

CHAPTER 1

What Is Disciplinary Literacy?

Literacy unlocks the door to learning throughout life, is essential to development and health, and opens the way for democratic participation and active citizenship.
—KOFI ANNAN¹

What's the difference between content-area literacy and disciplinary literacy? The concepts seem synonymous, don't they? For more than three decades, teachers of content have been told they are all teachers of reading, and while students do read, write, and communicate in every discipline, the focus of content teachers is on instructing about the subject matter within their discipline. Draper, Broomhead, Jensen, and Siebert (2010) cautioned many years ago that disciplinary literacy involves the communication skills of reading, writing, and speaking that are needed to communicate about the content. However, teachers of the content who are the experts in these fields are the ones who should be supporting literacy learning within these disciplines because they know exactly the type of literacy processes that are needed to succeed within their discipline. So, to answer the initial question, the difference between content-area reading and discipline literacy is that

disciplinary literacy is more aimed at what we teach (which would include how to read and use information like a scientist), than how we teach (such as how can students read the history book well enough to pass the test). The idea of disciplinary literacy is that students not only have to learn the essential content of a field, but how reading and writing are used in that field. On the other hand, content-area reading focuses on imparting reading and study skills that may help students to better understand and remember whatever they read. (T. Shanahan, 2012)

¹<https://press.um.org/en/2003/sgsm8849.doc.htm>.

In this text, we posit the idea that science teachers are the best teachers of the literacies needed to understand science. We go after the notion that social studies teachers are best suited to help students understand how professional historians make sense of the historical record and mathematics teachers should support their students' close analysis of math problems. Even though physical education should be about physical activity during the school day, we argue that there is a literacy of health- and sports-related professions that might really hook some students in grades 5–12 to think critically and deeply about what it means to be healthy and fit. We also note that good coaches are often effective communicators with spoken language and catchers use subtle pitch signals to communicate, too. Insights about the arts should be shared by teachers in those disciplines as they expose students to the literacy practices most common among artists and musicians.



Throughout this book, you will find links to several webpages. The two sites we have provided most often are Learner.org and Literacybeat.com. To find the individual resources on Learner.org, please visit the project page at www.learner.org/series/reading-writing-in-the-disciplines or scan the QR code at left. We invite you to explore an Annenberg Learner video series on this website titled *Reading and Writing in the Disciplines*. Diane Lapp was one of the consultants to their program, so throughout this text we refer to several videos in the series that illuminate many of the ideas we're sharing. Additional resources with links to more websites can be found on Literacybeat.com at <https://literacybeat.com/tag/disciplinary-literacy> or scan the QR code at right. To quickly access the downloadable materials for this book, see the box at the end of the table of contents.



The idea that teachers of specific content may connect and engage students with the nature of the discipline and how novices, amateurs, informed citizens, and professionals in each discipline make sense of the world through that disciplinary lens is at the heart of this book. Recent studies show that teachers in different disciplines, specifically English and mathematics, teach in different ways in classrooms that have higher scores on the General Certificate of Secondary Education or GSCE exams in Britain. While English teachers engage students in discussion, mathematics teachers tend to engage students in the practice of problems and assessment of their work (Burgess, Rawal, & Taylor, 2023).

Here it is, in short: Experts and professionals think in specific ways about their fields. As professionals, they understand information within their disciplines; they often expand it through the books and articles they write, the scores they compose, the inventions they create, and the problems they solve. To create, they first must understand how knowledge is constructed in the discipline. Words help us understand the discipline, and the discipline informs how we understand the world. The essence of our message is that neither we nor our students can be an expert in every discipline, but every student can better comprehend the fascinating world we inhabit by looking at it from the perspectives of experts who know their parts of the world well.

Read more complex texts and read more often within all disciplines is the call, perhaps even the mandate, teachers hear. For teachers who primarily teach within the disciplines associated with content areas (e.g., science, mathematics, physical education), the increase in reading goes beyond the traditional reading associated with English literature coursework. However, more teachers are finding that when they help readers to make sense of disciplinary texts, their students make leaps toward learning the content. Simply put, students who understand how historians engage in thinking through reading, writing, and discussion tend to understand history better. The same is true for science, math, the arts, and physical education. This book addresses disciplinary literacy and academic language needs for students and their teachers in grades 5–12.

The challenge for content-area teachers is to put literacy in the service of learning information by thinking (i.e., reading, composing, viewing, listening, speaking) through a disciplinary lens. In turn, students' literacy improves. At the same time, students are not usually experts in each of the fields that schooling requires of them (Heller, 2010). Rather, they are aspiring novices or sometimes amateurs seeking to make sense of what their mathematics, art, and social studies teachers present to them. Teachers must leverage students' reading skills to help them make sense of often complex content knowledge. Fortunately, many familiar instructional routines (sometimes called "strategies") are easily adaptable by teachers who want to clear the haze from the discipline-specific lens of learning and literacy in the content areas.

Researchers (see Moje, 2007; Shanahan & Shanahan, 2008) have identified the need for increased attention to how teachers can build literacy capacity in their students and, at the same time, more effectively teach the content and the thinking patterns of the discipline. However, much of the current literature describes the nature of disciplinary learning or how the areas of content learning overlap (e.g., Wolsey, 2010) rather than how to develop literacy abilities and content knowledge. Teachers need resources that address literacy through a comprehensive and disciplinary approach to learning, receptive and expressive practices through a comprehensive literacy (e.g., Brozo, Moorman, Meyer, & Stewart, 2013), and a disciplinary approach to learning (rather than separating reading from writing as if there were no relationship between the two and how content is learned [e.g., Shanahan, 2006]). In this book, we adapt some general strategies commonly known as content-area literacy to the disciplines, and we offer some classroom-tested approaches to the specific literacies of the disciplines. We use the terms *literacy in the disciplines* and *disciplinary literacy* interchangeably in this volume. Keep reading to learn a bit more about content-area literacy and how literacy in the disciplines is different.

We wondered whether we really must choose between content literacy and disciplinary literacy. Do we have to abandon the tools and routines we know to get our students onboard with disciplinary literacy? We don't think so. Those familiar routines can often be the bridge our students need from understanding and creating

texts in general ways to a more diverse way of looking at the world through the lens of each discipline as we come to understand the literacy practices used by experts in each discipline.

DISCIPLINARY LITERACY AND CONTENT-AREA LITERACY

Like most of you, we have found that effective teachers typically integrate and learn from each new iteration of the ideas they encounter. They use their training, experience, and wisdom, along with genuine caring and knowledge of the students in their classrooms to teach about an ever-changing world. With a focus on disciplinary literacy, this text delves into what it means to be an effective communicator and producer of information in several of the disciplines—mathematics, history/social studies, science, English, the arts, physical education, and technical subjects—and looks at strategies that support building students' communication/literacy skills within each. Although each discipline has its own literacy demands, understanding the differences and commonalities can help teachers build upon the relevant skills and strategies that students bring with them to class.

Throughout this book, we have avoided what we call the “versus” syndrome. Choosing between content literacy and disciplinary literacy seems counterproductive. Binary constructions that force us to choose between two opposite choices rarely produce understanding, we think (Hayakawa & Hayakawa, 1990). Both have a place and a purpose for some students at some times during their educational journeys. But what do we mean by content literacy or disciplinary literacy? The terms are not interchangeable, and the use of one does not mean the other has no place. We teach general learning strategies when that is appropriate, and we look more specifically at the disciplinary or content approaches when that is more likely to engage students and improve learning. Like most things in life, words are often quite complex. The same word can be used in diverse ways depending on who speaks or writes the word and what the context is for its use. Let's take a quick tour of the terms *content*, *content areas*, and *disciplinary literacy*.

A Brief Tour of the Terms

Content

What the words are all about, really. Every text is about something. Stephen Hawking (1996) wrote about the universe and how it came to be. That's content. Ernest Hemingway (1952) wrote about life through the allegory of a fisherman confronting challenges at sea. That is also content. John Wesley Powell (1895) wrote about his expedition down the Colorado River and what is now known as the Grand Canyon.

Yes, what we learn about that voyage and the geology and people of the region is also content. Put a bit too simply, content is the *what*. Of course, we agree with Rosenblatt (1995) that how we respond to the words and how our own experiences inform our reading are vitally important to how we make sense of content. Content is what the author, using words and other modalities (such as images or sounds), tries to convey to the reader while the reader brings experiences of her or his own to that content. This interaction of reader and text is more important than we might think, and we return to this idea in Chapter 2.

Content Areas

Now here is a tough one, because the term includes the word *content*, but it is more than, and less than, the word *content* all by itself. *Content area* is really a school term that one encounters only in teachers' lounges and colleges of education. Sometimes the term *subject area* is used interchangeably with *content area*. The words and syntax teachers use are necessarily important to the students who benefit from the ideas embedded in those words in those content areas. When our doctors talk among themselves, they sometimes use words that we would not understand because we are not trained or experienced in the field of medicine. When they speak with us, they use different terms, or they explain the terms they use. Teachers are not any different. Content area refers to school subjects—mathematics, science, history, literature, arts, and so on. These subjects are often put into containers or silos by grade level and by course numbers. Organizing content into these “areas” is a way of keeping the entire enterprise of schooling moving forward. We may argue about the way the content is organized or how students move through the system, but content area is just a means of thinking about the way content (what we learn) is organized during the school day or year. It is the *how* of content as it appears in school.

Disciplinary Literacy

Shanahan and Shanahan (2008) suggested a pyramid model for the increasing specialization of literacy development that shows the relationship between basic literacy skills, intermediate or generic literacy skills, and disciplinary literacy skills. They write that disciplinary literacy skills are those that are “specialized to history, science, mathematics, literature, or other subject matter” (p. 44). This definition captures the essence of disciplinary literacy to us. Moje (2013), in an online seminar on the Text-Project site, equated *subject area* with the term *discipline*. Her insight here is that subject areas are how the disciplines are experienced in schools. Wow, that is an insight! It would not be useful to expect students in 10th grade to be conversant with every conceivable discipline that exists or might exist in the world. Those subject areas provide a scaffold for students as they enter and explore the disciplines as they encounter

them in school, and as they find them in the world of work and as informed citizens later in life.

One other notion Moje explains is worth our attention, too. She tells us, “Subject matter learning is not merely about learning the *stuff* [emphasis added] of the disciplines; it is also about the processes and practices by which that stuff is produced. . . . Some of the power of knowledge comes from being an active part of its production, rather than from merely possessing it” (Moje, 2013, time index 10:48). We explore that in more detail in Chapters 2 and 3.

We are going to come back to this later because the idea that students can produce knowledge is particularly worthwhile when we talk about disciplinary literacy. Producing knowledge means that learners have some command of the concepts, and they can add their voices to the discussions that are appropriate for their own disciplinary thinking. In Chapter 3, we also explore how disciplines and professions overlap but are not interchangeable terms.

While we agree with Brozo and colleagues (2013) that generic literacy skills that work across content areas are worthwhile for students, too, teaching students to understand how experts in the disciplines think, approach texts in their fields, and organize their parts of the world have a prominent place in the curriculum. Put simply, we need not choose between universally applicable content literacy approaches and those specific to any given discipline.

One of our favorite websites is TextProject, where teachers may find a wealth of information and resources about many aspects of literacy instruction and standards alignment. We recommend checking it out at <http://textproject.org>. As mentioned earlier, throughout this book, we also include links to video resources from Learner.org and our own Disciplinary Literacy channel on YouTube, which can be found at <https://literacybeat.com/literacy-in-the-disciplines>.



One question that teachers at any level face is just what does disciplinary learning look like for students of different age levels and in different grades? And what a good question it is. We teachers often tell students that they should think like a scientist, a historian, a mathematician, or an author of fiction. But what do we mean by that? It seems quite improbable that most students would actually be experts in all those fields, doesn't it? It also seems unlikely that students in high school, for example, could usually emulate the thinking habits of someone with multiple university degrees and years of experience in specialized fields. What does a teacher in any subject area do? Let's explore that in the next section.

Disciplinary Literacy across Grade Levels

Imagine a young child who can explain the scientific concept known as Bernoulli's principle she had learned through investigation in preschool. Moje (2013) describes just such an event as her preschool daughter questioned a phenomenon and attempted to explain it as she sat in the bathtub with a squeeze bottle. You can hear Moje describe

it at <https://youtu.be/8fMncjLcliQ?t=12m46s>. Even at an early age, children are interested in the world and question why and how things work.

Others have identified what may be termed as *core disciplinary literacies* as a way of grouping differing disciplinary practices. For example, Colwell, Hutchinson, and Woodward (2022) suggest that students should be able to study multiple forms of historical evidence (history), read reports of scientific findings (science), read mathematical representations using numbers and symbols (mathematics), and read short stories, novels, and poetry (English-language arts). And all of these can be grouped as a core disciplinary practice: “Recognizing and comprehending multiple text types” (p. 466). They identified three other core disciplinary practices, as well: analyzing text, using discipline-specific language, and communicating an argument, rationalization, or understanding.

Diagrams often help us conceptualize our ideas, so we created one in Figure 1.1 that we think may help us consider literacy growth as a function of increasing specialization in school settings. We agree with Shanahan and Shanahan (2008) that literacy learning is increasingly specialized and occurs in diverse ways depending on where learners are in their own growth. At the same time, we wanted to represent the idea that disciplinary learning occurs throughout children’s lives. We tipped their literacy pyramid on its side, then split it apart to show a continuum. It is, of course, a

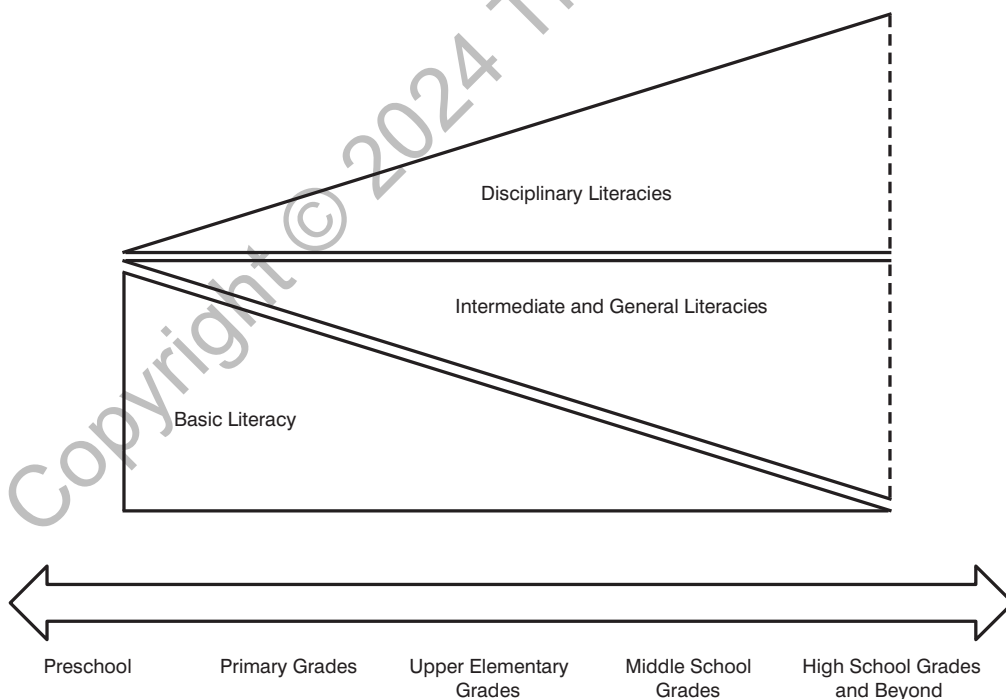


FIGURE 1.1. Continuum of literacy specialization.

rough model, but it can help us think through just where and when disciplinary learning can and should occur.

Because we think of the literacy skills as interlocked and overlapping, we reconceptualized the pyramid in this way. Disciplinary thinking and the associated literacies may start and be fostered quite early in a child's life. At the same time, the basic literacy skills (alphabetic principle, letter–sound correspondences, sight words, and so on) are of particular importance early in life. As intermediate and general proficiencies in comprehension, fluency, and other thinking strategies improve, so do disciplinary literacies. Over time, and depending on the demands of curriculum, the workplace, and the needs of individual students, disciplinary literacies might be a greater focus for students.

A Question of Questions

A couple of paragraphs ago, we recounted Moje's story of her preschool daughter who questioned a phenomenon she encountered in the bathtub. We are reminded that schools often turn the idea of questions upside down. The teacher becomes the one with the question and the students must produce a suitable answer. Holt (1982) poignantly explained how children often become fearful of not knowing the answer expected and their natural instincts to explore and question the world blunted as a result. Mehan (1979) identified the input–response–evaluate format identified as characteristic of oral classroom discussion, where the teacher asks a question to which the teacher already has an answer in mind. The student responds and the teacher then evaluates the degree of correctness, a pattern we observe in some classrooms to this day. Under such circumstances, how would a student ever develop the habit of mind of asking questions to which the answer might require investigation? We argue that the disciplines demand that students be the ones with the questions, that they be taught to navigate (Moje, 2013) the complex worlds of the disciplines, and to take the risks that all experts in any field take when confronted with challenging problems.

In addition to being able to ask and frame questions or identify worthwhile problems, all the disciplines typically represented in school (as subjects or content areas) tend to use data to inform decisions. They present and evaluate arguments, but the manner of making or evaluating the argument may be different for mathematicians than it is for authors of fiction, for example. Experts and students working in the disciplines often use language and other symbol systems in ways that are unique to that discipline. They work with multiple texts that often provide differing points of view, and they can summarize them in ways that are familiar to those who think about and communicate in that discipline. Finally, and most importantly, experts and students know how to produce knowledge and communicate that knowledge in ways that are distinctive to that discipline.

So, let's see where we are in our thinking about disciplinary literacy. We proposed the ideas that

1. Thinking skills expressed through language are useful in ways specific to school-oriented disciplines.
2. Students benefit from learning through disciplinary lenses, but they are not experts in most cases.
3. There are some common attributes to the disciplines that cross all of them, but the way professionals and experts approach those attributes varies from one discipline to another. For example, historians tend to approach the use of data in ways that are quite different from the methods scientists use.

As a result, the way literacy informs and is informed by the disciplines has unique qualities to a mathematician, a social scientist, an author of fiction, an artist, or an athlete. We're about to go on a journey to discover some of the many ways that scientists read a report or a historian evaluates a source of information. Throughout our journey, we hope you will recognize familiar instructional routines and adapt them to help your students more thoroughly understand the nature of the disciplines and produce knowledge in the best traditions of those disciplines. At the same time, we hope you find new ways to help students construct knowledge in the disciplines. We also hope that you find a unique place for your voice as an advocate for your discipline and the literacy practices that inform it as we go along.

Just How Many Literacies Are There?

In this book, we focus on the literacies of disciplines commonly found in schools. These include the disciplines of mathematics, history and the social sciences, the arts, literature, and the sciences. The disciplines specific to physical education and athletics and music have found their way into our exploration, as well. Of course, we subscribe to the notion of “new literacies” that refers to how digital technologies are infused into our ways of knowing and understanding the world (e.g., Lankshear & Knobel, 2006). You will find the idea of new literacies throughout this book infused into the disciplines. However, there are other literacies as well. It is beyond the scope of this book to explore the possibilities of just how many literacies there are and what disciplines are represented therein. We point out a few to highlight the idea that the language and symbols used in a variety of fields, professions, and businesses are worthwhile even when they are typically not traditional subjects taught in schools on a sustained basis. Some examples are shown in Figure 1.2.

HOW DOES DISCIPLINARY LITERACY HELP TEACHERS TEACH CONTENT MORE EFFECTIVELY?

Earlier in this chapter, we suggested that there is the “stuff,” or content, to be learned. There are also ways of knowing, learning, and communicating that are frequently specific

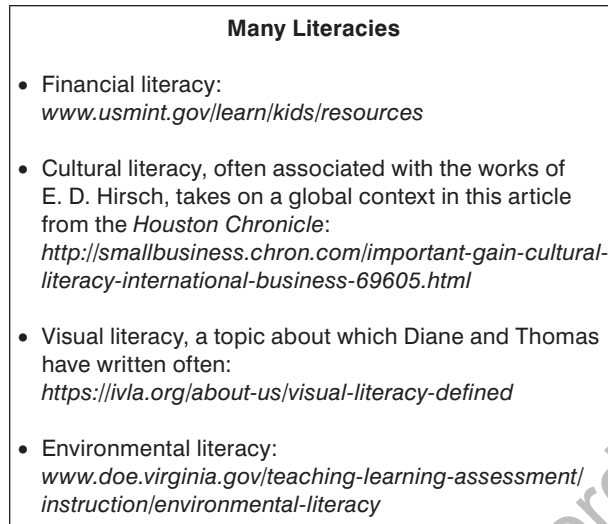


FIGURE 1.2. Many literacies, with example websites. Of course, there are many more.

to the disciplines as they are taught in schools. Disciplinary literacy helps us get to the very soul of what we learn, why we learn it, and how that learning informs our ability to navigate the world and, most importantly, navigate the world of ideas and people who produce those ideas. Disciplinary literacy gives students a voice, sometimes as informed novices and sometimes as aspiring experts, to understand ideas from many perspectives and as knowledgeable participants in the public sphere (see Habermas, 1991).

Standards and curricula increasingly demand that students learn the ways of knowing and communicating that are specific to the disciplines they encounter in schools. If the content is the *what*, these ways of knowing and communicating are the *how*. What's more, students are asked to look at the world through multiple lenses as they integrate what they know from their studies in one discipline with those of other disciplines to solve the complex problems that society faces. To accommodate their developing understandings, we have considered the roles literacy plays in the lives of those working within each discipline. Then we addressed this understanding through the information and examples shared in this text. We hope this approach will support you, the teachers of all disciplines, in expanding your students' literacy skills within the context of your discipline. We believe the results will be well-prepared and well-informed students who have the literacy prowess needed to succeed in any career they choose.

HOW TO READ THIS BOOK

Although the nuances of each discipline are unique, some aspects of literacy provide a lens through which we might examine the uniqueness of each. In the chapters that follow, we look at those aspects.

This chapter has provided an overview of disciplinary literacy and of essential concepts related to proficient reading, writing, and communication that support literacy development. Next, in Chapter 2, several experts focus on the literacy demands of each discipline. Teachers respond to each of the experts and suggest ideas based on their readings from this chapter. Let's start our journey. In Chapter 3, we go beyond the world of college and career readiness and explore how disciplinary literacy helps students and their teachers become informed citizens who live rich and full lives, too (e.g., Clabough & Sheffield, 2023).

Each chapter beginning with Chapter 4 includes an anticipation guide to help you think about your current understanding of the topic organized around themes such as using vocabulary, constructing arguments, and so on. When you and your colleagues are done reading the chapter, discuss the content and revisit the anticipation guide to note how your understanding has changed or become deeper. In this edition of *Literacy in the Disciplines*, we have also attended in more detail to mathematics (e.g., Elliott, 2023; Sikko, 2023) as a discipline, and we examine the new phenomenon of generative artificial intelligence (AI), too. It has been nearly a decade since we published the first edition, and teachers have had more time to implement and adjust ideas about literacy in the disciplines. We hope you find their experiences useful in your professional practice. Ready to explore the worlds of the disciplines?

TRY IT ON!

A Graphic Organizer to Guide You through Your Reading

A common approach for decades, known as content-area literacy, benefited many students as they learned to navigate texts in science, mathematics, and other disciplines. The approach relied on general strategies to help students work with texts they encountered in their classwork.

Getting the content right is our goal, and using language specific to the discipline is one way to accomplish that. Literacy in the disciplines (or disciplinary literacy) goes a step beyond general approaches that may be used across disciplines. Whereas content-area reading (or content-area literacy) focused on strategies that build students' skills with any text, disciplinary literacy homes in on what makes each discipline unique in the ways experts and professionals approach the field. It is important that students—novices in fields such as history, art, or mathematics—learn to work with texts that will lead them to better understand the content.

Figure 1.3 can help you isolate the unique features of language as they are used in your discipline or content area. Here is how you can use the chart:

1. Choose a literacy-related task that is specific to your discipline or content area.
2. In column A, indicate the most common practices relative to the four areas: Vocabulary, Reading and Writing, Using Visual Information, and Using Sources. A few blank rows are also included so you can study other aspects of language in your discipline, such as presentations, interdisciplinary connections, and so on.
3. In column B, note the literacy aspects of the specific task you chose to study.
4. In column C, compare the common practices in your discipline with those in this specific task.
5. In column D, contrast information in the first three columns from an example task in

What Literacy Looks Like in My Discipline

	A	B	C	D
My discipline or content area:	My discipline usually:	An example literacy task in my content area or discipline	Differences between usual and specific task (columns A and B)	Contrasting example from another discipline
Approach to Vocabulary → Word origins → Discipline-specific vocab → Academic vocab across disciplines				
Approach to → Reading → Writing				

(continued)

FIGURE 1.3. Disciplinary comparison chart.

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A	B	C	D
My discipline or content area:	My discipline usually:	An example literacy task in my content area or discipline	Differences between usual and specific task (columns A and B)
<p>My discipline or content area:</p> <p>Approach to Visual Information</p> <ul style="list-style-type: none"> → Charts → Graphs → Images 	<p>My discipline usually:</p>		<p>Contrasting example from another discipline</p>
<p>Approach to Sources</p> <ul style="list-style-type: none"> → Relative importance → How attributed → Perspective 			

(continued)

FIGURE 1.3. (continued)

	A	B	C	D
My discipline or content area:	My discipline usually:	An example literacy task in my content area or discipline	Differences between usual and specific task (columns A and B)	Contrasting example from another discipline

FIGURE 1.3. (continued)

another discipline. You may want to work with a colleague who works in another content area or discipline to collaborate with you. The filled-in example for vocabulary in Figure 1.4, using an article about plankton study from *Science* magazine, may guide you.

To support you in identifying the features of your discipline, refer to www.learner.org/series/reading-writing-in-the-disciplines/what-is-disciplinary-literacy/experiencing-discipline-specific-texts-2. Then, navigate to the videos related to your discipline. You'll be able to choose from many videos, including:

- Reading and Writing in Science
- Reading and Writing in English
- Reading and Writing in History
- Mathematics in the Real World: An Epidemiologist
- Science in the Real World: A Biotech Startup
- English in the Real World: A Sports Journalist
- History in the Real World: A Documentary Filmmaker

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