Reasoning Strategies: Improving Critical Thinking

11



FIGURE 11.1 Throughout their college careers and beyond, students use a number of different reasoning strategies in academic and professional writing. (credit: "Howard Tilton Library Computers 2010" by Tulane Public Relations/ Wikimedia Commons, CC BY 2.0)

CHAPTER OUTLINE

11.1 Developing Your Sense of Logic
11.2 Reasoning Trailblazer: Paul D. N. Hebert
11.3 Glance at Genre: Reasoning Strategies and Signal Words
11.4 Annotated Sample Reading: from Book VII of The Republic by Plato
11.5 Writing Process: Reasoning Supported by Evidence

INTRODUCTION The ways in which you approach and discuss debatable topics incorporate critical thinking, critical reading, and critical writing. The reasoning strategies discussed in this chapter reflect the patterns people use to think critically and the structures with which writers and speakers commonly build their arguments. These strategies are also the ones you will use in most of your college writing projects, including your assignments for Position Argument: Practicing the Art of Rhetoric and Argumentative Research: Enhancing the Art of Rhetoric with Evidence. Each strategy is a building block of logic; that is, each is built on a pattern of thought, which you use out of the classroom as well. For instance, you might approach a text or real-life situation in some of the following ways:

- Explain it in terms of something unrelated but more familiar.
- Compare or contrast it with other texts or situations.
- Group it in a category with similar texts or situations.
- Consider it as a problem that needs to be solved.

- Examine the reasons something happens or what happens as a result.
- Explain what the text or situation means to you.

These thought patterns exemplify active critical thinking, which translates into critical writing. In other words, writing patterns reflect thinking patterns. By applying these reasoning patterns appropriately and effectively, you will be able to incorporate the evidence you need to support a thesis and persuade readers of the validity of your argument. Remember, too, that these are skills, and like other skills, the more you practice, the better you will get at using them effectively. (You can read more about argument and logic in Rhetorical Analysis: Interpreting the Art of Rhetoric.)

11.1 Developing Your Sense of Logic

LEARNING OUTCOMES

By the end of this section, you will be able to:

- Identify key rhetorical concepts and thought patterns in a variety of texts.
- Explain how patterns of thought function for different audiences, purposes, and situations.

For the purposes of this course, **logic** means "reasoning based on thought and evidence." In practical terms, logic is the ability to analyze and evaluate persuasive or argument writing for effectiveness. By extension, it also means that you can learn to use logic in your own argumentative writing. Like any other new skill, you are likely to learn best when you have a starting point. Here are some suggestions for how to begin thinking and writing logically:

- Approach a topic with an open mind.
- Consider what you already know about the topic.
- Consider what you want to know about the topic.
- Find credible information about the topic.
- Base your judgments of the topic on sound reasoning and evidence.

Once you have formed your opinions on a particular debatable subject, you must decide on the best way to organize them to share with others. Developing your skills in six widely used **reasoning strategies**, or patterns for thinking and writing, can help you determine the most logical and effective means of organizing information to make your points.

In this chapter, you will examine these six reasoning strategies—analogy, cause and effect, classification and division, comparison and contrast, problem and solution, and definition—that are often used in college classes. In addition, you will consider how writers' personal views, cultural backgrounds, and purposes for writing help determine

- which reasoning strategy suits their needs; and
- what they decide to include in their writing.

As you progress in your college classes and beyond, you will find these reasoning strategies used in all genres of writing, both nonfiction (e.g., textbooks, how-to books) and fiction (e.g., novels, short stories). Understanding how these strategies work can help you recognize their common formats and analyze what you read; likewise, as a writer, understanding how these strategies work to reflect your thinking can help you determine the strategy you need to use.

Analogy

Writers frequently use **analogy** as a strategy to compare two unlike subjects—one subject is familiar to readers, whereas the other is not. To explain or clarify the unfamiliar subject, the writer emphasizes the way or ways in which the two subjects are similar, even though they are dissimilar and unrelated in all other ways. Analogies are basically long forms of **similes** (short comparisons of unlike elements, based on the word *like* or *as*) or **metaphors** (short comparisons without signal words). In the example paragraph, the writer explains

unfamiliar aspects of the COVID-19 pandemic by comparing it with the more familiar concept of a robbery spree.

Model Paragraph

> Examining COVID-19 is like examining a robbery case in this way: both require a great deal of investigation. Those investigating the causes behind the pandemic look for the history of how the virus spread, and those investigating a crime look for the backstory that might connect the victims and criminals. In addition, the two groups of investigators look at the reasons behind the focus of their study. Medical investigators look at why the virus spread throughout the world; police investigators look at why the crime spree took place in a particular area. Also, both types of investigators are trying to stop whatever or whoever is the focus of their investigation. Medical investigators want to stop the virus; police investigators want to stop the crimes.

Cause and Effect

Cause-and-effect writing identifies and examines the **reasons** (causes) for and **consequences** (effects) of an action, event, or idea. Cause-and-effect writing often answers the question "Why?" and helps readers understand the connections between what happens because of—or as a result of—something else.

Model Paragraph

> Ray's grocery, Artie's Hardware store, and Cradle and Teen department store all went out of business because a well-known superstore opened in Springdale. Customers who frequented Ray's, an establishment that had been run by the same family for four generations, used to drive many miles to take advantage of the high quality of items in the meat and deli departments. After the opening of the superstore, however, those same customers found they could get similar items at a savings, even if the quality was not as high as the products at Ray's. Customers at Artie's Hardware often talked with owner Artie Shoeman about their hardware needs, but the store did not offer the same variety of items they could find in the superstore. The same was true for those who shopped at Cradle and Teen. The superstore featured lower prices and more variety, even if the items did not match the quality of the items at Cradle and Teen.



FIGURE 11.2 Small retailers often lose out to superstores. (credit: "Fort Bragg CA Storefront" by Ellin Beltz/ Wikimedia Commons, Public Domain)

Classification and Division

Classification and division are actually two closely related strategies, generally discussed together because of

their similarity. When using the strategy of division, the writer identifies a single subject or group and explains categories within that subject or group. In other words, the writer divides the larger unit into component parts. When using the strategy of classification, writers do the opposite. They group various elements and place them into larger, more comprehensive categories rather than divide the whole into parts. In general, the reasoning strategy of classification and division looks at smaller elements as parts of a larger element and thus helps readers understand a general concept and the elements that it comprises.

Model Paragraphs

> Extra material in the textbook can be divided into photographs, quotations, and tables. The photographs were all taken by the author and focus on various parts of the life cycle of the plants highlighted in the chapter. In addition, to add color and more information about the subject matter of each chapter, the author has inserted sidebar quotations from both famous and non-famous people. The tables the author has included help readers see more details about the progression of the plants' spread across the country.

> After three months of training, the young dogs were placed into three categories: those who would go directly to permanent homes, those who would repeat the course, and those who would advance to the next level. The dogs that would be homed immediately were those who were far too social or far too active to be service dogs. The dogs that would repeat the course had possibilities as service dogs but needed more discipline and instruction. Their futures were yet to be decided. Those that advanced to the next level were obedient and focused and learned quickly. They displayed great promise as service dogs.

Comparison and Contrast

Compare and contrast, one of the most frequently used reasoning strategies, analyzes two (sometimes more) subjects, examining the **similarities** (comparisons) and **differences** (contrasts) between them. Nearly everything you can think of can be a subject for comparison and contrast: objects, people, concepts, places, movies, literature, and styles, to name a few. To elaborate on the separate points, writers provide details about each element being compared or contrasted. Comparison and contrast helps readers analyze and evaluate subjects.

This strategy is helpful when the similarities or differences are *not* obvious and when a significant common thread exists between the subjects. For example, a contrast between an expensive, elegant restaurant and a fast-food restaurant would be useless because the differences are clearly obvious, despite the common thread—both are restaurants. However, *not* so obvious might be some similarities.

When subjects have no common thread or have obvious shared characteristics, any comparison or contrast makes little sense—like contrasting a fish and a shoe (no common thread) or comparing two fast-food restaurants (obvious similarities). However, a writer actually might find a common thread between a fish and a shoe (perhaps shine or texture or color), and a valid topic of contrast might be differences between the two fast-food restaurants.

Model Paragraph

> Although they seem different on the surface, one way in which Romantic-period poetry and 1980s rap music are alike is the desire the writers had to create a new approach to their art. They wanted to represent simpler values that were more connected to the natural world, values to which a general audience could relate. For example, in William Wordsworth's "Daffodils," the speaker can escape the depressing, industrialized urban world to find peace in nature by contemplating a field of flowers. Similarly, in the Sugarhill Gang's 1979 "Rapper's Delight," the band sings of how their beats can lift spirits and cause listeners to dance and forget their woes. However, Romantic-period poetry and 1980s rap music are different in the delivery style and form of the art; "Rapper's Delight" is set to music, which is an integral part of the piece, but "Daffodils" is not.

Problem and Solution

When using this reasoning strategy, writers introduce a **predicament** or challenging issue (the problem) and offer information about what was done or what should be done to **remedy** the predicament or issue (the solution). Problem-and-solution writing helps readers understand the complexities of some predicaments and the actions that can improve or eliminate them.

Model Paragraph

> The issue of combating the spread of hate speech and misinformation on social media can be addressed if more social media providers improve their monitoring services. Aside from creating more algorithms that search for linked key words and phrases, social media providers should increase the number of professional monitors conducting active searches. Additionally, while many platforms such as Twitter and Facebook respond within a few days to reports of posts that violate their policies, more monitors could lessen the amount of time these posts are available. According to Facebook, inappropriate posts are investigated and removed within 24 to 48 hours (Facebook "Community Standards"). Some offenders have been reported multiple times for their platform violations, and social media sponsors should increase their monitoring of those offenders. Although such surveillance would increase the burden on the social media providers, it would help solve the growing challenge of online hate speech and misinformation.

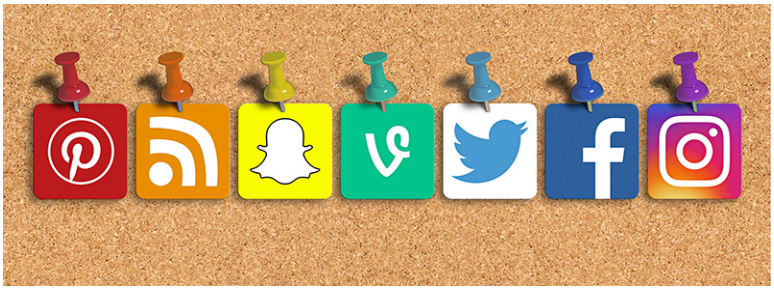


FIGURE 11.3 Social Media Icons (credit: "Social Media Mixed Icons – Banner" by Blogtrepreneur/Wikimedia Commons, Creative Commons, CC BY 2.0)

Definition

When using the reasoning strategy of **definition**, writers elaborate on the meaning of an idea, a word, or an expression, usually one that is controversial or that can be viewed in multiple ways. Beginning writers tend to think that definition writing looks only at the **denotation**, or dictionary definition. However, definition writing entails much more than relaying a dictionary definition. It also explains and elaborates on the **connotations**, the emotions and implications the topic evokes. Definition writing is especially useful for explaining and interpreting terms, ideas, or concepts that are easily or often confused or that have meanings beyond their denotations. Sometimes these meanings are personal interpretations and thus reflect a writer's particular viewpoint. Additionally, this strategy is beneficial when writers want to explain or reinforce a term before making an argument about a larger concept.

Model Paragraph

> In everyday speech, the word *critical* is often used to highlight negative aspects of a topic. If someone says a friend was critical of a new haircut, the implication is that the friend did not like the cut. However, when used in college classes, *critical* has an expanded meaning: noting both the negative and positive aspects of a topic, examining those aspects in depth, and then making decisions about the discoveries. Students directed to use critical thinking, critical reading, or critical writing should know they are expected to examine all sides of a topic fully, evaluate the validity of those sides, and then make sound judgments on the basis of their evaluation.

In this chapter, you have learned about various reasoning strategies that you may use in academic and professional writing. Utilizing these strategies when you write can help you both evaluate and analyze text that

you read and create more logical and persuasive arguments.

Access multimedia content (http://openstax.org/books/writing-guide/pages/11-1-developing-your-sense-of-logic)

11.2 Trailblazer

Reasoning Trailblazer: Paul D. N. Hebert

LEARNING OUTCOMES

By the end of this section, you will be able to:

- Read for inquiry, learning, and critical thinking.
- Identify reasoning strategies and explain their functions.



FIGURE 11.4 Paul D. N. Hebert, 2015 (credit: "Paul Hebert- Revealing Planetary Biodiversity through DNA Barcodes" by Åge Hojem, NTNU Vitenskapsmuseet/NTNU University Museum/ Wikimedia Commons, CC BY 2.0)

"[R]esearchers will find a barcode linked to just about anything... encountered anywhere on the planet."

Reasoning Strategies in Science

Born in Kingston, Ontario, Canada, Paul Hebert (b. 1947) earned his bachelor of science degree from Queen's University, a public research university in his hometown. He then pursued graduate studies at the University of Cambridge (United Kingdom), where he received his PhD in genetics (a branch of biology dealing with heredity and the variation of inherited characteristics). He spent three years at Sydney University in Australia

and then another year in London at the Natural History Museum. Returning to Canada, he began research at the University of Windsor, followed by a directorship at the Great Lakes Institute at Windsor. In 1990, he joined the faculty of Ontario's University of Guelph, where he became director of the Centre for Biodiversity Genomics (a branch of biotechnology that strives to apply concepts of genetics and molecular biology to genetic mapping and DNA sequencing), and he holds a Canada Research Chair in molecular biodiversity (the study of the variety of life found on Earth or in a particular place on Earth).

Interestingly, Dr. Hebert, a well-known genetic scientist, uses reasoning strategies to organize his research. In 2019, a team he led launched a multimillion-dollar effort to identify more than two million new species of creatures. Because the world is losing species faster than species are being discovered, his initiative comes at an opportune time and adds to the value of his work. Experts in the field of biodiversity estimate that Earth is home to 8.7 million to 20 million different kinds of plants, animals, and fungi. To date, however, only 1.8 million of them have been formally described.

In 2003, Dr. Hebert first proposed the concept of using DNA (abbreviation for deoxyribonucleic acid, which codes genetic information for the transmission of inherited traits from a specimen) to create what is called DNA barcoding (https://openstax.org/r/barcode). This strategy is a method of identifying and classifying species by using a specific section of genetic code. In his groundbreaking paper, he proposed DNA barcoding as a solution to differentiate species by using the same small piece of DNA for every organism. A similarity today is the way in which scanners at groceries and other stores use UPC barcodes on items to determine prices.

The idea behind the barcode thinking is that it creates a unique sequence that can be used in myriad ways. Two of these ways include identifying an organism as part of a larger species and identifying a previously unknown species. Hebert proposed that animal species could be distinguished by sequencing fewer than 1,000 bases of mitochondrial (dealing with a subcellular structure found in many organisms) DNA from a given specimen.

Dr. Hebert was the founding director of the Biodiversity Institute of Ontario. Its goals are to

- advance the knowledge of what makes up biodiversity;
- protect biodiversity; and
- help boost the global collaboration of biodiversity researchers.

In addition to his work with the Biodiversity Institute of Ontario, Dr. Hebert heads the International Barcode of Life, which began in 2008 as a reference library of known species with their identifying sequences. The barcodes have helped identify organisms and document how they interact with other species.

One research program of the International Barcode of Life is BIOSCAN (https://openstax.org/r/bioscan). BIOSCAN's areas of research are threefold. The first is to speed the discovery of species. BIOSCAN will use new means to increase the identification of the millions of species yet to be discovered by analyzing hundreds of millions of specimens from freshwater, saltwater, and land sources. The second area is interaction of species, which will investigate the complex ecosystem of species, a topic that, for the most part, remains shrouded in mystery. The third area is species dynamics, which will study many of the world's areas as they are defined by their environmental conditions. Researchers will use that data to compile comprehensive starting points for comparisons about biodiversity.

In its ongoing efforts, BIOSCAN hopes to more than double the reference library, using specimens and species interactions at 2,500 sites around the world, a nod to the international impact of DNA technology. Almost all the new barcode records will come from undescribed species. A primary goal will be discovery of species. A sample barcode sequence will be taken. If it does not match an existing species, researchers will examine the specimen more closely, hoping to find a new species. In the past, this process would have taken years before a specimen was, indeed, confirmed as a new species.

Dr. Hebert hopes that by 2030, students can take handheld barcoders into the wild and use them to identify plants and animals instantly.

Discussion Questions

1. Does the comparison between DNA barcoding and UPC barcodes used in grocery stores help you understand the concept of DNA barcoding? Why or why not?
2. How might BIOSCAN's use of interactions from more than 2,500 sites around the world help the program realize its goals?
3. How does Dr. Hebert use the cause-and-effect reasoning strategy in the initiative launched by the team he led? What is the cause of the initiative, and what is its effect?
4. How does Dr. Hebert use the reasoning strategy of problem and solution in his proposal about DNA barcoding? What problem does Dr. Hebert address, and what is its solution?
5. How would the reasoning strategy of classification and division be useful to a researcher like Dr. Hebert? Support your response with examples from the text.
6. In what ways might researchers use a comparison-and contrast reasoning strategy to discover a new species?

11.3 Glance at Genre: Reasoning Strategies and Signal Words

LEARNING OUTCOMES

By the end of this section, you will be able to:

- Identify and define reasoning strategies and signal words.
- Determine how the rhetorical situation influences the content and reasoning strategies of written works.

As you read in The Digital World: Building on What You Already Know to Respond Critically, **rhetorical situation** are shaped by the conditions of the communication and the agents involved in that communication. To help you determine the conditions and the agents, you can examine purpose, culture, and audience expectation.

The **purpose**, or intention, for your writing determines the reasoning strategies you use. For example, if your purpose is to explain why one restaurant is better than another, you likely would use comparison and contrast.

Writers of essays and other formal papers usually support their ideas by using more than one reasoning strategy. For example, within comparison and contrast, they may include **description**, such as sensory details about the food at the two restaurants; **narration**, such as an anecdote about why they and their companions went to the restaurants or about something that happened at one of the restaurants; and **sequencing**, such as the order in which they received their food or the directions to get to the restaurants.

Alternatively, writers may combine some of the six strategies already mentioned. For instance, within the larger structure of comparison and contrast, they may use **classification** and **division** when discussing the restaurants' menus, sorting by main dishes, side dishes, appetizers, soups, salads, and desserts. Therefore, while the essay's primary purpose may be to compare and contrast, individual strategies within an essay or even within a paragraph may differ.

Recognizing Purpose

Throughout your paper, your purpose for writing should be clear and focused. Your introduction, thesis, topic sentences, body paragraphs (which include reasoning and evidence), and conclusion should all reflect your argumentative or persuasive purpose.

To support and clarify your purpose, you are likely to use the following:

- **Analogy:** to explain to readers a subject with which they are unfamiliar by comparing a specific trait or traits with those of a more familiar subject.
- **Cause-and-effect:** to provide a clear understanding of the relationship between an event or situation and/or what happened because of it, why it occurred, and what might continue to happen.
- **Classification and division:** to explain a subject by breaking it into smaller parts and explaining the distinctions of the smaller parts or by grouping individual, disparate elements on the basis of certain characteristics to form larger units.
- **Compare and contrast:** to examine the similarities and/or differences of subjects in order to explain a specific point about their similarity or difference (often an unexpected similarity or difference).
- **Problem-and-solution:** to indicate a predicament or difficulty and suggest ways to deal with or eliminate it.
- **Definition:** to illustrate to readers an idea, word, or expression, allowing you to explain a unique meaning of a topic through details and analysis.

Recognizing Audience

Critically thinking about the **culture**, or common beliefs and lived experiences, of your **audience**, the people who will read your work, can help you choose an appropriate vocabulary and level of detail.

The culture and audience expectation determine the language you use, the amount and type of information you include, and the way you deliver that information. Determine first what your readers want to know (their expectations), what they already know, and what they do not know. Determining—or at least making an educated guess about—the culture of your audience will aid you in deciding how to use the reasoning strategy you choose and the way in which you present your paper.

Suppose, for instance, your purpose is to persuade your audience to vote for a proposed local ordinance. First, consider the culture of your audience to ensure the language you use clearly explains the terms of ordinance for those who know nothing about it. Also, be sure that you fully understand the issues surrounding the ordinance and how it might have different effects on different groups of people so that what you assert is accurate. Next, again consider the culture of your audience members and what they may or may not know about your topic. For example, they may not know the reason for the proposed ordinance, what might happen if it is passed or not passed, or how it might affect them personally or culturally. If they are not as informed as you are, then include the background information they need to know about it in order for your reasoning strategy and overall argument to be effective.



FIGURE 11.5 Considering the needs and expectations of an audience is key to effective writing. In college, an audience often may consist of your instructor and classmates, but in other situations it may consist of people of more varying ages and backgrounds, like this audience at a town hall meeting. (credit: "Youth and Tobacco Town

Hall Meeting" by The U.S. Food and Drug Administration/Wikimedia Commons, Public Domain)

Depending on your audience, you may want to include an analogy to help readers understand connections and particular points in certain ways. An analogy is also useful if the subject is complex. You can make a complex subject more accessible for your audience by comparing it to something familiar.

Recognizing Points

Every point you make in a paper should be meaningful and should relate to the paper's **thesis**, its overarching claim or angle. How you make each point is determined by your reason for making that point. In most academic writing, you will use structures that present a thesis at the beginning of the essay. Readers should recognize your thesis because of

- its prominent placement in the essay;
- the language you use leading up to it; and
- the language you use following it.

For example, if your thesis is that the first two years of college should be tuition free for students (that is, tuition should be subsidized by the state), then you might begin your essay with an attention-getting fact stating that the current national student debt is over $1.7 trillion. After that, you might share evidence about the number of students who do not finish a bachelor's degree but have accrued student loan debt. Finally, you might preview your reasons for the position advocating for free tuition for the first two years of college.

Readers will recognize your supporting points as stated in your paragraph-level topic sentences because of how you discuss them in relation to your thesis. In all of your academic writing, choose language and reasoning strategies that guide readers back to your thesis.

When you present facts, whether in your thesis or in your evidence, remember to cite them properly according to the format your instructor requires. For more about proper citations, see MLA Documentation and Format and APA Documentation and Format.

Structuring Your Reasoning Strategies

To present your reasoning, which is the main part of your essay, try these suggestions for using the six strategies:

Analogy paragraphs often begin with a statement of comparison between two unlike subjects, followed by reasons, explanations, or analyses of their similarities.

- **Example topic 1:** compare enrolling as a first-year student to visiting an amusement park for the first time

  Example sentence: Enrolling as a first-year student is like visiting an amusement park for the first time in this way: the inexperienced students and park goers must pay a high fee, abide by strict rules, and choose how they spend their adventure.

- **Example topic 2:** compare increasing the federal deficit to eating salted peanuts

  Example sentence: Increasing the federal deficit is like eating salted peanuts: the higher the increase, the more will be demanded. When you eat salted peanuts, the more you eat, the more you want.

Paragraphs explaining **cause-and-effect** often begin in one of these two ways: (1) an explanation of the cause(s), followed by an explanation of the effect(s) that happened as a result of the cause(s); or (2) an explanation of the effect(s), followed by an explanation of the cause(s) that led to the effect(s).

- **Example topic 1:** how an oil spill affected animals, waterways, and environmental costs

  Example sentence: Because an oil spill occurred off the coast of California, the fur and feathers of animals became dangerously matted, waterways were damaged, and the cost of maintaining a clean environment skyrocketed.

- **Example topic 2:** how the pandemic affected the population

  Example sentence: Because of the pandemic, gas consumption dropped, indoor dining at restaurants declined, and online shopping rose.

- **Example topic 3:** how animals, waterways, and environmental costs were affected by an oil spill

  Example sentence: The fur and feathers of animals became dangerously matted, waterways were damaged, and the cost of maintaining a clean environment skyrocketed as the result of an oil spill off the coast of California.

- **Example topic 4:** how the pandemic affected the population

  Example sentence: Gas consumption dropped, indoor dining at restaurants declined, and online shopping rose because of the pandemic.

Classification-and-**division** paragraphs often begin in either of two ways: (1) Classification paragraphs identify individual items and place them in a larger group; and (2) Division paragraphs break a large group or a single unit into smaller parts.

- **Example classification topic:** essential workers during the pandemic included employees in several fields

  Example sentence: During the pandemic, essential workers not under quarantine included employees in the fields of health care, childcare, transportation, water and wastewater, and agriculture and food production.

- **Example division topic:** how the new superstore will be divided

  Example sentence: The layout for the new superstore will be divided into furniture (third floor), household goods and kitchenware (second floor), and men's, women's, and children's clothing (first floor).

When using **compare and contrast** reasoning, you have choices about the structure to use. Comparison-and-contrast paragraphs identify two subjects and address their similarities and then their differences; or comparison-and-contrast paragraphs identify two subjects and address their similarities and then their differences.

- **Example topic 1:** reality television and scripted television

  Example sentence: Reality television and scripted television are alike in that both should make money for the network that airs them; however, they differ in the predictability of what the characters do in their roles.

- **Example topic 2:** printed book and audio book

  Example sentence: A printed book and an audio book are alike in that both present the material the author wrote; one way they differ is that listeners—as opposed to readers—cannot make notes on text in a printed book.

- **Example topic 3:** reality television and scripted television

  Example sentence: Reality television and scripted television differ in the predictability of what the characters do in their roles, but they are alike in that they both should make money for the network that airs them.

- **Example topic 4:** printed book and audio book

  Example sentence: One way a printed book and an audio book differ is that listeners—as opposed to readers—cannot make notes on material in the printed book; however, both present the material the author wrote.

You can develop a **problem-and-solution** paragraph in one of two ways: (1) identify the problem, and then explain a way to solve it; or (2) explain the solution to a problem, and then identify the problem(s) that necessitated it.

- **Example topic 1:** student loans

  Example sentence: The issue of defaulting on repayment of student loans would be solved by increasing the time the students are given to repay the loans.

- **Example topic 2:** campus parking

  Example sentence: The issue of the increased need for parking on campus would be solved by paving the area on the corner of Twelfth and Locust Streets to allow parking on that lot.

- **Example topic 3:** student loans

  Example sentence: By increasing the time in which student loans must be repaid, the issue of defaulting on repayment of student loans would be solved, and students could have more ease of mind to pursue their careers.

- **Example topic 4:** campus parking

  Example sentence By paving the area on the corner of Twelfth and Locust Streets to allow parking on that lot, the issue of the increased need for parking on campus would be solved, an eyesore would be beautified, and more students and faculty would get to class on time.

Definition paragraphs often begin by noting the dictionary definition (denotation) of the topic and then illustrating and explaining its unique or extended meaning.

- **Example topic 1:** patriotism

  Example sentence: Most people think patriotism is showing devotion to their country; to me, however, it is conducting myself in ways that are respectful to everyone.

- **Example topic 2:** independence

  Example sentence: Independence means freedom from outside control, but college students often find it brings personal responsibility they had not considered.

Integrating Evidence from Appropriate Sources



Most academic writing is built on the writer's own ideas as supported by the ideas of others. Regardless of the reasoning strategies you use in an essay, you will usually need to integrate others' ideas to

- help you explore a topic;
- define, illustrate, explain, or prove an idea;
- help readers think critically about an idea; and
- give strength or credibility to your ideas.

These ideas from others could come from a variety of sources such as print or electronic media or in-person conversations. Similarly, these sources could be either personal (e.g., a conversation you had with someone or an email you received) or public (e.g., available online or in a printed publication). You can read more about finding and using credible sources in Research Process: Accessing and Recording Information and Annotated Bibliography: Gathering, Evaluating, and Documenting Sources.

These models show how writers integrate ideas from appropriate sources into their reasoning strategies.

Analogy

Enrolling as a first-year student is like going to an amusement park for the first time: the inexperienced students or park goers must pay a high fee, abide by many rules, and choose their adventures. Like the cost for riding roller coasters, the cost for taking college classes is great and must be paid before the students start their journey. However, even after paying tuition, students do not have immediate access to whatever class they want to take, just as the park visitor cannot jump on any ride at any time. In the park, certain rides have warnings, such as "You must be at least 60 inches tall to go on this ride." In college, many classes have prerequisites or require students to have earned a minimum placement score. Also, even though park goers have paid their entrance fees and received armbands that allow them to go anywhere in the park, they are not guaranteed a place on that one awesome ride they have heard so much about. They may have to choose between waiting in a line for hours or doing something else and trying to catch that ride another time. Similarly, college classes have a limited number of seats. Like the roller coaster that everyone wants to ride, college classes close, and students must make another choice. So, while students may not be able to pick up that class that semester, they can try again the next term. Like those starting an adventure at an amusement park, those starting the college journey should have a plan of how they want to fill their time and have a backup plan should they be unable to get every class they want, according to Max Vega, a first-year adviser. Similarly, park goers should use a map to plan their adventure.

Cause and Effect

Because an oil spill occurred off the coast of California, the fur and feathers of many animals became dangerously matted, waterways were damaged, and the cost of maintaining a clean environment skyrocketed. In May 2015, a ruptured pipeline in Santa Barbara County spilled oil along 20 miles of coastline. According to information published by the University of California-Davis, wildlife rescuers were able to save 49 coastal birds, 25 sea lions, and 6 elephant seals (Kerlin, "Wildlife Experience High Price of Oil"). Helping ecosystems recover from oil spills is difficult and can take decades and billions of dollars to recover even partially.

Classification and Division

The layout for the new superstore can be divided into furniture (third floor), household goods and kitchenware (second floor), and men's, women's, and children's clothing (first floor). This arrangement allows customers to feel they have control over their shopping experience. Customers shopping for clothes are not distracted by household goods or furniture displays. "By categorizing our merchandise in this manner, we can further subdivide the merchandise on each floor, developing a logical system of separation that repeat customers will learn easily," said Carla Dawkins, general manager for Hometown Corner Store, in a *Curtisville News* report (Thurston 2). These subdivisions, Thurston stated, would allow individual floor managers to design the footprint of their floors to create an originality distinct and separate from the other floors (8).

Comparison and Contrast

One way *Romeo and Juliet* and *Macbeth* are alike is that both are tragedies written by William Shakespeare; one way they differ is that they explore different themes. In *Romeo and Juliet*, almost all action centers on the theme of love, whether it is the innocent love between two young people or the protective love of parents for their children. In *Macbeth*, however, the action centers on ambition. The characters act on their ambitions for themselves and for their country, but excessive ambition is condemned and severely punished (Royal Shakespeare Company, "*Macbeth* Analysis").

Problem and Solution

The issue of the increased need for parking on campus would be solved by paving the area on the corner of Twelfth and Locust Streets to allow parking on that lot. According to an email sent to all students from the provost, Dr. Sandra Kuryakin, the college purchased the corner lot two years ago with the intent of creating more parking spaces. In the email, Dr. Kuryakin adds, "We will break ground in June and plan to have the lot

finished before students are back on campus in August, thus solving our parking problem on the west end of campus."



FIGURE 11.6 Empty lot to be converted to parking spaces (credit: "Columbus-Whittier Peninsula – Northern Tier (BRLF)" by Ohio Redevelopment Projects—ODSA/flickr, CC BY 2.0)

Definition

Most people think patriotism means showing devotion to their country; to me, however, it is conducting myself in ways that are respectful to everyone. Too often, people proclaim themselves as patriots when they are actively seeking to withhold liberties from their fellow citizens or even harm them. When those claiming to be patriots condemn and physically harm others because they do not agree on political issues, they are not showing any reverence for their country. Instead, they dishonor their country by dishonoring its people. Respecting America should mean more than saluting the flag or singing the national anthem. It should mean respecting others' rights to life, liberty, and the pursuit of happiness. In light of all this, for me, patriotism means respecting others not only because they are fellow Americans but because they are fellow human beings.

Signal Words and Phrases

Writers use signal words and phrases to steer readers in certain directions. You might use signal words and phrases to give readers clues about

how one idea connects with another;
how one paragraph connects with another;
how one idea supports or refutes another;
what is to come;
points you want to emphasize;
illustrations of your topic; or
similarities or differences you want to emphasize.

Common signal words and phrases for reasoning strategies include these:

Analogy

accordingly	for instance	in relation to
as has been shown	given that	in the same way (that)
as noted	granted that	in this way
as previously discussed	having established that	ironically
as previously mentioned	in addition	paradoxically
as . . . so	in contrast	similarly
by extension	in fact	specifically
compared with	in parallel	the aforementioned
for example	in particular	thus

TABLE 11.1

Cause-and-effect

because (of)	in order to	since
begins with	in that	the reason is
for	is caused by	this led to
for this reason	leads (led) to	for this reason
if this (that) happens	reason	

TABLE 11.2

Effect

as a consequence	for this reason	outcome
as a result (of)	hence	result
as expected	it follows that	so (that)
because (of)	namely	therefore
consequently	on account of	thus

TABLE 11.3

Classification

aspects	feature(s)	part(s)
characteristics	field	rank
classes	form(s)	second
classify	genre(s)	set(s)
comprises	group(s)	several
consists of	kinds	sort(s)
dimension(s)	methods	stage(s) of
element(s)	numbers	types
various	ways	

TABLE 11.4

Division

another	is composed of	style(s)
category(-ies)	kind(s)	type(s)
contain(s)	one	variety(-ies)
first	other	
include(s)	sort(s)	

TABLE 11.5

Compare and contrast

alike	compared with	same (as)
along the same lines	in comparison	share
as well as	in like manner	similar(ly)
both	in the same way	similar (to)
each	is comparable to	the same as
equal(ly)	just as	too
in common	likewise	

TABLE 11.6

Contrast

although	but	difference
and yet	by (in) contrast	different (from)
as opposed to	compared with	either/or
better	conversely	even though
however	on the contrary	yet
instead (of)	on the other hand	so (that)
more/less than	unequal	therefore
neither/nor	vary	
nevertheless	whereas	

TABLE 11.7

Problem

catch	factors (include)	puzzle
challenge	hitch	quandary
conundrum	issue	riddle
crisis	obstruction	situation
difficulty	pose	snag
dilemma	predicament	the question is
enigma	problem(atic)	

TABLE 11.8

Solution

a (one) solution	cure	one answer is
address	deal with	option
alleviate	ease	possibility
ameliorate	explain/explanation	probability
amend	fix	propose
answer	improve	proposition
correct	lighten	prospect

TABLE 11.9

reason	solution	treat(ment)
remedy	solve	way out
resolution (resolve)	take care of	

TABLE 11.9

Definition

according to (source)	for this reason (purpose)	not only . . . but also
also	further(more)	on the contrary
as a result	however	on the other hand
at the same	in addition to	otherwise
because	in brief	rather
besides	in conclusion	similarly
but	in fact	since
consequently	in other words	so
conversely	in particular	such as
equally important	likewise	then
finally	namelyx	therefore
first (second, etc.)	nevertheless	to illustrate
for example (instance)	next	

TABLE 11.10

Frequently Used Reasoning Strategies Terms

- **Audience:** the people who will read your paper.
- **Description:** writing in which the author attempts to depict certain characteristics of a person, place, or object. Writers describe their subjects by carefully noting details and sensory impressions, such as what the subject looks, sounds, smells, tastes, or feels like.
- **Metaphors:** comparison of two unlike elements. For example, the arguing protestors were volcanic, spewing hot, inflammatory speech.
- **Narration:** telling a story or relating events.
- **Point:** an important idea to share with the audience.
- **Purpose:** reason for writing.
- **Sequencing:** relating information in the order in which something happened or in which steps should be followed.
- **Similes:** comparison of two unlike elements. The word *as* or *like* appears in a simile. For example, the protestors' arguments were as heated as an erupting volcano.

- **Thesis:** the overarching and unifying idea of a piece of writing.

11.4 Annotated Sample Reading: from Book VII of The Republic by Plato

LEARNING OUTCOMES

By the end of this section, you will be able to:

- Identify reasoning strategies and explain their function in a written text.
- Explain how reasoning strategies are shaped by purpose, language, culture, and expectation.
- Read and respond critically to a text.

Introduction



FIGURE 11.7 Bust of Plato (credit: "Plato Pio-Clemetino" by Marie-Lan Nguyen (2006)/Vatican Museums/ Wikimedia Commons, Public Domain)

The following excerpt is an example of classical rhetoric. It comes from Book VII of *The Republic (https://openstax.org/r/therepublic)* by Plato (c. 424 BCE–c. 347 BCE), written in the latter part of the fourth century BCE.

In this section, Socrates, Plato's teacher, and Glaucon, Plato's older brother, discuss the relationship between education and the human soul. Socrates argues that education is what moves the philosopher's soul toward its destination of enlightenment, or what he calls "the Form of Good."

Socrates explains this relationship through a famous allegory, "The Allegory of the Cave." An **allegory** is a written or pictorial work that can be interpreted to reveal a hidden meaning, typically a moral, religious, or political one. A **literary allegory** is a fictional narrative in which characters and actions are symbols of truth or ideas about life. While an allegory is a concrete representation of abstract ideas—a comparison between the real and the abstract—an **analogy** creates a comparative relationship between two conditions, people, or items.

Socrates's literary allegory concerns characters he refers to as prisoners who were born into captivity in an underground cave and who have never seen daylight. He asks his student Glaucon to assume that one of the underground prisoners escapes and then asks Glaucon to consider how the other prisoners would react if the

escaped prisoner returned and explained to them that what they had believed to be real is, in fact, false. The allegory and questions Socrates poses illustrate that everyone is capable of knowing the truth; however, when someone has known a skewed reality for so long, learning the truth can be as blinding and difficult to fathom as seeing the sun for the first time.

To contemporary readers, this tale may seem archaic. Consider, however, a modern-day scenario that mirrors many of the same elements. Suppose a child is born into a commune run by a group of racial supremacists and raised into adulthood by those people. The child is taught only doctrines the adults support and is allowed to view only particular Internet sites and television shows that reinforce the group's racist views. Like the prisoners in the cave, the child has been kept from the realities of the outside world. The prisoners in the cave know about the outside world only through shadows. Similarly, the child knows about the outside world only through stories told by the adults. In "The Allegory of the Cave," one of the prisoners leaves the cave, experiences the outside world, and returns with truths discovered during the time away. This experience would be analogous to the now-grown child from the commune escaping, living in the real world, learning that the "truths" they had been taught were, in fact, falsehoods, and then returning to the commune to let others know about the discoveries.

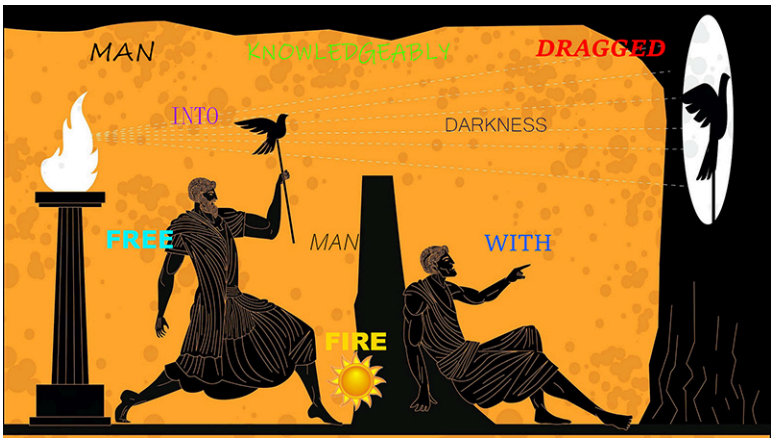


FIGURE 11.8 This illustration of Plato's "Allegory of the Cave" shows the prisoner chained to the wall and looking at the shadow of a manipulated image projected in front of him. The prisoner is unaware of anything about the outside world other than the shadow he sees on the wall. (credit: "Platos-Allegory-of-the-Cave-Featured-Image" by Carter Watkins/flickr, CC BY 2.0

LIVING BY THEIR OWN WORDS

Thinking Through Allegory

> **(Socrates)** And now, I said, let me show in a figure how far our nature is enlightened or unenlightened:—Behold! human beings living in an underground den, which has a mouth open towards the light and reaching all along the den; here they have been from their childhood, and have their legs and necks chained so that they cannot move, and can only see before them, being prevented by the chains from turning round their heads. Above and behind them a fire is blazing at a distance, and between the fire and the prisoners there is a raised way; and you will see, if you look, a low wall built along the way, like the screen which marionette players have in front of them, over which they show the puppets.

Narration. *This narration relates the dialogue between Socrates and Glaucon.*

Description. *Throughout the excerpt, Socrates uses description to paint a picture of the changing life of humans moving from living underground in darkness to living above ground in light.*

Problem and Solution. *Plato uses the problem-and-solution reasoning strategy to offer a way to solve people's*

ignorance. The problem is how to get people who are uneducated (living in darkness) to know the truth (see the light) and accept it. The solution is to rise from the cave (use effort) and face the harsh light (attain knowledge) about truth (the idea of good).

Simile. *Here Socrates, the speaker, uses a simile to compare a low wall to a screen that is in front of marionette players.*

Plot Summary. *Socrates shares with Glaucon an allegory that centers on a group of people who were born into captivity in a deep cave and have never seen daylight. Instead, they are chained in a position so that they can look only straight ahead at shadows that appear on a wall in front of them. Behind them is another wall with puppetlike images of people, animals, and trees; behind this wall is a fire. Another group of people manipulate the images, and the fire causes the images' shadows to project onto the large wall in front of the prisoners. The stories acted out by these shadows are all that the prisoners ever see of the outside world.*

> **(Glaucon)** I see.

> (**Socrates)** And do you see, I said, men passing along the wall carrying all sorts of vessels, and statues and figures of animals made of wood and stone and various materials, which appear over the wall? Some of them are talking, others silent.

> **(Glaucon)** You have shown me a strange image, and they are strange prisoners.

> **(Socrates)** Like ourselves, I replied; and they see only their own shadows, or the shadows of one another, which the fire throws on the opposite wall of the cave?

Comparison and Contrast. *Socrates compares Glaucon and himself to the prisoners in that they too can know only that which they see or experience; thus, they are similar to the prisoners in how they achieve knowledge.*

> **(Glaucon)** True, he said; how could they see anything but the shadows if they were never allowed to move their heads?

> **(Socrates)** And of the objects which are being carried in like manner they would only see the shadows?

> **(Glaucon)** Yes, he said.

> **(Socrates)** And if they were able to converse with one another, would they not suppose that they were naming what was actually before them?

> **(Glaucon)** Very true.

> **(Socrates)** And suppose further that the prison had an echo which came from the other side, would they not be sure to fancy when one of the passers-by spoke that the voice which they heard came from the passing shadow?

> **(Glaucon)** No question, he replied.

> **(Socrates)** To them, I said, the truth would be literally nothing but the shadows of the images.

> **(Glaucon)** That is certain.

Plot Summary*. Glaucon agrees with Socrates that the prisoners would think the shadows on the wall represented real life and that the statues and figures of animals made of wood and stone are real.*

> **(Socrates)** And now look again, and see what will naturally follow if the prisoners are released and disabused of their error. At first, when any of them is liberated and compelled suddenly to stand up and turn his neck round and walk and look towards the light, he will suffer sharp pains; the glare will distress him, and he will be unable to see the realities of which in his former state he had seen the shadows; and then conceive someone saying to him, that what he saw before was an illusion, but that now, when he is approaching nearer to being and his eye is turned towards more real existence, he has a clearer vision,—what will be his reply? And you may further imagine that his instructor is pointing to the objects as they pass and requiring him to name them,—will he not be perplexed? Will he not fancy that the shadows which he formerly saw are truer than the objects which are now shown to him?

Cause and Effect. *Here Plato uses the cause-and-effect reasoning strategy. The causes of the prisoners' ignorance are the restrictions placed on them in the cave. The effect of the restrictions is the prisoners' ignorance of reality, or lack of knowledge.*

> (**Glaucon)** Far truer.

> (**Socrates)** And if he is compelled to look straight at the light, will he not have a pain in his eyes which will make him turn away to take refuge in the objects of vision which he can see, and which he will conceive to be in reality clearer than the things which are now being shown to him?

Cause and Effect. *Here Plato uses the cause-and-effect reasoning strategy. The effect of the prisoner looking directly at the light will be pain. The effect of the pain will be the prisoner's turning away from the light.*

> **(Glaucon)** True, he said.

Plot Summary. *Glaucon agrees that a prisoner would suffer if he were suddenly released from the chains that held him and were then shown the reality of how the shadows were made. He would suffer physical pain from being held stiffly and then suddenly allowed to move and would experience eyestrain from being exposed to real sunlight for the first time. He would suffer mental anguish and confusion as he struggled to accept that what he had seen previously was not real, so he would turn his vision to look at the things he believed to be real.*

> **(Socrates)** And suppose once more, that he is reluctantly dragged up a steep and rugged ascent, and held fast until he is forced into the presence of the sun himself, is he not likely to be pained and irritated? When he approaches the light, his eyes will be dazzled, and he will not be able to see anything at all of what are now called realities.

> **(Glaucon)** Not all in a moment, he said.

> **(Socrates)** He will require to grow accustomed to the sight of the upper world. And first he will see the shadows best, next the reflections of men and other objects in the water, and then the objects themselves; then he will gaze upon the light of the moon and the stars and the spangled heaven; and he will see the sky and the stars by night better than the sun or the light of the sun by day?

> **(Glaucon)** Certainly.

> **(Socrates)** Last of all he will be able to see the sun, and not mere reflections of him in the water, but he will see him in his own proper place, and not in another; and he will contemplate him as he is.

> **(Glaucon)** Certainly.

Plot Summary. *Socrates then poses that the prisoner be dragged up a hill so high that he is near the sun. The bright sunlight would prevent him from seeing anything, including what he thought was real. In getting accustomed to the brightness of the light, the prisoner would first see the shadows, then reflections in the water, then actual objects, and finally the moon and other celestial beings. Socrates ends by stating that only after the prisoner takes these steps to accepting his new reality can he understand his place in this new world.*

> **(Socrates)** He will then proceed to argue that this is he who gives the season and the years, and is the guardian of all that is in the visible world, and in a certain way the cause of all things which he and his fellows have been accustomed to behold?

> **(Glaucon)** Clearly, he said, he would first see the sun and then reason about him.

> **(Socrates)** And when he remembered his old habitation, and the wisdom of the den and his fellow-prisoners, do you not suppose that he would felicitate himself on the change, and pity them?

> **(Glaucon)** Certainly, he would.

> **(Socrates)** And if they were in the habit of conferring honors among themselves on those who were quickest to observe the passing shadows and to remark which of them went before, and which followed after, and which were together; and who were therefore best able to draw conclusions as to the future, do you think that he would care for such honors and glories, or envy the possessors of them? Would he not say with Homer, "Better to be the poor servant of a poor master," and to endure anything, rather than think as they do and live after their manner?

> **(Glaucon)** Yes, he said, I think that he would rather suffer anything than entertain these false notions and live in this miserable manner.

Plot Summary. *Through a series of questions, Socrates asks if the prisoner would claim that the sun is what makes all things possible and if he would remember his life in the cave and feel sorry for the other prisoners who do not have this knowledge that he has. Socrates then quotes the Greek poet Homer, saying that the prisoner would think it is better to be poor and have knowledge than to be rich and know nothing. Glaucon agrees with what Socrates poses in all his questions.*

> **(Socrates)** Imagine once more, I said, such an one coming suddenly out of the sun to be replaced in his old situation; would he not be certain to have his eyes full of darkness?

> **(Glaucon)** To be sure, he said.

> **(Socrates)** And if there were a contest, and he had to compete in measuring the shadows with the prisoners who had never moved out of the den, while his sight was still weak, and before his eyes had become steady (and the time which would be needed to acquire this new habit of sight might be very considerable), would he not be ridiculous? Men would say of him that up he went and down he came without his eyes; and that it was better not even to think of ascending; and if any one tried to loose another and lead him up to the light, let them only catch the offender, and they would put him to death.

> **(Glaucon)** No question, he said.

> **(Socrates)** This entire allegory, I said, you may now append, dear Glaucon, to the previous argument; the prison-house is the world of sight, the light of the fire is the sun, and you will not misapprehend me if you interpret the journey upwards to be the ascent of the soul into the intellectual world according to my poor belief, which, at your desire, I have expressed—whether rightly or wrongly God knows. But, whether true or false, my opinion is that in the world of knowledge the idea of good appears last of all, and is seen only with an effort; and, when seen, is also inferred to be the universal author of all things beautiful and right, parent of light and of the lord of light in this visible world, and the immediate source of reason and truth in the intellectual; and that this is the power upon which he who would act rationally either in public or private life must have his eye fixed.

Metaphor. *In two metaphors, Socrates says (1) the prison-house is the world of sight and (2) the light of the fire is the sun.*

Analogy. *Plato compares the prisoners' climb from the cave into the light of day to people learning reality.*

Plot Summary. *In the end of this excerpt, Socrates tells Glaucon to consider the prisoner being returned to the dark*

cave. He asks Glaucon if the prisoner, after his eyes had previously adjusted to the light of day, would be scorned by the other prisoners for being unable to see underground now. Socrates then suggests that in the allegory, light represents knowledge and the journey from below ground to above ground represents the intellectual growth of the individual. Those who have little knowledge—dim light from a fire that can only cast shadows—know little of the real world and of truth. Thus, he suggests that the prisoners' fear of the knowledge (of that which they do not comprehend rightly) is so profound that they would kill anyone who attempted to drag them out of the cave.

Discussion Questions

1. What purpose might Plato have had for using an allegory to impart his message?
2. In his allegory, Plato compares the prisoners' climb from the cave into the light of day to people learning what reality is. Explain the allegory and how the prisoners' emerging from the cave is similar to learning that what they thought previously was not real.
3. In this excerpt, written around 375 BCE, Plato begins a discussion about what education ought to do. In the 21st century CE, what do you think education ought to do?
4. In the last paragraph, Plato says that "in the world of knowledge the idea of good appears last of all." Think critically think about whether you agree with that statement. Then explain your stance.

11.5 Writing Process: Reasoning Supported by Evidence

LEARNING OUTCOMES

By the end of this section, you will be able to:

- Use organizational and reasoning strategies to compose texts that integrate the writer's ideas with those from appropriate sources.
- Implement varying language structures in the process of composing.
- Develop flexible strategies for drafting and revising.

In this section you will practice writing paragraphs that demonstrate your ability to use the reasoning strategies discussed.

Summary of Assignment

Using three of the strategies for reasoning (analogy, cause and effect, classification and division, comparison and contrast, definition, or problem and solution), write at least three body paragraphs for your Position Argument: Practicing the Art of Rhetoric assignment. Write at least one single paragraph for each strategy you choose. You may write additional paragraphs in which you combine strategies.

Another Lens. Make a visual draft of your assignment by using photos you take, images you find online (be sure to adhere to copyright guidelines), images you create, or a combination of these. Your instructor will tell you whether to substitute visuals for all three paragraphs or just one or two. Put the title at the top of your poster and, if necessary, include explanations of your images. The images you use and the manner in which you arrange them should convey the same ideas you want to express about your subject in writing. The selected images should reflect your critical thinking on your subject and should invite the viewer also to think critically about your subject. You can read more about understanding various aspects of visual rhetoric in Image Analysis: Writing About What You See. Although the design arrangements, or layouts, for a poster are numerous, consider using one of these:

- **Centered image—nucleus idea:** The primary image is in the center of the poster. Other secondary images radiate outward from the primary image or are arranged around it another meaningful way.
- **Left-to-right flow—horizontal:** Images progress across the poster like lines of text, from left to right.
- **Left-to-right flow—vertical:** Images progress across the poster like lines of text in a column. Depending on the size of your poster, you could include from three to five columns of images.

- **Two contrasting fields:** Images are divided into two sections of the poster, some on the left and some on the right.



FIGURE 11.9 This cause-and-effect poster with two contrasting fields indicates the possible result of working without eye protection in a lab. (credit: "A flask exploding, a left eye open without protection" by Science Museum Group/Wikimedia Commons, CC BY 4.0)



FIGURE 11.10 In this centered-image poster illustrating the strategy of definition, the sentence indicates a requirement of communication, and the images indicate ways ii,koln which people communicate. (credit: "Communication affirmation poster, USAF" by Dave Ahlschwede/Wikimedia Commons, Public Domain)

Quick Launch: Structural Paragraph Frames

Once you have determined your reasoning strategy and purpose for a particular paragraph, consider how to develop the evidence within that paragraph through a topic sentence, explanation, and analysis. To do this task, choose the most appropriate structure for a given paragraph from the structures below, and complete the frame according to the prompts. You may alter the frames as needed. Remember that each paragraph that you develop should support your thesis. In other words, make sure that each topic sentence ties back to your thesis.

First, record your working thesis: _____

Analogy

- **Working topic sentence** _____ is like _____ in many ways.

Structure

- explanation:
- analysis:

TABLE 11.11

Cause-and-Effect

- **Working topic sentence for Structure #1**

  Because (cause/s) _____ (what had happened), (effect/s) _____ (what happened as a result).

  Structure #1 for cause-and-effect paragraph

  cause(s):

  effect(s):

- **Working topic sentence for Structure #2**

  (effect/s) _____ (what happened as a result) because (cause/s)_____ (what had happened).

  Structure #2 for cause-and-effect paragraph

  cause(s):

  effect(s):

TABLE 11.12

Classification and **Division**

- **Working topic sentence for Structure #1** (general subject) _____ can be divided into (smaller categories) _____, _____, and _____.

  Structure #1 for classification-and-division paragraphs: division

  larger subject:

  first category:

  second category:

  third category:

- **Working topic sentence for Structure #2**

  (smaller category) _____, _____, and _____ are (types) of (larger subject) _____.

  Structure #2 for classification-and-division paragraph: classification

  smaller category:

  smaller category:

  smaller category:

  larger subject:

TABLE 11.13

Comparison and Contrast

- **Working topic sentence for Structure #1**

  One way in which (subject 1)_____ and (subject 2)_____ are alike is (similarity) _____; one way in which they differ is (difference) _____.

  Structure #1 for comparison-and-contrast paragraph

  Subject 1:

  Subject 2:

  Similarity(-ies) of subject 1 and subject 2:

  Difference(s) of subject 1 and subject 2:

- **Working topic sentence for Structure #2**

  One way in which (subject 1) _____ and (subject 2) _____ are different is (difference)_____; one way in which they are similar is (similarity)_____.

  Structure #2 for comparison-and-contrast paragraph

  Subject 1:

  Subject 2:

  Difference(s) of subject 1 and subject 2:

  Similarity(-ies) of subject 1 and subject 2:

TABLE 11.14

Problem-and-Solution

- **Working topic sentence for Structure #1**

  The issue of (predicament or challenge) _____ was/can be solved by (what was/should be done)_____.

  Structure #1 for problem-and-solution paragraph

  problem(s):

  solution:

- **Working topic sentence for Structure #2**

  By (what was/should be done) _____, the issue of (predicament/challenge) _____ was/could be solved.

  Structure #2 for problem-and-solution paragraph

  solution:

  problem(s):

TABLE 11.15

Definition

- **Working topic sentence** Most people think _____ means _____; to me, however, _____ means _____.

  Structure

  Common definition or denotation:

  Expanded definition from writer:

TABLE 11.16

Drafting: Reasoning Strategies

As you write, keep in mind the reasoning strategy you are using. Then begin your draft by using the applicable frame for the paragraph. Beginning in this way will help you focus the details of the paragraph to ensure they support the thesis and provide the reasoning you need. Note that when you revise, you may choose to reword your frame and the sentences that develop it. Revisions like these are part of the **recursive** nature of the writing process.

Below are frames for types of writing, sample sentences of filled-in frames, patterns for the six reasoning strategies, and sample paragraphs. In the sample paragraphs, topic sentences are underlined, and transitional words and phrases are italicized.

Analogy

- **Frame for analogy topic sentence:** (subject 1) _____ is like (subject 2) _____ in this way: (way in which they are similar)_____.

  Learning a foreign language is like learning to ride a bicycle in this way: you must learn to perform multiple tasks, some at the same time.

- **Structure for analogy paragraph comparing learning a foreign language and learning to ride a bicycle:**

  comparison: learning a foreign language compared to learning to ride a bicycle

  reason/explanation/analysis: must learn the basic parts

  reason/explanation/analysis: must learn how parts work together

  reason/explanation/analysis: must learn multiple actions without thinking about them

Model analogy paragraph

Learning a foreign language is like learning to ride a bicycle: you must learn to perform multiple tasks, some at the same time. You *first* have to develop a foundational knowledge by learning how the individual parts of the bike work and how to use them, just as you learn the parts of speech of a language. *Then* you must learn how these parts work together. *For example*, through the action of pedaling the bike, you transfer energy to the wheels, causing them to rotate, *thus* moving the bike forward. *Similarly*, by learning how to use verbs in another language, you learn how to apply meaning that expresses an action or state of being. To steer the direction of the bike, you learn to change its path by turning the handlebars. To change the direction of a sentence, you learn how to control prepositions and modifiers. *Most important, though*, you must get to the point at which the actions of pedaling, steering, and balancing happen simultaneously and with little thought to the individual actions, just as you must do when speaking a foreign language.

Cause and Effect

- **Frame for cause-and-effect topic sentence (Structure #1):**

  Because (cause/s) _____ (what had happened), then (effect/s) _____ (what happened).

  Because vehicles sped without regard to the speed limit, pedestrians dodged traffic and accidents increased; for those reasons, a traffic signal was installed.

- **Structure #1 for cause-and effect paragraph about reasons for installing a traffic signal:**

  explanation of the cause(s), followed by an explanation of the effect(s) that happened as a result of the cause(s)

  cause: vehicles sped without regard to the speed limit

  cause: pedestrians had to dodge traffic

  cause: number of accidents increased

  effect: traffic signal was installed

Model cause-and-effect paragraph about reasons for installing a traffic signal (Structure #1)

Many vehicles raced through the intersection of Clay Street and Eagle Avenue without regard to the posted speed limit. Pedestrians, many of whom were students, crossed the intersection to get to and from campus, *but* they had to dodge in and out of constant traffic. The number of accidents rose far past an acceptable limit. *Indeed,* one recent accident caused a loss of life. *For these reasons*, a traffic signal was installed at the intersection of Clay Street and Eagle Avenue.

- **Frame for a cause-and-effect topic sentence (Structure #2):**

  (effect/s) _____ (what happened) because (cause/s) _____ (what had happened).

  A traffic signal was installed because vehicles sped, people had to dodge traffic, and accidents increased.

- **Structure #2 for cause-and effect paragraph about reasons for installing a traffic signal:**

  explanation of the effect(s), followed by an explanation of the causes(s) that led to the effect

  effect: traffic signal was installed

  cause: vehicles sped without regard to speed limit

  cause: pedestrians had to dodge traffic

  cause: number of accidents increased

Model cause-and-effect paragraph about reasons for installing a traffic signal (Structure #2)

A traffic signal was installed at the intersection of Clay Street and Eagle Avenue. *Before* it was installed, many vehicles raced through the intersection without regard to the posted speed limit. Pedestrians, many of whom were students, crossed the intersection to get to and from campus, *but* they had to dodge in and out of constant traffic. The number of accidents rose far past an acceptable limit. *Indeed,* one recent accident resulted in a loss of life.

Classification and Division

Notice that these paragraphs do not separate classification from division. Rather, they look at the same larger unit (sports drinks) from two angles: types of drinks that could be classified and the larger unit—sports drinks—broken down into smaller units contained within it.

- **Frame for classification-and-division topic sentence (Structure #1):** (general subject) _____ can be divided into (smaller categories) _____, _____, and _____.

  Sports drinks can be divided into hypotonic, isotonic, and hypertonic.

- **Structure #1 for classification-and-division paragraph about types of sports drinks:**

  identification of the general subject followed by categories of that general subject

  general subject: sports drinks

  first category: hypotonic

  second category: isotonic

  third category: hypertonic

Model classification-and-division paragraph about types of sports drinks (Structure #1)

All sports drinks are designed to increase hydration before, during, and after exercise or athletic involvement. They do this by replacing minerals *such as* sodium and potassium lost through sweat and by replacing electrolytes and carbohydrates. *However*, not all sports drinks are created equally. The *first* type of sports drink, **hypotonic** (having a lower concentration of dissolved content than the human body), includes drinks that have both a low number of carbohydrates and a higher concentration of salt and sugar than the human body. **Isotonic** (having the same concentration of dissolved content as the human body) drinks have salt and sugar concentrations similar to the human body but have higher carbohydrate content. *Last*, **hypertonic** (having a higher concentration of dissolved content than the human body) drinks are designed to supplement daily carbohydrate intake *and therefore* have high levels of carbohydrates to provide quick energy replacement. Their salt and sugar concentration is significantly lower than the human body's.

- **Frame for classification-and-division topic sentence (Structure #2):**

  (smaller categories) _____, _____, and _____ are divisions /types of (general subject)_____.

  Hypotonic, isotonic, and hypertonic are types of sports drinks.

- **Structure #2 for classification-and-division paragraph about types of sports drinks:**

  categories of general subject followed by identification of the general subject

  smaller category: hypotonic

  smaller category: isotonic

  smaller category: hypertonic

  general subject: sports drinks

Model classification-and-division paragraph about types of sports drinks (Structure #2)

Hypotonic (having a lower concentration of dissolved content than the human body) drinks include beverages that have both a low number of carbohydrates *and* a concentration of salt and sugar higher than the human body. Isotonic (having the same concentration of dissolved content as the human body) beverages have salt and sugar concentrations similar to the human body but have higher carbohydrate content. *Last*, hypertonic (having a higher concentration of dissolved content than the human body) beverages are designed to supplement daily carbohydrate intake *and therefore* have high levels of carbohydrate to provide quick energy replacement. Their salt and sugar concentration is significantly lower than the human body's. What do these beverages have in common? All are types of sports drinks, designed to increase hydration before, during, and after exercise or athletic involvement.

Comparison and Contrast

- **Frame for a comparison-and-contrast topic sentence (Structure #1):**

  One way (subject 1) _____ and (subject 2) _____ are alike is (similarity) _____; one way they differ is (difference) _____.

  One way virtual learning and face-to-face learning are alike is that student responsibility is a key element in both; one way they differ is in the methods students choose to be attentive.

- **Structure #1 for comparison-and-contrast paragraph about virtual learning and face-to-face learning:**

  identification of two subjects followed by a point-by-point discussion

  point 1: discussion of a similarity of virtual learning and face-to-face learning

  point 2: discussion of a difference between virtual learning and face-to-face learning

Model comparison-and-contrast paragraph about virtual learning and face-to-face learning (Structure #1)

Student responsibility is a key factor in both virtual learning and face-to-face learning. In both settings, a student must be attentive in order to understand what is happening in the classroom and what is expected regarding readings, lab work, and other outside assignments. Differences occur in virtual classes and face-to-face classes, *though*, in how students choose to be attentive. *Depending on* how the virtual classes are set up, students' attention can range from complete to nonexistent, *and* the instructor might never know how much attention a particular student is paying. With in-person classes, *on the other hand*, an instructor can see a student's body language more closely and determine whether that student is attentive.



FIGURE 11.11 Informal face-to-face instruction (credit: "Creative writing class-fine arts center" by Leesa/ Wikimedia Commons, CC BY 2.0)

- **Frame for a comparison-and-contrast topic sentence (Structure #2):**

  One way (subject 1) _____ and (subject 2) _____ are different is (difference) _____; a way they are alike is (similarity) _____.

  One way virtual learning and face-to-face learning are different is in the way students choose to be attentive; a way they are alike is that student responsibility is a key element.

- **Structure #2 for comparison-and-contrast paragraph about virtual learning and face-to-face learning:**

  identification of two subjects followed by a point-by-point discussion

  point 1: discussion of a difference between virtual learning and face-to-face learning

  point 2: discussion of a similarity of virtual learning and face-to-face learning

Model comparison-and-contrast paragraph about virtual learning and face-to-face learning (Structure #2)

One way that virtual learning and face-to-face learning are different is in the methods students choose to be attentive, *but* they are alike in that student responsibility is a key factor in both. *With* virtual learning, students must clear their study space of distractions and be sure to have reliable Internet connections. *Alternatively*, in face-to-face learning, the study area and Internet connections are already in place and are provided by the school. *However*, in both styles of classes, students have the responsibility to be attentive in order to understand what is happening in the classroom and what is expected as far as readings, lab work, and other outside assignments.

Problem and Solution

- **Frame for problem-and-solution topic sentence (Structure #1):**

  The issue of (predicament/s or challenging issue/s) _____ was solved/can be solved by (what was done/what should be done) _____.

  The issue of juveniles repeatedly committing crimes can be solved by treating juvenile offenders as adults.

- **Structure #1 for problem-and-solution paragraph about trying juveniles as adults:**

  an explanation of problem(s), followed by the solution

  problem: number of juveniles committing serious crimes is rising

  problem: facilities to which these juveniles are sent have failed to rehabilitate them

  problem: youths continue their life of crime

  solution: juveniles should be tried as adults

Model problem-and-solution paragraph about trying juveniles as adults (Structure #1)

Across the country, the number of juveniles committing serious crimes is rising dramatically. The facilities to which these juveniles are sent have failed to rehabilitate them, *and* a high percentage of the youths continue with their life of crime. Law-abiding citizens of the country, *however*, realize that this situation must change. *By* trying juveniles as adults, the issue of juveniles repeatedly committing crimes can be solved.

- **Frame for problem-and-solution topic sentence (Structure #2):**

  By (what was done/what should be done) _____, the issue of (predicament/s or challenging issue/s) _____ would be solved/was solved.

  By trying juveniles as adults, the issue of juveniles repeatedly committing crimes can be solved.

- **Structure #2 for problem-and-solution paragraph about trying juveniles as adults:**

  an explanation of a solution, followed by the problems that necessitated it

  solution: juveniles are tried as adults

  problem: number of juveniles committing serious crimes is rising

  problem: facilities to which these juveniles are sent have failed to rehabilitate them

problem: youths continue their life of crime

Model problem-and-solution paragraph about trying juveniles as adults (Structure #2)

Juveniles should be tried as adults. Across the country, the number of juveniles committing serious crimes is rising dramatically. The facilities to which these juveniles are sent have failed to rehabilitate them, *though*, and a high percentage of the youths continue with their life of crime. *Because of this lack of success,* law-abiding citizens of the country realize that these problems must be addressed immediately.

Definition

- **Frame for definition topic sentence:**

  To most people, (subject) is _____; however, it really is _____.

  To most people, a hero is a famous person who is admired or idealized; however, a hero is really anyone who goes out of the way to help others.

- **Structure for definition paragraph:**

  common definition or denotation: a famous person who is admired or idealized

  writer's expanded definition or connotation: anyone who goes out of the way to help others

  explanation/examples/details: healthcare professionals

  explanation/examples/details: grocery and convenience store workers

Model definition paragraph

To most people, a hero is a famous person who is admired or idealized; however, it really is anyone who goes out of the way to help others. For example, during the pandemic that began in 2020, a number of people with everyday jobs suddenly became heroes. First, the need for healthcare went up sharply, and healthcare professionals worked many overtime hours and risked their lives to diagnose and treat others, with the hope of saving them. Consequently, these people became heroes. Also, because most people stayed at home and restaurants were closed, people purchased more food from grocery stores. Therefore, the people who delivered the food to grocery stores and the essential workers at the grocery stores became heroes to those who depended on their services.



FIGURE 11.12 Health care workers in 2020 during the COVID-19 pandemic (credit: "Healthcare workers wearing PPE" by Javed Anees/Wikimedia Commons, CC0)

Checking Validity

After you have completed your paragraphs, check the validity, or soundness, of their logic. To perform this check, begin by assessing the logical connection of your topic sentences to your thesis statement. Because the

topic sentences are the major supporting statements for your thesis, each one should support it. Ask and answer the following questions of each topic sentence:

1. Does this topic sentence reflect the reasoning strategy you are using?
2. Does this topic sentence directly support the thesis statement?
3. Does the topic sentence make a sensible point?
4. What is the topic sentence's purpose? Is it to provide
    - background information;
    - a reason;
    - an illustration;
    - an explanation; or
    - a response to a counterclaim? (See Position Argument: Practicing the Art of Rhetoric for more information about counterclaims.)

If you have trouble answering any of the questions and cannot establish the sentence's validity, consider revising the topic sentence.

Next, check the validity of your body paragraphs' development. To perform this check, copy and paste to a new page one topic sentence and the sentences that develop it. Then, answer these questions on all the major supporting ideas that you develop for each topic sentence:

1. Does this body paragraph reflect the reasoning strategy you are using?
2. Does developing the idea in this body paragraph directly support its topic sentence?
3. Does this idea make a sensible point?
4. What is the purpose of developing this idea? Is it to provide
    - background information;
    - a reason for the topic sentence's claim;
    - an illustration of the topic sentence's point;
    - an explanation of the sentence's point; or
    - evidence demonstrating the topic sentence's point?

If you have trouble answering any of the questions and cannot establish a supporting idea's validity, consider revising or replacing the idea with one that you can logically develop to prove, illustrate, or explain the topic idea.

Further Reading

The following titles are well-known examples of writings that use the reasoning strategies of analogy, cause and effect, classification and division, comparison and contrast, problem and solution, and definition.

Kennedy, John. "Inaugural Address." *John F. Kennedy Presidential Library and Museum,* 20 Jan. 1961, https://www.jfklibrary.org/learn/about-jfk/historic-speeches/inaugural-address. Accessed 25 Jan. 2021.

King, Martin Luther, Jr. "Letter from a Birmingham Jail [King, Jr.]." *African Studies Center—University of Pennsylvania,* 16 April 1963, https://www.africa.upenn.edu/Articles_Gen/Letter_Birmingham.html. Accessed 1 Feb. 2021.

Lincoln, Abraham. "The Gettysburg Address." *Abraham Lincoln Online*, 19 Nov. 1863, http://www.abrahamlincolnonline.org/lincoln/speeches/gettysburg.htm. Accessed 1 Feb. 2021.

Yousafzai, Malala. "Nobel Peace Prize Acceptance Speech." *Malala.org*, 10 Dec. 2014, https://www.malala.org/newsroom/archive/malala-nobel-speech. Accessed 23 Jan. 2021.

Works Cited

Kerlin, Kat. "Wildlife Experience High Price of Oil." *UC Davis,* 2 June 2015, www.ucdavis.edu/news/wildlife-experience-high-price-oil/. Accessed 5 Mar. 2021.

Pennisi, Elizabeth. "$180 Million DNA 'Barcode' Project Aims to Discover 2 Million New Species." *Science,* 6 Jun. 2019, https://www.sciencemag.org/news/2019/06/180-million-dna-barcode-project-aims-discover-2-million-new-species. Accessed 1 Feb. 2021.

Plato. "Book VII." *The Republic*. E-book, Translated by B. Jowett, Project Gutenberg, 2016. https://www.gutenberg.org/files/1497/1497-h/1497-h.htm#link2H_4_0010.

"Poster Design Guide." *Cain Project*, 2003. Rice University, www.owlnet.rice.edu/~cainproj/designing. Accessed 25 Jan. 2021.

Royal Shakespeare Company. *Macbeth,* https://www.rsc.org.uk/shakespeare-learning-zone/macbeth. Accessed 26 Apr. 2021.

Thurman, Susan Sommers, and William L. Gary, Jr. *Critical Literacy: Integrating Critical Thinking, Reading, and Writing*. Cognella, Inc., 2019.

"World's First Centre for Rapid DNA Species Identification Opens in Guelph." *CBC News*, 9 May 2007, https://www.cbc.ca/news/technology/world-s-first-centre-for-rapid-dna-species-identification- opens-in-guelph-1.663503. Accessed 1 Feb. 2021.