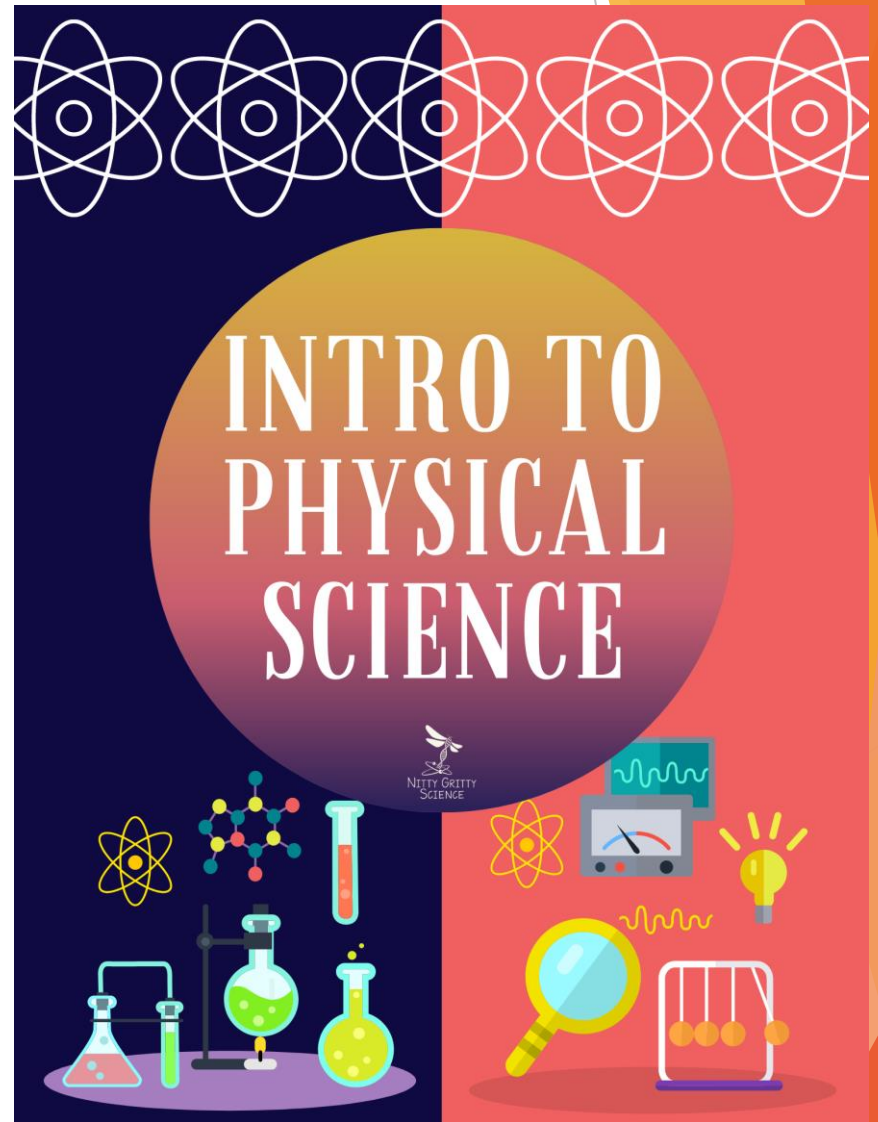


# Intro to Physical Science

Intro to Physical Science 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.

The image displays a collection of pages from a science interactive notebook, arranged in a collage. The pages include:

- Table of Contents: Intro to Physical Science**
- Introduction**: A page explaining the purpose of the notebook and how to use it.
- Section 1: The Scope of Physical Science**: A page with a diagram of physical science fields and a list of directions for using the file cards.
- Section 2: Science Lab Safety**: A page with a grid of safety symbols and a list of directions for using the safety contract.
- Student Science Laboratory Safety Contract**: A page with a list of safety rules and a section for the student and parent/guardian signatures.
- PHYSICAL SCIENCE**: A page with a diagram of the electromagnetic spectrum and a list of directions for using the file cards.
- Section 3: Methods of Science and Technology**: A page with a diagram of the technological design process and a list of directions for using the file cards.

Each page includes instructions on how to use the notebook, such as cutting out file cards, using a pocket, and labeling the pages. The pages are designed to be interactive and engaging for students.

# 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.

The screenshot displays a digital notebook interface. On the left, a page titled 'TECHNOLOGICAL DESIGN PROCESS' features a diagram of eight interlocking gears numbered 1 through 8. To the left of the gears are eight circular buttons, each containing a step of the design process: 'GENERATE POSSIBLE SOLUTIONS', 'TEST THE MODEL', 'SHARE THE RESULTS', 'RESEARCH THE PROBLEM', 'TESTING AND RETEST THE MODEL', 'IDENTIFY THE PROBLEM', 'CREATE A SKETCH OF THE SOLUTION', and 'SELECT THE SOLUTION'. A text box above these buttons reads: 'Directions: Drag each step below into the correct order of the technological design process.' On the right, a page titled 'METHODS OF SCIENCE & TECHNOLOGY' contains text about technology and scientific notation. A large text input box is present with the prompt: 'What are possible reasons for technological design limitations?'. Below this, it states 'Scientific work often requires \_\_\_\_\_ to solve formulas or convert units.' and 'Scientific notation -  $a \times 10^b$ '. A small note explains: 'a represents a decimal number; b represents an exponent, or power, of 10'. A list of steps to convert to and from scientific notation is provided: 1. \_\_\_\_\_, 2. \_\_\_\_\_, 3. \_\_\_\_\_. On the far right, a vertical navigation bar has tabs for 'THE SCOPE OF PHYSICAL SCIENCE', 'LAB SAFETY', 'METHODS OF SCIENCE & TECH', and 'CLASSROOM LITERARY'. A video player is embedded, showing a play button over a video titled 'Methods of Science and Technology'. Below the video is a 'Digital Textbook' button.

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.

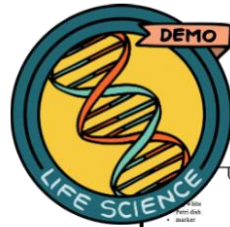
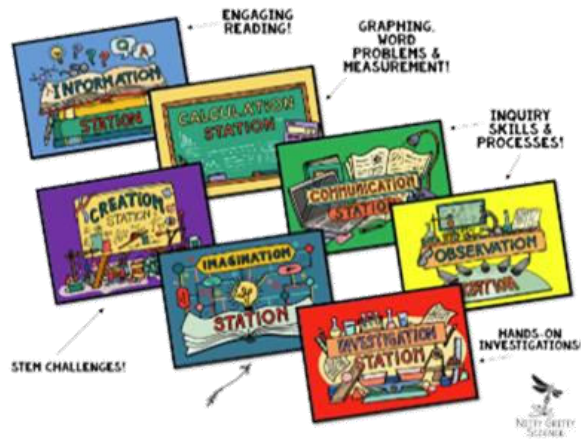
# Demos, Labs, & Science Stations

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

**Procedure:**

1. Draw an eye on the underside of the Petri dish and display for class using the projector.
2. Crack open the egg and place the egg white only in the Petri 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 strong and is permanent that is chemical reactions occur 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 types of safety equipment must be worn when doing Lab?

A: goggles, apron, lab kit, gloves

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Discussion questions and teacher set-up included!

Teacher guide and answer key offered for every lab!

Easy-to-get materials!



### 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.

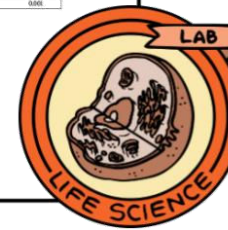
Prefix	Symbol	Abbreviation
Milli-	m	1/1000
Centi-	c	1/100
Deci-	d	1/10
Deci-	d	0.1
Centi-	c	0.01
Milli-	m	0.001

**Materials:**

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

**Safety:**

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### 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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**USER-FRIENDLY PAGES:**  
Students easily recognize which answer sheet to use at each station by matching station icons located on each page!!

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

### Hypothesis

Drop Height (cm)

Color	3	25	50	75	100
Water					
Syrup					

Height of Drop vs. Splatter Size

Number of Drop (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** EXPLAIN  
Explain what it means if you see this lab safety symbol.  


**2** LIST  
List three examples of Physical

**3** DECIDE  
The ability to push a fridge across a

**4** TRUE OR FALSE  
Wiring a home is an example of someone using chemistry.

**5** TRUE OR FALSE  
We depend on physical science for almost everything we do.

**6** COMPLETE  
\_\_\_\_\_ is the application of science to solve problems.


**7** DECIDE  
\_\_\_\_\_ is a way of writing very large or very small numbers that use exponents.  
a. Scientific theory    b. Conversion  
c. Scientific notation    d. Technology

**8** EXPLAIN  
Explain the impact technology has had on society.

**9** IDENTIFY  
 $a = 15^b$   
What does the  $b$  represent in this equation?

**10** EXPLAIN  
Explain what it means if you see this lab safety symbol.  


Digital Task Cards

**Intro to Physical Science**  
Identify all of the images that are examples of physical science.  


**Intro to Physical Science**  
The first step to convert to and from scientific notation is to move the decimal point left or right until the last nonzero digit.

**Intro to Physical Science**  
How are technological design and scientific investigation similar? Click on all that apply.  
 Both follow a list of steps or procedures  
 Both rely on reasoning  
 Both rely on evidence



# 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**

**INTRO TO PHYSICAL SCIENCE**

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

**SECTION 1**

Directions: Fill in the blanks with the correct terms from the unscrambled word search.

I	A	B	Q	G
D	S	M	E	C
K	D	F	Z	L
R	E	T	T	A
Y	N	V	K	D

**SECTION 2**

Directions: List four examples of chemical changes and then draw a picture for each.

Chemical Changes

**SECTION 3**

Directions: List examples of both Chemistry and Physics that you might find all around you.

CHEMISTRY

PHYSICS

**SECTION 5**

Directions: Arrange the steps of the technological design process in the correct order.

- ❖ Refine and retest the model
- ❖ Create a model of the solution
- ❖ Identify the problem
- ❖ Communicate the results

1.

2.

5.

6.

Directions: First, write down scientific notation. Then, solve.

Step 1. \_\_\_\_\_

Step 2. \_\_\_\_\_

Step 3. \_\_\_\_\_

Write the scientific notation \_\_\_\_\_

Write the scientific notation \_\_\_\_\_


**SECTION 6**

Directions: Read each of the lab safety and determine if it is True or False. If the answer is False, write the correct answer in the blank space to make it true.

STATEMENT	True/False	Correct Answer
1. After you hold an animal and put it back in its cage, you should wash your hands.		
2. You should NOT ask your teacher if you have a question about something you're working on.		
3. Hazardous materials should be thrown outside.		
4. When doing an experiment, protective clothing should be worn.		
5. Food and drinks are encouraged to be consumed in the lab.		
6. Responsible lab behavior includes listening, no horseplay, and overall good behavior.		
7. During an experiment, directions aren't meant to be followed exactly as stated. Feel free to add anything to the experiment at any time.		

**SECTION 7**

Directions: Scan the QR code to watch the video and then explain each step of the Engineering Process.



**THE ENGINEERING PROCESS**

1. Define the Problem	2. Research
3. Develop a Possible Solution	4. Design your Solution
5. Build your Prototype	6. Test it
7. Evaluate your Solution	

The first cell phone cost \$3,995 and only offered 30 minutes of talk time!

# 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 collage of educational assessment materials. On the left, two identical 'Quiz: Science Lab Safety' forms are shown. Each form includes a header for 'Name' and 'Date', followed by the title 'Quiz: Science Lab Safety' and the instruction 'Identify the safety symbol and explain its meaning.' Below this, there is a 2x2 grid of safety symbols: a pair of scissors, a Bunsen burner, a hand being washed, and a biohazard symbol. Each symbol is followed by a set of horizontal lines for a student to write an explanation. To the right of these quizzes is a larger 'CHAPTER TEST' document. It features a title 'CHAPTER TEST' and a list of multiple-choice questions. A red-bordered box at the top of the test 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 states: 'ANSWER KEY INCLUDED — IMAGES ARE BLURRED FOR COPYRIGHT REASONS'. The test page also includes a section for 'Fill in the blank' questions and a section for 'Interpret each illustration with the correct vocabulary term.'

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

