

# Rocks & Minerals

Rocks and Minerals Unit includes:

- Print and digital Interactive Notebooks
- Editable Resources including notes, PowerPoints, and test
- Instructional Videos
- Teacher-led Demos & Guided Inquiry Labs
- Task Cards & Digital Task Cards
- Study Guides





## Suggested Pacing Guide



The following is a **suggested pacing guide** for my COMPLETE COURSES (Earth, Life or Physical Science) which are based on 50-minute class periods. There are three variations below. **Each variation is based on the number of sections in your SCIENCE INTERACTIVE NOTEBOOK chapter.**

Based on a 4-Section Chapter

Day	Lesson/Activity	Engage	Explain	Explore	Elaborate	Evaluate
1	• Teacher Demo	x				
	• Section 1 Notes – INB input • INB Activity – INB output (homework if not completed in class)		x			
2	• Mini-quiz					x
	• Section 2 Notes – use PowerPoint • INB Activity		x			
3	• Mini-quiz					x
	• Guided Inquiry Lab – Student Led			x		
4	• Section 3 Notes – use PowerPoint • INB Activity		x			
	• Mini-quiz			x		x
5	• Section 4 Notes – use PowerPoint • INB Activity		x			
	• Mini quiz			x		x
6	• Science Stations				x	
	• Science Stations				x	
8	• Final draft and testing for Creation Station (STEM)				x	x
9	• Task Card Review (game-style, full class, partner)				x	
10	• Chapter Test					x
	• Have students complete notes for next chapter*	x				

\* **Note-taking option:** Once students are done with chapter test, they get the next set of notes and work quietly on completing them while other students finish up. All notes are to be completed when they return to class. Have students glue each page of notes into the next few pages of their INB (right side only). This way, when you go over the PowerPoint each day, they have already reviewed topic and are ready for class.

### 5 E Model

**Engage** – Teacher-led demos foster wonder and classroom discussion and serve as the hook for the lesson. Videos and images of natural phenomena also foster questioning and communication. NGSS phenomena are aligned to middle school NGSS standards.

**Explain** – PowerPoints, instructional videos, and guided notes (input side of interactive notebooks) provide definitions, explanations, and information through mini-lecture, text, internet, and other resources which encourages students to explain concepts and definitions in their own words.

**Explore** – Students investigate problems, events, or situations. As a result of their mental and physical involvement in these activities, students question events, observe patterns, identify and test variables, and communicate results.

**Elaborate** – It is important to involve students in further experiences that apply, extend, or elaborate the concepts, processes, or skill they are learning. Elaborate activities provide time for students to apply their understanding of concepts and skills. They might apply their understanding to similar phenomena or problems.

**Evaluate** – Use a variety of assessment to gather evidence of student's understanding and provide opportunities for them to assess their own progress.

# Student Interactive Notebook

Each concept shares:

- Actual photos of both the INPUT and OUTPUT pages of Science Interactive Notebook
- Instructions on how to create/use/complete activity for OUTPUT side
- Mini-Quizzes for each concept to check students' understanding
- Answer Keys for all mini-quizzes
- Appendix with Teacher Notes for Interactive Notebook in LARGE print.

**Introduction**

If you are new to the idea of using a classroom, stop by my Nitty Gritty Science Interactive Notebooks tutorial how to begin with your students, what is important, how it will enhance your creativity.

**Focused Lessons with Differentiated**

The lessons shared on the following pages meet students' needs. I have given students having the Side - Out (OOD) register student's Left Side.

Instruct or master first, but them, no you will be areas.

**Mini-Apps**

Mini quizzes understand you can

**Section 1: Properties of Minerals**

**Properties of Minerals Flow Chart**

Directions:

1. Cut out the scrambled vocabulary/description boxes below
2. Unscramble the boxes to fit into each category of the Mineral Properties on the following page.
3. Paste each box under the proper category of properties making sure descriptors on the Flow chart to help with placement.
4. Paste completed Flow chart into your Science Interactive Notebook.

**MINERAL PROPERTIES**

STREAK	LUSTER	CRYSTAL SYSTEM
observed by	terms used to describe appearance	tetragonal

**Answer Key**

**Section 2: Mineral Formation & Resources**

**How Minerals Form**

**Introduction**

Minerals are usually formed through crystallization, which is the process that occurs when particles dissolved in a liquid solidify in an orderly, repeating pattern and form crystals. Geologists can use the physical and chemical properties of these minerals to determine the type of environment in which they formed.

A halite mineral is pictured here with a repeating pattern of sodium and chlorine atoms.

**How Minerals Form**

**How Minerals Form**

**Description:**

Students will understand the process of mineral formation when they complete this diagram. They will then be asked to research and find minerals that are formed by each method and complete a data table.

Student printable is offered in color and black and white. Also included a completed data table that you can use in your Master Interactive Notebook.

**Directions:**

1. Cut the dotted lines on the diagram to create sides of each flap so they open up.
2. Cut out descriptions below of how mineral formation occurs on the diagram in the appropriate window.
3. Research and find two picture examples of minerals that were formed. Paste the examples in the table below.
4. Paste completed diagram and table into your notebook.

Environment	Minerals From Cool Solutions	Minerals From Hot Solutions
Mineral name and picture		
Mineral name and picture		

Environment	Minerals From Cool Solutions	Minerals From Hot Solutions
Mineral name and picture		
Mineral name and picture		

**Section 4: Rock Groups**

**Description:**

The final activity for this chapter is helping students understand the formation of sedimentary rock through erosion and pressure. Students will need to recognize which diagram matches the vocabulary term and definition to create this colorful vocabulary flap diagram.

A student printable, a teacher answer key and a mini-quiz are included for this concept.

# Student Digital Notebook

The student notebook is on Google Drive and ready for you to share with your students. Here's a quick overview of the features:

Set up like a traditional interactive notebook with input and output sides.

Hyperlinked tabs so student can easily move through chapter for review

Students watch video < 6 min to complete notes.

Directions: Minerals are usually formed through crystallization, which is the process that occurs when particles dissolved in a liquid solidify in an orderly, repeating pattern and form crystals. Geologists can use the physical and chemical properties of these minerals to determine the type of environment in which they formed.

Click and drag the descriptions below of how minerals form and place them in the appropriate location on the image. Research and find two picture examples of minerals for each environment in which they were formed. Insert image and mineral name in table.

Environment	Cool Solutions	Hot Solutions	Magma
Mineral name and picture			
Mineral name and picture			

Mineral Formation & Resources

Geode -  
Crystallization -

Minerals form in two ways:

- Crystallization of magma and lava -
- Crystallization of materials dissolved in water -

- Some minerals form with solutions
- Pure metals that crystallize from hot water solutions underground often come from a narrow channel or slab that is different from surrounding rock.

Minerals are the source of gemstones, metals and a variety of materials used to make many products.

gemstone	
metals	
ore	

To produce \_\_\_\_\_ from a \_\_\_\_\_:

- Rocks containing minerals must be located through prospecting.
- One deposit must be removed from the ground through mining.
- Rock is processed by smelting to produce metals.

Mineral Formation & Resources

Digital Textbook

For further exploration, click button(s) below:

Mineral Formation

Encouraging independent learners. Directions for output side are here along with what they need to complete the activity.

Notes are chunked into manageable sections with large spaces for textboxes

Some pages have links so students can go deeper into the topic if they need.

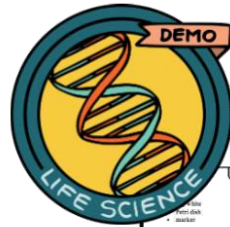
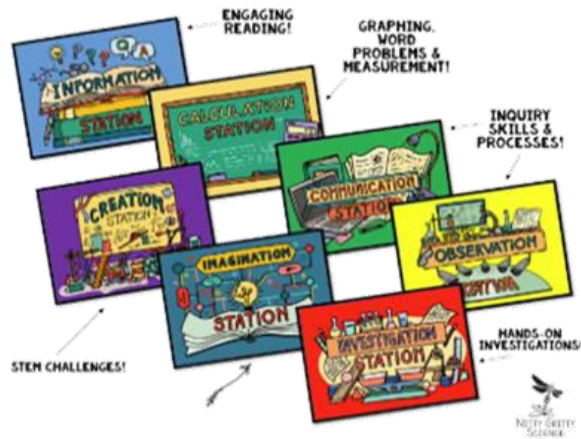
# Demos, Labs, & Science Stations

Working in the lab and being engaged in science experiments is the most exciting part of science.

Demo, Labs, and Science Stations Includes:

1. **SCIENCE STATION SIGNAGE** for all 7 stations is provided in color and in black and white (see preview) and all student answer sheets have icons that correspond with each station for ease of use.
2. **DEMONSTRATION** (teacher-led) allows teachers to invite scientific discussions and can help uncover misconceptions and, most importantly, lead to heightened curiosity and interest in the topic being studied.
3. **GUIDED INQUIRY LAB** which is a traditional lab that allows students to perform an investigation in order to solve a problem. Students will hypothesize, collect and analyze data and communicate their results.
4. **TEACHER GUIDES to DEMOS & SCIENCE STATIONS** help get you started and give you background information to make your science lessons engaging.
5. **7 SCIENCE STATIONS** which are designated locations in the classroom with activities that challenge students to extend their knowledge and elaborate on their science skills by working independently of the teacher in small groups or pairs. Stations included are:
  - **INFORMATION STATION** – Group members will read an interesting and relevant science passage then complete a task to help increase science literacy and deepen their understanding of the science concept.
  - **OBSERVATION STATION** – Group members will have images, illustrations, or actual samples at this station that show applications or processes of the science topic. Using what they've learned, they will need to apply their observation skills to complete the questions attached to each.
  - **CALCULATION STATION** – Group members use their math skills to complete the station challenge. Skills may include graphing, analyzing data, using models, measurement, and calculating formulas or word problems.
  - **INVESTIGATION STATION** – Group members will work with one another to explore the concept through hands-on activities so they may practice specific inquiry process skills as they learn.
  - **COMMUNICATION STATION** – There are three different options for this station: interviews, video, group essay. Depending on the option you choose, group members will communicate what they know by answering questions in creative ways.
  - **CREATION STATION** – Group members will work together to solve a STEM (Science, Technology, Engineering, Math) challenge by creating models or designs that demonstrate their understanding of the science topic being taught.
  - **IMAGINATION STATION** – This station makes science concepts relevant for students by asking them to imagine scenarios that will bring about discussion and critical thinking.
6. **INQUIRY PROCESS SKILLS CHECKLIST** is provided with each set to show teachers and administrators the inquiry skills used by students in each activity. These skills include, but are not limited to, communicating, creating models, inferring, classifying, identifying variables, measuring, observing, predicting, gathering and organizing data, comparing and contrasting, interpreting data, and manipulating materials.

# SCIENCE STATIONS



**Eye Safety**

SCIENCE SKILLS AND LAB SAFETY

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Procedure:**

1. Draw an eye on the underside of the Post-It and display for class using the projector.
2. Cook over the egg and place the egg white only in the front dish.
3. Explain that the proteins in egg whites are similar to those found in the protective layer of the eye.
4. Tell them that someone was not being cautious and has splashed acid into their eye - add drops of acid to the egg white.
5. Ask students to make observations of what is happening to the egg white.
6. Try adding water to reverse the effects. Have students make observations.

**What's Happening?**

The proteins in the egg white become cloudy when the acid is causing a denaturation of the proteins. This can't be reversed chemically because acid is added and is not removed that is chemical and cause severe damage to their eyes or skin if not used properly. Students must be made aware of the safety procedure scenarios like such as wearing goggles, gloves and aprons. Make sure they are aware of safety equipment - eye wash station, shower, fire blanket, etc.

**Discussion:**

Q: What happened to the "eye"?

A: The protective layer became cloudy and damaged the eye.

Q: What type of safety equipment must be worn when doing Lab?

A: goggles, apron, hot this gloves

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Teacher guide and answer key offered for every lab!

Easy-to-get materials!



**Measure with SI Units**

SCIENCE SKILLS AND LAB SAFETY

Name: \_\_\_\_\_ Date: \_\_\_\_\_

The standard system of measurement used by scientists around the world is known as the International System of Units, which is abbreviated as SI. SI units are easy to use because they are based on multiples of 10. Each unit is ten times larger than the next smallest unit and one-tenth the size of the next largest unit. The following table lists the prefixes used to name the most common SI units.

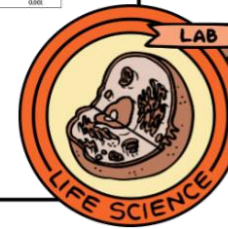
Prefix	Symbol	Abbreviation
kilo-	k	1,000
hecto-	h	100
deka-	da	10
deci-	d	0.1
centi-	c	0.01
milli-	m	0.001

**Materials:**

- scattered seeds
- tape
- balance
- postage scale
- capsaicin (very small milk cartons)
- fertilizer solution
- metric ruler
- 10-mL graduated cylinder
- colored pencils

**Safety:**

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Discussion questions and teacher set-up included!

## USER-FRIENDLY PAGES:

Students easily recognize which answer sheet to use at each station by matching station icons located on each page!!

**Drip, Drop, Splat!**

How does the density of a liquid and drop height affect the size and shape of droplet splatters?

**Materials:**

- colored water (graduated cylinder A)
- colored syrup (graduated cylinder B)
- eye dropper
- paper
- metric ruler
- meter stick

**Procedure:**

1. Make a hypothesis of how density of a liquid will affect splatter size on your lab sheet.
2. Place the piece of paper down on the lab table in order to catch splatters.
3. Measure the heights listed in the data table using a meter stick. Place meter stick with end starting at zero on paper and move up stick when increasing height of drop.
4. Use the eye dropper to drop ONE drop of colored water and ONE drop of colored syrup. Make sure to drop on different places on paper.
5. Measure the size of the splatter in MILLIMETERS. Record in data table on answer sheet.
6. Repeat for each height.
7. Use the collected data to graph the splatter size versus drop height for each liquid.

**Analyze and Conclude**

1. Was your hypothesis correct? Explain.
2. What are two controls in your experiment that helped you collect the most accurate data possible?

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Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Hypothesis**

\_\_\_\_\_

	3	25	50	75	100
Colored Water					
Colored Syrup					

**Height of Drop vs. Splatter Size**

Number of Drops (mm)

Size of Splatter (mm)

**Legend:**

- Water
- Syrup

**Analyze and Conclude:**

1. \_\_\_\_\_
2. \_\_\_\_\_

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**TEACHERS SAVE TIME:**  
Laminate station pages and reuse for each class and for years to follow!  
Inquiry skills used are timeless!

# Instructional Videos

The Intro to Life Science Instructional Videos and Digital Assessments are designed to help teachers move instruction from the group learning space to the individual learning space. Not only does this give students independence in their learning, but it also allows more time for dynamic and interactive learning when teachers meet with students in a group setting.

This resource is perfect for:

- Flipped Classroom
- Absent students
- 1:1 Classrooms
- Sub Plans
- Hybrid Schedules
- Teachers who want more time to guide students as they apply concepts and engage creatively in the subject matter

Features of this resource include:

- Instructional videos which are six minutes or less to keep students focus
- Videos and assessments can be completed independently
- Auto grading and reporting in Google Forms
- Share link with students through educational platforms or email
- Quizzes are editable with 5 – 8 questions per quiz
- Information in video pairs with Nitty Gritty Science Interactive Notebooks

# Task Cards & Digital Task Cards

Task cards are a great tool for concept review that can be used in a variety of ways - pairs, small groups, team games, or individually. The reason they are so effective is there is only ONE task per card, allowing students to focus on that single task until they have successfully completed it. Answers sheet and answer key for teachers are included.

The digital, self-checking task cards are hosted at Boom Learning™ and are compatible with Google Classroom. These are perfect for displaying on your interactive whiteboard and leading class games or review sessions.

Print Task Cards

1. **DECIDE**  
The repeating pattern of a mineral's particles form a solid called a(n) \_\_\_\_\_.  
a. element      c. compound  
b. crystal      d. stone

2. **DECIDE**  
What process causes minerals to form in a shallow lake during dry conditions?  
a. melting      c. evaporation  
b. high pressure      d. condensation

3. **IDENTIFY**  
Identify the shape of this crystal structure.

4. **IDENTIFY**  
Identify three environments where minerals form.

5. **DETERMINE**  
What process of sedimentary rock formation is illustrated by Diagram C?  
a. conglomerate      b. foliated      c. non-foliated      d. chemical

6. **COMPLETE**  
\_\_\_\_\_ is molten rock material that exists below Earth's surface.

7. **IDENTIFY**  
Identify the shape of this crystal structure.

8. **DETERMINE**  
What process causes crystallization of minerals from magma?  
a. evaporation      b. pressure      c. cooling      d. melting

9. **COMPLETE**  
\_\_\_\_\_ is a mineral's ability to glow under ultraviolet light.

10. **EXPLAIN**  
Explain what affects the size of crystals formed from magma.

11. **DETERMINE**  
What process causes crystallization of minerals from magma?  
a. cooling      c. evaporation  
b. melting      d. high pressure

12. **IDENTIFY**  
Identify the shape of this crystal structure.

13. **DETERMINE**  
What process causes crystallization of minerals from magma?  
a. cooling      c. evaporation  
b. melting      d. high pressure

14. **DETERMINE**  
What process causes crystallization of minerals from magma?  
a. cooling      c. evaporation  
b. melting      d. high pressure

15. **DETERMINE**  
What process causes crystallization of minerals from magma?  
a. cooling      c. evaporation  
b. melting      d. high pressure

16. **DETERMINE**  
What process causes crystallization of minerals from magma?  
a. cooling      c. evaporation  
b. melting      d. high pressure

Digital Task Cards

1. **Rocks and Minerals**  
What process causes crystallization of minerals from magma?  
evaporation  
pressure  
cooling  
melting

2. **Rocks and Minerals**  
Can be foliated or non-foliated and changed by pressure and heat are all characteristics of what type of rock?  
igneous      metamorphic      sedimentary

3. **Rocks and Minerals**  
\_\_\_\_\_ rocks have their grains arranged in parallel layers or bands.  
Conglomerate      Foliated  
Non-foliated      Chemical



# Study Guides: Includes *print* or *digital* options

Nitty Gritty Science Study Guides are directly aligned to the notes and assessments offered by Nitty Gritty Science and include a variety of review strategies which meet the needs of your learners for independent study and indirect instruction.

Each study guide provides a combination of strategies which may include:

- Graphic organizers
- Vocabulary building
- Compare and contrast
- Problem solving
- Concept mapping
- Interpreting data
- Critical thinking
- Theme connection
- Matching
- Fill-in-the-blank
- Short answer
- Real world application
- QR videos with accompanying questions

**STUDY GUIDE**

**ROCKS & MINERALS**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**SECTION 1**

Directions: Use the clues to help you unscramble the words below. Use the numbers of letters to answer the riddle on the back.

sneasdhr \_\_\_\_\_ 1 \_\_\_\_\_

ecaturfr \_\_\_\_\_

**SECTION 2**

Directions: Fill in the graphic organizer and answer the questions below about rocks and minerals.

Formation Minerals

**SECTION 3**

Directions: Label each type of rock and fill in the chart below.

**SECTION 4**

Directions: Draw a foliated and non-foliated metamorphic rock. What is the difference between the two?

Foliated VS Non-foliated

Difference \_\_\_\_\_

Directions: Arrange the terms below to describe the formation of sedimentary rock.

deposition cementation

**SECTION 5**

Directions: Determine whether each of the statements about the different types of rocks is true or false.

1. Extrusive rocks form from lava that erupts from the earth's surface.
2. The deeper a rock is buried in the crust, the higher the temperature.
3. Intrusive rocks form when magma hardens below the earth's surface.
4. Compaction refers to when dissolved mineral particles of sediment are pressed together.
5. Sedimentary rocks form when particles are cemented together.

**SECTION 7**

Directions: Scan the QR code to watch the video about the formation of diamonds. Describe the problem material scientists faced when it came to diamonds. How were they able to help solve this problem? What material did they use? Describe the process in detail below.

Did you know diamond comes from the Greek word meaning unbreakable?

# Assessments:

Teachers can use a variety of assessments to evaluate student progress throughout the unit. The curriculum provides mini-quizzes for each Interactive Notebook chapter and an online assessments that goes with the instructional videos. The chapter test includes multiple choice, short answer, interpreting diagrams, and an essay.

Name \_\_\_\_\_ Date \_\_\_\_\_

**Quiz: Continental Drift and Sea-Floor Spreading**

Multiple Choice

1. Who first proposed the theory of continental drift?  
a. Hess                      b. Pangea                      c. Wegener
2. All are evidence to support the theory of continental drift  
a. land features                      b. climate change                      c. fossils
3. Seafloor spreads apart at both sides of a \_\_\_\_\_ as new  
a. mid-ocean ridge                      b. rift valley                      c. trench
4. Rocks on the seafloor that lie in a pattern show a record of  
a. atmosphere                      b. magnetic field                      c. temperature
5. Drilling samples revealed that rock samples taken farther  
a. older                      b. younger                      c. hotter

Name \_\_\_\_\_ Date \_\_\_\_\_

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a. older                      b. younger                      c. hotter

**EDITABLE CHAPTER TEST INCLUDES MULTIPLE CHOICE, FILL IN THE BLANK, INTERPRETING DIAGRAMS, & SHORT ANSWERS QUESTIONS**

**ANSWER KEY INCLUDED — IMAGES ARE BLURRED FOR COPYRIGHT REASONS**

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