

How to Read Textbooks & Nonfiction



NOTE: Nonfiction is about real information. I remember it as “**N**ot **F**alse” or “**N**ot **F**antasy.”

Scorecard preview

This chapter provides solutions to the following problems. Do you ...

26. Feel overwhelmed or bored when reading textbooks?
27. Need a long time to read nonfiction, particularly textbooks?
28. Find it difficult to understand or remember content from textbooks and nonfiction?

Author’s note

When I learned “study skills” in college, it was the strategies in this chapter that I learned first. They were quick and easy to do, yet they instantly doubled my reading speed *and* comprehension!

In other words, my total reading time was cut in half, while my understanding skyrocketed!

For me, “cracking the code” on how to read text that is challenging (and boring) made everything about managing school and learning so much easier, it was like gaining an extra superpower!

Over time, I hope you find these strategies as life-changing as I did.

Section A



Like a busy photo, textbooks can overwhelm us if we don’t know where to focus.

What is it REALLY like to read a textbook?

1. Turn to page 160; look at the picture on that page. In only five seconds, make as many observations as you can.
2. Now, answer as many questions as you can on page 77, in the sidebar.
3. Check your answers at the bottom of page 160.

What’s the point?

The five questions on the following page are very simple. But most people struggle to get just one or two correct.

Why the challenge?

The photo has a lot going on! It’s hard to answer questions because there are so many details and you don’t know WHAT to focus on. It would be much easier if you first knew where to focus your attention.

This busy photo represents how we usually read textbooks—without knowing what is important. Textbooks feel just as overwhelming as this photo! We get so overwhelmed because we don't know where to focus our attention.

As a result, we don't understand anything! For this reason, many students don't bother even bother to read their textbooks.

Three points of *friction* in nonfiction reading

When reading nonfiction, three factors work against us:

- **The “readability level” of the text is often 1–2 grades higher than its target level** because of technical terms. For example, a text for a 9th-grade class usually has a readability level of 10–11th grade.
- **We don't KNOW much about the topic.** Learning new things requires connecting to what we already know. If we lack prior knowledge, it's hard to make these connections.
- **We don't CARE much about the topic.** Our interest activates the emotional center of our brain, which provides fuel to power connections. Without this extra boost, our brains may not have enough power to forge connections with new information.

These factors create friction in understanding nonfiction. This chapter shows how “asking questions” helps us overcome these challenges!

Questions

For Step 2 (from the previous page), answer the following questions:

1. What is centered directly above the man's head?
2. What toy is directly above his left shoulder (on the right side of the photo)?
3. Was the snake hanging over his head striped or spotted?
4. How many times is the word “light” visible in this photo?
5. How many fish are in the package on the right side of the picture?

Why “ask questions” to improve reading comprehension and speed?

Section B

The PROCESS of creating questions improves reading speed and comprehension in several ways:

1. **Questions connect new information to our prior knowledge**, which is how we learn. Questions naturally bridge known to new stuff, while activating neurons that are thirsty to find answers.
2. **It is the fastest and most consistent way for our brains to make learning connections.** The strategy works quickly, with any text, and is easy to remember.
3. **It engages our brain and helps us focus.** The process instantly shifts our brain into “high gear.” Instead of just passively looking at information, it turns reading into a dialogue with the text, where we actively create questions, then seek answers.

Section C

Step 1: (Before reading) Read the visuals.

Leverage the visuals! Text requires layers of decoding, but our brains *instantly* understand visuals. Plus, visuals usually contain 40–60% of the information in a textbook.

This three-step process, called *visual networking*, is done BEFORE reading:

1. **Look at each visual**, including: photos, illustrations, diagrams, graphs, charts, etc. Each visual is specifically selected to improve understanding of the text.
2. **Read the caption** for details linking the visual to the text.
3. **Connect the visual to the topic**. Ask yourself, “Why is this visual here? How does it relate to the chapter’s title?” As you answer your own questions, you are making the vital connections between the new information and your prior knowledge.

For example ...

- A. **Look at each visual**. In our example, start by looking at the first visual in the section; it is an image of a globe.
- B. **Read the caption**. In our example, the caption reads, “_____.”
- C. **Connect the visual to the chapter’s topic** by asking *and* answering, “Why is this visual here? How does it relate to the chapter’s title?” For example, in a chapter titled “The Earth System,” you might note, “This image shows the Earth, and the chapter is about ‘The Earth’s System.’”

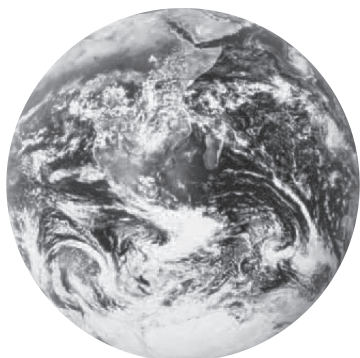
This step may seem overly simple, but this is when your brain makes the critical connections. Don’t skip it!

Complete these three steps in under 30 seconds per image.

For example, the chapter pictured includes five images; that’s a total of 2.5 minutes to preview this chapter.

After using this strategy 2–3×, your reading speed and comprehension will skyrocket ... all from taking just 2–3 minutes to read the visuals!

Source: Holt Publishing Company



This image is from a section titled, “The Earth’s System.” The caption says, “The view from space shows that water covers most of the Earth’s surface.”

How could this image be connected to the main topic of this section?

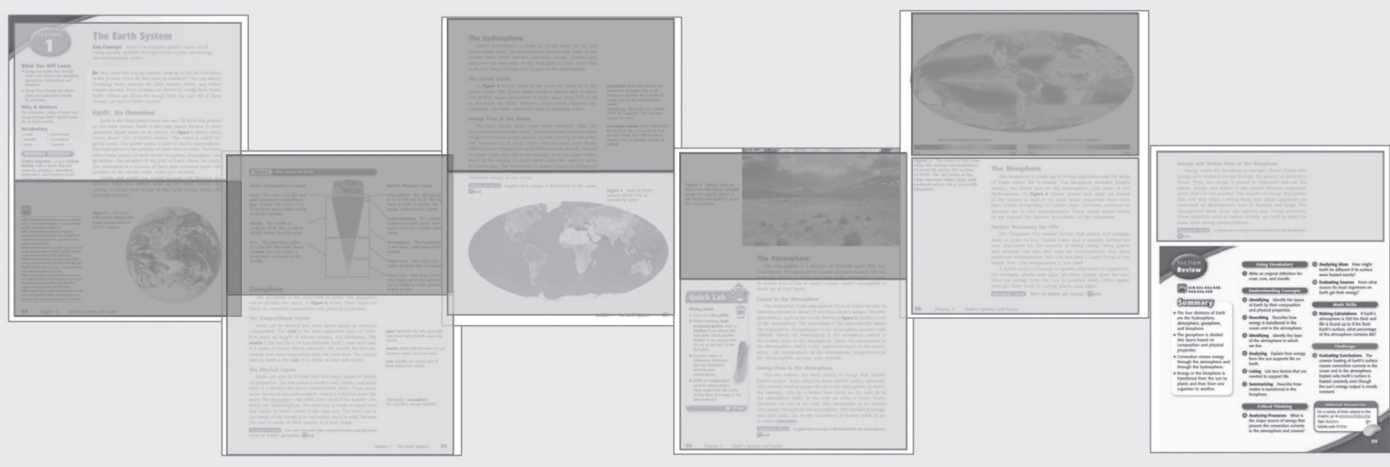
Source: SOAR Learning, Inc.



80/20 Power Strategy
Read the visuals

In most textbooks, visuals occupy 40–60% of the space, highlighting their significant role in enhancing comprehension.

Source: Holt Publishing Company



Step 2: (Before reading) ... Read the summary questions.

In most cases, the summary questions won't even make sense to us ... until *after* we've read the visuals!

But, in just 2–3 minutes of “reading visuals,” we can usually answer about 50% of the summary questions, in full! Stop and appreciate what a dynamic boost this, alone, already is to our comprehension!

For the other 50%, we typically have *partial* answers; which now gives us major insights on where to focus our attention when reading the text.

Next, review summary questions to identify key points. You can answer about 50% just from reading the visuals!

Section D

Energy and Matter Flow in the Biosphere

Energy enters the biosphere as sunlight. Plants change this energy into chemical energy through the process of photosynthesis. Then, the energy is passed to organisms that eat the plants. Energy and matter is also passed between organisms when they eat one another. The transfer of energy and matter does not stop when a living thing dies. Dead organisms are consumed by decomposers, such as bacteria and fungi. The decomposers break down the remains into simple materials. These materials, such as carbon dioxide, are used by plants to make food during photosynthesis.

Section Review

Summary

- The four divisions of Earth are the hydrosphere, atmosphere, geosphere, and biosphere.
- The geosphere is divided into layers based on composition and physical properties.
- Convection moves energy through the atmosphere and through the hydrosphere.
- Energy in the biosphere is transferred from the sun to plants and then from one organism to another.

Using Vocabulary

- Write an original definition for each word, and explain.
- Identifying** Identify the layers of Earth by their composition and physical properties.
- Describing** Describe how energy is transferred in the ocean and in the atmosphere.
- Identifying** Identify the layer of the atmosphere in which we live.
- Analyzing** Explain how energy from the sun supports life on Earth.
- Listing** List two factors that are needed to support life.
- Summarizing** Describe how energy is transferred in the biosphere.

Applying Ideas How might Earth be different if the surface were heated evenly?

Evaluating Sources From what source do most organisms on Earth get their energy?

Making Calculations If Earth's atmosphere is 100 km thick and life is found up to 8 km from Earth's surface, what percentage of the atmosphere contains life?

Evaluating Conclusions The uneven heating of Earth's surface causes convection currents in the ocean and in the atmosphere. Explain why Earth's surface is heated unevenly even though the sun's energy output is mostly constant.

Critical Thinking

- Analyzing Processes** What is the major source of energy that powers the convection currents in the atmosphere and ocean?

Related Extensions

For a series of questions related to this chapter, go to www.pearsoned.com to take a test.

Source: Holt Publishing Company

Step 3: Turn headings and subheadings into questions, then read to find the answers.

Transform each heading or subheading into a question, then read the text to answer it. The following chart illustrates examples of questions made from the headings pictured, right.

Heading/subheading	Possible Questions
The Atmosphere	<ul style="list-style-type: none"> • What is the atmosphere? • Why is the atmosphere important?
Layers in the Atmosphere	<ul style="list-style-type: none"> • What are layers in the atmosphere? • Why are layers in the atmosphere important?
Energy Flow in the Atmosphere	<ul style="list-style-type: none"> • How/why does energy flow in the atmosphere?

This strategy focuses our attention like a “heat-seeking missile” because it gives our brain a purpose for reading. It turns a “boring chore” into an “active conversation” with the text and is a very effective shortcut!

Once a heading question can be answered, move on to the next heading/subheading. (You don't have to read every word ... unless you want to!)

Section E

Figure 3 Clouds, such as these over the Sierra Nevada range, are usually found in the lowest atmospheric layer, the troposphere.

The Atmosphere

The atmosphere is a mixture of invisible gases that surround Earth. The atmosphere extends outward to about 100 km from the surface of Earth. But most of the atmosphere's gases lie within 8 to 12 km of Earth's surface. Earth's atmosphere is made up of four layers.

Quick Lab

Rising Heat

- Turn on a hot plate.
- While wearing heat-resistant gloves, hold a feather 5 cm above the hot plate. Hold another feather 5 cm above and 10 cm to the left of the hot plate.
- Do you notice a difference between the two feathers? Record your observations.
- Write an explanation of your observations. How might this lab relate to the flow of energy in the atmosphere?

Layers in the Atmosphere

The troposphere is the atmospheric layer in which we live. It extends outward to about 12 km from Earth's surface. Weather phenomena, such as the clouds shown in **Figure 3**, usually occur in the troposphere. The stratosphere is the layer directly above the troposphere. Temperatures in the stratosphere increase with altitude. Above the stratosphere is the mesosphere, which is the coldest layer of the atmosphere. Above the mesosphere is the thermosphere, which is the uppermost layer of the atmosphere. Like temperatures in the stratosphere, temperatures in the thermosphere increase with altitude.

Energy Flow in the Atmosphere

The sun transfers the main source of energy that reaches Earth's surface. Solar radiation heats Earth's surface unevenly. This uneven heating causes the air in the atmosphere to move. For example, cold air is denser than warm air. So, cold air in the atmosphere sinks. As the cold air sinks, it forces warm, less-dense air out of the way. This movement of air distributes energy throughout the atmosphere. The transfer of energy, especially heat, due to the movement of matter, such as air, is called **convection**.

Section Review

Using Vocabulary Explain how energy is distributed in the atmosphere.

Source: Holt Publishing Company

Step 3 gives our brain a purpose for reading.

Section **F**

How to read “other” nonfiction: online text, non-illustrated nonfiction, etc.

How to read online text

Online texts differ from traditional textbooks, but we can adapt these strategies for the digital landscape:

A. Before reading

1. **Read the visuals.** Scroll through the FULL screen to locate all visuals, then use the same three-step process:
 - a. Look at each visual.
 - b. Read its caption.
 - c. Connect each visual to the chapter’s title/topic.

For videos:

- Watch videos shorter than 2 minutes at a faster speed (1.25x–1.5x).
 - For longer videos, read the title, caption, or description, and relate it to the chapter’s main topic.
2. **Read the summary questions ...** *only* if they are accessible in two clicks or less. If not, proceed to the next step.

B. While reading

3. **Change headings and subheadings into questions, then read to find the answers.** Apply this “ask question-answer question” method for active reading throughout the text.

How to read non-illustrated nonfiction

Reading nonfiction with little or no visuals is a bit more challenging, but not by much. Remember, the key is to “ask questions.” So, here’s how to adapt this strategy:

A. Before reading

Choose 2–3 of the following “before reading” strategies that best suit your material. Limit this prep to 10 minutes.

- **Read the front and back book cover, if applicable.** If it’s a digital book, check online descriptions.
- **Find images for yourself.** Do an online search of images for the topic or book-title. Scan through the results, asking yourself questions about how various images may connect to the topic.

For example, I recently did a quick image search for a book my friend suggested. Most images were NOT useful; 90% were repetitive cover photos and 5% were irrelevant. However, the remaining 5%—memes with book quotes and images of the author’s other works—offered very insightful clues! In just two minutes, these visuals boosted my understanding.

- **Read reviews.** The “top ranked” reviews on sites such as Amazon, GoodReads, etc. provide useful summaries and insights.

- **Brainstorm questions you expect the book to answer.** You will be amazed how powerful this simple task is for boosting reading speed and understanding!

B. While reading ...

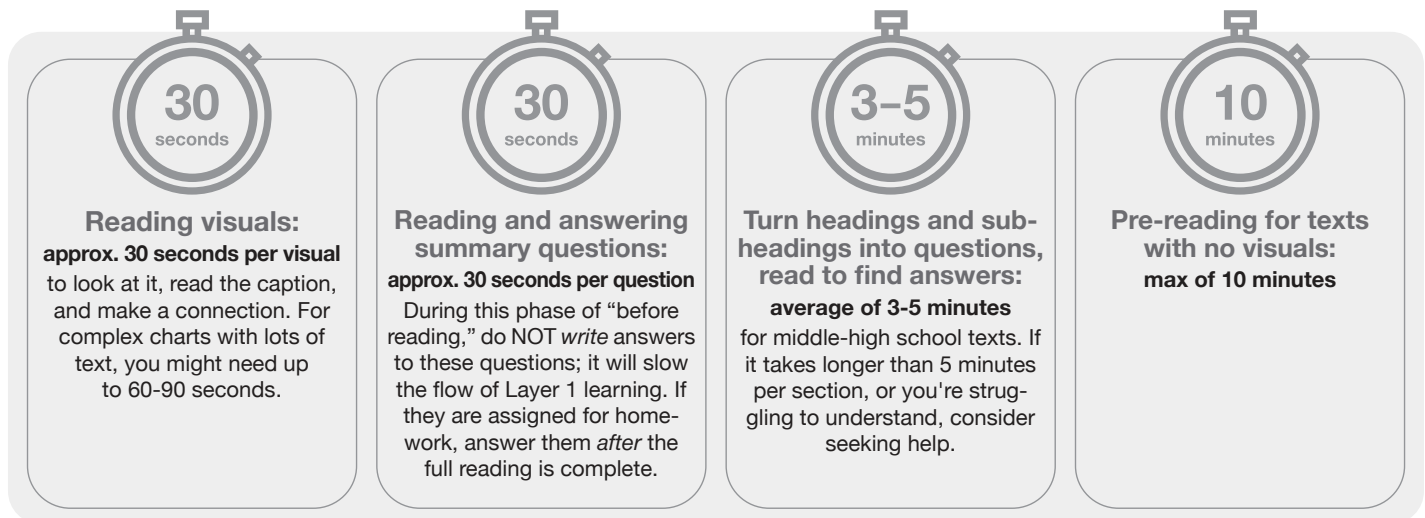
As you read, turn *text elements* into questions. Text elements include: chapter titles, call-outs, words in italics, etc. In a text without visuals, this step is *critical* for building comprehension!

Optimal time-limits for each strategy

The strategies in this chapter help us learn new information in small, manageable layers. But spending too much time on any layer can overload the brain and become counterproductive.

The optimal time limits are gathered below to emphasize the *optimal*, “just-right” timing of learning in small chunks:

Section G



Conclusion

At the top of this chapter, we introduced three common challenges faced when reading textbooks. Now, let's review their solutions:

Higher readability level.	We don't know much about the topic.	We don't CARE much about the topic.
Due to technical terms, textbooks usually have a readability 1–2 grade-level above the current grade. The solution is to read the visuals, which typically illustrate and explain these terms, making the reading easier to understand.	Asking questions and “reading the visuals” activates prior knowledge, allowing the new information to connect.	Asking questions triggers our Emotional Center, igniting curiosity! Even the smallest sliver of curiosity provides a big boost of brain chemicals to power connections.

The core strategy is to “ask questions.” Creating questions identifies the important information and instantly forges connections between known and new information. This process: removes the most common reading blockers, boosts speed and comprehension, *and* makes reading more enjoyable!



Make the invisible, visible

In this chapter, we made the invisible, visible by ... revealing a “hidden map” within nonfiction text, the visuals and text elements.

Every title, visual, and italicized phrase is a signpost that can be turned into a guiding question. Converting these elements into questions builds our personal network of understanding.

Source: iStockphoto



Making connections through questions and images helps transfer new information to long-term memory.

The brain on ... reading textbooks and nonfiction

As we covered in Chapter 3, “making connections” is a strategy *and* a biological process! When we learn something new, neuron wires in our brain extend from our existing knowledge to connect with the new information. As our brain learns something new, it literally forms a network of neuron connections.

Asking questions transfers information from our Front Brain to our Back Brain, moving it from short-term to long-term memory.

Images instantly activate and engage prior knowledge creating faster and stronger connections than text alone.

Scorecard review

What solutions have you learned for the following problems ...

26. Feeling overwhelmed or bored when reading textbooks?
27. Needing a long time to read nonfiction, particularly textbooks?
28. Finding it difficult to understand or remember content from textbooks and nonfiction?