

# Intro to Life Science



Intro to Life 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.

| Table of Contents:<br>Intro to Life Science/Biology |      |
|---|------|
| Description   | Page |
| Introduction  | 3    |
| Section 1: The Science of Biology                   | 4    |
| Ten Themes of Biology Printable (table)             | 5    |
| Ten Themes of Biology Printable (descriptions)      | 6    |
| Quiz: The Science of Biology                        | 7    |

**Introduction**  
If you are new to the idea of using a Science Interactive classroom, stop by my Nifty Gritty Science shop and Science Interactive Notebooks tutorial for FREE! In this tutorial, I explain how to begin with your students, what materials to use, and how important it is to be creative with your students' learning. I also explain how to use differentiated instruction on the following pages cover Nat...

**Section 1: The Science of Biology**

What is Biology? Biology is the study of life and living organisms. It is the study of how life works and how it changes over time. Biology is the study of the characteristics of life, the interactions of organisms with their environment, and the evolution of life.

**THE SCIENCE OF BIOLOGY**  
Biology: the study of life and living things.  
\*The study of Biology: the study of how living things change over time (through genetic change).  
\*Biology: things that have all the characteristics of life, in order of least to most complex.  
\*Characteristics of Living Things:  
- Organization (cells) - Energy from Biology - Reproduction - Response to Stimuli - Growth and Development - Homeostasis - Adaptation - Evolution  
\*Life can be studied at the following levels:  
- Molecular - Cellular - Organismal - Population - Community - Ecosystem - Biosphere

**Ten Themes of Biology**

Directions: Cut out and read the following descriptions that apply to all levels of biology for all living organisms. Match each description to the correct Biology/Life Science theme and paste into the table. When the table is complete, cut and paste it into your Science Interactive Notebook.

| TEN THEMES OF BIOLOGY |             |
|-----------------------|-------------|
| Theme                 | Description |
| Biological            |             |

**Section 2: Science Lab Safety**

**Instructions:**  
This is always a good thing to have in the Science Interactive Notebooks as a reminder to students that they signed a Lab Safety Contract and agree to follow the safety guidelines. Attached is the Lab Safety Contract, Safety Symbol Matchbooks and a mini-quiz.

**Student Science Laboratory Safety Contract**

Directions: Take this Science Laboratory Safety Contract home and read it over with you and your parents/guardian. You and your parent/guardian will both sign and date the bottom lab safety contract which will need to be returned to your teacher. Paste the top portion of this contract into your Science Interactive Notebook.

The Student Science Laboratory Safety Contract states that I agree to:

- Act responsibly at all times in the laboratory.
- Follow all instructions given - orally or written by my teacher.
- Perform ONLY those activities assigned and approved by my teacher.
- Protect my eyes, face, hands and body by wearing proper clothing and protective equipment provided by my school.
- Carry out good housekeeping practices as instructed by my teacher.
- Know the location of safety and first aid equipment in the laboratory.
- Notify my teacher immediately of an emergency.
- NEVER work alone in the laboratory.
- NEVER eat or drink in the laboratory unless instructed to do so by my teacher.
- Handle living organisms or preserved specimens only when authorized by my teacher, and then always carefully and with respect.
- NEVER enter or work in a supply area unless instructed to do so and supervised by my teacher.

(Return this portion to your teacher)

I, \_\_\_\_\_ (print name) understand each statement in the Student Science Laboratory Safety Contract. I understand the safety rules set in place by my teacher, school and any other safety regulations put in place by my district. I understand by doing so I am protecting myself and others from unnecessary harm.

Student Signature \_\_\_\_\_ Date \_\_\_\_\_  
I acknowledge that my student has read this contract and understands its contents and agrees to follow the good faith.

Parent Signature \_\_\_\_\_ Date \_\_\_\_\_

Directions: Cut out the safety symbol matchbooks. Fold on dotted lines, and write safety rule on each matchbook tab, and describe the safety rule on the inside of each matchbook. Paste into your Science Interactive Notebook.

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |

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

**Quiz: Science Lab Safety**

Identify the safety symbol and explain its meaning.

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |

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

**Quiz: Science Lab Safety**

Identify the safety symbol and explain its meaning.

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |

# 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 with several key components:

- THE 10 THEMES OF BIOLOGY:** A grid of 10 colored boxes, each containing a theme and a brief description. A red arrow points from the text 'Set up like a traditional interactive notebook...' to this section.
- THE SCIENCE OF BIOLOGY:** A central page with a title, a list of characteristics of a living thing (numbered 1-8), and a table for notes. A red arrow points from the text 'Notes are chunked into manageable sections...' to this page.
- Navigation and Resources:** On the right side, there are vertical tabs for 'THE SCIENCE OF BIOLOGY', 'SCIENTIFIC RESEARCH AND TOOLS', 'LAB SAFETY', and 'CLASSROOM LIBRARY'. Below these is a video player titled 'THE SCIENCE OF BIOLOGY' with a play button. A red arrow points from the text 'Students watch video < 6 min to complete notes.' to the video player. Below the video is a 'Digital Textbook' button and a 'Characteristics of Life' button. A red arrow points from the text 'Some pages have links so students can go deeper into the topic if they need.' to the 'Characteristics of Life' button.
- Input/Output Sides:** On the left side, there is a 'Directions: Click and drag the theme below and place them with the correct description.' box. Below it is a list of themes: 'Interactions with Environment', 'Regulation', 'Cellular Basis of Life', 'Scientific Inquiry', 'Energy of Life', 'Form and Function', 'Biology and Society', 'Biological Systems', 'Reproduction & Inheritance', and 'Adaptation and Evolution'. A red arrow points from the text 'Encouraging independent learners. Directions for output side are here along with what they need to complete the activity.' to this list.

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

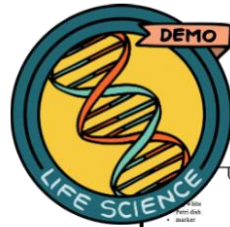
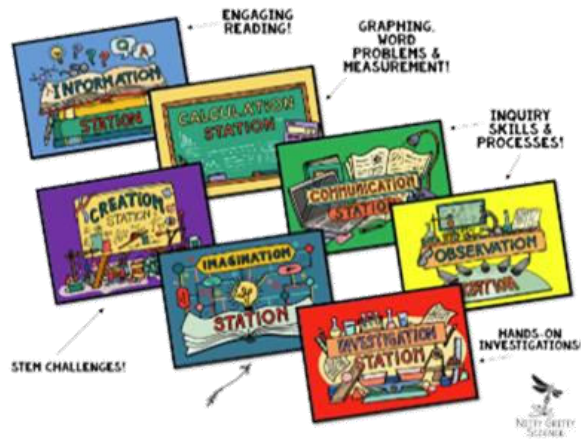


Working in the lab and being engaged in science experiments is the most exciting part of science.

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 is an irreversible chemical reaction and students need to understand that a chemical reaction cannot reverse damage to their eyes or skin if not used properly. Students must be made aware of the safety procedure 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

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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

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.

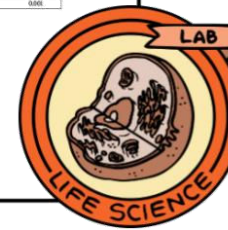
| Prefix | Symbol | Abbreviation |
|--------|--------|--------------|
| kilo-  | k      | 1,000        |
| hecto- | h      | 100          |
| deka-  | da     | 10           |
| deci-  | d      | 0.1          |
| centi- | c      | 0.01         |
| milli- | m      | 0.001        |

Materials:

- scattered seeds
- tape
- balance
- postage scale
- capsaicin (strong) 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?

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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!

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

Hypothesis

Drop Height (cm)

|               | 3 | 25 | 50 | 75 | 100 |
|---------------|---|----|----|----|-----|
| Colored Water |   |    |    |    |     |
| Colored Syrup |   |    |    |    |     |

Height of Drop vs. Splatter Size

Number of Drops (cm)

| Size of Splatter (mm) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |  |
|-----------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|--|
| Water                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |  |
| Syrup                 |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |  |

Legend:

- Water
- Syrup

Analyze and Conclude:

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

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# 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

Digital Task Cards



# 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**

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

**SECTION 1** **BIOLOGY**

Directions: Fill in the blank with information.

Biology is \_\_\_\_\_

Initials: \_\_\_\_\_

**SECTION 2**

Directions: Pick three levels of life study listed below, provide a brief description of your choices, and then answer the questions below.

|            |           |           |
|------------|-----------|-----------|
| Biosphere  | Ecosystem | Community |
| Population | Organism  | Group     |
| Cells      | Molecules |           |

Initials: \_\_\_\_\_

**SECTION 3**

Directions: Fill in the graphic organizer with five rules that should be followed in the lab. At the bottom describe the functions of the microscopes listed.

Initials: \_\_\_\_\_

**SECTION 4**

Directions: Match each of the terms with the correct definition.

|               |       |
|---------------|-------|
| Data          | _____ |
| Inference     | _____ |
| Metric System | _____ |
| Observation   | _____ |

Initials: \_\_\_\_\_

Directions: Define quantitatively and draw a line to the instrument that is used to measure it.

Quantitative Research

|  |       |
|--|-------|
|  | _____ |
|  | _____ |

Initials: \_\_\_\_\_

**SECTION 6**

Directions: Find three things to measure and use the metric system to measure them. Then draw it on the chart to show the results.

|       |       |       |
|-------|-------|-------|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

Initials: \_\_\_\_\_

**SECTION 7**

Directions: Scan the QR code to watch the video and explain how living things change with their environment. Include what adaptations are and how they can help an animal. What other animals can you think of that have adaptations?

Initials: \_\_\_\_\_

**LIVING THINGS CHANGE**

Did you know the first microscopes were called "the glasses" because they were used to study small insects?

Initials: \_\_\_\_\_



# 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: The Science of Biology**

*Matching*

|                                       |  |
|---------------------------------------|--|
| _____ 1. form and function            | a. ability of organisms to make offspring  |
| _____ 2. scientific inquiry           | b. maintenance of a stable internal environment  |
| _____ 3. adaptation                   | c. how something works is related to its structure                                     |
| _____ 4. biological system            | d. each organism interacts continuously with its environment                           |
| _____ 5. reproduction                 | e. a combination of parts can form a more complex organization                         |
| _____ 6. energy                       | f. involves asking questions about nature and biology                                  |
| _____ 7. interaction with environment | g. is needed for organisms to grow, develop and reproduce                              |
| _____ 8. regulation                   | h. changes in genes lead to inherited traits that help organisms survive and reproduce |

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

**Quiz: The Science of Biology**

*Matching*

|                                       |  |
|---------------------------------------|--|
| _____ 1. form and function            | a. ability of organisms to make offspring  |
| _____ 2. scientific inquiry           | b. maintenance of a stable internal environment  |
| _____ 3. adaptation                   | c. how something works is related to its structure                                     |
| _____ 4. biological system            | d. each organism interacts continuously with its environment                           |
| _____ 5. reproduction                 | e. a combination of parts can form a more complex organization                         |
| _____ 6. energy                       | f. involves asking questions about nature and biology                                  |
| _____ 7. interaction with environment | g. is needed for organisms to grow, develop and reproduce                              |
| _____ 8. regulation                   | h. changes in genes lead to inherited traits that help organisms survive and reproduce |

**CHAPTER TEST**

Name \_\_\_\_\_

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

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

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### Contact Information:

Email: [erica@nittygrittyscience.com](mailto:erica@nittygrittyscience.com)

Website: [www.nittygrittyscience.com](http://www.nittygrittyscience.com)

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

