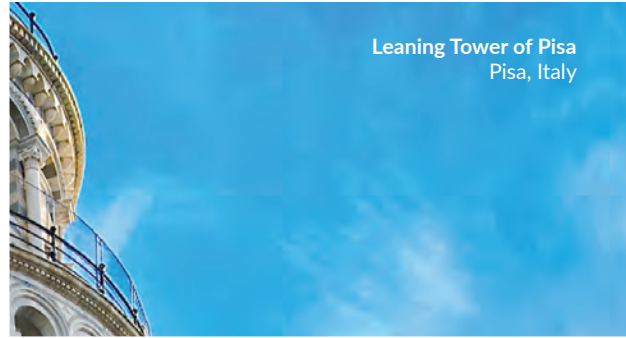


J HISTORY OF SCIENCE



Leaning Tower of Pisa
Pisa, Italy

FUN FACT

Zeno proved the existence of infinity in 450 BC.





Thank you for downloading this sample of Sonlight's History / Bible / Literature J Instructor's Guide (what we affectionately refer to as an IG). In order to give you a full perspective on our Instructor's Guides, this sample will include parts from every section that is included in the full IG.

Here's a quick overview of what you'll find in this sample.

- A Quick Start Guide **START HERE**
- A 3-week Schedule
- Discussion questions, notes and additional features to enhance your school year
- A Scope and Sequence of topics and skills your children will be developing throughout the school year
- A schedule for Timeline Figures
- Samples of the full-color laminated maps included in History / Bible / Literature IGs to help your children locate key places mentioned in your history, Reader and Read-Aloud books

SONLIGHT'S "SECRET" COMES DOWN TO THIS:

We believe most children respond more positively to great literature than they do to textbooks. To properly use this sample to teach your student, you will need the books that are scheduled in it. We include all the books you will need when you purchase a package from sonlight.com.

Curriculum experts develop each IG to ensure that you have everything you need for your homeschool day. Every IG offers a customizable homeschool schedule, complete lesson plans, pertinent activities, and thoughtful questions to aid your students' comprehension. It includes handy teaching tips and pointers so you can homeschool with confidence all year long.

If you need any help using or customizing our IGs, please reach out to our experienced homeschool advisors at sonlight.com/advisors.

We hope you enjoy using this sample. For even more information about Sonlight's IGs, please visit: sonlight.com/ig. It would be our pleasure to serve you as you begin your homeschool journey.

If you like what you see in this sample, visit sonlight.com/hbl to order your History / Bible / Literature package.

Blessings!

Sarita Holzmann,
Co-founder and president
of Sonlight Curriculum

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advisor@sonlight.com

History Bible Literature

History of Science

By the Sonlight Team

*“The fear of the LORD is the beginning of knowledge,
But fools despise wisdom and instruction.”*

Proverbs 1:7 (NKJV)

Sonlight Curriculum® “History of Science” Instructor’s Guide and Notes,
Third Edition

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“Do to others what you would have them do to you”
(Matthew 7:12).

“The worker is worth his keep” (Matthew 10:10).

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Sonlight Curriculum, Ltd. is committed to providing the best homeschool resources on the market. This entails regular upgrades to our curriculum and to our Instructor’s Guides. This guide is the 2020 Edition of the Sonlight Curriculum® “History of Science” Instructor’s Guide and Notes. If you purchased it from a source other than Sonlight Curriculum, Ltd., you should know that it may not be the latest edition available.

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Section Two

Schedule and Notes

HISTORY / BIBLE / LITERATURE Quick Start Guide

What's included in your History / Bible / Literature Instructor's Guide.

With Sonlight's daily readings all scheduled, you'll read good books and talk with your children about what you're learning. You'll be amazed at how much you all learn, so easily and enjoyably. With notes and teaching tips along the way, the Sonlight History / Bible / Literature Instructor's Guide is guaranteed to help you love to learn, and love to teach.

1

Level A: History/Bible/Literature																																																
Days 26–30: Date: _____ to _____																																																
<table border="1" style="display: inline-table; margin: auto;"> <thead> <tr> <th colspan="7">Week Overview</th> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td> </tr> <tr> <td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td> </tr> </thead></table>						Week Overview							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Week Overview																																																
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Week 6																																																
	Date:	Day 26	Day 27	Day 28	Day 29	Day 30																																										
BIBLE	<i>Egermeier's Bible Story Book</i>	pp. 86–88	pp. 88–90	pp. 91–93	pp. 94–96	pp. 96–98																																										
	Memorization	F: Fear not, for I have redeemed you; I have summoned you by name; you are mine. (Isaiah 43:1)																																														
	<i>Sing the Word: From A to Z</i>	"Fear Not"—Track 6. Listen to this track the entire week.																																														
HISTORY & GEOGRAPHY	<i>Adventures in Ancient Greece</i>	pp. 32–33	pp. 34–35	pp. 36–39	pp. 40–47																																											
	<i>The Usborne Internet-Linked Children's Encyclopedia</i>					pp. 124–125 ↑ ↓ ↻																																										
READ-ALOUDS	<i>Dolphin Adventure</i>	chaps. 1–2 ↻	chaps. 3–4	chaps. 5–6	chaps. 7–8																																											
	<i>The Llama Who Had No Pajama</i>	p. 15																																														
	<i>The Arnold Lobel Book of Mother Goose</i>		pp. 28–29	pp. 30–31	pp. 32–33																																											
	<i>James Herriot's Treasury for Children</i>					"Oscar, Cat-About-Town"																																										
MISCELLANEOUS	Developmental Activity	Act out a play on politeness.																																														
	Field Trip/Practical Life Skills																																															
Additional Subjects:																																																

2

3

4

1 Complete, ready-to-use lesson plans

All your books and activities are fully scheduled for the entire year. No need to create your own lesson plans or coordinate the reading. This IG covers Bible, History, Geography, Read-Alouds, and Readers. Each day you open your IG, do the given assignments, and—if you want a formal record of what you have done—check or date each box as you complete it. If your state requires a record of how many hours you dedicated to a subject, you also have space to record the time you spent.

2 Day-by-day Schedule

The Sonlight IG schedule lets you see your entire week at a glance. Each schedule is broken out into either four or five days of material for each of the 36 scheduled weeks. The first column indicates the various subjects or topics you will be studying. (i.e. Bible, History, Read-Alouds, etc.) The second column lists the titles of each book or assignment. The remaining columns include the day-by-day assigned pages or tasks.

3 Discussion Questions

Each IG includes various types of discussion questions—including review, comprehension, and open-ended questions, with answers. Focus on the key points, maximize the time spent, and assess how well your children understand what they're learning. Use it as best suits your needs.

4 Timeline and Map Points

Incorporate geography naturally into your school day. Students use the Markable Map to make a visual connection to how all their Readers, history books, and Read-Alouds relate geographically. A hole-punched, laminated answer key map folds into your IG. Timeline activities tell you when to add people, events, and dates to your Timeline Book.

5 Vocabulary and Cultural Literacy notes

Find clear definitions for important vocabulary that appears in your reading. Enjoy useful Cultural Literacy notes that add depth to your reading and explain things students probably don't know (e.g., what a hoop skirt looks like).

6 Notes

Immediately following the schedule, you will find each week's Bible and history notes. These extensive teaching notes help you instruct your students with excellence, and ensure that they grasp key concepts. Notes provide counter-balancing arguments, clarification, further explanations, and commentary. The IG notes also offer warnings about specific books or difficult content, so you can discuss important issues—such as racism and poverty—with thoughtfulness.

Note: At the back of your History / Bible / Literature Guide, you will find reading assignments and notes for the Read-Alouds and Readers. (In the early elementary Levels A-C programs, Readers are packaged separately to allow an adjustable reading level and pace for your children. We have not included them in this sample. Learn more about Readers packages at sonlight.com/readers.) Follow the notes for Read-Alouds and Readers as you would the History/Bible notes.

7 Teaching tips

Detailed teaching notes each week explain assignments and provide extra information about important topics to help you get the most from your materials. You will teach with confidence!

Flexible format

Because many families end up ahead of behind in a subject—at least occasionally—the IGs are structured for maximum flexibility. Some customers follow the schedule religiously. They do everything scheduled each day during that day. Others read ahead, or drop a book, or work through several days' worth of one or two subjects in a day (reading, or history, for example), and similarly the next day, and so on, until they have completed all the assignments for the week.

The IG is a guide, not a task master.

As you become comfortable teaching your children, you can skip or alter assignment to fit your family's unique needs.

6

Bible Reading

James is a very practical book. He reminds us that life isn't all rainbows and roses, but that we must work hard, turn to God in difficult times, and do what the Word says. We can be part of God's story if we follow Him. James also urges us to live in the freedom Christ brings through His forgiveness. This kind of life, one that is firmly set on being part of God's story through trouble and hard work, is exactly what Daniel and his friends demonstrate in your children's reading.

Memorization (Bible)

Psalm 42:1–6

Continue to memorize Psalm 42.

- 1 As the deer pants for the water brooks,
So my soul pants for You, O God.
- 2 My soul thirsts for God, for the living God;
When shall I come and appear before God?
- 3 My tears have been my food day and night,
While they say to me all day long, "Where is your God?"
- 4 These things I remember and I pour out my soul
within me.
For I used to go along with the throng and lead
them in procession to the house of God,
With the voice of joy and thanksgiving, a multitude
keeping festival.
- 5 Why are you in despair, O my soul?
And why have you become disturbed within me?
Hope in God, for I shall again praise Him
For the help of His presence.
- 6 O my God, my soul is in despair within me;
Therefore I remember You from the land of the Jordan
And the peaks of Hermon, from Mount Mizar.

The Beginner's American History

pp. 200–205

Cultural Literacy

steamboat: a ship using steam-driven propellers for propulsion.

To Discuss After You Read

- Q: Why didn't France want to buy Fulton's diving boat?
A: Who did want to buy it?
A: *Napoleon found a leak; the English government*
- Q: Where did Robert Fulton make and try his first steamboat?
A: *France*
- Q: How far up the Hudson did his New York steamboat go?
A: *150 miles*
- Q: Describe the route of the first steamboat in the West.
A: *starting from Pittsburgh, it went down the Ohio River, then down the Mississippi to New Orleans*

Timeline and Map Points

New York (D3) (map 5)

Day 165 pp. 228–232

To Discuss After You Read

- Q: Did the telegraph idea come easily to Samuel Morse?
A: *no; he worked on it with little profit; Alfred Vail helped him financially and got the patent and helped with the design*

Landmark History of the Amer. People, Vol. 1

Day 162 Chapter 19 pp. 134–136

Cultural Literacy

pipe dream: a saying that means that something is unrealistic or unattainable. The phrase originated in late 19th century America in reference to dreams or visions people would experience from smoking opium pipes. [p. 136]

Monticello: Thomas Jefferson's estate in Charlottesville, Virginia. [p. 136]

To Discuss After You Read

- Q: Why were Barber-Surgeons thought of as members of a lower class than doctors? [p. 135]
A: *because they dirtied their hands, they didn't have to know any special languages, they didn't need to read books, they were just seen as craftsmen who knew how to carve, cut, and sew up the human body*
- Q: What did apothecaries do? [p. 135]
A: *they mixed medicines*

The book mentions that "people thought it was indecent or irreligious to dissect a human body. And if anyone did such a thing, he did it in secret if he did it at all." Why do you think people of the time took this perspective? Some of the influence came from Christianity, which believes every human being is uniquely made in God's image. As such, there is a certain amount of holy respect and awe for God's creation, especially the human body since people are said in the Bible to be made in the image of God (see Genesis 1:26-27, for instance). Fortunately, some Christians also understood that since God created the world and everything in it, they had a duty to explore and seek to understand God's creation, which included learning how the human body works. This is why many Christians were eventually on the forefront of science and medicine. Still, given that human beings are made in God's image, Christians who work with human remains for scientific purposes should do so with "trembling awe," as C.S. Lewis put it (*God in the Dock*, "Vivisection," p. 226). [p. 136]

Timeline and Map Points

Every Man his own Doctor; or, the Poor Planter's Physician is first published by Benjamin Franklin in Philadelphia (1734)

London (E3); Oxford (E3); Cambridge (E3) (map 4)

114 | Week 33 | Section Two | 5-Day | Intro to American History, Year 1 of 2

How it works:

1. Read the assigned pages from the schedule.
2. Do the vocabulary and Discussion Questions.
3. Do the timeline, Map, and any other activities.
4. Now you're ready to move on to the next subject!

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sonlight.com/samples

Level J: History/Bible/Literature

Days 1–4: Date: _____ to _____

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 1

	Date:	Day 1	Day 2	Day 3	Day 4	Day 5
BIBLE	Disappointment With God	preface–chap. 2				
	Bible Reading	1 Chronicles 1:1; 9:1–34	1 Chronicles 10	1 Chronicles 11:1–25	1 Chronicles 12:1–3, 8, 14–19, 38–40	1 Chronicles 13
	Memorization	Hebrews 4:14–16 ²				
HISTORY & GEOGRAPHY	The Story of Science: Aristotle Leads the Way	chap. 1 🕒 🌐	chap. 2 🌐	chap. 3, pp. 20–28 (mid–page) 🕒 🌐	chap. 3, pp. 28–33 🕒 🌐	
	String, Straightedge, and Shadow	Prologue	chap. 1	chap. 2	chap. 3	chaps. 4–5 🕒 🌐
	Current Events	Use the following box to record when you have completed the activity. Seventh Grade: two reports weekly; at least one of international concern. Eighth & Ninth Grade: three reports weekly; at least two of international concern.				
READ-ALOUDS	Holes	chaps. 1–5	chaps. 6–7 🌐	chaps. 8–12	chaps. 13–17	chaps. 18–22
	National Geographic Book of Nature Poetry	pp. 6–7	pp. 8–10	pp. 11–12	p. 13	
READERS	The Thief ³	chaps. 1–2	chap. 3	chap. 4	chap. 5	chaps. 6–7
Additional Subjects:						

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1. Find the notes for the **Bible** readings in the notes on the next page.
2. We cite the NIV versions in our schedule for your convenience. However, if you would prefer to have your children memorize another version of the Bible that your family uses more frequently, please feel free to do so.
3. See the notes for the **History** titles on the next page.
4. Find the notes for both **Read-Alouds** and **Readers** in **Section Three**. This structure provides added flexibility for various reading levels.

“How to” Quick Start Information

Record Keeping

To keep track of your progress, simply place a check mark in the corner of each assignment on the weekly schedule chart as your children finish it. If your state/country requires

you to keep a daily record of when (what date) you completed a project, and/or how many hours you spent on a subject, then record that information as well. If you decide to reuse your Instructor’s Guide with a second child, then add each child’s initials next to the check mark or hours.

Vocabulary & Cultural Literacy

Knowing definitions is critical to understanding. That's why we've included important vocabulary terms in your Instructor's Guide.

In all of our study guides, we categorize the words we highlight in two ways. **Vocabulary** words are words your students will probably encounter in other texts—not just those included in this curriculum. We list these words within an excerpt of the text from the book in which they are found so that you may challenge your students to define the terms using the clues found in the context of the rest of the story. Simply read these short quotes aloud and see if your students can tell you the meaning of the bold italicized terms.

Cultural Literacy terms are words that, if defined while your students are reading, will broaden and deepen their understanding of the text. However, these words are generally specific to course content, and we wouldn't expect your students read or hear them on a regular basis. You may use these words, formatted in bold followed by a colon and their definitions, more like a convenient glossary.

To Discuss After You Read

In the "To Discuss After You Read" section, the comprehension questions are meant to help your children focus on some of the more important aspects of the stories you read together. Our intent with this additional material is to provide you with the resources you need to get every bit of enjoyment you possibly can from a book.

Timeline

Your students will record significant people and events in a spiral-bound timeline book. Over the years, you'll fill this book as your student's knowledge and understanding of history expands.

The † symbol indicates it has an accompanying figure in the Sonlight Timeline Figure packet. Place these stickers into your timeline book. Timeline suggestions are marked with a Ⓞ symbol. Handwrite these suggestions into the timeline book as well.

When a timeline suggestion denotes a range of dates (e.g., 1865–1890), we recommend that you use the ending date when placing the figure on your Timeline.

All suggestions and figures can be found on the Timeline Figure Schedule, in Section Four.

Map Points

We provide map suggestions from the assigned reading in the Study Guide. Look for the 📍 symbol on the schedule page and in the notes. Use the coordinates and the location name in the notes to find each location on the laminated colorful maps in the front of the guide. Then, have your children note each location on your blank, **Markable Map** using a washable pen.

Complete the map assignments included in all of the guides to lend context to the stories your children are reading and improve their knowledge of geography.

Further information and useful documents

If you would like further information on how to use the instructor guide, please login to your Sonlight Account and go to the My Downloads section to access the "Understanding the Structure of Your Guide" and "Getting Started" documents.

For extra schedule pages, field trip planning sheets, and other documents specific to your guide go to the My Downloads section of your Sonlight Account (available to original purchaser only).

Disappointment With God

We start the year off with this title. Please read the scheduled chapters over the course of the week. There are no notes for this book, so please read and enjoy.

Memorization (Bible)

Each week, read through your passage(s) at least ten times. Some students say it works best to recite the passage two times a day. Make sure you use all your gestures and the full range of vocal effects.

We want your children to make the presentation of their memorization as naturally dramatic as possible. It should not be overly dramatic, but it should be lively and interesting.

Because they are usually nervous, beginning speakers often fail in this area. They speak in tiny voices, with little dynamism (inflection, emphasis, or change in volume from one section to another), and stand stiffly. If they make any motions, the motions look unnatural and choppy.

Even good speakers have a natural tendency to "tighten up" and speak with less dynamism or drama than they ought. Therefore, before making public presentations, good speakers will "loosen up."

There are two things public speakers need to loosen: their vocal chords and their bodies. Help your children practice the following exercises this week so they can do them easily next week before going "onstage."

1. In order to loosen your vocal chords, try "singing" your passage. Begin "singing" it at the lowest note you can reach, and then let your voice rise through its full range—to the highest note you can sing. Keep "singing" your passage, letting your voice rise and fall from its bottom note to its top and back down to its bottom.
2. Another loosening exercise for your voice: don't *sing* the passage; just say it, without expression, but beginning in a whisper and building volume until you are shouting. Keep saying your speech, but let your voice grow softer until it is just a whisper. Continue oscillating from whispers to shouts until you have finished your speech, or until you feel relaxed at both ends of your vocal spectrum.

3. How about working your voice (and face) through various emotions? Start with a belly laugh: "Ho! Ho! Ho! Ha! Ha! Ha! Hee! Hee! Hee!" (etc.). Then pretend you're angry. Embarrassed. Excited. Sad.... Can you think of any other emotions to pretend?
4. In order to loosen your body: try swinging and shaking your arms, rolling your head in circles on your shoulders, shaking your legs, doing jumping jacks, etc. Another exercise: try saying your speech with exaggerated motions: make the motions far broader, faster, more dramatic than you would ever plan to do them before an audience.

Day
ALL**Hebrews 4:14–16**

- ¹⁴Therefore, since we have a great high priest who has ascended into heaven, Jesus the Son of God, let us hold firmly to the faith we profess.
- ¹⁵For we do not have a high priest who is unable to empathize with our weaknesses, but we have one who has been tempted in every way, just as we are—yet he did not sin.
- ¹⁶Let us then approach God's throne of grace with confidence, so that we may receive mercy and find grace to help us in our time of need.

The Story of Science: Aristotle Leads the Way

We use a 4-day schedule for the *History of Science* books, and assign extra reading on the fifth day, with the additional titles used in the program. We schedule it this way because our Science program then aligns with the *History of Science* books, and we seek to keep that connection.

Day
1**Chapter 1**

The book opens with three wildly different quotes about the beginning of the world. Each culture on Earth has stories that explain Earth's beginning. Talk with your students about what you believe about that beginning.

To Discuss After You Read

In Hakim's pre-recorded history, she postulates that "someone with a scientific mind" figured out how to plant seeds, "to make the connection between soil and time and growth" [p. 2]. When we read the Bible, we learn that the first people, Adam and Eve, worked in a garden; and their son, Cain, brought food offerings to the Lord (Genesis 2, 4). We don't have to wonder how people learned to farm.

- Q: Why is Sumer considered the "world's first great civilization?" [p. 2]
- A: *the Sumerians built well-to-do city-states with temples and schools; they divided the work—not everyone was a farmer or herder, but some were priests, craftsmen, traders, laborers; they had governing and serving classes; some were free to "study, plan, invent and think"; they used the wheel; invented cuneiform writing; studied the stars and created a lunar-based calendar*

- Q: What was the difference between the ancient Sumerian and Egyptian calendars? What inspired the difference?
- A: *the Sumerian calendar was based on the lunar (moon-based) cycle. The Egyptians developed a solar (sun-based) calendar. Each was based on the god that they worshipped (Sumerians had a moon god; Egyptians had a sun god)*

Scientists and Christians agree that the earth had a beginning, which differs from the Hindu idea that the earth is eternal.

Timeline and Map Points

- 🕒 **Sumerian civilization (ca. 3100–2000 B.C.)**
- 🕒 **Ziggurat of Ur (ca. 2100 B.C.)**
- 🕒 **Babylonian Empire (1750–539 B.C.)**
- 🕒 **Assyrian Empire (950–612 B.C.)**
- 🌐 *Iraq (Mesopotamia); Egypt (use the map on page 5 in your book)*

Day
2**Chapter 2****To Discuss After You Read**

In the first quote of this chapter, the author states that the Rig-Veda "is the oldest-known religious text in any Indo-European language. [p. 9] Jews and Christians would date the Old Testament as older than that. Bible Gateway lists the Book of Job as the oldest book (with an unknown date), with Genesis–Deuteronomy being written by Moses in 1445–1405 B.C.¹

- Q: How is science different from myth? How did myths help form science?
- A: *myths explain the unexplainable through imagination and emotion; science seeks proof; scientists start with a question, and they search for answers; they sought to explain the unexplained, that had been introduced by myths*
- Q: What is a hypothesis?
- A: *an untested answer or an idea or a possibility*
- Q: When does a hypothesis become a theory?
- A: *after testing a possibility, if it survives the tests, it becomes a theory*
- Q: What do you need to be a scientific thinker?
- A: *"staying awake and keeping your mind open": basically, be observant and willing to investigate new ideas*
- Q: What two questions have scientists asked from the beginning?
- A: *"What is this universe of ours all about?" and "What is life?"*
- Q: How do numbers and math intersect with science?
- A: *"Physical laws should have mathematical beauty." Basically, the universe seems to work in ways that can be precisely explained in numbers, ratios, and mathematical equations*

1. Petersen, Jonathan. Bible Gateway Blog, "When Was Each Book of the Bible Written?" <https://www.biblegateway.com/blog/2016/02/when-was-each-book-of-the-bible-written/>. Accessed January 1, 2018.

- Q: What does it mean that “It’s the average pattern of a large sample of roses or sunflowers or elephant tusks that is predictable. You can never be sure how any single one may turn out”?
- A: *a single rose may not look like the established pattern, even though most roses look like the average; births follow a general progression, but any single birth may not look like that progression*

Timeline and Map Points

- 🌐 Greece (H7) (map 1)
- 🌐 Egypt (D4), India (D8), China (D10) (map 2)
- 🌐 Peru (E4) (map 4)

Day
3

Chapter 3, pp. 20–28 (mid–page)

To Discuss After You Read

Young Earth Creationists reject the idea of the Paleolithic period, as mentioned in the book when the reference is made about the baboon’s bone being, “about 37,000 years old” [p. 21]. They believe that men have lived for about 10,000 years, and that thinking does align with recorded history.

- Q: Why did the ancient peoples create calendars?
- A: *to tell farmers when to plant and harvest*
- Q: What causes the seasons?
- A: *the tilt of the earth (not the distance from the sun)*

“Chinese, Jewish, and Islamic calendars are still lunar” [p. 23]. This explains why the Chinese New Year celebration occurs on different days at the beginning of each year, and the Jewish and Muslim holidays rotate.

- Q: What fixed event helped the Egyptians determine the length of a solar year?
- A: *Sirius’s reappearance at the start of the Nile flooding*
- Q: What is the summer solstice? The winter solstice?
- A: *June 20 or 21, when the sun appears at its highest point in the sky (apex), the day lasts the longest, the first day of summer (or, in the southern hemisphere, winter; December 20 or 21, the shortest day of the year, and the first day of winter)*
- Q: What are equinoxes?
- A: *In spring and fall, March 20 or 21 and September 22 or 23, when day and night are about the same length*
- Q: What is the analemma?
- A: *the figure-eight pattern that the rising sun makes during the year, or, more accurately, “a diagram showing the deviation of the sun from its mean motion in the sky, as viewed from a fixed location on the earth”*
- Q: Why does the moon dazzle and disappear?
- A: *the moon travels around the earth, and depending on where it is in its orbit, people on earth see more or less of it*

Timeline and Map Points

- 🌐 **Emperor Yao establishes lunar calendar (ca. 2357 B.C.)**
- 🌐 *Mesopotamia, Egypt (use the map located on page 5 in the book)*
- 🌐 *Swaziland (I4), China (D10) (map 2)*

Day
4

Chapter 3, pp. 28–33

Vocabulary

Rationale: Knowing definitions is critical to understanding. That’s why we’ve included important vocabulary terms in your Instructor’s Guide. More common terms that your children may not know are listed first, followed by, where applicable, cultural literacy terms that provide depth to stories but may not be commonly known.

waft: to pass smoothly through the air or over water.

ephemeral: short-lived.

To Discuss After You Read

- Q: How do clock time and calendar time differ? [p. 29]
- A: *clock time is cyclical, morning and evening, again and again; calendar time is linear: it goes on a timeline, and 1000 B.C. is earlier than 1 A.D. which is earlier than 1982*
- Q: Who came up with a 24-hour day?
- A: *the Egyptians, perhaps thinking that the sun could visit the 12 constellations during the day and the 12 regions of the underworld at night*
- Q: Where did the seven-day week come from? [p. 30]
- A: *the Babylonians observed five “stars” (really planets) plus the sun and moon, and came up with a seven-day week*

While the author gives credit to the Egyptians and the Babylonians for the 24-hour day, and the days of the week, the Hebrew Bible in Genesis talks about “morning and evening”, coupled with God creating the world in 6 days and resting on the seventh (the structure for the week).

- Q: Is time absolute or relative?
- A: *relative: it is a bit different for a person on Earth than for an astronaut in space; the speed of light is different as well*
- Q: What is the difference between arithmetic and geometry? [p. 32]
- A: *arithmetic is addition, subtraction, multiplication and division; geometry is about shapes, space, and measuring*

Timeline and Map Points

- 🌐 **Palenque astronomical center (600–800 A.D.)**
- 🌐 **Stonehenge (ca. 3000–1500 B.C.)**
- 🌐 *Babylon, Mesopotamia (use the map located on page 5 in the book)*
- 🌐 *Stonehenge, England (E2) (map 1)*
- 🌐 *India (D8) (map 2)*
- 🌐 *Palenque, Mexico (H5) (map 3)*

String, Straightedge, and Shadow

Day
1

Prologue

To Discuss After You Read

The author mentions “the huge telescope at Mount Palomar.” This 200-inch diameter Hale telescope is the earliest of its kind, though in the years since this book was published, the world has 18 telescopes larger in size, including single mirrors 323” in diameter, and segmented mirrors up to 409”.

Today, the proper descriptor is no longer “Primitive man” (p. 12). Wikipedia explains:

In older anthropology texts and discussions, the term “primitive culture” refers to a society believed to lack cultural, technological, or economic sophistication or development. For instance, a culture that lacks a written language might be considered less culturally sophisticated than cultures with writing systems; or a hunter–gatherer society might be considered less developed than an industrial capitalist society. While becoming less politically correct, some Western authors, such as anthropologists and historians, used it to describe pre–industrial indigenous cultures. Historically, assigning “primitive” to other people has been used to justify conquering them.

Q: What three tools did the ancient people use to make mathematical discoveries?

A: *string, straightedge, and shadow*

Q: Where does the word “geometry” come from?

A: *“geo” is earth and “metry” (metria) is measurement*

Q: What has been the result of the work of the Greek geometers?

A: *theoretical geometry which laid the foundation for modern science and invention*

Day
2

Chapter 1

To Discuss After You Read

Q: Summarize this chapter.

A: *animals have an inherent understanding of the mathematical order of the universe (spiders’ webs, bees’ comb). Humans, too, have an inherent understanding, to greater or lesser extent, of rhythm, harmony, symmetry, direction, mass and weight. We, too, have a sixth sense of mathematics*

Day
3

Chapter 2

To Discuss After You Read

Q: Summarize this chapter.

A: *in the art gallery of the universe, nature shows shapes such as circles and spirals, and geometric shapes with three, four, five, and six sides. Today, we are removed from*

nature, but for the earliest peoples, even the sun fading in the west, or the turning of the seasons, would be stressful and filled with fear, as well as the beautiful

Young Earth Creationists believe that the Stone Age occurred after Noah’s flood.

Even today, some people groups lack technology and live close to nature. Evolutionists believe man is always progressing forward, but the variety of people and how each society lives goes against that thinking.

Day
4

Chapter 3

To Discuss After You Read

Please note that this chapter is speculative and imaginative. We have no written accounts from these ancient peoples. The author imagines how mathematics moved forward through time. Read her story and enjoy it, but don’t take it as factual.

Q: In what two ways did the Stone Age men use geometry?

A: *in technics, to make life easier (it was easier to push a rock down an incline than up; three sticks tied together were more stable than one), and in art, to make life more pleasant (curves and patterns are more aesthetically pleasing)*

Q: What was probably the first geometric form to be admired, as the author imagines?

A: *the circle: as in the sun, the eye, and raindrops in a pond*

Q: How were the first circles probably made?

A: *an animal tethered might press down or graze all the grass in the circle; children might run at the end of a vine, circumscribing the full circle*

Day
5

Chapters 4–5

To Discuss After You Read

Q: How did early mathematicians use shadows? [chap. 4]

A: *as a measurement of time*

The author mentions that the dimensions of Noah’s Ark were written in cubics. This reference comes from the ancient text, the Bible, and the reference can be found in Genesis 6. [chap. 5]

Q: What did rope–stretchers do? [chap. 5]

A: *they were the surveyors of the ancient river valley civilizations (the Nile, Tigris, and Euphrates), the men who divided land into right angles and who helped ensure irrigation ditches were dug appropriately*

Q: What does “3–4–5” have to do with swift surveying? [chap. 5]

A: *a right–angle triangle has sides of, say, 3’, 4’, and 5’; once the surveyors realized that, it was easy to accurately check the boundary markers: a pre–measured set of ropes in the 3–4–5 dimension could quickly lay out accurate right angles*

- Q: How did the rope stretchers determine whether the canals were dimensionally sound? [chap. 5]
- A: *they made a level out of a wooden A, with a weighted string hanging down, and they used a plumb line on the edges of the canals*
- Q: How could rope–stretchers determine length? [chap. 5]
- A: *using standardized ropes, they could measure a distance: double the rope for twice the distance, fold it in half for half the distance—they used body parts as units of measure*

Timeline and Map Points

- 🕒 **Pyramid at Saqqara—oldest man-made stone structure (2730 B.C.)**
- 🕒 **Jarmo, Syria—oldest known village (5000 B.C.)**
- 🗺️ *Nile, Tigris, Euphrates River valleys (use the map on page 122 of *The Story of Science* book)*

Current Events

Report

We believe that by middle school, students need to begin learning that world affairs—matters of social, political, economic, and cultural concern—are appropriate for their interest. They should be informed about these matters, and they ought to be forming biblically appropriate opinions about them. As citizens of God’s Kingdom, they are called upon to be gracious (and, therefore, informed) ambassadors to the peoples and kingdoms of this world.

Beginning in seventh grade, we believe students ought to begin to add a statement of their own position on the issues of the day and explain why they believe and feel as they do. Three times each week, students must report verbally on some matter of significant local, regional, national, or international concern that they have read about during the previous week. They must state who the protagonists are in the case and what makes the matter significant. What are the potential effects of the matter turning out one way or another? What are the two (or more) sides arguing about (issues as well as side issues)? In seventh grade, students should make two such verbal reports each week. In eighth and ninth grades, three reports.

Please read the same article as your children read and add background information to aid in your children’s understanding.

If you came across an uncommon or unfamiliar term, explain it. Give your children whatever historical, cultural, and other background you can, as well as talk about any parallel situations with which your children might be familiar from their studies of history or other cultures.

The best time to hold these discussions about current events is over the dinner table.

A Rationale for Studying Current Events

Why study current events? There are many reasons. One is to help children become familiar with the names and events that are in the news. When students become familiar with these names and events, they are better able in the future to read articles about the same people or the same or related events.

“Great,” says your son or daughter. “Just what I need. An assignment to read the news so I can read the news in the future!”

That’s right!

“But why do I need to know about Hong Kong and 1997? What do I care about the GATT?” —These are the kinds of questions my daughter asked me when we began requiring current events reports from her. “Look,” she said, “the news about President Clinton and about the murder that took place yesterday down in Denver, or the fact that the Rockies won: that’s interesting. But this other stuff . . . !”

Perhaps we could extend this reasoning. Who cares that a murder took place in Denver (or wherever)? Or what does it matter that a certain baseball (football, basketball, or other) team won a game? Who cares about anything? Why should we be concerned about anything besides our local community . . . or our own family, for that matter? These are fair questions.

Before answering them directly, I want to acknowledge that it is at least theoretically possible to become over-informed. I can imagine there are a few people in this world who spend so much time listening to the news and “being informed” that they never have time to do anything useful.

But most of us are in another position. We are neither informed nor are we engaged in so many useful activities that we cannot possibly afford the time to become informed. We are simply selfish. We prefer to be entertained rather than to be informed and to act on what we know.

God hasn’t placed us in this world for the purpose of being entertained. God has placed us here to act as His ambassadors of light in “a crooked and perverse generation.” He wants us to bring every people group and every area of life under His control.

Now, none of us can possibly do this job on our own. This is something God has given all of us to do together. In other words, we need each other.

In turn, this means that, on the one hand, none of us needs to know about everything that happens in the world: God knows that. Even if it were possible for us to know everything, it would be impossible for us effectively to use so much information. At the same time, however, since God hears our prayers, if we pray for our brothers and sisters elsewhere in the world and if they pray for us, and since God answers our prayers, we (and they) can help each other do our respective tasks by praying.

But how will we pray—and especially, how will we pray effectively—if we don’t know anything about our brothers and sisters elsewhere in the world? Reading the news can help us know what they are going through, what they are experiencing, and what they might appreciate us praying about.

So, our first reason for keeping up on current events is so we can pray knowledgeably and effectively for our brothers and sisters elsewhere around the world.

Another reason: by reading news from other parts of the world, we get to see our local situation in a broader context. It's similar to what we gain by studying history. We see, for instance, that we are not alone in some of our experiences: "We don't have it so bad." Then again, we see that some people enjoy certain blessings that we do not. As the Apostle Paul said concerning the Jews as they looked at the Christians, perhaps we will be stirred to a righteous envy. Then again, a study of current events may help us see that we enjoy certain blessings that others don't. Perhaps we will learn to keep our mouths shut when we think we "have it so bad." Finally, a study of current events—as a study of history in general—can give us the opportunity to learn from other people's mistakes.

Besides the direct benefits we and our brothers and sisters around the world enjoy because we keep up on current events, by reading the newspaper we give God the opportunity to lead us in new directions.

Imagine. Are you likely to go someplace or serve a people group you've never heard of? Hardly! Nor are you likely to try a new idea if you've never heard of anyone else doing the same thing before.

By becoming informed about other people in other places, we broaden our horizons and minds to all manner of options we would otherwise never consider.

A Brief List of Magazines and Newspapers for Current Events Study

If you are looking for newspapers, newsletters or magazines that can provide a broader perspective on the world and current events, we are happy to suggest the following:

Christian and/or Kingdom-Oriented Periodicals

- **God's World Publications.** A series of graded (therefore, easy to read), eight-page publications published weekly during the school year. Reminiscent of "My Weekly Reader." High human interest and U.S.-oriented content. Editorial slant is conservative, anti-socialist, pro-Western. One article each issue uses Scripture to evaluate and comment on some matter of current U.S. or international concern. Adult version of the magazine *World*, a bi-weekly, is a force to be reckoned with. Their coverage of national and international news is remarkably thorough, thoughtful, and thought-provoking. Includes, besides concise headline news analyzed from a Biblical bent, concise media reviews, and reports from the frontlines of missions, a surprising number of articles that "scoop" the mainstream media on breaking news and analyze Western culture. We have grown very fond of this magazine! Order from God's World Publications, P.O. Box 2330, Asheville, NC 28802, USA; (800) 951-5437; www.gwnews.com/sonlight. Discounts available for three or more subscriptions mailed to same address.

- **Focus on the Family Citizen.** Monthly. An activists' advocacy magazine for wholesome, biblical values in American culture. Provides more in-depth coverage on socio-political matters often dealt with on the Focus on the Family radio programs. Good reading. Call 1(800)232-6459 or write to Focus on the Family, Colorado Springs, CO 80995.
- **Focus on the Family Plugged-In.** Monthly. This is another magazine that we have come to appreciate more and more as our kids have grown older and the publication itself has matured. Filled with up-to-the-minute analyses, from a conservative, Christian perspective, of all the latest films, musical recordings (virtually all genres), and videos. See address and phone number above.

Secular Periodicals

- **The Christian Science Monitor.** Daily. If you want a daily overview of what is happening around the world, the *Monitor* is the place to turn. Though clearly *not* written from a Christian perspective, the *Monitor* provides better daily news coverage of world events than almost any other newspaper. Write Christian Science Monitor, P.O. Box 11202, Des Moines, IA 50340; or call (800) 456-2220. Available only in the United States.
- Personally, daily newspapers overwhelm me with too much information about too many insignificant matters. Therefore, I prefer weekly and monthly periodicals: journals in which the news has been a bit more fully digested and there can be deeper analysis of what has happened during the previous seven to 31 days. If you are like me in this way, then you will probably prefer the following:
- **The Week.** Weekly. Covers U.S. and world news of all types—political, economic, social, media (film, music, TV), popular (tabloid gossip), business, tech, and more—pulled from a wide range of sources, both domestic and international. In general, the editors hold a liberal bias, but, more than any other periodical we have found, they view their role as giving a relatively fair editorial voice to all sides on contentious issues. For the conservative side, they often quote the *Wall Street Journal*. At only 42 pages long, and carrying relatively little advertising, the magazine offers a good, quick take on most current events of any significance in the world at large. Most of the adult members of our family read this magazine faithfully. You can get a six-week, risk-free trial subscription by calling (877) 245-8151. ■

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 2

	Date:	Day 6	Day 7	Day 8	Day 9	Day 10
BIBLE	Disappointment With God	chaps. 3–5				
	Bible Reading	1 Chronicles 14	1 Chronicles 15	1 Chronicles 16	1 Chronicles 17	1 Chronicles 18
	Memorization	Ephesians 4:31–32				
HISTORY & GEOGRAPHY	The Story of Science: Aristotle Leads the Way	chap. 4 & pp. 42–43 ⚙️ 🌐 🗺️	chap. 5 & pp. 50–53 ⚙️ 🌐	chap. 6 🗺️	chap. 7 & pp. 62–63 ⚙️ 🌐	
	String, Straightedge, and Shadow	chap. 6 ⚙️	chap. 7 ⚙️ 🌐	chap. 8 🗺️	chap. 9 🗺️	chap. 10
	Current Events	Three reports this week.				
READ-ALOUDS	Holes	chaps. 23–26	chaps. 27–30	chaps. 31–34	chaps. 35–38	chaps. 39–43
	National Geographic Book of Nature Poetry	p. 14	pp. 15–16	p. 17	p. 18	
READERS	The Thief	chap. 8	chap. 9	chap. 10	chap. 11	chap. 12
Additional Subjects:						

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Memorization (Bible)

Day ALL Ephesians 4:31–32

- ³¹ Get rid of all bitterness, rage and anger, brawling and slander, along with every form of malice.
- ³² Be kind and compassionate to one another, forgiving each other, just as in Christ God forgave you.

The Story of Science: Aristotle Leads the Way

Read the special feature along with the chapter in front of it.

Day 6 Chapter 4 & pp. 42–43

To Discuss After You Read

Q: Why is Thales noteworthy? [p. 36]

A: *living in the 6th century B.C., he “is said to be the world’s first philosopher–scientist–mathematician; the first to look for explanations in observed facts, not myths; the first scientist to leave his name on his ideas”*

- Q: How could Thales easily measure the height of a pyramid?
- A: *he reasoned that when the length of a shadow is the same length as the height of a stick, the length of the shadow of the pyramid would also be the same as the height of the pyramid*
- Q: What is an axiom?
- A: *a generally accepted rule*
- Q: Why is Thales seen as one of the founders of “Western civilization”?
- A: *he rejected the old supernatural religions and incantations, and looked to the natural world for answers*
- Q: Thales thought that all things in nature are made of water. Although that isn’t correct, why was that hypothesis interesting? [p. 40]
- A: *he wondered, “What is the nature of matter? What are we made of? What is the world made of?”; because of the idea that all things in nature come from one basic unit of life; today, we have about a hundred atoms, but perhaps the subatomic particles are actually all the same thing*
- Q: Thales wondered if the earth floats on water. Was he correct in that hypothesis?
- A: *almost; the theory of plate tectonics shows that molten rock underlies large pieces of the earth’s crust; the crust pieces slide and glide together*
- Q: Are most ratios constant?
- A: *no; if 24 rowers can row at 15 mph, no matter how many rowers join them, they will not break the speed of sound; most ratios are variable*

Timeline and Map Points

- † **Thales (ca. 624–546 B.C.). The world’s first philosopher–scientist–mathematician. Predicted a solar eclipse, figured out a way to calculate the distance from a ship to the shore, identified static electricity.**
- 📅 **Homer writes the *Iliad* and the *Odyssey* (8th century B.C.)**
- 🌐 *Aegean Sea, Ionia (see the map on page 35 of the book)*

Day
7

Chapter 5 & pp. 50–53

To Discuss After You Read

- Q: What were some of Anaximander’s new ideas?
- A: *that there were many inhabited worlds (that possibility is under investigation now); that the first animals came out of the water and evolved into more complicated forms (part of the evolutionary theory— postulated but not proven); he tried to picture the whole earth and its place in the cosmos, hypothesizing that the earth was curved, and unsupported, and that the heavens were a transparent sphere that moves*
- Q: What were some of Anaximenes’s new ideas?
- A: *that air is the single element that makes up everything in the universe, and that different mathematical qualities of air produce the different forms of matter (which approaches the idea of atoms and their different mathemati-*

cal quantities); he recognized that Venus and Mars are not stars (they are planets); he recognized that rainbows are a natural phenomenon and not a goddess; he also said that earth is a flat disc

- Q: Why is Anaxagoras important beyond his scientific ideas?
- A: *he influenced the most important generation in Greek history, which influenced world history*
- Q: Who were Pericles, Euripides, and Socrates?
- A: *Pericles: a great military and political leader who built the Parthenon and promoted democracy; Euripides: a famous playwright; Socrates: a wise man, teacher of Plato, who taught Aristotle*
- Q: What does it mean that “reason rules the world”?
- A: *the mind can understand the world around us; the world can be explained rationally*
- Q: What were some of Anaxagoras’s new ideas?
- A: *that matter existed as tiny particles initially; that the moon is made up of ordinary matter, and has mountains, and that it shines because of reflected light; that the sun was not a god but made of fiery matter*
- Q: What are meteors?
- A: *space rocks that are burning up in the earth’s atmosphere*
- Q: Why is base 60 a reasonable way to use numbers?
- A: *it can be evenly divided by 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, and 30, which allowed remainders to not be much of an issue*
- Q: Compare the number systems of the Babylonians, Egyptians, Phoenicians, Mayan, and Romans.
- A: *Babylonians used 60 as their key numbering system and calculated the measurement of circles and spheres; the Egyptians used a base–10 system with numbers as symbols but they lacked ‘zero’; the Phoenicians used numerals from their alphabet; the Romans used strokes and blocked mathematical progress; the Mayans used ‘zero’ as a placeholder, dots, and bars as symbols*

Timeline and Map Points

- † **Anaximander (ca. 611–547 B.C.). A pupil of Thales. Claimed the first animals came out of the water and evolved into more complicated life forms. Called the Founder of Astronomy. Tried to picture where Earth fit in the cosmos.**
- † **Anaximenes (ca. 570–500 B.C.). A pupil of Anaximander. Said to be the first Greek to realize that Mars and Venus are not stars, and that a rainbow is not a goddess, but a natural phenomenon.**
- † **Anaxagoras (ca. 500–428 B.C.). Claimed that at the beginning of time, a powerful Mind brought order out of chaos. Taught that the moon is made of ordinary matter and shines from reflected light, and that the sun is fiery stone.**
- 🌐 *Athens, Greece (H7) (map 1)*
- 🌐 *Babylon (modern–day Iraq) (D5) (map 2)*

To Discuss After You Read

- Q: Empedocles believed there were four elements that made up the world, and two primary impulses. What were they?
- A: *earth, air, fire, water, with love and strife (or attraction and repulsion, or push and pull)*
- Q: What are the four states of matter?
- A: *solid, liquid, gas, plasma*

Wikipedia offers a brief introduction to plasma:

A plasma can be created by heating a gas or subjecting it to a strong electromagnetic field applied with a laser or microwave generator. This decreases or increases the number of electrons, creating positive or negative charged particles called ions, and is accompanied by the dissociation of molecular bonds, if present.

The presence of a significant number of charge carriers makes plasma electrically conductive so that it responds strongly to electromagnetic fields. Like gas, plasma does not have a definite shape or a definite volume unless enclosed in a container. Unlike gas, under the influence of a magnetic field, it may form structures such as filaments, beams, and double layers.

Plasma is the most abundant form of ordinary matter in the Universe (the only matter known to exist for sure, the more abundant dark matter is hypothetical and may or may not be explained by ordinary matter), most of which is in the rarefied intergalactic regions, particularly the intracluster medium, and in stars, including the sun. A common form of plasmas on Earth is seen in neon signs.¹

- Q: What belief of the Greeks impacts science even today?
- A: *to understand the large (the universe), scientists must study the small (elements)*
- Q: Rewrite Empedocles' paragraph on p. 57.
- A: *Come and listen. The more you learn, the more your mind grows. Previously I explained my basic point: once, there were many things that combined into one. The one then separated into many: fire, water, earth, and air. Destructive strife is present, but not one of them. Strife keeps the four in proportion, and love is there, too, equal in dimension to them.*
- Q: Empedocles' statement was the first (as far as we know) to declare what? [p. 57]
- A: *"that matter and its interactions make up all the world and determine how it changes"*

1. "Plasma (physics)". [https://en.wikipedia.org/wiki/Plasma_\(physics\)](https://en.wikipedia.org/wiki/Plasma_(physics)). Accessed April 13th, 2018.

Timeline and Map Points

- † **Empedocles (ca. 495–435 B.C.). Taught there are four fundamental elements (earth, air, fire, water) and two primary impulses (Love and Strife, or Attraction and Repulsion)—a set of the longest-lasting and most influential ideas in history.**
- 🌐 *Athens, Greece (use the map on page 59 of the book)*

To Discuss After You Read

- Q: Why was Herodotus significant?
- A: *he was the world's first historian*
- Q: Are the skies the same in the northern and southern hemispheres?
- A: *no, in the southern hemisphere the noonday sun appears in the northern part of the sky instead of the southern; the constellations that are visible in both hemispheres appear upside-down*
- Q: Why was it significant that the Greeks and Phoenicians were "people of the sea?"
- A: *they had to study the stars to sail effectively*
- Q: What was the Phoenicians' greatest contribution to the world?
- A: *the alphabet*
- Q: What two unlike things did Pytheas, the Greek Navigator, connect?
- A: *the tides to the moon: as Newton showed, years later, the moon's gravity pulls the ocean waters*
- Q: Has Polaris always been the North Star?
- A: *no; the earth wobbles because of the torque, or twisting force, on the earth caused by the uneven tug of the sun and moon; one full wobble takes 25,800 years, so 2500 years ago, Kochab was the North Star, and 5000 years ago, Thuban was the North Star*

Timeline and Map Points

- 🌐 **Herodotus the first historian (ca. 484–425 B.C.)**
- 🌐 *Greece, Phoenicia (Lebanon), Carthage, Crete, Aegean Sea, Strait of Gibraltar (use the map on page 59 of the book)*

String, Straightedge, and Shadow**To Discuss After You Read**

- Q: Why were the stars important for the people of Mesopotamia?
- A: *since the plain and the surrounding area were so devoid of landmarks, they needed the stars to determine direction for trading, and they believed the stars directed the affairs of men*
- Q: How did the stargazers measure an angle? [p. 51]
- A: *by dividing a circle into six parts; the circle was eventually broken into 360 parts; now angles between stars could be made*

“East” is where the sun rises on the spring and fall equinoxes. Directions are angles from that point.

Q: Besides astronomy, what two other inventions did the Mesopotamians leave us?

A: *the wheel and the arch, both useful for creating strong, light structures*

Q: What modern everyday item has come to us from the Babylonian astronomers’ discovery?

A: *the clock, divided into 12 hours, each with 60 minutes, each with 60 seconds*

Timeline and Map Points

🕒 **More than 300 years of astronomical observations begins (747 B.C.)**

Day 7 Chapter 7

To Discuss After You Read

We read about Thales in *The Story of Science: Aristotle Leads the Way*, beginning in chapter 4.

Q: How did the mathematics of the Greeks differ from the mathematics of the Egyptians and Mesopotamians? How were they the same?

A: *the Egyptians and people of Mesopotamia used practical geometry to establish farmland and build buildings, the Greeks use theoretical geometry; all based their math on the circles, right angles, and the relationships between them*

Q: Besides the Ionian philosophers, what other famous people were living near Miletus in the 6th century B.C.? [p. 61]

A: *Aesop, who told fables; Pythagoras, on the island of Samos, credited with inventing the multiplication tables*

Q: What new kind of thinking did the Greeks develop?

A: *rational thought; while the Babylonians discovered new ways of doing things, the Greeks found new ways of thinking about things: observation, ordering the observations, trying to find abstract rules*

Timeline and Map Points

🕒 **Thales (ca. 624–546 B.C.)**

🌐 *Ninevah, Babylon* (use the map on page 5 of *The Story of Science* book)

🌐 *Aegean Sea, Miletus, Greece* (use the map on page 35 of *The Story of Science* book)

🌐 *Black Sea* (use the map on page 59 of *The Story of Science* book)

Day 8 Chapter 8

To Discuss After You Read

Q: What were some of the things Thales learned about?

A: *magnetism (“the magnet has a soul because it moves the iron”) and static electricity from a piece of amber*

Q: How did Thales earn money quickly?

A: *by observation, he determined a large olive harvest would soon happen, and bought all the olive presses and cornered the market*

Q: What story does Aesop tell about Thales?

A: *after his donkey dissolves salt in a stream and so relieves itself of burden, Thales loads down the donkey with sponges, which became far heavier after his plunge into the creek*

Q: What did Thales learn in his travels?

A: *sky measurement and circle geometry in Babylon, surveying in Egypt*

Timeline and Map Points

🌐 *Mesopotamia, Egypt* (use the map on page 5 of *The Story of Science* book)

Day 9 Chapter 9

To Discuss After You Read

Q: How did Thales astound the Egyptians?

A: *he calculated the height of the Great Pyramid, based on a proportion calculation between the height of a man and half the base of the pyramid plus the shadow*

Q: What did Thales notice about shadows?

A: *shadows changed proportionally; he pictured vertical items, like men and trees, as the vertical in a right triangle; the shape of the triangle changed as time passed, but the shape of them all changed proportionally*

Timeline and Map Points

🌐 *Giza, Egypt (D4)* (map 2)

Day 10 Chapter 10

To Discuss After You Read

Q: Whether Thales actually predicted the solar eclipse or not, why was the experience significant?

A: *the Greeks believed such a prediction was possible, that an eclipse was not a random occurrence but one that could be understood based on calculation*

Q: How was Thales’ thinking different from what the Babylonians and Egyptians had done before?

A: *the Babylonians and Egyptians had used right angles, levels, divided circles, geometric designs, but Thales was thinking about them in the abstract and could create the rules of geometry*

Q: How could you sum up Thales’ contribution to world understanding?

A: *he made geometry abstract and started deductive reasoning; he formulated the first geometry rules or theorems* ■

Level J: History/Bible/Literature

Days 9–12: Date: _____ to _____

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 3

	Date:	Day 11	Day 12	Day 13	Day 14	Day 15
BIBLE	Disappointment With God	chaps. 6–8				
	Bible Reading	1 Chronicles 19	1 Chronicles 20	1 Chronicles 21	1 Chronicles 22	1 Chronicles 23:1–6, 24–32; 24:1–6, 19, 31; 25:1, 6–8
	Memorization	Proverbs 3:27–28				
HISTORY & GEOGRAPHY	The Story of Science: Aristotle Leads the Way	chap. 8 & pp. 70–71 † 🌐	chap. 9 pp. 72–81 🕒 🌐	chap. 9 pp. 82–85	chap. 10 & pp. 92–93 † 🌐	
	String, Straightedge, and Shadow	chap. 11 🌐	chap. 12	chap. 13	chap. 14	chap. 15 † 🕒 🌐
	Current Events	Three reports this week.				
READ-ALONGS	Holes	chaps. 44–46	chaps. 47–50			
	A Ring of Endless Light			chap. 1, pp. 7–24 (up to break) 🌐 [N]	chap. 1, pp. 24–42 🌐	chap. 2, pp. 43–58 (up to break)
	National Geographic Book of Nature Poetry	p. 19	p. 20	p. 21	pp. 22–24	
READERS	Going Solo	pp. 1–19 🌐	pp. 20–40 🌐	pp. 41–66 🌐	pp. 67–96 🌐 [N]	pp. 97–121 🌐
Additional Subjects:						

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Memorization (Bible)

Day **ALL** Proverbs 3:27–28

- ²⁷ Do not withhold good from those to whom it is due, when it is in your power to act.
- ²⁸ Do not say to your neighbor, “Come back tomorrow and I’ll give it to you”—when you already have it with you.

The Story of Science: Aristotle Leads the Way

Day **11** Chapter 8 & pp. 70–71

To Discuss After You Read

- Q: How did the Babylonians use numbers?
- A: *for commercial purposes: trading, keeping records, dividing land and work*

- Q: How did the Egyptians use numbers?
 A: *for measuring; geometry allowed them to build pyramids and temples*
- Q: Explain the difference between concrete and abstract math.
 A: *concrete uses things you can touch: counting pennies one by one to figure out how many there are; abstract math uses symbols to stand for something*
- Q: Why did science succeed in the Western world?
 A: *because the Greeks applied math to science*
- Q: Who was Pythagoras?
 A: *the world's first great mathematician*
- Q: Why was Pythagoras' home in Samos significant?
 A: *it was in a significant port with access to many new ideas and the people of Samos were great builders and engineers*
- Q: Worldwide, who else lived concurrently with Pythagoras?
 A: *besides Thales and the A-team (Mander, Menes, Goras, as Hakim says), Confucius, Lao-tzu, Pharaoh Necho, Zoroaster, Jewish prophets, Gautama Buddha*
- Q: What is pi?
 A: *the ratio between the circumference of a circle and the diameter; an irrational number that begins 3.1415....*

Timeline and Map Points

- † **Pythagoras (ca. 582–507 B.C.). Mathematician and philosopher. Among many things, proved what is called the Pythagorean Theorem (in right triangles, $a^2 + b^2 = c^2$). Founded a famous school in Croton, Italy.**
- 📍 *Samos; Delphi (use the map on page 65 of the book)*

Day 12 Chapter 9, pp. 72–81

To Discuss After You Read

- Q: What is the difference between an Ionian thinker and Pythagoras?
 A: *the Ionians observed and added block after block of information, one after the next; Pythagoras believed in an orderly creation, and came up with mathematical formulas (today, the scientific method uses both thinking and observation and adds experimentation)*
- Q: Why were numbers important for Pythagoras?
 A: *they were the way to understand the universe, by searching for things that are absolutely true; he said, "All is number," and he believed they were the expression of God's mind*
- Q: What is an irrational number?
 A: *one that cannot be turned into a ratio of two integers; pi, for example, is not quite one-seventh*
- Q: How did Pythagoras impact our understanding of sound?
 A: *music can be explained mathematically: in musical strings of identical tension when one is twice as long they produce sounds an octave apart; he also believed that the*

cosmos was like an orchestra, playing mathematical and musical harmony (and since modern astronomers think they have heard a B flat, 57 octaves below middle C, coming from a black hole, he might be right)

- Q: What is the Pythagorean Theorem?
 A: *the square of the hypotenuse of a right triangle equals the sum of the squares of the other two sides*
- Q: What were some of Pythagoras' other breakthroughs?
 A: *he taught that Earth is a sphere, that the earth moves, that earth is not the center of the universe, that the morning and evening star are the same (today we know that is the planet Venus); he made mathematics the language of Western science*

Timeline and Map Points

- 📍 **Great Pyramids built (ca. 2550 B.C.)**
 📍 *Croton, Italy (use the map on page 75 of the book)*

Day 13 Chapter 9, pp. 82–85

To Discuss After You Read

- Q: Is one-third an irrational number?
 A: *no, because although it goes on forever, it repeats; irrational numbers do not repeat*
- Q: Do irrational numbers have a place on a number line?
 A: *they do, and can be used for calculations, but can't be used exactly*
- Q: What is phi? Why is it significant?
 A: *the Golden Ratio, 1.618..., found regularly in nature (the spacing of rose petals, the swirls on pineapples and pinecones) although an irregular number, the ratio creates beautiful forms*

Search for a YouTube movie by Vi Hart, that goes further into pineapple and pinecone structure. Look up "Doodling in Math: Spirals, Fibonacci, and Being a Plant."

Day 14 Chapter 10 & pp. 92–93

To Discuss After You Read

- Hakim states that "for religious and cultural reasons, scientific progress stopped for almost 1,000 years" [p. 89]. Scientific progress moved forward in the West only because Christianity (which gained momentum about 100 years after the Greeks) allows believers to wonder and search for truth. See Rodney Stark's *How the West Was Won* for a clear explanation.
- Q: Did Democritus agree with the idea that the four basic elements were the basis of all things?
 A: *no; he believed there was something more basic, that unified all, that was the smallest substance in the universe; this he called the "atom," from the Greek meaning "something that cannot be cut"; he believed there was nothing but atoms and the void*

- Q: What is the difference between fission and fusion?
 A: *fission splits the nucleus of a heavy atom into light atoms, and fusion joins light atoms into a heavy atom; they both create energy*

- Q: What did Lucretius teach about atoms?
 A: *they are solid and indestructible, that they assume geometric forms, and that they are perpetually in motion*

Ms. Hakim states that Democritus' "writings were destroyed by religious zealots" [p. 91]. In searching the web, the only reference to destroying his works comes from Plato, who demanded the burning of Democritus' works—not a religious zealot.¹

- Q: Why did science stall after Democritus?
 A: *he and the other ancients could hypothesize about the nature of things, but they couldn't prove anything, or do experiments, so there was really nowhere for science to go*

Timeline and Map Points

- † **Democritus (ca. 460–370 B.C.). Claimed there had to be a smallest substance that could not be cut up or destroyed, the basis of all other things. He called these "atoms." Said to have written 73 books.**
- † **Socrates (469–399 B.C.). Called "the wisest man in the world" by the Oracle of Delphi. Ran a school famous for its "Socratic method": using questions to draw out ideas and assumptions and lead students to think more clearly.**
- 🌐 *Thrace (use the map on page 87 of the book)*

String, Straightedge, and Shadow

Day 11 Chapter 11

To Discuss After You Read

- Q: What is the story of Pythagoras' first pupil?
 A: *at first, no one would listen to him, so he finally found a poor child and promised to pay him a certain amount for every lesson he learned; after some time, the child was so interested, he demanded more and more, but Pythagoras was too poor to pay, so then the child paid him*
- Q: What did Pythagoras' sect mean by "knowledge is the greatest purification"?
 A: *they believed that by studying mathematics, they could be freed from endless rebirth in reincarnation; math was their salvation*

Timeline and Map Points

- 🌐 *Croton, Italy (G6) (map 1)*
- 🌐 *Diospolis (modern-day Thebes) (D4) (map 2)*
- 🌐 *Babylon; Egypt; Memphis, Egypt (use the map on page 5 of the book The Story of Science)*

1. Ferwerda, R. "Democritus and Plato", *Mnemosyne*, Fourth Series, Vol. 25, Fasc. 4 (1972). Found at https://www.jstor.org/stable/4430143?seq=1#page_scan_tab_contents, accessed January 2, 2018.

- 🌐 *Samos (use the map on page 96 of the book The Story of Science)*

Day 12 Chapter 12

To Discuss After You Read

Studying music, astronomy, arithmetic, and geometry, in the 6th century A.D. was called the "quadrivium." This is still a part of classical education.

This proof of the Pythagorean Theorem is so stunningly elegant, it boggles the mind. No wonder Pythagoras and his followers had a celebration!

- Q: What is Pythagoras known for?
 A: *his theorem, $a^2 + b^2 = c^2$; he was the first to consider math a part of formal education*
- Q: What new method of problem solving did Pythagoras develop?
 A: *diagramming them*

Day 13 Chapter 13

To Discuss After You Read

This book claims Pythagoras and his followers discovered the five regular solids, or the five Platonic solids. Wikipedia says, "The ancient Greeks studied the Platonic solids extensively. Some sources (such as Proclus) credit Pythagoras with their discovery. Other evidence suggests that he may have only been familiar with the tetrahedron, cube, and dodecahedron and that the discovery of the octahedron and icosahedron belong to Theaetetus, a contemporary of Plato. In any case, Theaetetus gave a mathematical description of all five and may have been responsible for the first known proof that no other convex regular polyhedra exist." The article goes on to explain that Plato describes them in his dialogue with Timaeus, and so his name is associated with them.

The book says, "An infinite number of regular polygons can be inscribed in a circle—their sides becoming so small that they approach the form of the circle itself." A "polygon" is a two-dimensional, closed shape, where every edge is a straight line. A regular polygon has only equal sides. The book says that a triangle can be drawn in a circle so that all three of the points (vertices) touch the circle. Likewise a square, a pentagon, an octagon, and so on. A regular polygon with so many sides it is practically a circle can also fit. Apparently, then, in a sphere, only these five shapes can fit inside without protrusions and such.

- Q: Which three shapes cover a flat area completely? Why?
 A: *triangles, squares, and hexagons; since there are four right angles and a point, only forms whose corner angles together make that total*
- Q: Name the regular solids.
 A: *cube (6 squares), regular pyramid (4 triangles), octahedron (8 triangles), icosahedron (20 triangles), dodecahedron (12 pentagons)*

To Discuss After You Read

- Q: Why was the discovery of irrationals so upsetting for the Pythagoreans? Why was this significant for the world?
- A: *they believed the universe was ordered by whole numbers; to have irrational numbers messed up their whole concept of the cosmos; the secret society broke up and geometry and the study of mathematics became available for all to learn*

To Discuss After You Read

- Q: Why is Eudoxus of Cnidus significant?
- A: *"he broke the deadlock of the irrationals and freed geometry" to advance*
- Q: How do you create a "root five rectangle," or a rectangle with an irregular side?
- A: *inside a semicircle, inscribe a square, then make it a rectangle as long as the semicircle's diameter; when the width of the rectangle is one, the length is the square root of five*

For a refresher on the Golden Mean, see pp. 84–85 in *The Story of Science: Aristotle Leads the Way*.

- Q: Why is the Golden Mean important?
- A: *it is a beautiful proportion often used in architecture and art, and is used to construct the pentagram and dodecahedron; although the Golden Mean is irregular, it can be handled through geometry*

Timeline and Map Points

- † **Plato (ca. 427–327 B.C.). Student of Socrates; a deep thinker. Recorded dialogues between other students and Socrates. Sought truth, beauty, clarity, and the perfect form. Discovered patterns and order in mathematics and the stars.**
- 🕒 **Eudoxus (408–355 B.C.)**
- 🕒 **Pericles (495–429 B.C.) rebuilds Athens beautifully**
- 🌐 *Athens; Sparta (H7); Cnidus (H8) (map 1) ■*

Section Three

Reading Assignments and Notes

Read Alouds

Day
1

Chapters 1–5

To Discuss After You Read

Q: What is the setting of the story? [chap. 1]

A: *a camp on a dry lake bed in Texas*

Q: What task do the campers have? [chap. 1]

A: *to dig holes and try to stay alive*

Q: Why are the campers at the camp? [chap. 2]

A: *as punishment for crimes, and to learn how to be good citizens*

Q: Describe Stanley's life. [chap. 3]

A: *sample: he comes from a poor family, he is overweight and teased, his father is a failed inventor, his family believes they have been cursed with bad luck, all the men in the family have the same name as it is a cool palindrome, they live in a small apartment, he had no friends*

Q: How are the campers to spend their day? [chap. 4]

A: *they must dig a 5 foot square hole each day, and give anything they find to the people in charge*

Q: Mr. Pendanki tells Stanley that the only person he needs to fear is the warden. What do you think? [chap. 5]

A: *since we haven't met the warden yet, his fellow campers don't seem too friendly, and Mr. Sir didn't seem welcoming. Life does not look promising*

Day
2

Chapters 6–7

Cultural Literacy

American League: one of two leagues (or groups of teams) that make up Major League Baseball in the United States and Canada; the two leagues compete in the World Series.

four triples in one game: as a player, he got to third base four times in one game.

To Discuss After You Read

Q: What was Stanley's crime? [chap. 6]

A: *he found a pair of sneakers, and the police considered them stolen*

Q: Do you think Stanley's great-great grandfather deserved his trouble? [chap. 7]

A: *no; although he was foolish to love a girl who was merely beautiful, he forgot his promise to his friend Madame Zeroni, and he tried to make good on his promise by seeking out her son*

Q: The family calls the great-great grandfather a pig stealer. Was he one? [chap. 7]

A: *no, Madame Zeroni gave him the piglet; it was the runt who would have died anyway*

Q: Do you think the family was wise to keep singing a song that ended, "If only..."? [chap. 7]

A: *while they remained hopeful, they always blamed their troubles on the curse*

Timeline and Map Points

🌐 *Latvia (C7) (map 1)*

Day
3

Chapters 8–12

To Discuss After You Read

Q: Why does the author have a chapter on the yellow-spotted lizards? [chap. 8]

A: *they are deadly, they live in the holes the boys dig, and must be a key facet of the story*

Q: Why does Stanley lie to his mother in his letter home? [chap. 9]

A: *so she doesn't worry, and the place is so bad, no one would believe it*

Q: Why do the campers nickname Stanley, "Caveman"? [chap. 9]

A: *maybe because he growled at the "Lump" in the chair, and hadn't taken a shower with soap, maybe because he was the opposite of a caveman when he wrote home...*

Q: What does Stanley find and why is it significant? [chap. 10]

A: *a fossil of a fish; while it isn't something the warden wants, it does prove there once was a lake at the camp*

Q: Why is Stanley glad he has a nickname? [chap. 11]

A: *it proves he is accepted by the boys, and he is glad to be friends with such tough guys; he hopes he can use them to stand up to the bullies at his school*

Q: What do you think of Mr. Pendanski's advice to the boys? [chap. 12]

A: *while he seems to say the "right" things, he insults Zero, is unaware of why the different boys are there, and says they can be anything they want with work; his comments seem simplistic at best*

Day
4

Chapters 13–17

To Discuss After You Read

Q: How long is Stanley's sentence? Does it seem reasonable? [chap. 13]

A: *a year and a half of hard labor; it feels excessive for a first offense*

Q: What does Stanley find? [chap. 13]

A: *a finger-long engraved tube, open at one end and closed at the other*

- Q: Why do you think the Warden tells Mr. Pendanski to fill the boys' canteens? [chap. 14]
- A: *it is probably a power move to make her look good to the boys and in charge*
- Q: The Warden asks X-Ray if he found the item in his hole. Why is his answer potentially problematic? [chap. 14]
- A: *he didn't find the item, so if the Warden is hopeful for more stuff, she won't find anything near his hole*
- Q: How does the Warden know everyone's name, even though she never comes to see them? [chap. 15]
- A: *she watches the boys with cameras and microphones*
- Q: What does Stanley figure out about the holes? [chap. 15]
- A: *the boys are searching for something for the Warden*
- Q: What do you think of Zero's education? [chap. 16]
- A: *I wonder if he has had one; he is unaware of a famous nursery rhyme*
- Q: Describe the Warden's character. [chap. 17]
- A: *impatient, cruel, sadistic, power-hungry, etc.*

Day
5

Chapters 23–26

To Discuss After You Read

- Q: Why does Stanley decide to not teach Zero to read? [chap. 18]
- A: *his heart has hardened, Zero has no value, he is too tired after digging all day, he doesn't know how to teach—all wrong reasons to not help*
- Q: What bad luck comes to Stanley? [chap. 19]
- A: *although a fellow camper steals a bag of sunflower seeds, Stanley chooses to take the punishment for all the boys*
- Q: Do you think the Warden wants the boys to learn to act honorably? For the good of society? [chap. 20]
- A: *no; she seems to have her own purposes and doesn't care about anyone else at all*
- Q: Why does Stanley think about his great-grandfather on his walk back to the lake? [chap. 21]
- A: *he felt his circumstance was similar to his great-grandfather's; both had been robbed of their past lives, and left to die in the desert*
- Q: Why does Stanley decide to teach Zero to read? [chap. 22]
- A: *to thank him for helping to dig his hole, and because Zero really sees Stanley for who he is*
- Q: What does Stanley discover about Zero's learning ability? [chap. 22]
- A: *he is sharp and a math genius*

Day
6

Chapters 23–26

To Discuss After You Read

- Q: Why does the author include a chapter on Katherine Barlow? [chap. 23]
- A: *to connect Stanley's great-grandfather's story to Green Lake camp; to show us a different side of the famous outlaw, to explain why the lipstick tube ended up in the lake*
- Q: How does Mr. Sir punish Stanley, and should he have? [chap. 24]
- A: *he poured Stanley's water on the ground; no, he should complain to the cruel warden, Stanley was not responsible for his sore face*
- Q: Why does Hattie say, "God will punish you!"? [chap. 25]
- A: *because Katherine fell in love with an man with a different skin color; one who couldn't come to school, but could be used to do tasks*
- Q: Why did Kissin' Kate become an outlaw? [chap. 26]
- A: *because of great injustice; her boyfriend was killed, the sheriff was evil, the townspeople cruel, the schoolhouse burned*

Day
7

Chapters 27–30

To Discuss After You Read

- Q: Should Stanley have accepted Zero's help in digging his hole? [chap. 27]
- A: *probably not—it led to hard feelings, and he was able to do so himself*
- Q: What is Zero's real name, and why is it significant? [chap. 27]
- A: *Hector Zeroni—it is the name of Stanley's great-great grandfather's friend and Stanley wouldn't have learned that if he hadn't taught Zero his name*
- Q: What is the Warden searching for? [chap. 28]
- A: *Kate Barlow's buried treasure*
- Q: What does the bad weather bring? [chap. 29]
- A: *hot, muggy weather, lightning, and a glimpse of a land form that Stanley thinks he recognizes*
- Q: Why do the boys riot? [chap. 30]
- A: *because Stanley isn't working, Zigzag thinks he should have special privileges because its his birthday, the heat makes them crazy, and Stanley is investing in Zero and no one else*

Day
8

Chapters 31–34

To Discuss After You Read

- Q: What does the Warden decide to do about Zero's escape? [chap. 31]
- A: *she erases his file as deeply as she can, and guards the water so he will die in the desert; she assumes no one*

will come for him since he was found on the streets with no guardian

- Q: Why does Stanley escape? [chap. 32]
A: *to search for Zero in the small chance that he might be alive*
- Q: Is his escape well planned? [chap. 32]
A: *no, he crashes a truck and leaves with no water*
- Q: Why does Stanley keep walking even though the search is hopeless? [chap. 333]
A: *it is better than returning and meeting the warden; he wants the people in the camp to calm down*
- Q: As Stanley walks, what does he discover? [chap. 34]
A: *he initially travels toward the Thumbs Up rock structure, but detours to a half-buried boat (the Mary Lou—named for the donkey that died)*

Day
9

Chapters 35–38

To Discuss After You Read

- Q: What do the boys discover? [chap. 35]
A: *Katherine's canned spiced peaches*
- Q: Why do the boys travel further from the camp? [chap. 36]
A: *Zero has decided he won't dig anymore, and Stanley doesn't want to leave him, and they want to check out the strange stone structure*
- Q: As the boys climb the mountain what gives them hope? [chap. 37]
A: *both the thumbs up rock formation, and weeds and bugs help them believe water is near*
- Q: What do the boys find at the top of the mountain? [chap. 38]
A: *water and an onion*

Day
10

Chapters 39–43

Cultural Literacy

ward of the state: when the state takes responsibility for a child. [chap. 41]

To Discuss After You Read

- Q: How did Zero know that Stanley was innocent of his crime? [chap. 39]
A: *Zero had stolen the shoes*
- Q: What do the boys find and why is it important? [chap. 40]
A: *they found Sam's onion patch, and the onions healed both boys*
- Q: What is the example of irony in this chapter? [chap. 41]
A: *if Zero had kept the stolen sneakers, neither boy would be in the camp*

- Q: Why is Stanley happy as he thinks about being a fugitive? [chap. 42]
A: *he can leave the camp, he has a friend like he has not had before, he has a plan, he figures how he and Zero can get some money to use while on the run*
- Q: Why was Zero on his own? [chap. 43]
A: *when his mother lost their home, she would leave him at intervals while she went and did mysterious things; one day, she never returned and Zero was alone*

Day
11

Chapters 44–46

Cultural Literacy

A.G.: Attorney General. [chap. 46]

To Discuss After You Read

- Q: What plan do the boys have? [chap. 44]
A: *to dig for treasure in the dark, to collect water and food from the camp, and walk away*
- Q: What is the climax of the book? [chap. 45]
A: *when the boys find the missing suitcase, are captured by the Warden and her crew, and are surrounded by deadly lizards*
- Q: What irony occurs in this chapter? [chap. 46]
A: *Stanley's lawyer (he didn't know he had one) came to collect him as a free man; the Warden will never let him go free, nor will the lizards keep him alive*

Day
12

Chapters 47–50

To Discuss After You Read

- Q: Why does the suitcase have Stanley's name on it? [chap. 47]
A: *it was the one Kissin' Kate stole from his great-grandfather*
- Q: Why does Stanley insist Zero come with him? Why can Zero come? [chap. 48]
A: *Zero will be severely punished if left behind, and the Warden deleted all his records when he escaped earlier; the camp has no jurisdiction to hold him*
- Q: Why were the boys safe in the lizards' nest? [chap. 49]
A: *they had onion in their blood*
- Q: Give an example of irony from this chapter. [chap. 50]
A: *all through the story Mr. Sir tells the campers, "This ain't no Girl Scout Camp." When the Warden needs cash, the property is sold to the Girl Scouts and they make a camp there; the baseball player who sent Stanley to camp ended up a friend of the family*
- Q: Retell the resolution of the story. [chap. 50]
A: *the curse ended when the great-great-great grandson of Elya carried the great-great-great grandson of Madame Zeroni up a mountain (after getting stronger through the hard work of digging), and Hector hired a private investigator to find his missing mother (which he did) ■*

Note to Mom or Dad: This is a Newbery Honor book by a well-respected author, who deals with a lot of very challenging subjects in very beautiful and unusual ways. The impending death of a beloved grandfather is memorable and impactful. The author treats this difficult subject so well!

As with all difficult subjects, there may be some situations that are less than ideal. Do we want 16-year-olds (or almost 16-year-olds) to be pursued by really unhealthy, manipulative young men? Of course not. But does this happen? Obviously so. It's interesting: there's the uninteresting, plodding acquaintance who becomes romantically inclined. The challenge there is to refuse his advances while not hurting him as a person. There's the interesting and unhealthy Jeffrey (who may be one of the most repugnant characters, but Vicky apparently likes him). The challenge with him is to avoid entanglement, even if there's a tiny piece that appreciates the thrill of being pursued. A lot of girls may need to take this lesson to heart. Maybe not a lot of homeschooled girls, but a lot of girls in general.

And as for Adam, the older guy (maybe 22?). The age difference may not be ideal at those ages, and if they were having sex that would be statutory rape. But they're not having sex. And in another two years or so, their ages will become immaterial. (In many cultures of the world, this age span is not a big deal even at age 16.)

Many marriages have an age difference of 6 or more years and that is not as frowned upon, but that could be because it doesn't happen in the teen years.

But Vicky always presents as older than she is. She is intriguing to Adam because she's thoughtful and has certain abilities (her interactions with dolphins) that he values.

And in the end, she figures out who she can rely on, which shows some level of increased self-awareness.

To sum up: these sorts of relational knots seem fairly common among young people. There are a few paragraphs where Jeffrey puts his head on Vicky's lap or some such that we would not hope for our own children, but this can be used as a reasonable cautionary tale (don't put yourself in compromising situations! Don't give in to flattery!) without being terribly explicit.

The treatment of a beloved dying relative is unusual and valuable and beautifully done.

Vocabulary

...his **ostentatious** station wagon... (*vulgar, gaudy, pretentious, loud, fancy, extravagant*)

... all merged into a **soporific** counterpoint. (*to induce sleep or drowsiness*)

Cultural Literacy

petite and piquante: stimulating, interesting.

cafe au lait: coffee with hot milk added.

undertow: an undercurrent that moves offshore as waves come in; it can be dangerous for swimmers.

Leukemia: a cancer of the blood-forming tissues.

MIT: Massachusetts Institute of Technology—prestigious school that teaches science and technology to prepare students for the 21st Century.

El Greco: 1541–1614; Greek painter of the Spanish Renaissance.

To Discuss After You Read

Q: How did Commander Rodney die? What theme of the book does this introduce?

A: *he died of a heart attack saving the life of "some dumb rich kid who'd gone out in his sail boat in complete disregard of storm warnings;" since Vicky's family has come to the island to help while her grandfather is dying, a theme is death and how to deal with it*

Q: How would you describe the funeral service as officiated by Vicky's grandfather?

A: *while Grandfather recognizes that we are mortal and all die, he proclaims "Alleluia" and has the funeral people take away the fake niceties; he sought to emphasize that death is real, but "this reality was less terrible than plastic pretense;" he emphasizes the Lord's blessing on those who still live; "yet even at the grave we make our song: Alleluia..."*

Q: What does Adam say about death?

A: *when someone dies, initially you don't feel anything, but later it hurts*

Q: Why does Grandfather recommend the family "use all the pretty things as much as possible this summer?" Do you think we should use pretty things all the time?

A: *to celebrate life; to not live in fear of the future and "someday"*

Q: Describe Vicky's grandfather's life experiences.

A: *it was well-lived; he and wife lived with an African tribe to learn their language and write down their wisdom and history; then served as pastor of a large church; then served as pastor of a mission church in Alaska; he got a pilot's license to visit his church members; and based on his graveside service, he's not afraid to die*

Timeline and Map Points

📍 Africa (E3) (map 2)

📍 Chicago (D7); Boston (C9); New York (C9) (map 3)

Vocabulary

... **gauche and naive** (lacking grace; socially awkward; unsophisticated)

He gave me his fullest **Hamlet** look... (a tragic Shakespeare figure)

* * *

Cultural Literacy

ménage-a-trois: a domestic arrangement with three individuals romantically involved.

Charters to the mainland: the reservation of a boat for private use Great Smoky Mountains National Park.

Cryonics: to freeze in hopes that one day the body can be resurrected.

AMA: American Medical Association.

fugue-type: a music form that begins with the melody in one voice and then a second voice plays the melody and the two parts weave together.

ballade: a short musical piece specifically for the piano.

rondel: a specific poetry form.

fibrillating: an irregular heart rate.

Boston bluestocking: an intelligent educated woman.

jodhpurs: full length pants; fitted below the knee with extra padding on the inside of the thigh.

To Discuss After You Read

- Q: Zachary expects that one day scientists will be able to resurrect his frozen mother. Grandfather says with a small smile, "I think I prefer another kind of resurrection." What could be the problems of being resurrected in the future? Why would Grandfather's type of resurrection be preferred?
- A: *the world would be very different if you came back to life in the future; your friends might not still be alive; would you know how to survive in a future world; and you would have to die once again; Grandfather believes he will regain life in heaven with a Savior who loves him; in a body that will not die again; a new life without sin or suffering or tears or sorrow—much to be preferred*
- Q: When Zachary says that cryonics is expensive, Grandfather replies that "Resurrection has always been costly, though not in terms of money. It took only thirty pieces of silver." What does he mean?
- A: *when Judas betrayed Jesus for thirty pieces of silver, Jesus then went to the cross to die for our sins—the most expensive death ever; Jesus had to die and then come to life to conquer death for all of us*

- Q: What does Vicky compare Zachary's mother's deep-freezing to?
- A: *the artificial things at the cemetery; it pretends death hasn't happened*
- Q: When Rob asks Grandfather anxiously, "It doesn't really matter, does it? Whether you're frozen or buried or cremated or what, God can manage, can't he?" How does Grandfather respond?
- A: *warmly, confidently, compassionately; he states, "I stake my life on that."*
- Q: Why does Zachary claim he needs to see Vicky? Is his reason fair to Vicky?
- A: *he had tried to kill himself because he was bored, but "some Boy Scout Coast Guard foiled me by rescuing me;" I'm not sure Vicky can save someone who is so conflicted—on one hand to freeze his mother, and on the other hand to disregard life so thoroughly; I doubt she can give him a reason to live*
- Q: "Zachary had accused us of moralism." How does Vicky respond?
- A: *Grandfather taught the family that thinking you know all the answers is a "snare and delusion," the family wrestles to figure out the right things to do*
- Q: Why is Zachary "desperate" to see Vicky?
- A: *he's drawn to her family—her parents seem to love one another; she's sanity in an insane world; the light of the gospel shines*
- Q: What does Grandfather say to Vicky about blaming Zachary for Commander Rodney's death?
- A: *it's easier to blame a scapegoat (in this case Zachary) than be angry at God (for such a senseless death); God can handle your anger*
- Q: What is Grandfather's view of death?
- A: *to live forever in this body would take away much of the joy of living; we wouldn't treasure our time; "Simply the awareness that our mortal lives had a beginning and will have an end enhances our quality of our living."*
- Grandfather says, "Nancy Rodney is more than the salt of the earth. She's the leaven in the bread. And the light that's too often under a bushel." All of these descriptions are based on Matthew 5–7.
- Q: When Vicky asks if she should help Zachary, how does Grandfather wisely reply?
- A: *"The obligations of normal human kindness—chesed, as the Hebrew has it—that we all owe. But there's a kind of vanity in thinking you can nurse the world. There's a kind of vanity in goodness."*
- Q: Vicky thinks, "Confusing enough when there are three generations together. How much more confusing it would be for Zachary and his Immortalists if there could be ten or fifteen generations of one family all alive at the same time." Do you agree?

- Q: Why does Grandfather encourage Vicky to write poetry?
 A: *poems can know more than we do—are deep within and can help us articulate what we only sense we are feeling*

Timeline and Map Points

🌐 California (D1) (map 3)

Day 17 Chapter 3

Vocabulary

John **expostulated**... (to earnestly reason with)

* * *

Cultural Literacy

Ignominious: shameful, dishonorable.

Gentian eyes: blue.

To Discuss After You Read

- Q: What does Grandfather believe about coincidences? Who does he give as an example, and why (p. 78)?
 A: *there are none; "The pattern is closely woven"... it doesn't impact free will; "Any one of us can cause changes in the pattern by our responses of love or acceptance or resentment." So our response to situations is important; Nancy Rodney plans to go back to nursing—she's a good nurse who inspires confidence; rather than sit at home and feel sorry for herself, she plans to go out and serve*
- Q: When Suzy blames Zachary for Commander Rodney's death, how does Adam respond (p. 80)? Do you agree?
 A: *"You can't pile a load of guilt on someone like that... You can't hindsight that way. When something happens, it happens, and you have to accept it and go on from there."; the Bible tells us that our days are numbered, so as Daddy says, "The heart attack could have happened while he was weeding the garden..."*
- Q: Grandfather reads a quote from a book written by Elie Wiesel who spent time in a concentration camp. What does Elie say?
 A: *"Guilt cannot be transmitted." And, "But it is given to man to begin again—and he does so every time he chooses to defy death and side with the living." And, "It is possible to suffer and despair an entire lifetime and still not give up the art of laughter."*
- Q: How does Mother explain the seemingly sexist Biblical writing about mankind (p. 83)?
 A: *"So God created man in his own image, in the image of God created he him; male and female; females are half of mankind"*
- Q: When Suzy comes down on people, preferring the porpoises, how does Adam reply (p. 86)? Do you agree?
 A: *"There've been, and still are, some pretty good people, Suzy."*

Day 18 Chapter 4

Cultural Literacy

de vivre: joy of living.

Semaphore Vs: communication via flags, or bare hands using symbols; Adam would have spread his legs apart to form the letter "V."

reticent: to not reveal one's thoughts or feelings.

monk's tonsure: to shave part of the scalp

To Discuss After You Read

- Q: Why does the Marine Lab study starfish?
 A: *to see if the way starfish heal could be used on people; while starfish have a central nerve disc, it is not known if people have that as well.*
- Adam gives the current theory of how dolphins came to be sea creatures. Please understand that these are theories only.
- Q: Vicky says, "We hear about man's inhumanity to man, but never dolphin's inhumanity to dolphin" (p. 99). Why might this be so?
 A: *man is the fallen creature; man has both beautiful acts of kindness that reflect how we were made in God's image, but the fall produces great wickedness—the Christian worldview is the only logical as it explains both sides of how man acts*
- Q: When Adam considers that dolphins may have chosen to give up their hands, does that idea fit with current evolutionary theory?
 A: *it doesn't seem to; since current theory depends on random mutations not choice*
- Q: Why does Adam think hands are important? (99) Can you think of other things?
 A: *they enable writing, history, painting, sculpture, poetry, music; sample: building, organizing, worship, gardening, work*
- Q: What are Adam and his boss studying?
 A: *dolphin sounds to see if they have a complex language; they have a sense of humor which is a sign of intelligence and a larger brain than most animals*
- Q: When Vicky meets Basil, what is her reaction?
 A: *initially fear, and then she gets a clear sense of what he wants; he reminds her of her family's dog Joie*
- Q: What does Adam say to Vicky about letting her Grandfather go?
 A: *"It's hard to let go anything we love. We live in a world which teaches us to clutch. But when we clutch we're left with a fistful of ashes" (p. 117). We need to learn to let go.*

Section Three

Reading Assignments and Notes

Readers

Overview

The magus (wise advisor) of Sounis takes the talented thief, Gen, out of prison in order to steal a hidden treasure. As they travel, they share myths; they are set upon by soldiers; they risk death at every turn. This is an awesome book with a surprising twist at the end!

Setting

The characters dwell and travel in Sounis, Eddis, and Attolia, three imaginary countries something like Greece, something like ancient times, but with watches and an occasional gun (first invented in the ninth century).

Vocabulary

Rationale: Knowing definitions is critical to understanding, so we have included vocabulary words in this Instructor’s Guide. We also add cultural literacy terms that provide depth to stories.

... to look **lithe** and graceful and perhaps **feral** ... (*lithe: thin, supple, and graceful; feral: in a wild state, especially after escape from captivity or domestication; resembling a wild animal*) [chap. 1]

... sat back in my chair, **mollified** and delighted ... (*appease the anger or anxiety of someone*) [chap. 1]

... crossing the more **circuitous** Sacred Way ... (*winding, indirect route*) [chap. 2]

... thanks to the **ministrations** of the king’s magus ... (*dealings, provisions*) [chap. 2]

... the edge of a **veranda**. (*a covered porch*) [chap. 2]

... not even an **undulation** in the ground ... (*have a wavy form or outline*) [chap. 2]

... I **consigned** to the fires ... (*gave into another’s custody*) [chap. 2]

Not exactly **stalwart**, are you? (*loyal, reliable, and hard-working; sturdy and strong; perhaps “stoic” would be a better word in this case*) [chap. 2]

Cultural Literacy

megaron: the great hall of the Grecian palace complexes. It was a rectangular hall, fronted by an open, two-columned porch, and a more or less central, open hearth vented through an oculus in the roof above it and surrounded by four columns. [chap. 1]

sconce: a candle holder, or a holder of another light source, that is attached to a wall with an ornamental bracket. [chap. 1]

agora: in ancient Greece, a public open space used for assemblies and markets. [chap. 1]

amphora: a tall ancient Greek or Roman jar with two handles and a narrow neck. [chap. 1]

hypocaust: a hollow space under the floor of an ancient Roman building, into which hot air was sent for heating a room or bath. [chap. 1]

retort: a glass container with a long neck, used in distilling liquids and other chemical operations. [chap. 2]

To Discuss After You Read

Q: What previous contact had Gen had with the magus and the King of Sounis before the meeting in the study? [chap. 1]

A: *he had seen the magus at his trial, and perhaps he hadn’t seen the king before, but we know that he had crept through the palace and hid in his treasure room*

Q: What threat does the King promise Gen? [chap. 1]

A: *if he runs, the king will offer gold pieces to anyone who captures Gen, and since each piece would buy a farm, that’s a large reward*

Gen mentions a lion gate. To see photos online of a real life lion gate, such as the entrance to Mycenae in southern Greece, use your favorite search engine to look up the phrase, “Lions Gate Mycenae.” [chap. 2]

Q: Briefly describe each of Gen’s traveling companions. [chap. 2]

A: *the magus is the king’s scholar, a curt, composed leader; Pol is a soldier, strong and quiet; the boys are well-bred apprentices; the older one, Ambiades, is haughty and strong; the younger one, Sophos, is curious, book-smart, and feebler*

Vocabulary

...blending together into an **undifferentiated** forest ... (*lacking variety; uniform*)

...made my **hackles** rise. (*hairs on the back of an animal’s neck that rise when it is angry*)

...liked to put people in a **hierarchy** ... (*a system of organization that ranks some above others*)

...in spite of my **subservient** position... (*less important; subject to obey another*)

The magus **commiserated**. (*shared in a negative feeling; sympathized*)

He’s probably **septic**. (*infected with bacteria*)

...just a little more **condescending** ... (*showing superiority*)

To Discuss After You Read

Q: Why was Gen imprisoned? [p. 58]

A: *apparently, he bet a man that he could steal the king's seal and then show it as proof the next day in a wineshop*

Day
3

Chapter 4

Vocabulary

... as I had been doing **assiduously** since our first meal...
(*showing great care and perseverance*)

... the only easily **traversable** pass ... (*travel across or through*)

There is an almost infinite **pantheon** ... (*entire set of gods*)

When a **usurper** stole the stone ... (*someone who wrongfully takes another's place or position*)

He smiled **benignly** ... (*kindly; in a way that is not harmful*)

Once I **elicited** the information ... (*drew forth a response*)

... dropped my mouth open in **patent** disbelief ... (*easily recognizable; obvious*)

To Discuss After You Read

Q: What do we know about Eddis?

A: *at the top of the mountains between Sounis to the north and Attolia to the south, the country has the only pass through the mountains and acquires wealth by taxing the caravans that go through the mountains, and by selling timber from the mountains to Sounis and Attolia*

Day
4

Chapter 5

Vocabulary

... **emigrants** like your mother ... (*a person who leaves his or her home country*)

... my mother never **debased** anything ... (*reduced in quality*)

... tried to force me, I **balked**. (*hesitated; expressed unwillingness*)

I retired **chagrined** from the field of contest. (*distress or embarrassment at having failed or been humiliated*)

... your first **heathen** temple. (*not adhering to a widely-held religion*)

... she will **intercede** on their behalf. (*intervene; act as a go-between on behalf of another*)

* * *

Cultural Literacy

flysch: a deposit of sedimentary rocks.

To Discuss After You Read

Q: What is Hamiathes's Gift?

A: *according to myth, a stone that the goddess Hephestia dipped in the water of immortality that frees the bearer from death; she gave it to the king, and when his natural lifespan ended, the king gave it to his son; when the throne needed to change hands, one person would steal the stone and give it to the chosen candidate, making him king and avoiding civil war; the Gift, though, disappeared at some point, and has remained hidden*

Q: The magus claims that he needs to steal the Gift in order to persuade Eddis to marry Sounis. What is the real reason?

A: *Sounis wants the pass so he can invade Attolia*

Day
5

Chapters 6–7

Vocabulary

... the **precipitous** edge of the mountain... (*dangerously high or steep*) [chap. 6]

Well, **dithering** won't help ... (*delaying due to indecision*) [chap. 6]

A little **circumspection** might be wise ... (*consideration of potential consequences; unwillingness to take risks*) [chap. 6]

I paused to **filch** a comb... (*steal something small in a casual way*) [chap. 6]

... not a **propitious** start to the day. (*giving or indicating a good chance of success; favorable*) [chap. 6]

... **interposing** himself ... (*placing between one thing and another*) [chap. 7]

... to keep it from **sidling** ... (*walk in a furtive, unobtrusive, or timid manner, especially sideways or obliquely*) [chap. 7]

... cast a **contemptuous** glance in my direction. (*showing disregard; scornful*) [chap. 7]

... for fear of **contagion**. (*the spread of disease*) [chap. 7]

... that's **treasonous**. (*characteristic of betraying one's government or leader*) [chap. 7]

... made Sophos **writhe**. (*squirm; make continuous twisting movements*) [chap. 7]

... the **striations** in the soil ... (*a series of linear marks in rock or soil that show layers of deposit*) [chap. 7]

* * *

Cultural Literacy

dystopia: an imagined place or state in which everything is unpleasant or bad, typically a totalitarian or environmentally degraded one. The opposite of utopia. [chap. 6]

To Discuss After You Read

During the Eumen conspiracy, Ambiades' grandfather "tried to return the oligarchy." This means that, rather than a king (monarchy), the grandfather wanted some form of oligarchy, or rule by a few; presumably, himself and a few choice friends. This didn't work, and he was killed, with his lands and titles forfeit to the king. So Ambiades is extremely poor, from a disgraced family, yet, on some level, hoping to be honored for his ancestry. [chap. 6]

Q: What mystery does Ambiades offer? [chap. 6]

A: *his comb is very expensive; he is excessively moody and grumpy*

Q: The original Eugenides gets immortality, but also what? [chap. 6]

A: *a bitter life*

Q: When Gen is beaten for his assumed theft of food, what new bits of information do we learn about him? [chap. 7]

A: *he knows horses: he can mount on his own, and knows how to use the reins, so much that his horse is surprised; he wants to be a kingmaker and famous; he wants to reduce the arrogance of the magus; he held his tongue, which was new for him, and he had been angry enough that the magus had been frightened*

Q: Gen has several distressing things happen to him in Chapter 7. What are they? [chap. 7]

A: *he is beaten with a riding crop and almost has his hands destroyed from lack of circulation by the foolish Ambiades*

Q: What does Gen learn about Sophos? [chap. 7]

A: *not only will he be duke one day, but his father only is concerned that he learn riding and fencing; Pol is captain of his father's guard, which means that his father values Sophos very much, to send Pol as bodyguard*

Q: When Gen learns a bit of the history of the magus, what light does it shed on his own life? [chap. 7]

A: *he wonders if it was better to have relatives than not to have them; even though he dislikes most of his, he loves one, and that makes him better off*

Q: What casual dig infuriates Ambiades? [chap. 7]

A: *Gen accuses him of serving someone else—maybe himself*

Day
6

Chapter 8

Vocabulary

... Eugenides **evaded** his request ... (*escaped or avoided, especially through cleverness*)

... he nagged and **cajoled** ... (*persuaded; coaxed*)

... flowed through a **sluice** in its dam. (*a sliding gate that controls the flow of water*)

... waved one hand in a vague **benediction** ... (*the utterance or bestowing of a blessing*)

... I muttered a **perfunctory** prayer to the god of thieves ... (*done with minimal effort*)

... gotten myself **irretrievably** stuck ... (*in a way that is impossible to recover*)

... of the gods or of their **supplicants**. (*those who ask for favor or help from someone more powerful*)

The magus had been **swoggled** ... (*tricked or cheated*)

... feet began moving of their own **volition** ... (*the power of using one's own will*)

* * *

Cultural Literacy

peplos: a rich outer robe or shawl worn by women in ancient Greece, hanging in loose folds and sometimes drawn over the head.

naos: was the sanctuary, the innermost chamber, of a Greek temple.

pronaos: a vestibule at the front of a classical temple, enclosed by a portico and projecting sidewalls.

canted: sloped or tilted.

opisthodomos: treasure room of a temple.

fibula pins: a brooch for fastening garments.

To Discuss After You Read

Q: In his dream, what instruction is Gen given? [p. 146]

A: *"Take what you seek if you find it then, but be cautious. Do not offend the gods" (p. 146)*

Day
7

Chapter 9

My **predecessor** came here ... (*a person who held a position before the current holder*)

An **astute** observation ... (*the ability to accurately assess a situation and use it to one's advantage*)

... and my ready **compliance** ... (*obedience*)

The magus **capitulated** with a smile ... (*stopped resisting; surrendered*)

... a comforting **pretense** of anonymity... (*attempt to make something that is not true appear so*)

... cast its **frugal** glow ... (*not excessive*)

... afraid of the **retribution** ... (*punishment inflicted for a wrongdoing*)

... to get some **purchase** in order to lift my head ... (*a position that allows something to be used advantageously*)

To Discuss After You Read

Q: Who does Eugenides meet unexpectedly in Chapter 9?

A: *Eugenides the immortal, Moira, Hephestia, Oceanus, and other gods and goddesses*

Q: What unexpected enemy does Eugenides make in Chapter 9?

A: *Aractus, the river, who was charged to let no one enter, but then this human did*

Day
8

Chapter 10

Vocabulary

... how close he was to being **spitted**. (*having a skewer or sword passed through*)

My tone **nettled** him ... (*annoyed*)

... **recriminations** of uselessness ... (*accusations in response to one from someone else*)

... eager to **divest** myself of the gods' attention... (*rid oneself of something unwanted*)

* * *

Cultural Literacy

stela: also stela; an upright stone slab or column typically bearing a commemorative inscription or relief design, often serving as a gravestone.

ostler: hostler; one in charge of the horses of those staying at an inn.

To Discuss After You Read

Q: Very early on, the magus and Gen had an interesting interaction. "We might someday attain a relationship of mutual respect," he said softly. First, I thought, I will see gods walking the earth. He went on. "For now I will have your obedience." How does this possibility play out?

A: *Gen sees gods on the earth; shortly after, the magus says that he's a wonder and "hugged me like his own son, or anyway like a close relative" (p. 193)*

Q: Why did Sophos know that the stone was Hamiathes's Gift?

A: *it carries its own authority*

Q: What unsettling thing happens to Gen when he steals horses?

A: *not only are there no watchmen around, and the ostler is blind drunk, but when the horses walk on the cobbles, they stay silent: the god of thieves continues to look out for him*

Q: Is Gen pleased that the god of thieves is helping him? [p. 212]

A: *"I'd discovered I was eager to divest myself of the gods' attention as quickly as possible"; he would rather not be quite so noticeable to the gods*

Q: Why does Gen decide to help the magus?

A: *because he has grown to like some of them, and doesn't want to see them killed*

Day
9

Chapter 11

Vocabulary

Discretion prevented me from saying ... (*behavior that prevents revealing offensive or private information*)

The magus was **consternated**. (*filled with anxiety*)

My new, **vehement** belief in the gods ... (*strong or forceful; passionate*)

... we will be **subjugated** as we never were before ... (*brought under control through conquest*)

To Discuss After You Read

Q: Gen thinks about the killing he did. "I might just as well have stabbed him in the back in an alley". Is Gen right to think that? [p. 238]

A: *no; as a soldier, the opponent knew he was getting into a tussle with an enemy; I think Gen is feeling more guilt than he needs to*

Q: As Gen talks to Eugenides, he says, "The god beside me was silent, and the silence stretched out from my bedside through the castle and, it seemed, throughout the world as I remembered that Lyopidus had burned and died while Eugenides had not". What does this mean? [p. 235]

A: *Gen feels sorry for himself, and he says that he wishes that he had died, so he wouldn't have to think about the lives of Sophos and the magus, but then remembers that the god lives forever with the knowledge that he stole thunderbolts that burned the world and killed the brother he loved; basically, part of living is dealing with grief and, I suppose, guilt*

Q: What does the god mean when he says to Gen, "His wife died in the winter. His three children live with their aunt in Eia"? [p. 236]

A: *the god tells Gen about the family of the man he killed, and Gen can release his guilt and get on with life*

Q: What does the magus want most in the world?

A: *to be at the wedding of Sounis and Eddis, in hopes of alliances of the three countries so that they can stand together against the Medes*

Q: Why does Gen have a feather-shaped scar on his cheek?

A: *Eugenides the god has marked him with his own scar, as a sign of approval*

Day
10

Chapter 12

Vocabulary

... managed a **perfunctory** appearance ... (*of an action or gesture, carried out with a minimum of effort or reflection*)

... my queen and **staunchest** defender ... (*most loyal*)

If the gods were **incarnations** of the mountains ... (*physical embodiments of deities*)

... responsibility to be **opulent** ... (excessively luxurious)
... powers to **confer** immortality ... (grant or bestow)
... he was feeling **vindicated** ... (cleared of blame or suspicion)

* * *

Cultural Literacy

torque: also spelled torc; a neck ring.

cabochon: a gem polished but not faceted.

Asklepios: a god of medicine in ancient Greek religion and mythology.

To Discuss After You Read

As Gen and the others go to the palace of Eddis, he mentions the ponies' hooves "as they climbed the stone roadway that ran up the cleft in the mountains, cut by the Aractus before its path had changed" (p. 258). This is a reference to the story of Eugenides and the Great Fire (p. 151): it was the Aractus that had no desire to help Eugenides.

Q: What surprises show up in the final chapter?

A: *Eugenides is from Eddis, in fact, that same Eugenides the magus mentioned earlier: "The title of King's Thief is a hereditary one now in Eddis, and I think the current Thief is named Eugenides. Maybe you're related" (p. 86); and, Eugenides stole Hamiathes's Gift not once, but twice (reread p. 197 for the sneaky way Gen describes his second theft)*

Q: How did Pol know Gen's identity?

A: *when Gen thanked him for the ossil berries, he said, "Be blessed in your endeavors" (p. 139), an Eddisian thanks*

When Gen says to the magus, "I'll probably have to burn it" (p. 266), he's referring back to the initial interview, where Gen sits in the most comfortable chair and the magus tells him that it will now have to be cleaned (chap. 10).

Review

Q: Now that you've finished the book, can you think of any hints that pointed to the surprise ending?

A: *They are sprinkled throughout. How does Gen know about the history of the agora, about the magus, about the height of the king of Sounis's father (p. 14)? He is far too well-informed of history and politics to be a common thief. He mentions that he had been in the treasure room before, but apparently didn't steal (p. 16); he also was in the king's record room, to plant a false history (p. 234). The first time he tells the magus his name, he says, "He wasn't interested in the rest" (p. 7), which would have*

been helpful for the magus to know, perhaps. He delivers an ambiguous line about leaving the city: "two carved lions that were supposed to roar if an enemy of the king passed beneath them... They remained silent as we passed under" (p. 23). This could mean that they were not enemies, or it could mean that he was (or that there were multiple enemies), but that that myth was not true. Another ambiguous line: "I saw the magus watching me finger the wool, like a tailor assessing its value—or like scum from a gutter touching something he knows he shouldn't. I turned my back on him and let him think what he wanted" (pp. 61–62). He says truth throughout, but in such a way that it sounds disguised: "My uncle used to keep that much under his bed and count it every night" (p. 16); "I wouldn't know, not being scum from the gutter. But my father is a soldier" (p. 55); Gen reminds the magus, "that it was my place to be King's Thief" (p. 73). He says the treasonous line, "Gutter scum gets drafted into the infantry and fights for a worthless king, and hangers-on like you watch" (p. 141) to Ambiades, but that's because he owes no loyalty to Sounis, as he says, truthfully, to Attolia: "I have no particular loyalty to the king of Sounis" (p. 233). Far earlier than he should have, "I heard the king of Sounis and the queen of Eddis and other voices" (p. 225). Here he was in Attolia's prison, yet he knows what the queen of Eddis's voice sounds like? He also tells Attolia that he is promised to someone (p. 234), which is unexpected, as we've heard nothing about a sweetheart thus far. Just before the big reveal of the Gift, the magus is unsurprised by Gen's identity, and Gen hopes, "that the magus didn't know all my secrets" (p. 260).

Did you catch who commissioned Gen to attempt his foolhardy plan? "After years spent trying to dissuade me from wasting my time acquiring valueless skills, he had come to my study one night to tell me why the queen of Eddis would consider a marriage proposal from Sounis and why her council, himself included, urged her to accept. He'd left a stack of double-heavy coins on the table and gone away" (p. 266). Piecing the story together, Sounis had sent a message to Eddis that he had Hamiathes's Gift and was, thus, rightful king. Gen assumes that is because Sounis wants the pass so he can invade Attolia in revenge, but it could be that he is taking the long view, as is the magus, and wants Eddis so the three countries can fight against the Medes. In any case, Gen's father basically gives Gen the money and motivation to go get the Gift, whether by stealing it from Sounis's megaron or, as ends up happening, drinking through cheap taverns until he's arrested. ■

Did you grow up loving books (or movies) like *Willy Wonka and the Chocolate Factory*, *Matilda*, or *James and the Giant Peach*? Well if you love Roald Dahl's imaginative fiction, you're sure to enjoy the true story of this British author's life. While Dahl reminisces about his younger years in the autobiographical *Boy*, *Going Solo* focuses on the adventures of his young adulthood during World War II. Please note that he uses rougher speech when he refers to a "don't give a damn attitude" and "to hell ..."

Overview

Going Solo is Roald Dahl's memoir of a few years of his life. While an autobiography tells the story of the author's life, from birth to the time of writing, a memoir is only a select collection of the author's memories, a bit more focused. Dahl especially is a keen observer of life and tells a fascinating story.

After serving as a Shell Company employee in Africa for about a year, Dahl decided to join the Royal Air Force (RAF). In 1939, he began his training with fifteen other men, thirteen of whom would die in the next two years. In a statement typical of Dahl's style, he comments, "In retrospect, one gasps at the waste of life"—then he continues his narration. He crashes in Africa, convalesces in Alexandria, fights a losing battle in Greece, meets some of the earliest Jewish refugees that moved to Palestine, and finally returns to England in 1941.

Setting

The events in *Going Solo* take place between 1938 and 1941, from shortly before World War II and into the early years of the war. Dahl has adventures in many interesting places, from his home in England, to Egypt, Greece, and Palestine. As you read, consider how the particular times and places in the book affect Dahl's journey and impact his development.

With Dahl's help, you're going to learn quite a bit of geography this week!

Vocabulary

... Empire-builders' **jargon** would have filled ... (*the specialized or technical language of a particular trade or profession*)

... best of all about them was their **eccentricities** ... (*deviation from the normal or expected behaviors*)

... have seen a genuine **apparition** ... (*a ghostly figure*)

... Only a **bounder** would do that ... (*an ill-bred, unscrupulous man; a cad*)

... Major Griffiths was **vapid**, vulgar, arrogant ... (*lacking liveliness, animation, or interest; dull*)

... the full **regalia**, and to hell with the climate ... (*magnificent attire; finery*)

... be some subtle perfume or a magic **aphrodisiac** ... (*a drug or food that arouses or intensifies sexual desire*)

... He did it **ostentatiously**, slapping ... (*pretentiously*)

* * *

Cultural Literacy

Venus de Milo: famous Greek statue from 130–120 B.C.E.; can be viewed at the Louvre in Paris.

Polo: game played by two teams of three or four players on horseback who are equipped with long-handled mallets for driving a small wooden ball through the opponents' goal.

boomerang: a flat, curved, usually wooden missile shaped so that when thrown it returns to the thrower.

Isak Dinesen: pseudonym of Karen Blixen (1885–1962), the most celebrated Danish writer of the twentieth century; known for several books written in English, including *Seven Gothic Tales* (1934), *Winter's Tales* (1942), and *Out of Africa* (1938).

gramophone: a record player.

Cantharides: a toxic preparation of the crushed, dried bodies of the brilliant green blister beetle.

Sikh: a member of a monotheistic religion; never cuts his hair—either rolls it up on the top of his head or in a turban.

wallah: one employed in a particular occupation or activity; for example, a kitchen wallah.

coit: a flat ring of iron or rope thrown at a stake in the game of quoits.

pilchard: a small, herring-type of fish.

lager: A German beer.

To Discuss After You Read

In the 1930s, the sun never set on the British Empire. That fact is quite a testimony to Great Britain's ability to successfully colonize much of the world. Online find a historical map of the British Empire.

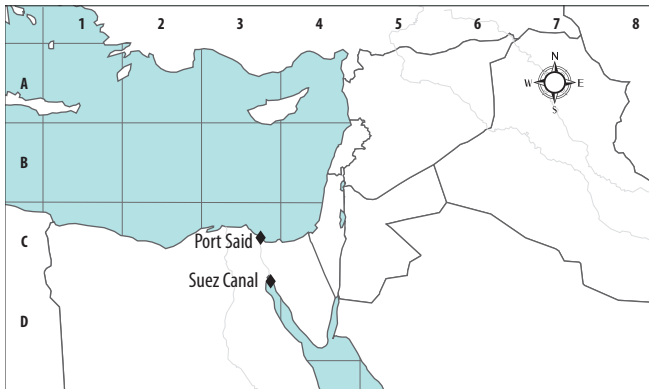
Q: Dahl writes wonderful sketches of people and places. He generally gives a one-paragraph intense description of a person, and then relates an anecdote about them. Notice that he uses colorful adjectives to describe a person or location he has closely observed. Find an example of each in today's reading.

A: *the Major who runs naked about the ship with his wife (second paragraph, p. 5); the woman who refuses to touch anything with her fingers (fourth paragraph, p. 8), and dreads toes even more; U.N. Savory has no single para-*

graph description, but his story is fantastic, as he elaborately disguises his baldness

Timeline and Map Points

- 📍 Marseilles (G3); Malta (H5) (map 1)
- 📍 Aden (E5); Ceylon (F8); Federated Malay States (F9); Allahabad (D8); Assam (D9); Punjab (D7); Port Sudan (E5) (map 2)
- 📍 Port Said; Suez Canal (see following map)



Day 12 pp. 20–40

Vocabulary

... In those **benighted** days of Empire ... (*unenlightened*)
... an immense low-slung **protuberant** belly ... (*bulging*)

* * *

Cultural Literacy

Mussolini: Benito Amilcare Andrea Mussolini (1883–1945); fascist dictator of Italy during World War II.

Abyssinia: modern day Federal Democratic Republic of Ethiopia.

casuarinas: a tree and shrub.

acacia: small tree or shrub, of the mimosa family, having clusters of small yellow flowers.

Swahili: African language of Bantu origin; borrows words from other languages, such as Arabic, as a result of the Swahili people using the Arabic Qur'an for spiritual guidance as Muslims.

Nyasaland: now called the Republic of Malawi; located in East Africa.

sisal: an agave that generates a stiff fiber used to make rope.

black mamba: a dark-brown to gray African snake belonging to the cobra family.

baobab: a large tree native to tropical Africa, with an exceedingly thick trunk, and a gourdlike fruit.

simba: Swahili for lion.

tarboosh: a brimless top-hat with a black tassel.

To Discuss After You Read

Mussolini invaded Abyssinia with one hundred thousand troops. Abyssinia, independent since the days of King Solomon, had been the only African nation to resist the European invasion. The League of Nations imposed economic sanctions against Italy as a result. Some believe Hitler invaded Czechoslovakia as a result of Mussolini's actions.

- Q: In the last section, you found intense, one-paragraph sketches of people and places Dahl has closely observed. Find another example in today's reading.
- A: *Dar-es-Salaam* (third paragraph, p. 22); *the Sanford house* (paragraph on pp. 32–33), etc.
- Q: What happens to the cook's wife?
- A: *a lion runs off with her, but she plays dead so the lion will not bite through her clothes; Robert Sanford shot in front of the lion, who turns, drops the wife, and runs away*

Timeline and Map Points

- 📍 Tenby (E1) (map 1)
- 📍 Abyssinia (modern-day Ethiopia) (F5); Nyasaland (modern-day Malawi) (H4) (map 2)

Day 13 pp. 41–66

Vocabulary

... safely put inside an **internment** camp ... (*to confine, especially during war*)

... out on to the grass **verge** as we went slowly ... (*the shoulder of the road*)

... the frogs were croaking **incessantly** ... (*continuing without stopping*)

... does it by blowing out his **dewlap** and letting ... (*a fold of loose skin hanging from the neck*)

* * *

Cultural Literacy

sundowner: an alcoholic drink in the evening.

pawpaw: the largest edible fruit native to America. Individual pawpaw fruits, which look similar to the mango, weigh 5–16 ounces and are 3–6 inches in length. They usually have 10–14 seeds in two rows; the brownish to blackish seeds are shaped like lima beans. Pawpaws occur as clusters of individual fruits. The ripe fruit is soft and thin skinned.

Armistice: the truce, the end of World War I.

Kilimanjaro: a mountain located in the northeastern part of Tanzania; it has the highest peak in Africa.

To Discuss After You Read

- Q: Dahl mentions that some snakes were deadly and some were simply poisonous. What does this mean?
- A: *the bite of some snakes would kill you, whereas others would merely make you sick*

Before World War I, Tanganyika had been a German colony (German East Africa). But in 1919 after the Armistice, Germany was forced to hand the territory over to the British, who renamed it Tanganyika.

Dahl tells Mdisho that countries must declare war before they may go and fight. In World War II, Hitler invaded countries without declaring war. Great Britain declared war on Germany on September 1, 1939, after Hitler's troops invaded Poland.

Timeline and Map Points

- 🌐 Kilimanjaro (G4); Kigoma (G4) (map 2)

Day 14 pp. 67–96

Vocabulary

- ... sipping the whisky and **ruminating** upon ... (*to turn a matter over and over in the mind*)
- ... a wonderfully **magnanimous** gesture ... (*noble in mind and heart*)
- ... they never ceased to **enthrall** me ... (*to hold spell-bound*)
- ... with **languorous demure** expressions ... (**languorous**: lack of physical energy; listlessness; **demure**: reserved in manner or behavior)
- ... examination by an **affable** English doctor ... (*easy and pleasant to speak to; approachable*)
- ... **retrospect**, one gasps at the waste of life ... (*a review of things in the past*)
- ... I was almost **asphyxiated** by the slipstream ... (*suffocated*)
- ... now we were **intrepid** flying men ... (*resolutely courageous, fearless*)
- ... a rather **supercilious** Flight–Lieutenant ... (*haughtily disdainful or contemptuous*)
- ... a parked Gladiator on the **tarmac** and said ... (*a road, airport runway, parking area, etc., paved with Tarmac, tarmacadam, or a layer of tar*)

* * *

Cultural Literacy

chit: a note or receipt.

Dhow: any of various lateen-rigged sailing vessels, typically having a raised poop, a raked stem, and one or two masts, used along the coasts of the Indian Ocean.

monsoon: a wind from the southwest that brings heavy rainfall to southern Asia in the summer.

Mount Kenya: Kenya's highest mountain and the second highest peak in Africa.

Gloster Gladiator: an old fighter biplane.

drogue: a funnel-shaped or cone-shaped device towed behind an aircraft as a target.

To Discuss After You Read

Note to Parents: On page 95, Dahl quotes a Lieutenant as saying, "Don't be an ass." Considering the time period and the context, this refers to a foolish person and not a body part or curse word.

- Q: As war begins, Dahl's tone, how he colors his writing, becomes understated. For example, he eats brown rice and bananas for dinner one evening and loves the meal. The next day, though, he states that the rice and bananas, "didn't taste so good early in the morning." Another example follows a couple pages later, as a German, shot through the head, falls dead at Dahl's feet. Instead of a description (for which we are all grateful), Dahl merely says, "It was a horrible sight." Can you find more examples of understatement?
- A: *"six feet six inches was not the ideal height for a flier of aeroplanes"; "in retrospect, one gasps at the waste of life"; "you took great care not to lose your balance and fall forward otherwise the prop would chop off your head"; "this was surely not the right way of doing things ... I myself survived only by the skin of my teeth"*
- Q: Why is Mdisho disappointed?
- A: *he kills a German because he is thrilled to be at war, but then finds out he must tell no one and even that the police will go after him; happily, though, Dahl gives him a sword for "bravery"*
- Q: After Mdisho hears that Dahl and the soldiers killed a German, he says, "Then we are equal, bwana," and Dahl agrees. Do you agree with Mdisho's statement?

Timeline and Map Points

- 🌐 Mount Kenya (F5); Eldoret (F4); Nakuru (F5); Kampala (F4) (map 2)

Day 15 pp. 97–121

Vocabulary

- ... flight in itself was a fairly **daunting** one ... (*intimidating*)
- ... my legs **galvanized** my soggy brain into action ... (*stimulated*)
- ... and the **incrustations** of blood around the eyelids ... (*crust or coating of anything on the surface of a body*)

... Mary Welland's **dulcet** tones were infinitely ... (*pleasant to the ear; melodious*)

... first it opened only an **infinitesimal** crack ... (*immeasurably small*)

... against the German **juggernaut** ... (*a massive, inexorable force that seems to crush everything in its way*)

* * *

Cultural Literacy

fuselage: the central body of an aircraft, to which the wings and tail are attached and which holds the crew, passengers, and cargo.

To Discuss After You Read

Q: Find an example of Dahl's excellent descriptions from today's reading. For example, in the paragraph on pp. 112–113, Dahl describes what he feels when he sees again for the first time in weeks. In these few short words, Dahl sketches his previous emotions, his present feelings, his actual vision, and his physical posture.

A: I like p. 120, last paragraph—why Dahl fears flight across the Mediterranean

Timeline and Map Points

📍 Plymouth (E2) (map 1)

Day
16

pp. 122–140

Vocabulary

... how to **extricate** their army from Greece ... (*to free or release from entanglement; disengage*)

... they aren't even **incendiaries** ... (*used or adapted for setting property on fire*)

* * *

Cultural Literacy

Dunkirk: in May 1940, the German army quickly moved into France and conquered it. The allied troops were bottled up in the French city of Dunkirk on the English Channel. Winston Churchill ordered Operation Dynamo to rescue as many soldiers as possible. Between May 27th and June 4th, 693 ships (from small sailing ships, fishing boats, to military ships) evacuated 338,226 French and British troops. Many small boats courageously sailed into the teeth of the Luftwaffe.

Battle of Britain: during WWII; after conquering most of Europe, Hitler sought to invade England. He ordered the RAF destroyed before sending in ground troops. Small RAF fighter planes fought Luftwaffe fighter and bomber planes. Hitler then sent planes to bomb civilian cities; he hoped to

demoralize the people. Hitler called off the attack in September, 1940. Churchill said, "Never in the field of human conflict was so much owed by so many to so few."

Luftwaffe: German air force.

Khalkis: the capital of the Greek island Évripos.

Piraeus Harbour: the harbor in the city of Piraeus which is located in the eastern–central part of Greece.

To Discuss After You Read

Q: Dahl can summarize, in one paragraph, an entire story. Find one example of an anecdote, a short, often humorous story, from today's reading. For an example, turn back to p. 117 and re-read the story of the woman and the orderly's repulsive behavior towards her.

A: one example: p. 134, first paragraph—latrine trouble

Day
17

pp. 141–154

Vocabulary

... the deeply wrinkled **doleful** face of a cat ... (*sorrowful; mournful; melancholy*)

The whole thing was a ridiculous **farce** ... (*foolish show; mockery; a ridiculous sham*)

* * *

Cultural Literacy

Parthenon: a Doric temple in Athens built by Phidias between ca. 447 B.C.E.–432 B.C.E.

Lamia: a city located in central Greece.

ace: a pilot who has destroyed five or more enemy aircraft.

aileron: a movable surface, usually near the trailing edge of a wing, that controls the roll of the airframe or effects maneuvers, as banks and the like.

squash: a racket game played in a closed, walled court with a rubber ball.

rugger: rugby; a form of football played with an oval ball.

To Discuss After You Read

Q: How do you think Dahl has been able to survive such dangerous situations with the odds stacked against him?

A: *it's not due to experience, teamwork, or superior machinery; in some cases (such as flying very low) it may be due to quick thinking, but in others it might be luck*

Cultural Literacy

Adjutant: an executive officer.

Air Commodore: an air force officer of a rank comparable to an army brigadier general.

perspex: a transparent theroplastic acrylic resin.

ground–strafed: airplane flies toward the ground dropping bombs or firing at individuals.

To Discuss After You Read

Q: What do you think of Dahl volunteering for the Air Commodore's assignment?

Cultural Literacy

Kalamata: also spelled Kalamai; a city in southern Greece.

Battle of (El) Alamein: fought in the deserts of North Africa; one of the decisive victories of World War II; fought between two outstanding commanders, Great Britain's Montgomery and Germany's Rommel; the Allied victory led to the retreat of the Afrika Korps and the German surrender in North Africa in May 1943.

To Discuss After You Read

Q: How did the Grecian fiasco significantly affect the war effort?

A: *the men and resources needed in Greece diminished the forces in the Western Desert, so that Rommel was able, for the next two years, to run rampant, and even threaten Egypt and the Middle East, until his final defeat*

Vocabulary

... British colonies were **parochial** and isolated ... (very limited or narrow in outlook)

* * *

Cultural Literacy

Rhodes: the largest of the Dodecanese islands, which are part of the Greek islands.

Vichy French: Frenchmen who supported the Germans.

Beersheba: a city in southern Israel.

Mount Carmel: a mountain located near Haifa, Israel.

Tyre: an ancient city in Lebanon.

Sidon: also Zidon or Saida; Lebanon's third largest city.

Jewish refugees: persecuted Jews who sought refuge in other countries.

Durban: a river in Lebanon.

Liverpool: a city in northwestern England.

Aylesbury: the county town of Buckinghamshire located in the south central part of England.

Tanagra: the brownish–orange color of terracotta—Tanagra was an ancient city of east–central Greece in eastern Boeotia known for producing terracotta pottery and sculptures.

To Discuss After You Read

Q: In Palestine, what surprise awaits Dahl?

A: *fifty children and an adult, all German Jews who fled Europe and settled in Palestine*

Note: From the mid 1800s, Zionist Jews believed they needed their own homeland; they moved to Palestine to form their own land. This dream came true with the formation of the modern state of Israel in 1948.

Q: Why does Dahl leave the RAF?

A: *because of his earlier accident, he begins to suffer awful headaches and receives a discharge* ■

Section Four

Instructor's Guide Resources

"History of Science"—Scope and Sequence: Schedule for Topics and Skills

Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
1	Hebrews 4:14-16	1 Chronicles –13	Beginnings of history, Ancient civilizations; Beginnings of astronomy; Ancient mathematics	<i>Mesopotamia; Egypt; China; Peru; Swaziland; England; India; Nile, Tigris, and Euphrates Rivers; Greece; Mexico</i>	
2	Ephesians 4:31-32	1 Chronicles 14–18	Beginnings of western civilization; Counting systems; Base-60; Historical recording begins; Greek math	<i>Aegean Sea; Greece; Babylon; Phoenicia; Carthage; Crete; Strait of Gibraltar; England; Norway; Baltic Sea</i>	Thales; Homer; Anaximander; Anaximenes; Anaxagoras; Empedocles; Herodotus
3	Proverbs 3:27-28	1 Chronicles 19–25:8	Babylonians; Egyptians; Algebraic math; rational and irrational numbers; the Golden Mean	<i>Samos; Delphi; Italy; Thrace; Diospolis; Babylon; Egypt; Croton; Athens; Sparta</i>	Pythagoras; Democritus; Socrates; Plato; Eudoxus; Pericles
4	Galatians 5:22-23	1 Chronicles 26–2 Chronicles 2	Perfect numbers; the study of the heavens; Calculating the size of the moon; Archimedean screw; Euclid's Elements	<i>Stagira; Athens; Macedon; Alexander's Empire; Syracuse; Sicily; Syene</i>	Plato; Aristotle; Alexander the Great; Aristarchus; Menaechmus; Eratosthenes; Euclid; Archimedes
5	1 Peter 3:15-16	2 Chronicles 3–7	Area of a triangle; beginnings of steam-powered vehicles; levers and pulleys; Euclidean geometry; Density; Working with large numbers; Archimedes' Principle; Finding Pi	<i>Alexandria; Cairo; Constantinople; Athens; Syracuse; Greece; Carthage; Rome</i>	Hero; Euclid; Apollonius; Archimedes
6	Psalms 46:1-2	2 Chronicles 8–12	Size of the Earth; Roman engineering; Mapping the stars	<i>Alexandria; Egypt; Cyrene; Libya; Rome; Cnidus; Rhodes; Syracuse; Carthage; India; Ceylon; Cape of Good Hope; Ohio; New York; Nebraska; Japan; Illinois; Massachusetts</i>	Eratosthenes; Julius Caesar; Augustus Caesar; Lucretius; Strabo; Hipparchus; Eudoxus; Archimedes; Ida Scudder; James Buchanan

(continued on the following page)

Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
7	Psalms 46:3-4	2 Chronicles 13-17	“The World is Round”; the Middle Ages; Comparing scientific exploration around the world; Beginnings of Higher Education; the Fibonacci Sequence	<i>Hippo; Italy; Spain; Iraq; Algeria; Zanzibar; Sumatra; Morocco; Egypt; New Jersey; Pennsylvania; New York</i>	Jerome; Augustine; Boethius; Pope Sylvester; Adelard of Bath; Avicenna; Averroes; Malmonides; Aryabhata; Brahmagupta; Muhammead Ibn-Musa-al-Khwarizmi; Lenoardo Fibonacci; Elizabeth Blackwell
8	Psalms 46:5-6	2 Chronicles 18-22	Aquinas, and Faith & Reason; Gutenberg & Movable Type; Magellan and the Explorers	<i>France; Italy; Samarkland; Spain; Portugal; Philippines; India; Massachusetts; Michigan; Ohio; Minnesota; Austria; Prague; Germany; Himalayas; England; Denmark; Ireland; Scotland; Australia; Ceylon; Egypt; Canada; Florida</i>	Thomas Aquinas; Rober Bacon; Johannes Guttenberg; William Tyndale; Vasco Nunez de Balboa; Magellan; Mahatma Gandhi
9	Psalms 46:7-8	2 Chronicles 23-27	Science & Art; the Hundred Years’ War; the Modern Times; the Black Death; Newton’s Theory of Gravitation	<i>Constantinople; Holland; Italy; Poland; England</i>	Francis Bacon; Leonardo da Vinci; Gutenberg; Copernicus; Michelangelo; Columbus; Isaac Newton
10	Psalms 46:9-10	2 Chronicles 28-32	Copernicus & Earth’s celestial orbit; Earth’s planetary orbit; Brahe and scientific observation; Supernovas; Newton’s Laws of Motion; the Nature of Light	<i>Denmark; Norway; Poland; Sweden; Austria; Prague; England; Baltic Sea</i>	Martin Luther; Copernicus; Vesalius; Tycho Brahe; Johannes Kepler; Francis Bacon; Christiaan Huygens; Galen of Pergamon
11	Psalms 46:1-11	2 Chronicles 33-36, Joel 1	Galileo & Gravity; “Nothing is at Rest”; Mathematics & Motion; Galileo’s Law of Uniformly Accelerated Motion; Friction; Inertia; Principle of Relativity; Perception of the Size of the Universe; the Telescope & Microscope	<i>Italy</i>	Galileo Galilei; Giordano Bruno; Christopher Marlowe; William Shakespeare; Copernicus; Antonie van Leeuwenhoek; Robert Hooke
12	Isaiah 40:28-29	Joel 2 & 3, Song of Solomon 1-3	Galileo’s Telescope; Kepler & the study of light; Planetary movement; Galileo’s Theory of Relativity	<i>Italy; Prague</i>	Galileo; Hans Lippershey; Johannes Kepler; Tycho Brahe

(continued on the following page)

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Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
13	Isaiah 40:30-31	Song of Solomon 4-8	Kepler's Laws of Planetary Motion; Ellipses; Descartes and Mathematical Variables; Newton's Law of Universal Gravitation; Calculus & Geometry; Grid Systems; Mathematical Abstraction; Distance & Infinity	<i>Holland; Sweden; France</i>	Kepler; Rene Descartes; Andrew Wiles; Isaac Newton; Robert Hooke; Zeno; Albert of Saxony; John Bunyan; Gottfried Wilhelm Leibniz
14	Amos 5:23-24	Mark 1-4:25	Color & Wavelengths; Newton's Laws of Motion; <i>Principia</i> ; Halley's Comet; Prime Meridian; Cartography; Instantaneous Speed	<i>France; Copenhagen; Denmark; Holland; Germany</i>	Newton; Edmond Halley; Samuel Janson; Olaus Christensen Roemer; John Harrison; Christiaan Huygens; Baruch Spinoza
15	Revelations 22:12-13	Mark 4:26-Mark 6:56	Chemicals Can Change Matter; Alchemy; Porcelain; Phosphorus; the Nine Elements; Boyle's Law; Air Pressure; Probability; Discovery of Neptune; Longitude and Latitude; the Equator; Age of Exploration	<i>Austria; Rhodes; Poland; Germany; Ireland; Belgium; Switzerland; Netherlands; Russia; Denmark; Italy; England; Portugal; Canary Islands; Madera Islands; Tropic of Cancer; Tropic of Capricorn; Jerusalem; Azores; Tangier; Philadelphia; Caribbean; Jamaica; Patagonia; Tierra del Fuego; Juan Ferdinand Island; Chile</i>	Jabir Ibn Hayyan; Albertus Magnus; Johann Friedrich Bottger; Franze Deleboe; Hennig Brandt; Robert Boyle; Blaise Pascal; Evangelista Torricelli; Daniel Bernoulli; Robert Hooke; Niels Bohr
16	Matthew 22:37-38	Mark 7-Mark 10:31	Chatelet and <i>Principia</i> Translation; Chatelet & Energy Calculations; Carbon Dioxide; Heat and Temperature; Hydrogen; Scheele's Discoveries; Fahrenheit, Celsius, and Kelvin; Density of the Earth; Electrostatic Force; Law of the Conservation of Mass; Industrial Revolution; Velocity of Light; Longitude Act; Pendulum Clocks	<i>France; Scotland; Poland; Holland; Sweden; Portugal; West Indies; England</i>	Emilie du Chatelet; Voltaire; John Locke; Louis XIV; Joseph Black; Karl Scheele; Joseph Priestley; Daniel Fahrenheit; Anders Celsius; Henry Cavendish; Charles-Augustin de Coulomb; Antoine-Laurent Lavoisier; James Watt; Huygens; John Harrison; Johannes Werner; Ole Roemer

(continued on the following page)

Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
17	Matthew 22:39-40	Mark 10:32– Mark 13	Water, Gases, and the Earth's Layers; Definition of an Element; Uranus; Chemical Nomenclature; Evaporation and Particles; Atoms; Chemical Bonding; Law of Definite Proportions; Avogadro's Law; Avogadro's Number; the H-4 vs. the Lunar Method; Mean Time	<i>England; France; Italy</i>	William Herschel; Lavoisier; Napoleon; Delambre & Méchain; Thomas Harriot; John Dalton; Amedeo Avogadro; Edward Frankland; Friedrich Kekulé; John Harrison; James Cook
18	Colossians 3:23-24	Mark 14:1– Mark 15:47	Spectroscopy; First International Chemical Congress; Periodic Table of Elements; Valency; Heat is Motion; Static Electricity; Distillation; Four States of Matter; Phlogiston	<i>Russia; Germany; Massachusetts; New Hampshire; Netherlands; Sumer; Egypt; Greece; Syria; Persia; Ireland; England; Bavaria; Italy</i>	Dmitri Ivanovich Mendeleev; Robert Bunsen; Benjamin Thompson; William Gilbert; Benjamin Franklin; Leyden; Jean Theophilus Desaguliers; Johann Baptista van Helment; Robert Boyle; Galileo; Johann Joachim Becher; George Ernst Stahl; Joseph Priestley; Stephen Hales; Henry Cavendish
19	1 Timothy 2:5-6	Mark 16, Acts 1–3	Electrolysis; Magnetism and Electricity; Electrical Currents; Electrons; Dynamos, Electric Motors, and Transformers; Light as a Wave; Color Theory; Maxwell's Equations; Electromagnetic Waves; Conservation of Mass; Acids and Bases; Table of Equivalents; Law of Definite Proportions; Dalton's Atomic Theory; Law of Multiple Proportions; Gases and Whole Numbers; Law of Octaves	<i>Italy; Scotland; France; Germany; England</i>	Alessandro Volta; Humphry Davy; Hans Christian Oersted; Andre-Marie Ampere; Jean-Bernard-Leon Foucault; William Sturgeon; Joseph Henry; Michael Faraday; Christian Huygens; Thomas Young; Augustin-Jean Fresnel; James Clerk Maxwell; Antoine Laurent Lavoisier; Daniel Rutherford; Jeremias Richter; Claude Berthollet; Joseph Proust; John Dalton; Jons Jakob Berzelius; Joseph Louis Gay-Lussac; Amedeo Avogadro; Johann Wolfgang Döbereiner; John Newlands
20	Matthew 7:24-25	Acts 4–7	Frequency of Sound; Heat as a Matter; Atomic Theory; Work and Energy; Joules; Power; Watts; Kinetic and Potential Energy; Noble Gases; Transition Bridge; Metals	<i>Austria; Ireland; Russia; Germany; England; Bosnia; Scotland; Afghanistan</i>	Heinrich Rudolf Hertz; Ludwig Edvard Boltzmann; Ernst Mach; Thomas Young; James Prescott Joule; Charles Babbage; George Boole; Mendeleev; Julius Plucker; Joseph John Thomson; Ernest Rutherford; Henry Moseley

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Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
21	Matthew 7:26-27	Acts 8– Acts 10:48	First Law of Thermodynamics; Joules; Second Law of Thermodynamics; Entropy; Kelvin Scale; Probability; Paper and Chemistry; Concrete; Jelly; Comet Dust	<i>Indonesia; Ireland; Scotland; Newfoundland; Canada; Belgium; Italy; France; Sweden; Denmark; Dubai; Switzerland; Holland; Austria; Germany; Norway; Honduras; New Mexico</i>	Julius Robert von Mayer; William Thomson
22	1 Corinthians 10:12-13	Acts 11 -14	X-Rays; Nitroglycerine and the Nobel Prize; Uranium and X-Rays; Moving Atoms; Plastic; Consumer Cameras; Glass and Light; Graphene; Graphite; Diamonds; Carbon Fiber	<i>Sweden; Maryland; Ohio; Italy; Spain; Libya; Czechia</i>	Antoine-Henri Becquerel; Wilhelm Conrad Roentgen; Alfred Bernhard Nobel; Joseph John Thomson; Albert Michelson; Albert Einstein; William Gilbert; John Wesley Hyatt; Alexander Parkes; George Eastman
23	Colossians 1:15-16	Acts 15–18	Electromagnetism; Coulomb’s Law; Morse code; Edison’s Inventions; Tesla’s Inventions; Light and Sound in a Vacuum; Electrons Orbit Atoms; Atoms and Matter; Ceramics; Splitting the Uranium Atom; Nuclear Advancement; Atomic Age	<i>Maryland; Ohio; New Jersey; Nevada; Prussia; England; California; Germany; Sweden; Denmark; Poland; Czechoslovakia; Norway; Canada</i>	Hans Christian Ørsted; Michael Faraday; Charles-Augustin de Coulomb; Samuel Morse; Thomas Edison; Nikola Tesla; Albert Abraham Michelson; Edward Williams Morley; J.J. Thomson; Herman von Helmholtz; William Crookes; Robert Andrews Millikan; Friedrich Böttger; Otto Hahn; Knut Haukelid; J. Robert Oppenheimer
24	Colossians 1:17-18	Acts 19– 21	Thomson’s Model of an Atom; Marie Curie and Radium; Alpha, Beta, and Gamma Rays; Cosmic Radiation; Blackbodies; Planck’s Equation; Light as a Particle and a Wave; Special Theory of Relativity; the Universe’s Three Key Constants; the Manhattan Project; Nuclear Chain Reaction; Heavy Water; Los Alamos; Plutonium	<i>Poland; France; Montreal; Norway; Scotland; New Mexico; Illinois; Russia; California; Tennessee; Washington</i>	Marie & Pierre Curie; Ernest Rutherford; Victor Hess; Antoine-Henri Becquerel; Max Planck; Enrico Fermi; Klaus Fuchs; Richard Feynman; Robert Serber; Werner Heisenberg; Theodore Hall

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Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
25	Colossians 1:19-20	Acts 22–26	Einstein & Light; Photoelectricity; Quantum Theory; Brownian Motion; Radioactive Decay; Actuarial Tables; Bomb Testing; Bombs Over Japan	<i>India; Bangladesh; Scotland; Denmark; New Zealand; Norway; Colorado; Utah; Algeria; Korea; New Mexico; Germany; Japan; Washington DC; Kazakhstan</i>	Thomas Young; Albert Einstein; Satyendra Nath Bose; Lord Rayleigh; Robert Brown; Niels Bohr; Ernest Rutherford; Frederick Soddy; Paul Tibbets; Harry S. Truman
26	Proverbs 15:22; 18:10	Acts 27–28, Romans 1–2	Bohr’s Atomic Diagram; Electromagnetic Energy; Protons and Neutrons; Carbon Dating; Quantum Mechanics; X-Rays; the Arms Race; Evolution and Creation	<i>Germany; Ukraine; Turkey; Netherlands; Russia; Norway; Missouri; East Germany; Bikini Atoll; Black Sea</i>	Ernest Rutherford; James Chadwick; James Franck; George Gamoff; Arthur Compton; Max von Lave; Louis-Victor de Broglie
27	1 Peter 5:6-7	Romans 3–7	Quantum Theory and Rest; Uncertainty Principle; Complementarity; Matrix Mechanics; Particles and Antiparticles; Accelerators; Quarks and Gluons; Standard Model of Particle Physics; Inert and Reactive Atoms; DNA; Fossils; Uniformitarianism	<i>Austria; Germany; England; Oregon; North Sea</i>	Werner Heisenberg; Max Born; Erwin Schrödinger; Ernest Solvay; Paul Adrien Maurice Dirac; Fermi; Wolfgang Pauli; Gilbert Lewis; Linus Carl Pauling; Watson and Crick
28	1 John 4:10-11	Romans 8–11	Ionic & Covalent Bonds; Octet Rule; Metals; Einstein’s Formula; Critical Mass; Fission and Fusion; Red Record and Rock Formations; the Flood and Extinction	<i>Hungary; Italy</i>	Franklin D. Roosevelt; James Chadwick; John Cockcroft; Paul Dirac; Edwin Armstrong; Leo Szilard; Harold Urey; Emilio Gino Segrè; Carl David Anderson; Alan Turing; Edward Teller; Irène & Frédéric Joliot-Curie; Otto Hahn; Fermi
29	Isaiah 41:10; Revelations 4:11	Romans 12–16	New Radioactive Substances; Nuclear Chain Reactions; World War II; Heavy Water; Uranium; Oort Cloud; Stars and Galaxies; Macroevolution	<i>Sweden; Norway; New Jersey</i>	Fritz Strassman; Lise Meitner; Einstein; Oppenheimer; Richard Feynman; Otto Frisch; Edward Teller; Stanislaw Ulam; Leo Szilard
30	John 10:27-28	Galatians 1–5	Quantumelectrodynamics (QED); Relative Motion; Center of the Universe; Space and Time; Random Mutation	<i>Japan; Sicily; Pocono Mountains</i>	Feynman; Dirac; Julian Schwinger; Sin-itiro Tomonaga; Freeman Dyson; Theodosius Dobzhansky

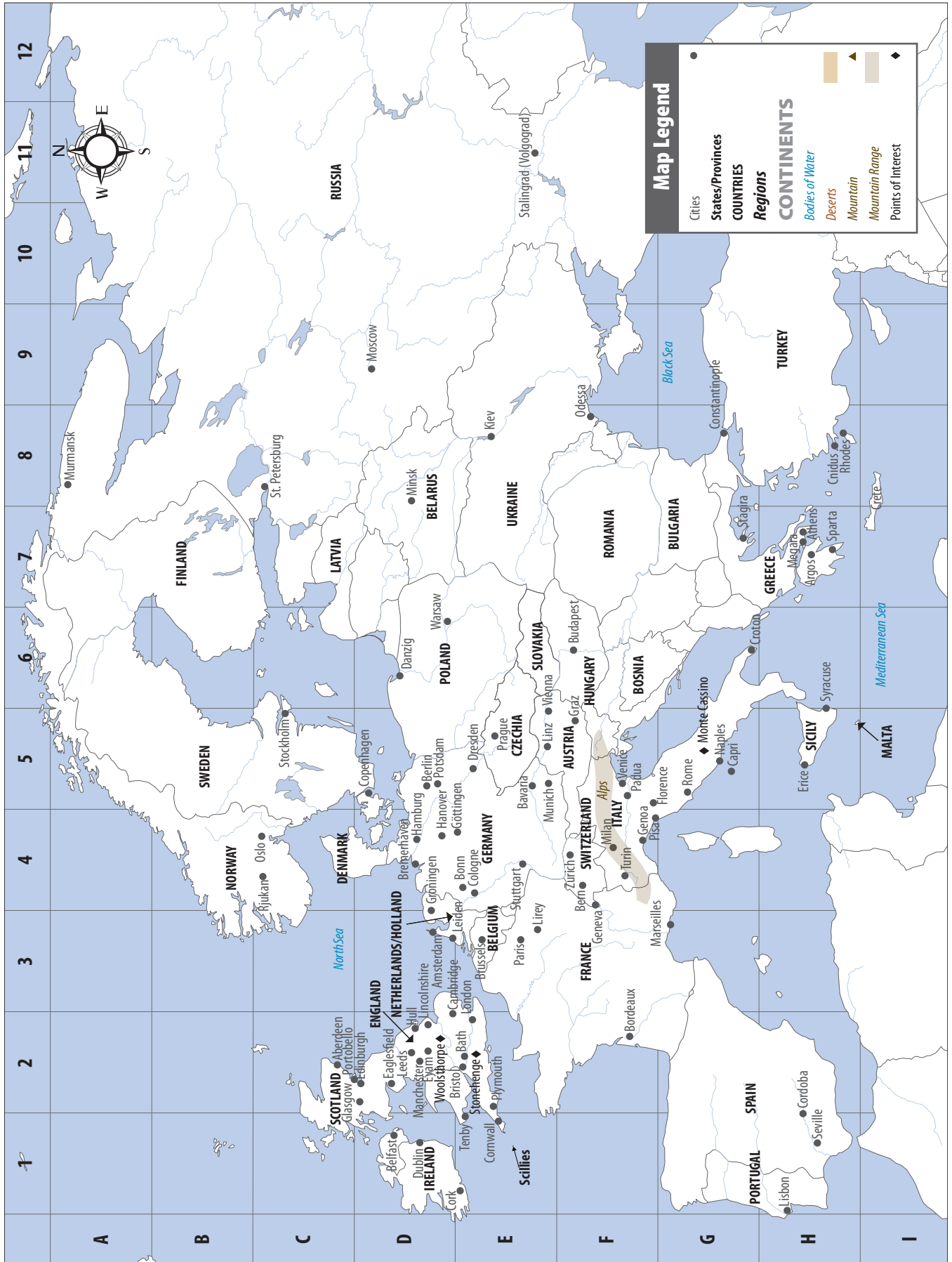
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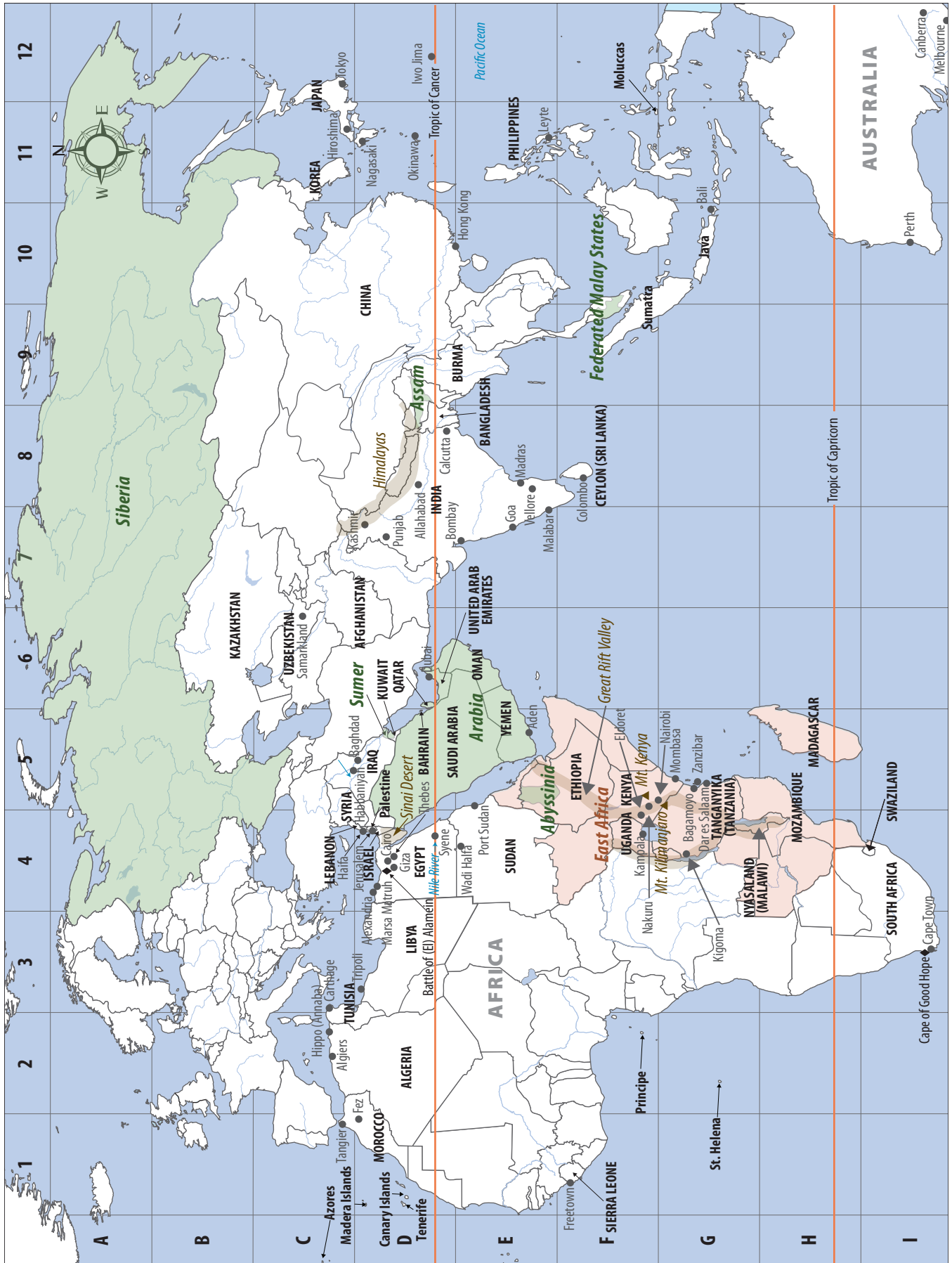
Week	Memory Work	Bible Reading	History/Social Studies	Geography	Biography
31	Deuteronomy 7:9; 1 Corinthians 10:31	Galatians 6, 1 Thessalonians 1–4	Non-Euclidean Geometry; Fourth Dimension; Time and Velocity; Mass and Motion; Matter and Energy; Special Relativity; Paradoxes; Time Dilation; Genetic Code; “Noise” and Entropy; Transposition	<i>Germany; Switzerland; Czechia; Belgium</i>	Georg Friedrich Bernhard Riemann; Hendrik Lorentz; Hermann Minkowski; Barbara McClintock
32	Galatians 3:27-28	1 Thessalonians 5, 2 Thessalonians 1–3, 1 Timothy 1	Einstein and Gravity; General Relativity; Spacetime; Gravitation; Lambda; Hubble’s Telescope; Redshifts and the Doppler Effect; Horizontal Gene Transfer; Cells and Communication; Symbiogenesis; Punctuated Equilibrium; Genome Duplication	<i>Italy; Siberia; Principe; Brazil; Russia; California; The Alps; Belgium</i>	Walther Nernst; Arthur Stanley Eddington; Edwin Powell Hubble; Harlow Shapley; Willem de Sitter; Annie J. Cannon; Aleksandr Friedmann; Georges Lemaitre; Christian Doppler
33	Hebrews 10:24-25	1 Timothy 2–6	Luminosity and Distance; Celestial Formations; Black Holes and Singularity; Supermassive Stars; Natural Selection; How Cells Communicate; Irreducible Complexity; Design in Biology	<i>California; India; Bulgaria</i>	Henrietta Leavitt; Subramanyan Chandrasekhar; Fritz Zwicky; Walter Baade; Lev Landau; George Gamow; John Archibald Wheeler; Maartin Schmidt
34	Luke 16:10-11	2 Timothy 1–4, Titus 1	Black Holes; Event Horizon; Quasars; LIGO; Gravitational Waves; Universal Forces; Paradigm of Physics; Neo-Darwinism; Artificial Intelligence	<i>Belarus; Russia; Italy; Germany; Japan; Australia; Louisiana; Washington</i>	Stephen Hawking; Yakov Boris Zeldovich; George Gamow; Ralph Alpher; Hans Bethe; Robert Herman; Robert H. Dickie
35	Luke 16:12-13	Titus 2 & 3, 1 Peter 1–3	Theory of Everything; Entanglement; “Random”; Ergodic; Multiverse; Random Mutations	<i>Australia; Chile; Hawaii</i>	Alan Guth; David Bohm; Einstein; Pololsky; Rosen
36	Luke 1:37; John 1:29	1 Peter 4 & 5, 2 Peter 1–3	Dark Energy; Dark Matter; Boolean Logic; Goldilock’s Search; SETI; Chaos Theory	<i>Switzerland; Arizona; Michigan; Argentina; West Virginia</i>	Zwicky; Vera Cooper Rubin; George Boole; Claude Shannon; Carl Sagan

History of Science—Map 1

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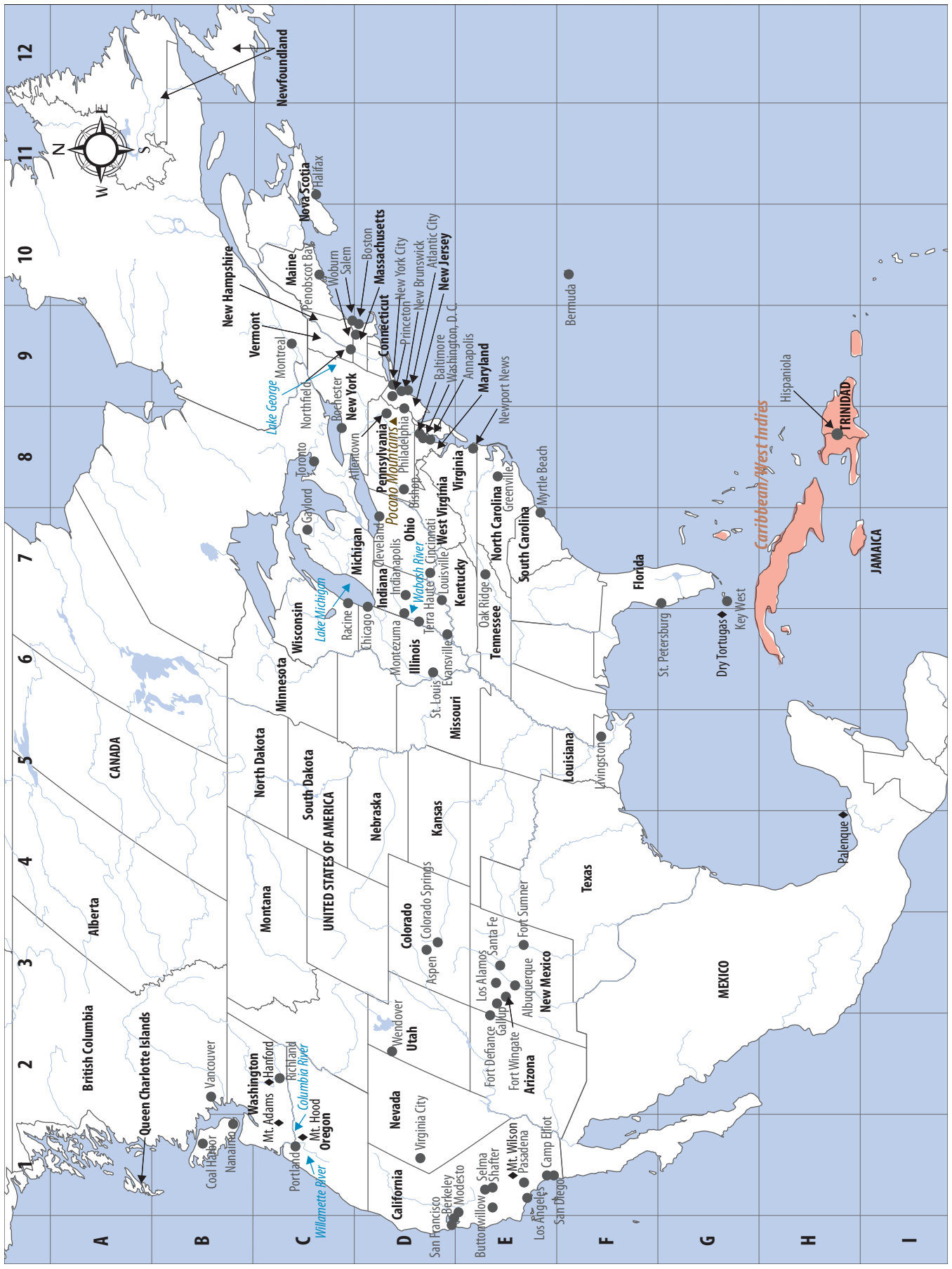


History of Science—Map 2



History of Science—Map 3

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History of Science—Map 4



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