

General Science & Labs, Natural History, Nature Lore

# Science



**Alveary**





## About the Course

The study of science is one of the primary ways children develop a relationship with the Things of the universe. To accomplish this, a Mason science program consists of nature lore, natural history, and general science. Nature immersion, inquiry, community connection, and supportive literature are woven into each of these three parts.

Form 2 students extend the scope of the Things they encounter and begin to notice that science is active in their world. Growing in their self-knowledge at this age, they may notice that they gravitate toward some of these Things more than others. This is a bit like noticing that you have a natural rapport with a particular friend because they seem to understand the way you think and they share the same interests. This is wonderful and very typical, but we still want them to get to know more “friends” in science and try different Things even though one might be their particular interest. Nature immersion continues. Use of a lab notebook is added to their methods of inquiry. Their sense of community is expanding: who are the scientists in their world and what are they doing? Literature is chosen to support varied interests, exploration around their expanding sense of community, and specific knowledge that they might encounter or think about, such as energy, motion, robotics, basic chemistry, and more.

In Grade 5, students share stories about nature with their community (i.e. lore). In natural history, students encounter botanical families, endangered species, invasive species, and secondary succession as they consider how man interacts with and thinks about the natural world. In general science, they engage with sound, meteorology, space exploration, and robotics as they practice beginning lab skills and expand their use of graphs. In all of these lessons, they build vocabulary and conceptual knowledge “by the way” and special care has been taken to maintain the connection between scientific endeavors and the human experience.



## Placement & Combining Tips

Ideally, general science terms are completed in sequence because the ideas and skills are progressive. Teachers should read the lab book thoroughly to understand what concepts might need to be supplemented should they choose a different sequence or a substitution. Natural science elements are not in a particular sequence within the Form beyond reading level, however. Therefore, teachers are encouraged to adjust the sequence to accommodate the season in their locality, the interest of their students, and any learning differences in their schoolroom.



## Scheduling

### Science: Grade 5

GRADE	MIN.	xWK	MORN.	TEACH.	TOPIC (S)	BOOK(S)
1-8 ↔	15-30	1	* or _	☐ or ☑	Nature Lore	That Quail Robert, Belle's Journey, or The Haymeadow
5	15	1	*	☑	Natural History	Ladybird & Plant,
5	20	1	*	☑	General Science	Elephant Scientists,
5	30	1	*	☐	Science Lab	Grade 5 Lab Book

### Sample Weekly View

Day 1	Day 2	Day 3	Day 4	Day 5
Nature Lore	Natural Science	General Science		Science Lab

\_ = afternoon  
\* = morning

☐ = full teacher attention  
☑ = half teacher attention

☐ = little teacher attention



## Planning & Prep

LINKS: Click text or scan the QR code in the top corner of the lesson plan pages to view online resources associated with the lessons.

Responsibility for previewing all links rests with the teacher. All links were checked at the time of publication; however, websites change frequently and may contain objectionable content. Please report broken links by contacting us through our website.

### Plan for a field trip to complement your nature lore selection, as desired:

- ☐ That Quail, Robert: Visit a local bird sanctuary that cares for any of the 6 quail species of North America. OR Visit the one that offers budgie feeding to spend time with birds up close - this story is really about getting to know any bird.
- ☐ Belle's Journey: Visit your local conservancy or nature preserve where and when you can see osprey. Plan a few walks to the site at the appropriate time. OR Contact your local Audubon Society chapter to find out when they are hosting a bird banding event and how to sign up to participate.
- ☐ The Haymeadow: Contact local farms or your cooperative extension to find out if you can watch a sheep shearing or take a tour of those that raise livestock.

# Science: Grade 5

## How To Teach



### Introduce

If starting a new book or a new topic in the book, then look at the title or a picture and take a moment to discuss what they think about it or what previous experience they have. If continuing a previous reading, recap what was read previously. Often the introduction in the lesson plans or the title of the book's section can help students to draw out the main idea. Use this to support students, as appropriate.



### Read

Read, as instructed in the lessons. For students who are still building reading skills, feel free to try supportive strategies and educational tools to reduce frustration and better engage the mind.



### Narrate

Process the ideas of the lesson by retelling the events in sequence, describing a scene or setting, explaining a concept, etc. Students may use words, pictures, or other methods, as appropriate. Teachers may take turns as model, as appropriate.



### Discuss

Consider together any thoughts, confusion, or concerns about the passage. Questions/topics are often provided in the lesson plans (or even lab books) to help. Alternatively, many of these can be used for composition, depending on the needs of the student and the instructional goals of the teacher. Notice if there were any dates that they want to keep for their Book of Centuries.



### Connect

Follow any extra links or examine any sidebars in the text, depending on student interest.



# Science: Grade 5

## How To Teach Science Lab



### Introduce

Regardless of how many days are required to complete a particular activity, every Science Lab has the same flow, which follows the scientific method and is guided by the lab book. On day 1, students will read an introduction in their lab book. They should consider how this lab activity relates to what they have learned so far, as well as any previous experience. They should also consider what they will learn from the lab. This is analogous to the conversation we might have when we begin something new in any subject, but they may need to dialogue as they learn to extend these narration skills to the laboratory. Once they have had a chance to think, they will compose this prelab narration to put these introductory ideas into their notebooks. The prompt in the lab is generalized and consistent, so they learn that it is essentially the same thought process every time. Eventually, they will learn to formulate this as an hypothesis. For example, a student preparing for a lab about the use of insect repellent might write:

"I have read about some diseases that are spread by insects, like Lyme disease. I also know that my sister is allergic to some insect bites. Insect repellent contains pesticide to keep insects away. Some scientists worry about how pesticides affect wildlife. I am going to compare some different insect repellents in this lab to see if they really work."

Written narration and composition are skills that they will build over time. These prelab narrations may seem short and even incomplete at first, but that is okay. Some students may need support as they learn these skills. Teachers may act as a scribe or provide assistive technology, as appropriate. After they complete their prelab narration, they should collect the listed materials. This gives the student some responsibility to let the teacher know if something is missing or to remind the teacher if something needs to be purchased at the store. If these activities on day 1 do not fill the scheduled time, that is fine. They might use the additional time to familiarize themselves with the procedure, draw a picture from their book, or catch up on any other work. Some labs may instruct the student to begin on the same day.



### Lab Procedure

On the next lab day or whenever prompted by the lab book, students will begin the procedure. The lab gives instructions for using their notebooks to create tables and figures, as needed. They may need guidance or modeling if they have never done this before. If the student is not yet ready for this, do not allow it to become an obstacle. They will work up to it. In the meantime, they can record directly in the Lab Book or on a photocopy. They may cut out and tape these into their lab books.

# Science: Grade 5

## Term 1

**\*NOTE:** These reading schedules for Nature Lore are provided as a tool for those needing additional structure and support. Teachers are encouraged to disregard them and to read their Nature Lore selection freely as they would any read-aloud.

### WEEK 1 Lesson 01

☐ 01 Nature Lore: Option 1  
That Quail, Robert

→ READ  
Ch.1 p.9-15 "Until July" – "bright little eyes."

☐ 01 Nature Lore: Option 2  
Belle's Journey

→ READ  
Foreword – Ch.1

☐ 01 Nature Lore: Option 3  
The Haymeadow

→ READ  
Ch.1

### WEEK 1 Lesson 02

☐ 02 Natural History

#### → INTRO

Begin your own small garden in the ground or even in a single pot. Plant seeds according to the seed packet and plan to check on them and water them regularly. The soil should be moist, but not wet. If it seems wet, then don't add more water. If you gently blow across the surface and the soil has a dusty character, then give it some water. As seeds sprout over the next few weeks, make careful observations in your nature journal.

∞ Video Link: Growing Basil Time Lapse

∞ Video Link: Wildflower Garden Time Lapse

#### → ACTIVITY

#### → NARRATE & DISCUSS

Use a nature journal to record what you planted.

#### • OUTDOOR WORK

Weekly walks and daily outdoor time is vital! See help for Nature Study in appendices.

### WEEK 1 Lesson 03

☐ 03 General Science  
The Elephant Scientist

#### → INTRO

Look at the picture on the cover and the title. Have you seen elephants at a zoo? What do you remember about them? Do you think they communicate with each other? If so, how? This is a story about scientists who are trying to explain how they communicate and what they are saying. Most of the elephants in this book live at Etosha National Park and Mushara Waterhole. You can find it on the map on the page just before the Table of Contents. Can you find the location on your globe?

#### → READ, NARRATE, & DISCUSS

p.1-3 "Caitlin O'Connell" – "their environment."

# Science: Grade 5

QR code &  
links not  
included in  
sample

## Term 1

**WEEK 1** ☐ O4 Science Lab

**Lesson 04** Grade 5 Lab Book

→ LAB DAY

Complete day 1 of Seeing Sound as directed in the Lab Book:

☐ Lab Book Resource: Grade 5 Lab Book

★ **TEACHER TIP**

Students read the Introduction. Then compose the prelab narration in their lab notebook. These need not be more than a 1-3 sentences at first and teachers should feel free to scribe for students, as necessary. Any remaining time can be spent gathering materials and/or copying the drawings from the Lab Book into their notebook.

**WEEK 2** ☐ O5 Nature Lore: That Quail, Robert

**Lesson 05**

→ READ

Ch.1 p.15-23 "The lamb's-wool" - "actual birthdays."

☐ O5 Nature Lore: Belle's Journey

→ READ

Ch.2-3

☐ O5 Nature Lore: The Haymeadow

→ READ

Ch.2

**WEEK 2** ☐ O6 Natural History Miss Lady Bird's Wildflowers

**Lesson 06**

→ INTRO

Look at the picture on the cover. Lady Bird Johnson was a First Lady of the United States but what some may not know is that she had a special interest in wildflowers. This is a story about her life and what she did for all of those wildflowers.

→ READ, NARRATE, & DISCUSS

p.5-20 "Deep in the" - "never been happier."

• If you have the Shanleya's Quest card game, then explore the deck today. Notice differences in the 8 plant families presented and how the key characteristics are repeated in different plants in the family. If you do not have the card game, then refer to the link (about halfway down the webpage).

∞ Link: Shanleya's Quest Patterns in Plants

• **OUTDOOR WORK**

Weekly walks and daily outdoor time is vital! See help for Nature Study in appendices.



# Science: Grade 5

## Term 1

**WEEK 2**    ☐ 07 General Science  
**Lesson 07**    The Elephant Scientist

→ INTRO

What did you read last time?

→ READ & NARRATE

p.4-6 "Caitlin O'Connell" – "animal studies."

→ READ, NARRATE, & DISCUSS

p.7-10 "After working with" – "never anticipated."

- Do you think it would be challenging to study and learn about something that you cannot see? Why or why not? Watch the video link. How can technology like this help scientists study the invisible?
- ∞ Video Link: What does Sound look like?

★ TEACHER TIP

Some students may be able to read the entire passage and narrate the scientist's journey, but others may benefit from having it broken into smaller portions, as it is presented here. Do whatever is most appropriate for the student's needs.

**WEEK 2**    ☐ 08 Science Lab  
**Lesson 08**    Grade 5 Lab Book

→ LAB DAY

Complete day 2 of Seeing Sound as directed in the Lab Book:

☐ Lab Book Resource: Grade 5 Lab Book

★ TEACHER TIP

Students will conduct the Procedure today. They may draw, diagram, or dictate in their lab notebook what they observe just as they would their nature journals. Then they will continue to the end, completing the short Analysis and Conclusion with a brief narration.

**WEEK 3**    ☐ 09 Nature Lore:  
**Lesson 09**    That Quail, Robert

→ READ  
Ch.2

☐ 09 Nature Lore:  
Belle's Journey

→ READ  
Ch.4

☐ 09 Nature Lore:  
The Haymeadow

→ READ  
Ch.3

**WEEK 3**    ☐ 10 Natural History  
**Lesson 10**    Miss Lady Bird's Wildflowers

→ INTRO

Recall what we read about Lady Bird's early life.

→ READ, NARRATE, & DISCUSS

p.22-37 "It wasn't long" – "of our hearts."

★ TEACHER TIP

Note that next week is an activity day!

• COMPOSITION – Written Narration

Tell about a scene from Miss Lady Bird Johnson's life.

• OUTDOOR WORK

Weekly walks and daily outdoor time is vital! See help for Nature Study in appendices.

# Science: Grade 5

## Appendix

### Visit the third landscape from Term 1. Notice what nature has provided this day

#### TERM 1

- 1 Visit a particular landscape, such as a forest, wetland, grassland, etc. Notice what nature has provided this day or use Natural History Club lessons.
- 2 Notice the trees. What is the color and shape of their leaves? Are there buds, flowers, or fruit visible? How many different trees do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 3 Notice the birds. What colors and patterns do you see? Where are the birds? What are they doing? How many different birds do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 4 Go out in the evening. What sounds do you hear? Are other creatures active? What do you see in the sky? What else do you notice? Record what you observe along with the date, weather, and location.
- 5 Visit a second landscape that is different from the first. Notice what nature has provided this day or use Natural History Club lessons.
- 6 Notice the trees. What is the color and shape of their leaves? Are there buds, flowers, or fruit visible? How many different trees do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 7 Notice the birds. What colors and patterns do you see? Where are the birds? What are they doing? How many different birds do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 8 Go out in the evening. What sounds do you hear? Are other creatures active? What do you see in the sky? What else do you notice? Record what you observe along with the date, weather, and location.
- 9 Visit a third landscape that is different from the first and second. Notice what nature has provided this day or use Natural History Club lessons.
- 10 Notice the trees. What is the color and shape of their leaves? Are there buds, flowers, or fruit visible? How many different trees do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 11 Notice the birds. What colors and patterns do you see? Where are the birds? What are they doing? How many different birds do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 12 Go out in the evening. What sounds do you hear? Are other creatures active? What do you see in the sky? What else do you notice? Record what you observe along with the date, weather, and location.

#### TERM 2

- 1 Visit the first landscape from Term 1. Notice what nature has provided this day or use Natural History Club lessons.
- 2 Notice the trees. What is the color and shape of their leaves? Are there buds, flowers, or fruit visible? How many different trees do you see? What else do you notice? Record what you observe along with the date, weather, and location.
- 3 Notice the birds. What colors and patterns do you see? Where are the birds? What are they doing? How many different birds do you see? What else do you notice? Record what you observe along with the date, weather, and location.

# Science: Grade 5

## Examination

### Term 1

#### GRADE 5

- Tell about or draw how plants differ in different places and seasons. OR Compare in word or picture 3 different plant types that you found this term.
- Explain what you know about sound waves?. OR Describe what you know about elephant communication.
- Explain how you did one investigation in science lab this term and what you learned from it.

### Term 2

#### GRADE 5

### Term 3

#### GRADE 5

Sample



# Science

SAMPLE

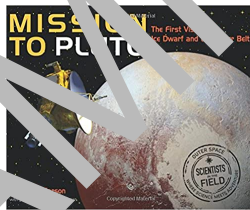


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# LAB BOOK

## Mission to Pluto





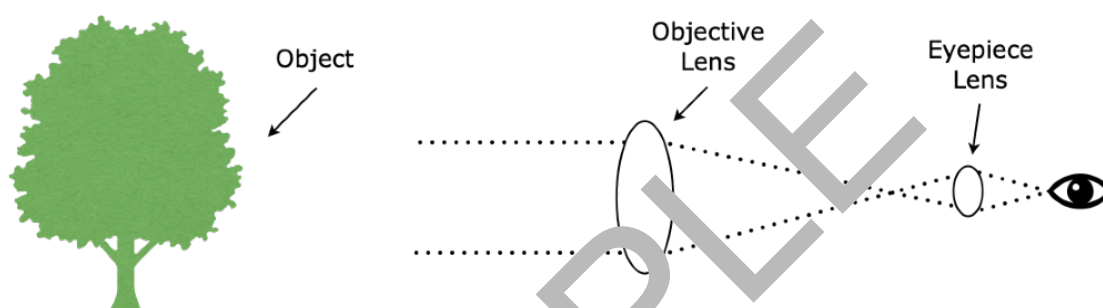
## Lab 1: The Makings of a Telescope (2 weeks)

### Introduction

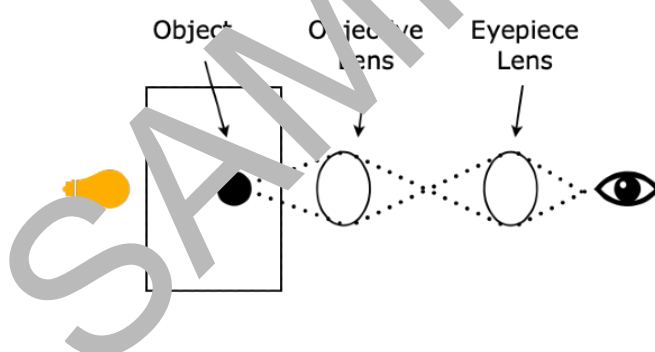
There are a few new terms in this lab. You do not need to memorize them. Just try to understand them.

Clyde Tombaugh first sighted Pluto through the use of a telescope. A telescope is a way to magnify what we can see with our eyes alone, and if you have ever used a microscope, then you have used a magnifier already. How do these tools work? A telescope and a microscope both have a pair of lenses that work in tandem (Figures A and B).

**Figure A: Telescope Lenses.**



**Figure B: Microscope Lenses.**



The arrangement of the lenses looks similar in Figures A and B, but the sizes of the lenses and the distances of the objects are very different. The result is that the telescope collects and focuses a lot of light to produce a bright, clear image of something that is large but very far away. The microscope produces an image of something very small and very close, and we usually need to provide extra light to see it better.

In this lab, you will experiment with some lenses to make your own telescope. By lining up different combinations of lenses, you will evaluate the changes these combinations have on the image you see. Does it matter which lens is in the objective or eyepiece position? Does the difference between the two lenses matter (i.e., their 'focal points')? Does the distance between the lenses matter? What is most challenging about using the telescope?



Take a few moments now to put what you know into words. In your lab notebook, compose a few sentences to answer the *hypothesis* questions, "What do I know about this?" and "What do I plan to find out?" When you are finished with this introductory narration, make sure that the materials below are ready for the procedure. If you have extra time today, copy the diagrams (above) into your lab notebook.

### Materials

- 3 pieces of cardstock
- masking tape
- 3 double convex lenses: 150mm f/l, 300mm f/l, 500mm f/l
- marker

### Procedure

1. Make 3 tubes with the cardstock – one for each lens. One end of each tube should be about the same circumference as the lens, but it can be helpful if the tube is a little more narrow or wide on one end because you want to be able to slip the tubes inside each other. If you don't get it quite right the first time, it's okay because you should be able to unstick the tape to adjust.
2. Use strips of tape to secure a lens to the end of each tube and mark which tube is which with your marker. The ends will look something like this:



3. Choose 2 lenses and slip the end of one tube into the other so the lenses are on either end. Try to look at something through your telescope. Move the tubes in and out to focus. Try turning it around and see what happens. Record what you see in your notebook.
4. Repeat with other combinations of the lenses, recording your observations in your notebook. Then go ahead and complete your analysis and conclusions.

### ***Analysis and Conclusions***

Were you able to focus every combination of lenses? If not, why not? Is there anything that you could do about that? What arrangement gave you the best focus? What about the best magnification? How far would you estimate that you could see with your chosen combination of lenses?

Take a few moments now to put what you have learned into words. In your lab notebook, compose a few sentences to answer the questions, "What did I find out?" and "What now?"

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SAMPLE