharing of observations and conclusions
<input checked="" type="checkbox"/> Other	Text feature scavenger hunt

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