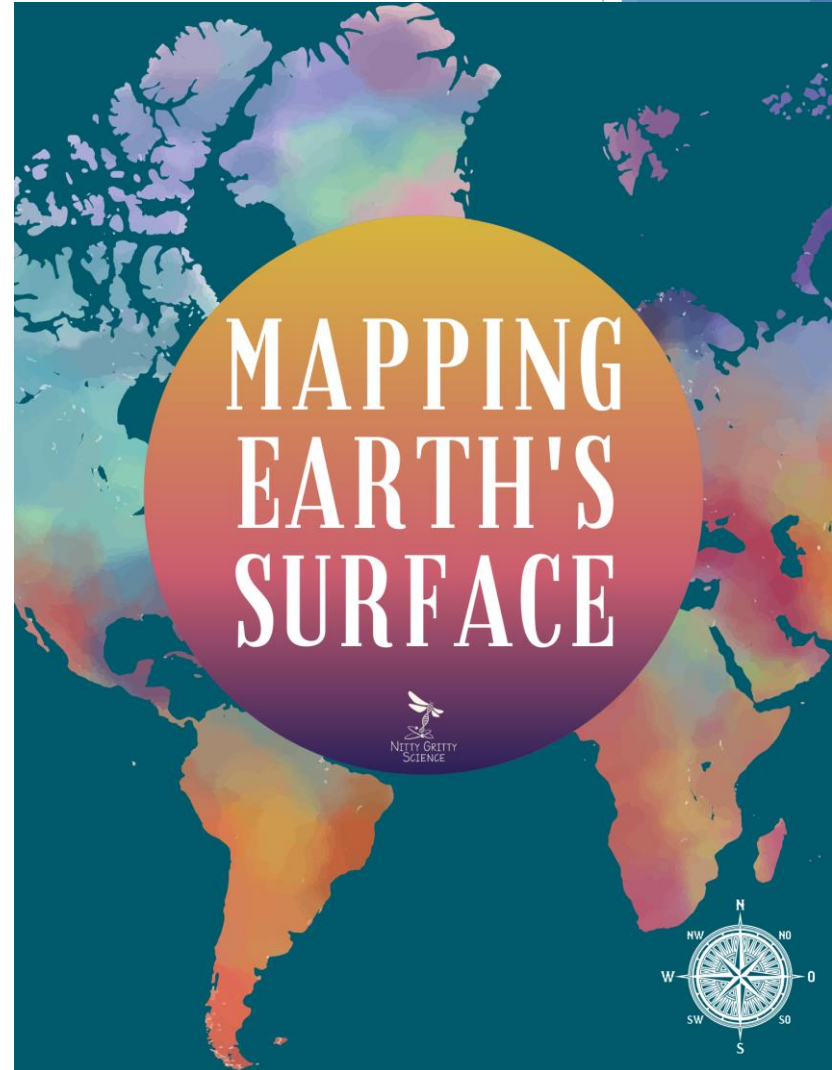




Mapping Earth's Surface

Mapping Earth's Surface 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		x			
	• INB Activity – INB output (homework if not completed in class)			x		
2	• Mini-quiz					x
	• Section 2 Notes – use PowerPoint		x			
	• INB Activity			x		
3	• Mini-quiz					x
	• Guided Inquiry Lab – Student Led			x		
4	• Section 3 Notes – use PowerPoint		x			
	• INB Activity			x		
5	• Mini-quiz					x
	• Section 4 Notes – use PowerPoint		x			
	• INB Activity			x		
6	• Mini quiz					x
	• Science Stations				x	
7	• 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.

Section 1: Exploring Earth's Surface

Landforms

Landforms are topographic features formed by processes that shape the Earth's surface. Characteristics such as size, shape, slope, elevation, and relief of the surrounding landscape are often used to describe landforms.

Directions:

1. Use the map below to identify features and complete the following tasks:

- Label each axis as either LONGITUDE or LATITUDE
- Label the Western and Eastern Hemispheres
- Label the Northern and Southern Hemispheres
- Draw a RED star at the approximate latitude and longitude of your location.

Reading and Understanding Maps

Directions:

1. Use the map below to identify features and complete the following tasks:

- Label each axis as either LONGITUDE or LATITUDE
- Label the Western and Eastern Hemispheres
- Label the Northern and Southern Hemispheres
- Draw a RED star at the approximate latitude and longitude of your location.

2. Color code the features of the map by coloring in the following areas:

- Prime Meridian
- Equator
- Directional Compass
- Contour Interval 60°W
- Contour Interval 140°E

Color code the following:

- Prime Meridian
- Equator
- Directional Compass
- Contour Interval 60°W
- Contour Interval 140°E

Answer Key

Quiz: Models of Earth

Connectively identify each feature of the map and write letter in space provided.

1. Equator
2. Northern Hemisphere
3. Directional Compass
4. Southern Hemisphere
5. Eastern Hemisphere
6. Prime Meridian

Quiz: Models of Earth

Connectively identify each feature of the map and write letter in space provided.

1. Equator
2. Northern Hemisphere
3. Directional Compass
4. Southern Hemisphere
5. Eastern Hemisphere
6. Prime Meridian

Name _____ Date _____

Quiz: Exploring Earth's Surface

Matching

_____ 1. landform	a. lies along a seacoast, low elevation
_____ 2. relief	b. landform with high elevation
_____ 3. contour line	c. feature of land formed by the erosion of a river
_____ 4. topographic map	d. landform with high elevation on a steep slope

Section 2: Models of Earth

Section 3: Maps & Computers

Description:

Students are given a grid of numbers in order to recognize numbers of elevation and use them to make contour lines for a map. Upon completion they will understand how contour lines represent elevation, relief and slope.

An introduction to contouring, a blank grid and an answer key are offered with this activity along with a mini quiz.

Contour Lines

Scientists use the term **topography** to describe the shape of a geographic area. A **topographic map** is a map showing the surface features of an area by providing accurate information on the elevation, relief and slope of the ground surface of a region.

To represent elevation, relief and slope on a topographic map, mapmakers use **contour lines** that connect points of equal elevation. Contour lines are always drawn on maps as seen from above. If you were hiking and using a map with contour lines, you could follow along one and you would neither gain nor lose elevation.

The difference in elevation between one contour line and the next is always the same on a given map. This difference is called the **contour interval**. The contour interval is important to know when **contouring** or drawing lines on a grid of numbers that connect points of equal value. Contouring helps determine the shape of an area.

Example of contouring

44	48	48	44	44	41
46	47	48	50	47	45
48	52	53	55	50	48
52	55	57	60	55	50
58	61	62	65	60	47
62	69	69	70	67	49
62	63	69	63	43	42

A few rules for contouring and reading topographic maps include:

- Contour lines never divide or cross one another, although on steep cliffs they seem to appear to run together.
- Contour lines are farther apart on gentle slopes than they are on steep slopes.
- Contour lines never stop in the middle of a map! They either form a closed loop or they run off the edge of the map/grid.
- The contour interval always stays the same on a given map.
- Elevations on one side of a contour line are higher than the elevations on the other side of the line.

Directions:

1. Practice contouring with Grid A and B below while being aware of contour intervals (first start with highest elevation).

Grid A	Contour interval = 10	Grid B	Contour interval = 5						
20	35	30	35	20	20	35	40	35	30
25	40	45	40	35	25	40	45	40	35
30	45	50	45	40	30	45	50	45	40
35	50	55	50	45	35	50	55	50	45
40	55	60	55	50	40	55	60	55	50
45	60	65	60	55	45	60	65	60	55
50	65	70	65	60	50	65	70	65	60
55	70	75	70	65	55	70	75	70	65
60	75	80	75	70	60	75	80	75	70

2. Use the rules for contouring above to complete the topography map on the following page. Hint: Highest elevation is 90 and contour interval is 5.

3. When finished, try to use information from map to draw a cross profile, or a side view of the area mapped.

4. Cut and paste topography map and cross profile in your Science Interactive Notebook.

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: Directions: Landforms are topographic features formed by processes that shape Earth's surface. Characteristics such as size, shape, slope, elevation, relief, and orientation to the surrounding landscape are often used to describe landforms.
1. Complete the table below with names and definitions of the main types of landforms, making sure to describe the elevation and relief of each.

	Name	Definition
Types of mountains	Mountain range	
	Mountain system	
	Mountain belt	
Types of plains	Coastal plain	
	Interior plain	

EXPLORING EARTH'S SURFACE

Topography -

- Elevation -
- Relief -
- Landform -

Plains -

- lies along a coast, low elevation and low relief
- lies away from a coast, low relief, elevation can vary

Mountains -

- group of mountains that are closely related in shape, structure and age
- different mountain ranges in a region
- large unit of mountain ranges and mountain systems in a long connected chain

Plateaus -

What is a landform region?

EXPLORING EARTH'S SURFACE

Digital Textbook

For further exploration, click button(s) below:

Landforms

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.

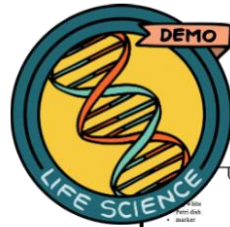
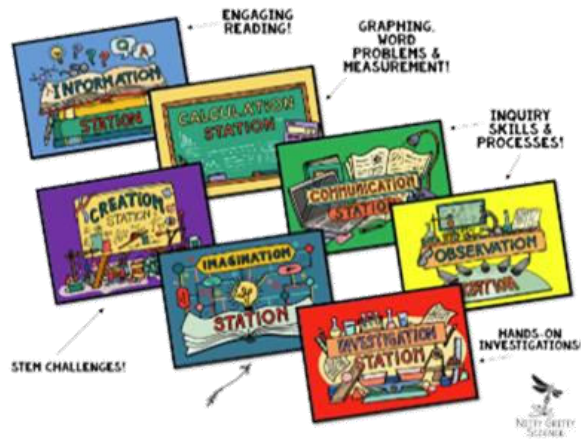
Demos, Labs, & Science Stations

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

Materials:

- projector
- strong acid (HCl or acetic acid)
- eye dropper
- water

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 (other reactions and systems used to understand that a chemical can cause severe damage to their eyes or skin if not used properly. Students must be made aware of the safety procedures associated with 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 fire gloves

©2016 Taina Science



Discussion questions and teacher set-up included!

Teacher guide and answer key offered for every lab!

Easy-to-get materials!



Name _____ Date _____

Measure with SI Units

SCIENCE SKILLS AND LAB SAFETY

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:

- measured words
- tape
- balloon
- posting wall
- explosive/empty small milk cartons
- fertilizer solution
- metric ruler
- 10-mL graduated cylinder
- colored pencils

Safety:

⚠️

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?

©2016 Taina Science

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

Name _____ Date _____

Hypothesis

Drop Height (cm)

	3	25	50	75	100
Colored Water					
Colored Syrup					

Height of Drop vs. Splatter Size

Number of Drops (mm)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Size of Splatter (mm)

Legend:

- Water
- Syrup

Analyze and Conclude:

1. _____
2. _____

©2016 Taina Science

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**
What term describes the difference in elevation between the highest and lowest parts of an area?
a. topography c. plateau
b. relief d. landform

2. **DECIDE**
One major difference between a

3. **DECIDE**
A _____ is a list of all of a map's symbols.
a. globe c. key

4. **IDENTIFY**
Identify the landform in the above illustration.

5. **DECIDE**
The Prime Meridian runs through _____.
a. 180° W c. Washington, DC
b. Greenwich d. New Zealand

6. **IDENTIFY**
Identify the landform in the above illustration.

7. **LIST**
List three different types of map projections.

8. **EXPLAIN**
Explain what points are connected by the contour lines.

9. **DECIDE**
The Prime Meridian runs through _____.
a. 180° W c. Washington, DC
b. Greenwich d. New Zealand

10. **IDENTIFY**
Identify the landform in the above illustration.

11. **COMPLETE**
A map's _____ relates distance on a map to a distance on Earth's surface.

12. **LIST**
List three different types of map projections.

13. **EXPLAIN**
Explain what points are connected by the contour lines.

14. **EXPLAIN**
Explain how the Prime Meridian divides the Earth.

15. **COMPLETE**
A _____ map shows the surface features of an area.

16. **EXPLAIN**
Explain how the Prime Meridian divides the Earth.

Digital Task Cards

1. **Mapping Earth's Surface**
The _____ is the

2. **Mapping Earth's Surface**
What term describes the difference in elevation between the highest and the lowest parts of an area?

3. **Mapping Earth's Surface**
Which letter shows the Eastern Hemisphere?

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

MAPPING EARTH'S SURFACE

Name: _____ Date: _____

SECTION 1

Have you ever dreamed of climbing the highest peaks in the world? For many, it will never come. But personal goals have the highest peaks in the world. There are other types of climbing and bouldering, ice climbing, and more. What equipment is needed? What might one of your findings be?

SECTION 2

Directions: Fill in the blank with the word that best fits the sentence.

elevation mountain system
topography coastal plain
plateau mountain belt

1. Scientists use this term to describe the difference between a plateau and a coastal plain.

2. A plain that lies away from the coast whose elevation is _____.

3. The height above sea level is called _____.

SECTION 3

Directions: Label the directions on the map.

Latitude

Longitude

Equator

90°N

60°N

30°N

0°

30°S

60°S

90°S

Following questions:

SECTION 4

Directions: Label the directions on the map.

SECTION 5

Directions: Complete the concept map. Computers have revolutionized map making.

SECTION 6

Directions: Topographic maps show elevation using symbols to portray the land. Imagine you're looking at these topographic maps. Draw contour lines for each of them.

A

B

Did you know the largest mountain in our solar system is on Mars?

SECTION 7

Directions: Scan the QR code to watch the video about landforms and fill in the blanks with the best answer below.

TYPES OF LANDFORMS

Mountains are formed when _____ . The low spaces in between mountains are called _____ . Plateaus have _____ tops. If they are medium sized, they are called mesas which is the Spanish word for _____ . If a plateau is small, it is called a _____ . Plateaus are formed in a lot of different ways. Two ways in which they're formed are by _____ and _____ . A mountain through which lava can flow is called a _____ . A landform that loses more water to air is called a _____ . The largest one of these in the world is _____ . A delta is found at the _____ of a river and is formed when _____ builds up to form a piece of land. One way an island forms is when _____ . As long as it has _____ on all sides it's an island.

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.

The image displays a collection of educational materials. On the left, two identical worksheets titled "Quiz Models of Earth" are shown. Each worksheet includes a world map with a grid and a compass rose, and a set of five numbered blanks for identifying features: 1. Equator, 2. Northern Hemisphere, 3. Directional Compass, 4. Southern Hemisphere, and 5. Eastern Hemisphere. In the center and right, a larger "CHAPTER TEST" page is visible. A red-bordered box at the top of this page states: "EDITABLE CHAPTER TEST INCLUDES MULTIPLE CHOICE, FILL IN THE BLANK, INTERPRETING DIAGRAMS, & SHORT ANSWERS QUESTIONS". At the bottom of the test page, another red-bordered box reads: "ANSWER KEY INCLUDED - IMAGES ARE BLURRED FOR COPYRIGHT REASONS".

Terms of Use

Thank you for sharing Nitty Gritty Science with your students!

Terms of Use

Copyright © Nitty Gritty Science, LLC and Nitty Gritty Science Jr., LLC. All rights reserved by author Dr. Erica Colón. This product is to be used by the original downloader only. Copying for more than one teacher, classroom, department, school, or school system is prohibited. This product may not be distributed or displayed digitally for public view. Failure to comply is a copyright infringement and a violation of the Digital Millennium Copyright Act (DMCA). Clipart and elements found in this PDF are copyrighted and cannot be extracted and used outside of this file without permission or license. Intended for classroom and personal use ONLY.

Contact Information:

Email: erica@nittygrittyscience.com

Website: www.nittygrittyscience.com

Shop the website or use the following links from Teachers Pay Teachers

Nitty Gritty Science (Grades 6–9)

<https://www.teacherspayteachers.com/Store/Nitty-Gritty-Science>

Nitty Gritty Science Jr (Grades K–5)

<https://www.teacherspayteachers.com/Store/Nitty-Gritty-Science-Jr>

