



Writing Exercises for Engineers and Scientists

Review of Definitions

[Parts of Speech \(1\)](#)

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[Phrases and Clauses](#)

These exercises are designed to help you, the engineer or scientist, master various mechanical and stylistic aspects of engineering writing and scientific writing. For these exercises to work, please do not have your browser override the selection of colors.

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Last updated 03/04

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Recognizing Parts of Speech (Basic)

Review of Definitions
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This exercise tests your knowledge of the basic parts of speech such as "noun," "verb," "adjective," and "adverb." These are terms that someone should know as he or she begins a serious study of scientific writing. Many terms tested for in this exercise come from E. D. Hirsch's book *Cultural Literacy*. It is not necessary that you have a "textbook definition" of each term, but you should have a working knowledge of these terms so that you can understand discussions in which these terms are used. For this exercise to be effective, do not override this document's choice of colors. Also, if possible, remove your browser's option to underline links.

1. Click on the subject of the second sentence.

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #1 correctly.

Exercise: Its slope collapsing, the **mountain** emitted a cloud of hot rock and gas.

Discussion: The word "mountain" is the subject, and the word "emitted" is the verb.
The word "cloud" is the object.

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2. Click on at least one adjective that appears in the first three sentences.

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the

mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #2 correctly.

Exercise: Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the

mountain emitted a cloud of **hot** rock and gas. In minutes the cloud devastated **500 square** kilometers of forests and lakes.

Discussion: Adjectives are defined on page 274 in *The Craft of Scientific Writing*.

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3. **Click on at least one adverb.**

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #3 correctly.

Exercise: Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were **well** documented, its origin is **not well** understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Discussion: The words "well," "not," and "well" are adverbs. Note that although many adverbs end in *-ly*, not all adverbs do, as this example shows. Adverbs are defined on page 274 in *The Craft of Scientific Writing*.

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4. **Click on at least one prepositional phrase.**

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #4 correctly.

Exercise: Mount St. Helens erupted **on May 18, 1980**. Its slope collapsing, the mountain emitted a cloud **of hot rock and gas**. **In minutes** the cloud devastated 500 square kilometers **of forests and lakes**. Although the effects **of the eruption** were well documented, its origin is not well understood. To understand the origin **of volcanic eruptions**, we have to determine how much water the magma contains.

Discussion: A discussion of prepositions and prepositional phrases can be found at the following [link](#). To return from this site, simply click on the "back" button on your

browser.

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5. Click on the subject of the following sentence.

In support of this theory, several witnesses reported a brilliant flash,
a long pause, and then a fireball.

Give up?

Congratulations, you have answered #5 correctly.

Exercise: In support of this theory, several **witnesses** reported a brilliant flash, a long pause, and then a fireball.

Discussion: The word "witnesses" is the subject, and the word "reported" is the verb. The words "flash," "pause," and "fireball" are objects of the verb, the word "support" is the object of the preposition "in," and the word "theory" is the object of the preposition "of."

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6. Click on at least one verb in the following sentence.

Despite the testimonies of these witnesses, this theory has not gained wide acceptance because no distinctively shattered metal has been found in the wreckage.

Give up?

Congratulations, you have answered #6 correctly.

Exercise: Despite the testimonies of these witnesses, this theory **has not gained** wide acceptance because no distinctively shattered metal **has been found** in the wreckage.

Discussion: The words "has gained" form the verb of the independent clause (the word "not" is just an adverb), and the words "has been found" constitute the verb of the dependent clause.

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7. Click on at least one adverb.

This section presents three theories to explain the explosion of TWA Flight 800. The first theory, which the FBI has pursued vigorously, was that a bomb on board the plane exploded. In support of this theory, several witnesses reported a brilliant flash, a long pause, and

then a fireball. However, this theory has not gained wide acceptance.

Give up?

Congratulations, you have answered #7 correctly.

Exercise: This section presents three theories to explain the explosion of TWA Flight

800. The first theory, which the FBI has pursued **vigorously**, was that a bomb on board the plane exploded. In support of this theory, several witnesses reported a brilliant flash, a long pause, and then a fireball. **However**, this theory has **not** gained wide acceptance.

Discussion: The words "vigorously," "however," and "not" are adverbs. Note that although many adverbs end in *-ly*, not all adverbs do, as this example shows. Adverbs are defined on page 274 of *The Craft of Scientific Writing*.

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8. Click on at least one prepositional phrase.

Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion in a fuel tank is difficult.

Give up?

Congratulations, you have answered #8 correctly.

Exercise: Earlier tests **on a Boeing 747** revealed that the fuel temperature **in the tank** could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion **in a fuel tank** is difficult.

Discussion: A discussion of prepositions and prepositional phrases can be found at the following [link](#). To return from this site, simply click on the "back" button on your browser.

You have reached the end of this exercise.

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Recognizing Parts of Speech (Advanced)

Review of Definitions
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This exercise tests your knowledge of advanced parts of speech such as "conjunction," "infinitive," "participle," and "gerund." These are terms that someone should know as he or she begins a serious study of scientific writing. Many terms tested for in this exercise come from E. D. Hirsch's book *Cultural Literacy*. It is not necessary that you have a "textbook definition" of each term, but you should have a working knowledge of these terms so that you can understand discussions in which these terms are used. For this exercise to be effective, do not override this document's choice of colors. Also, if possible, remove your browser's option to underline links.

1. Click on at least one infinitive phrase.

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #1 correctly.

Exercise: Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. **To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.**

Discussion: A discussion of infinitive phrases can be found on page 275 in *The Craft of Scientific Writing*.

2. Click on the one participial phrase.

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #2 correctly.

Exercise: Mount St. Helens erupted on May 18, 1980. **Its slope collapsing**, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Discussion: A discussion of participial phrases can be found on page 276.

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3. **Click on one coordinating conjunction.**

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #3 correctly.

Exercise: Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock **and** gas. In minutes the cloud devastated 500 square kilometers of forests **and** lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Discussion: The following link presents a discussion of [coordinating conjunctions](#).

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4. Click on at least one dependent clause.

Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. In minutes the cloud

devastated 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine how much water the magma contains.

Give up?

Congratulations, you have answered #4 correctly.

Exercise: Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the

mountain emitted a cloud of hot rock and gas. In minutes the cloud devastated 500 square kilometers of forests and lakes. **Although the effects of the eruption were well documented**, its origin is not well understood. To understand the origin of volcanic eruptions, we have to determine **how much water the magma contains**.

Discussion: A discussion of dependent clauses can be found at the following [link](#). To return from this site, simply click on the "back" button on your browser.

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5. Click on at least one dependent clause.

Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion in a fuel tank is difficult.

Give up?

Congratulations, you have answered #5 correctly.

Exercise: Earlier tests on a Boeing 747 revealed **that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but** military experts insist **that creating an explosion in a fuel tank is difficult.**

Discussion: A discussion of dependent clauses can be found at the following [link](#). To return from this site, simply click on the "back" button on your browser.

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6. **Click on at least one infinitive phrase.**

Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion in a fuel tank is difficult.

Give up?

Congratulations, you have answered #6 correctly.

Exercise: Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough **to vaporize**, allowing a spark **to create a fire**, but military experts insist that creating an explosion in a fuel tank is difficult.

Discussion: A discussion of infinitive phrases can be found on page 275 of *The Craft of Scientific Writing*.

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7. Click on one participial phrase.

Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion in a fuel tank is difficult.

Give up?

Congratulations, you have answered #7 correctly.

Exercise: Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, **allowing a spark to create a fire**, but military experts insist that **creating an explosion in a fuel tank** is difficult.

Discussion: A discussion of participial phrases can be found on page 276.

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8. **Click on the coordinating conjunction.**

Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion in a fuel tank is difficult.

Give up?

Congratulations, you have answered #8 correctly.

Exercise: Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, **but** military experts insist that creating an explosion in a fuel tank is difficult.

Discussion: The following link presents a discussion of [coordinating conjunctions](#).

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9. Click on the gerundial phrase.

Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, but military experts insist that creating an explosion in a fuel tank is difficult.

Give up?

Congratulations, you have answered #9 correctly.

Exercise: Earlier tests on a Boeing 747 revealed that the fuel temperature in the tank could have been high enough to vaporize, allowing a spark to create a fire, military experts insist that **creating an explosion in a fuel tank** is difficult.

Discussion: A discussion of gerundial phrases can be found on page 275. This gerundial phrase serves as the subject of a dependent clause.

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10. Click on the verb in the passive voice.

According to the second theory for the explosion, a shoulder-fired missile struck the plane and caused the fuel tank to explode. In this theory, the missile was launched from a boat.

Give up?

Congratulations, you have answered #10 correctly.

Exercise: According to the second theory for the explosion, a shoulder-fired missile struck the plane and caused the fuel tank to explode. In this theory, the missile **was launched** from a boat.

Discussion: The verb "was launched" is passive, and the verbs "struck" and "caused" are active. A discussion of active and passive voice occurs on pages 104-109.

You have reached the end of this exercise.

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Recognizing Phrases and Clauses

Review of Definitions

[Parts of Speech \(Basic\)](#)

[Parts of Speech \(Advanced\)](#)

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This exercise tests your understanding of phrases and clauses--these terms are important for an understanding of what constitutes a sentence. For each group of words, click on the appropriate answer: dependent clause, independent clause, infinitive phrase, participial phrase, or prepositional phrase. Should you answer correctly, you will be sent to the next group of words. Should you answer incorrectly, you will be sent to a definition of what you have chosen (to return, simply click the back button on your browser). For this exercise to be effective, please do not have your browser override this document's colors.

1. **although the Titanic had water tight compartments**

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

[prepositional phrase](#)

Congratulations, you have answered #1 correctly.

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2. to test the steel

dependent clause

independent clause

infinitive phrase

participial phrase

prepositional phrase

Congratulations, you have answered #2 correctly.

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3. **into the icy water**

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

[prepositional phrase](#)

Congratulations, you have answered #3 correctly.

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4. **when the lifeboats were lowered**

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

prepositional phrase

Congratulations, you have answered #4 correctly.

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5. sinking in less than three hours

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

[prepositional phrase](#)

Congratulations, you have answered #5 correctly.

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6. **otherwise, a ship would have arrived earlier**

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

[prepositional phrase](#)

Congratulations, you have answered #6 correctly.

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7. **below the bulkheads**

dependent clause

independent clause

infinitive phrase

participial phrase

prepositional phrase

Congratulations, you have answered #7 correctly.

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8. **however, many lifeboats were not filled**

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

[prepositional phrase](#)

Congratulations, you have answered #8 correctly.

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9. **to understand the ship's rapid demise**

[dependent clause](#)

independent clause

infinitive phrase

participial phrase

prepositional phrase

Congratulations, you have answered #9 correctly.

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10. **the hull breaking apart underwater**

[dependent clause](#)

[independent clause](#)

[infinitive phrase](#)

[participial phrase](#)

[prepositional phrase](#)

You have reached the end of this exercise.

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Recognizing Run-Ons and Fragments (Basic)

Exercise Links:

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Related Links:

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[Run-Ons \(Purdue\)](#)

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The sentence is the fundamental unit of expression in professional writing. To maintain credibility as a professional, you have to know what constitutes a sentence. In the exercise below, identify whether each of the highlighted word groups is a sentence (S), fragment (F), or run-on (RO). Note that a run-on is a specific grammatical term referring not to a long sentence, but to a group of words containing two or more [independent clauses](#) that are incorrectly joined. Once you have clicked on the right answer, you will view a discussion. Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not override this document's choice of font colors.

-
1. Although the shock sphere is still strong at the end of the fireball's life, the sphere is no longer strong enough to heat the air to incandescence.

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #1 correctly.

Original: Although the shock sphere is still strong at the end of the fireball's life, the sphere is no longer strong enough to heat the air to incandescence.

Discussion: No grammatical mistake exists. This group of words is a sentence with an introductory dependent clause coupled to an independent clause.

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2. **At that point the shock sphere is no longer strong enough to heat the air to incandescence, however, the sphere is still very**

strong.

Sentence

Fragment

Run-On

Congratulations, you have answered #2 correctly.

Original: At that point the shock sphere is no longer strong enough to heat the air to incandescence, however, the sphere is still very strong.

Revision: At that point, the shock sphere is no longer strong enough to heat the air to **incandescence**. **However**, the sphere is very strong.

Discussion: The original was a run-on. The adverb "however" cannot join two independent clauses. Note that several ways exist to correct this run-on. Also note that beginning a sentence with "however" is not an error. More discussion exists in *CE* (pages 115 and 129) and *CSW* (259, 270).

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3. **At the end of the fireball's life, the shock sphere no longer being strong enough to heat the air to incandescence.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #3 correctly.

Original: At the end of the fireball's life, the shock sphere no longer being strong enough to heat the air to incandescence.

Revision: At the end of the fireball's life, the shock sphere **is** no longer strong enough to heat the air to incandescence.

Discussion: The original was a fragment without a verb. The verb "is" makes this group of words a sentence. More discussion exists in *CE* (page 111).

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4. Both sites produce the same three sources of energy: coal, oil, and natural gas. **Both sites, however, do not produce these sources in the same proportions.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #4 correctly.

Original: Both sites produce the same three sources of energy: coal, oil, and natural gas. Both sites, however, do not produce these sources in the same proportions.

Discussion: No grammatical mistake exists. The first sentence is a simple independent clause that introduces a list, and the second sentence is a simple independent clause with the adverb "however" inserted as a parenthetical between the subject and the verb.

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-
5. **The plant shutdown was more than just another company having to close its doors, Bolens was a way of life for hundreds of families in the small town where the company was located.**

Sentence

Fragment

Run-On

Congratulations, you have answered #5 correctly.

Original: The plant shutdown was more than just another company having to close its doors, Bolens was a way of life for hundreds of families in the small town where the company was located.

Revision: The plant shutdown was more than just another company having to close its **doors--Bolens** was a way of life for hundreds of families in the small town where the company was located.

Discussion: The original was a run-on. While such a run-on is allowed in informal writing, it is not accepted in formal writing. Although several ways, including a semicolon, exist to join these two independent clauses, the em-dash perhaps works best to show their relationship. More discussion exists in *CE* (pages 106, 130).

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6. **Both designs produce the same three pollutants (nitrogen oxides, sulfur dioxides, and hydrocarbons) in roughly the same proportions, therefore, both designs have similar effects on the environment.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #6 correctly.

Original: Both designs produce the same three pollutants (nitrogen oxides, sulfur dioxides, and hydrocarbons) in roughly the same proportions, therefore, both designs have similar effects on the environment.

Revision: Both designs produce the same three pollutants (nitrogen oxides, sulfur dioxides, and hydrocarbons) in roughly the same **proportions. Therefore**, both designs have similar effects on the environment.

Discussion: The original was a run-on. The adverb "therefore" cannot join two independent clauses. More discussion exists in *CE* (pages 115 and 129) and *CSW* (259, 270).

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7. **Because both designs produce the same three pollutants (nitrogen oxides, sulfur dioxides, and hydrocarbons) in roughly the same proportions, both designs have similar effects on the environment.**

Sentence

Fragment

Run-On

Congratulations, you have answered #7 correctly.

Original: Because both designs produce the same three pollutants (nitrogen oxides, sulfur dioxides, and hydrocarbons) in roughly the same proportions, both designs have similar effects on the environment.

Discussion: No grammatical mistake exists. This group of words is a sentence with an introductory dependent clause coupled to an independent clause.

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8. **An oval shape is necessary in the die cavity, otherwise, the flow of metal from the hammering would be restricted.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #8 correctly.

Original: An oval shape is necessary in the die cavity, otherwise, the flow of metal from the hammering would be restricted.

Revision: An oval shape is necessary in the die **cavity; otherwise**, the flow of metal from the hammering would be restricted.

Discussion: The original group of words was a run-on. Because the word "otherwise" is not a coordinating conjunction, it cannot join two independent clauses. More discussion exists in *CE* (pages 115 and 129) and *CSW* (259, 270).

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9. **Not only does fresh ventilation reduce moisture levels in animal pens, but it also improves the health and longevity of livestock.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #9 correctly.

Original: Not only does fresh ventilation reduce moisture levels in animal pens, but it also improves the health and longevity of livestock.

Discussion: No grammatical mistake exists. Because the word "but" is a coordinating conjunction, it can join two independent clauses.

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-
10. **Primary bodies are those that are outside the zone of protection, thus, they are susceptible to the effects of a direct lightning stroke.**

Sentence

Fragment

Run-On

Congratulations, you have answered #10 correctly.

Original: Primary bodies are those that are outside the zone of protection, thus, they are susceptible to the effects of a direct lightning stroke.

Revision: Primary bodies are those that are outside the zone of **protection**. **Thus**, they are susceptible to the effects of a direct lightning stroke.

Discussion: The original was a run-on. The adverb "thus" cannot join two independent clauses. More discussion exists in *CE* (pages 115 and 129) and *CSW* (259, 270).

You have reached the end of this exercise.

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Parallelism, Pronoun References, and Modifier Placement



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Each of the following may have one of the following errors: faulty parallelism, unclear pronoun reference, or misplaced modifier. Click on the word or phrase that causes the error. If no error exists, click on "No error." Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not override this document's choice of font colors. Also, these exercises work best when you remove the underline option for links in your browser.

1. [Although design flaws in the Titanic were realized soon after its sinking in 1912, the reasons for the severe damage inflicted by the iceberg remained a mystery until its discovery in 1985.](#)

[\(No error\)](#)

[Give up?](#)

Congratulations, you have answered #1 correctly.

Discussion: Incorrect pronoun reference. Although the writer intended the second "its" to refer to the Titanic, someone could misread the reference to be the iceberg. To correct, change the second "its" to "Titanic's." More discussion in *CSW* (pages 93-94).

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2. Once the earthquake has subsided, you are not yet out of danger.
Often the electricity has gone out and it is dark. However, striking a match or any open flame may cause a gas explosion.

(No error)

Give up?

Congratulations, you have answered #2 correctly.

Discussion: Faulty parallelism. The gerundial phrase "striking a match" is not parallel with the noun phrase "any open flame." Moreover, the position of "striking" causes an ambiguity: Are open flames to be struck? To correct, replace the words "striking a match" with "a lit match." More discussion in *CE* (page 123) and *CSW* (page 259).

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3. At this time, the Department of Energy is only considering Yucca Mountain as a possible storage site for nuclear waste. For that reason, this report will not consider other sites.

(No error)

[Give up?](#)

Congratulations, you have answered #3 correctly.

Discussion: Misplaced modifier. Although the writer intended the word "only" to modify "Yucca Mountain," someone could easily assume that the word modifies "considering." To correct, move "only" such that it precedes "Yucca Mountain." More discussion in *CE* (pages 119, 122) and *CSW* (page 92).

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4. Scientists have problems assuring that the viral vectors apply themselves to the correct cells. When implanted, they tend to migrate throughout the body and miss targeted cells more often than not.

(No error)

Give up?

Congratulations, you have answered #4 correctly.

Discussion: Incorrect pronoun reference. To avoid confusion, the word "they" should be "vectors." More discussion in CSW (pages 93-94).

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5. Reductions of up to 80 percent in heat and mass transfer coefficients were measured due to outgassing.

(No error)

Give up?

Congratulations, you have answered #5 correctly.

Discussion: Misplaced modifier. Were the reductions measured because of outgassing, or were the reductions at the level of 80 percent because of outgassing? Because the writer intended the second possibility, the sentence should be rewritten: "Measured were reductions of up to 80 percent in heat and mass transfer coefficients. These large reductions occurred because of outgassing." More discussion in *CE* (page 119) and *CSW* (page 92).

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6. The objectives of the Viking mission were to obtain high-resolution images of the Martian surface, characterize the structure and composition of the atmosphere and surface, and to search for evidence of life.

(No error)

Give up?

Congratulations, you have answered #6 correctly.

Discussion: Faulty parallelism. The list of three verb phrases is not parallel. To correct, insert the word "to" before "characterize." More discussion in *CE* (page 123) and *CSW* (page 259).

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7. Mars and Earth are similar in that both are rapidly rotating planets and both have seasonal climate changes.

(No error)

Give up?

Congratulations, you have answered #7 correctly.

Discussion: no error.

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8. The decoder was either faster than the worst case specified by the manufacturer, or the HC11 held the data longer than the minimum time specified by Motorola.

(No error)

Give up?

Congratulations, you have answered #8 correctly.

Discussion: Faulty parallelism. With an either/or construction, what appears on the right of the "either" must be parallel with what appears on the right side of the "or." More discussion in *CE* (page 123) and *CSW* (page 259).

Correction: **Either the decoder was** faster than the worst case specified by the manufacturer, or the HC11 held the data longer than the minimum time specified by Motorola.

You have reached the end of this exercise.

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Recognizing Run-Ons and Fragments (Advanced)



Exercise Links:

[Grammar Exercise #1](#)

[Grammar Exercise #2](#)

[Punctuation Exercises](#)

[Usage Exercises](#)

Related Links:

[Fragments \(Purdue\)](#)

[Run-Ons \(Purdue\)](#)

Site Links:

[Writing Guidelines](#)

[Writing Exercises](#)

The sentence is the fundamental unit of expression in professional writing. To maintain credibility as a professional, you have to know what constitutes a sentence. In the exercise below, identify whether each of the highlighted word groups is a sentence (S), fragment (F), or run-on (RO). Note that a run-on is a specific grammatical term referring not to a long sentence, but to a group of words containing two or more independent clauses that are incorrectly joined. Once you have clicked on the right answer, you will view a discussion. Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not override this document's choice of font colors.

-
1. **Both bombs produce the same three effects: heat, blast, and radiation; however, the bombs do not produce the effects in the same proportions.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #1 correctly.

Original: Both bombs produce the same three effects: heat, blast, and radiation; however, the bombs do not produce the effects in the same proportions.

Revision: Both bombs produce the same three effects: heat, blast, and **radiation**. **However,** the bombs do not produce the effects in the same proportions.

Discussion: Original was a run-on. After a list following a colon, the sentence must end. More discussion in *CE* (page 103).

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2. Both bombs produce the same three effects: heat, blast, and radiation. **The first of which usually causes the most fatalities.**

Sentence

Fragment

Run-On

Congratulations, you have answered #2 correctly.

Original: Both bombs produce the same three effects: heat, blast, and radiation. The first of which usually causes the most fatalities.

Revision: Both bombs produce the same three effects: heat, blast, and radiation. The first of **these three** usually causes the most fatalities.

Discussion: The original second group of words is a fragment. The word "which" makes that second group of words a dependent clause, which by definition cannot stand alone as a sentence. More discussion in *CE* (page 111).

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3. **Heat, blast, and radiation are the bomb's three main effects, the first of which usually causes the most fatalities.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #3 correctly.

Original: Heat, blast, and radiation are the bomb's three main effects, the first of which usually causes the most fatalities.

Discussion: no mistake. The clause following the word "effects" is dependent and therefore can be joined with just a comma to the initial independent clause.

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4. **Both Mars and Earth are rapidly rotating planets, both have seasonal climate changes, and both have heat exchange of solar radiation between the atmosphere and the surface.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Congratulations, you have answered #4 correctly.

Original: Both Mars and Earth are rapidly rotating planets, both have seasonal climate changes, and both have heat exchange of solar radiation between the atmosphere and the surface.

Discussion: This group of words is a periodic sentence with the series of parallel clauses joined by the coordinating conjunction "and."

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5. **The Great Comet of 1811 not only had a large nucleus (between 30 and 40 kilometers), it also had a large coma, extending a length the diameter of the Sun.**

Sentence

Fragment

Run-On

Congratulations, you have answered #5 correctly.

Original: The Great Comet of 1811 not only had a large nucleus (between 30 and 40 kilometers), it also had a large coma, extending a length the diameter of the Sun.

Revision: The Great Comet of 1811 not only had a large nucleus (between 30 and 40 kilometers), **but** it also had a large coma, extending a length the diameter of the Sun.

Discussion: The original group of words is technically a run-on, although it is accepted as a sentence in many informal writing situations. To make it an undisputed sentence, you should add the coordinating conjunction "but."

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6. **The higher the temperature, the lower the pressure.**

[Sentence](#)

[Fragment](#)

[Run-On](#)

Trick question.

Original: The higher the temperature, the lower the pressure.

Possible Revision: The higher the temperature **is**, the lower the pressure **is**.

Discussion: This group of words is a technically a fragment that almost everyone lets pass as a sentence. Most people would treat this word grouping as having an understood verb in both the dependent clause and the independent clause (much as a command has the understood subject "you"). Should you feel uncomfortable with treating this word grouping as a sentence, simply add the verbs in the dependent and independent clauses. More discussion in *CE* (page 111).

You have reached the end of this exercise.

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Advanced Exercises on Grammar, Punctuation, and Usage



Exercise Links:

[Grammar Exercises](#)

[Punctuation Exercises](#)

[Usage Exercises](#)

Site Links:

[Writing Guidelines](#)

[Writing Exercises](#)

Each of the following paragraphs has **four** mistakes in grammar, punctuation, or usage. Possible mistakes are as follows: run-on, fragment, subject-verb disagreement, wrong word, missing comma, undesired comma, colon error, unclear pronoun reference, and possessive error. In order of mistakes through the paragraph, click on the word(s) or punctuation that causes the mistake.

Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*). To make this exercise even more challenging, remove the underlining-of-links option from your browser's list of preferences.

Paragraph #1

A greenhouse is a glass building used to grow plants. A greenhouse has transparent glass that allows the sunlight to pass through, but does not allow the heat inside to escape. The same affect occurs on the earth. The suns radiation passes through the atmosphere to heat the earth's surface. When heated, the earth's surface produces infrared radiation, which has a longer wavelength than that of sunlight. This infrared radiation rises into the atmosphere where gases, such as carbon dioxide, prevents the infrared radiation from escaping into space. The concentrations of these gases which are called greenhouse gases, control how much infrared radiation escapes. The retained radiation heats the earth's atmosphere,

thus keeping the planet warm.

Give up?

Congratulations, you have found the paragraph's first mistake.

Discussion: wrong word (*CE*, page 97; *CSW*, page 269).

A greenhouse is a glass building used to grow plants. A greenhouse has transparent glass that allows the sunlight to pass through, but does not allow the heat inside to escape. The same **effect** occurs on the earth. The sun's radiation passes through the atmosphere to heat the earth's surface. When heated, the earth's surface produces infrared radiation, which has a longer wavelength than that of sunlight. This infrared radiation rises into the atmosphere where gases, such as carbon dioxide, prevents the infrared radiation from escaping into space. The concentrations of these gases which are called greenhouse gases, control how much infrared radiation escapes. The retained radiation heats the earth's atmosphere, thus keeping the planet warm.

Give up?

Congratulations, you have found the paragraph's second mistake.

Discussion: possessive mistake (*CE*, page 124; *CSW*, page 271; or Strunk).

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A greenhouse is a glass building used to grow plants. A greenhouse has transparent glass that allows the sunlight to pass through, but does not allow the heat inside to escape. The same **effect** occurs on the earth. The **sun's** radiation passes through the atmosphere to heat the earth's surface. When heated, the earth's surface produces infrared radiation, which has a longer wavelength than that of sunlight. This infrared radiation rises into the atmosphere where gases, such as carbon dioxide, prevents the infrared radiation from escaping into space. The concentrations of these gases which are called greenhouse gases, control how much infrared radiation escapes. The retained radiation heats the earth's atmosphere,

thus keeping the planet warm.

Give up?

Congratulations, you have found the paragraph's third mistake.

Discussion: subject-verb disagreement (*CE*, pages 131-132; *CSW*, page 259-260).

A greenhouse is a glass building used to grow plants. A greenhouse has transparent glass that allows the sunlight to pass through, but does not allow the heat inside to escape. The same **effect** occurs on the earth. The **sun's** radiation passes through the atmosphere to heat the earth's surface. When heated, the earth's surface produces infrared radiation, which has a longer wavelength than that of sunlight. This infrared radiation rises into the atmosphere where gases, such as carbon dioxide, **prevent** the infrared radiation from escaping into space. The concentrations of these gases which are called greenhouse gases, control how much infrared radiation escapes. The retained radiation heats the earth's atmosphere, thus keeping the planet warm.

Give up?

Congratulations, you have found the paragraph's final mistake.

Discussion: missing parenthetical comma (*CE*, pages 103-104; *CSW*, page 263).

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A greenhouse is a glass building used to grow plants. A greenhouse has transparent glass that allows the sunlight to pass through, but does not allow the heat inside to escape. The same **effect** occurs on the earth. The **sun's** radiation passes through the atmosphere to heat the earth's surface. When heated, the earth's surface produces infrared radiation, which has a longer wavelength than that of sunlight. This infrared radiation rises into the atmosphere where gases, such as carbon dioxide, **prevent** the infrared radiation from escaping into space. The concentrations of these **gases, which** are called greenhouse gases, control how much infrared radiation escapes. The retained radiation heats the earth's atmosphere, thus keeping the planet warm.

Paragraph #2

During the last century, the concentrations of greenhouse gases have increased substantially [Holman, 1985]. Scientists believe that further increases could cause excess warming of the earth's climate. Moreover, many scientists believe this warming could produce side effects. For example, the changing of the earth's wind patterns. These wind patterns control the amount of rain received in a particular area. If the greenhouse gases warm the earth's climate too much, areas that now receive plenty of rainfall could become deserts, moreover, some scientists speculate that additional increases in warming could cause another effect, a rise in the ocean levels ["Greenhouse," 1990]. How would this rise occur? An increase in global temperature would melt the polar ice caps, thus emptying more water into the oceans. They also predict that this ocean rise, which may be as high as 1 meter could flood port cities and coastal lands.

Give up?

Congratulations, you have found the paragraph's first mistake.

Discussion: not a complete sentence (*CE*, page 111).

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During the last century, the concentrations of greenhouse gases have increased substantially [Holman, 1985]. Scientists believe that further increases could cause excess warming of the earth's climate. Moreover, many scientists believe this warming could produce side effects. **An example would be the changing of the earth's wind patterns.** These wind patterns control the amount of rain received in a particular area. If the greenhouse gases warm the earth's climate too much, areas that now receive plenty of rainfall could become deserts, moreover, some scientists speculate that additional increases in

warming could cause another effect, a rise in the ocean levels ["Greenhouse," 1990]. How would this rise occur? An increase in global temperature would melt the polar ice caps, thus emptying more water into the oceans. They also predict that this ocean rise, which may be as high as 1 meter could flood port cities and coastal lands.

Give up?

Congratulations, you have found the paragraph's second mistake.

Discussion: run-on sentence (*CE*, page 129; *CSW*, page 258).

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During the last century, the concentrations of greenhouse gases have increased substantially [Holman, 1985]. Scientists believe that further increases could cause excess warming of the earth's climate. Moreover, many scientists believe this warming could produce side effects. **An example would be the changing of the earth's wind patterns.** These wind patterns control the amount of rain received in a particular area. If the greenhouse gases warm the earth's climate too much, areas that now receive plenty of rainfall could become **deserts**. **Moreover**, some scientists speculate that additional increases in warming could cause another effect, a rise in the ocean levels ["Greenhouse," 1990]. How would this rise occur? An increase in global temperature would melt the polar ice caps, thus emptying more water into the oceans. They also predict that this ocean rise, which may be as high as 1 meter could flood port cities and coastal lands.

Give up?

Congratulations, you have found the paragraph's third mistake.

Discussion: ambiguous pronoun reference (CSW, pages 93-94; or [Writing Center](#)).

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During the last century, the concentrations of greenhouse gases have increased substantially [Holman, 1985]. Scientists believe that further increases could cause excess warming of the earth's climate. Moreover, many scientists believe this warming could produce side effects. **An example would be the**

changing of the earth's wind patterns. These wind patterns control the amount of rain received in a particular area. If the greenhouse gases warm the earth's climate too much, areas that now receive plenty of rainfall could become **deserts**. **Moreover**, some scientists speculate that additional increases in warming could cause another effect, a rise in the ocean levels ["Greenhouse," 1990]. How would this rise occur? An increase in global temperature would melt the polar ice caps, thus emptying more water into the oceans. **Scientists** also predict that this ocean rise, which may be as high as 1 meter could flood port cities and coastal lands.

Give up?

Congratulations, you have found the paragraph's final mistake.

Discussion: missing parenthetical comma (*CE*, pages 103-104; *CSW*, page 263).

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During the last century, the concentrations of greenhouse gases have increased substantially [Holman, 1985]. Scientists believe that further increases could cause excess warming of the earth's climate. Moreover, many scientists believe this warming could produce side effects. **An example would be the changing of the earth's wind patterns.** These wind patterns control the amount of rain received in a particular area. If the greenhouse gases warm the earth's climate too much, areas that now receive plenty of rainfall could become **deserts.** **Moreover,** some scientists speculate that additional increases in warming could cause another effect, a rise in the ocean levels ["Greenhouse," 1990]. How would this rise occur? An increase in global temperature would melt the polar ice caps, thus emptying more water into the oceans. **Scientists** also predict that this ocean rise, which may be as high as 1 **meter,** **could** flood port cities and coastal lands.

The gas that contributes most to the greenhouse effect, is carbon dioxide [Houghton, 1990]. Carbon dioxide cannot be seen, smelled, or tasted. In fact, its not even considered a pollutant. Plants use carbon dioxide in combination with chlorophyll, water, and sunshine for photosynthesis, which is a process essential to life. Besides aiding in photosynthesis, it also absorbs the earth's radiation. This gas occurs naturally in the atmosphere, however, man has dramatically increased the concentration of carbon dioxide over the last twenty years.

Give up?

Congratulations, you have found the paragraph's first mistake.

Discussion: unwanted parenthetical comma (*CE*, pages 103-104; *CSW*, page 263).

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The gas that contributes most to the greenhouse **effect** is carbon dioxide [Houghton, 1990]. Carbon dioxide cannot be seen, smelled, or tasted. In fact, its not even considered a pollutant. Plants use carbon dioxide in combination with chlorophyll, water, and sunshine for photosynthesis, which is a process essential to life. Besides aiding in photosynthesis, it also absorbs the earth's radiation. This gas occurs naturally in the atmosphere, however, man has dramatically increased the concentration of carbon dioxide over the last twenty years.

Give up?

Congratulations, you have found the paragraph's second mistake.

Discussion: incorrect usage (*CE*, page 117; *CSW*, page 271).

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The gas that contributes most to the greenhouse **effect is** carbon dioxide [Houghton, 1990]. Carbon dioxide cannot be seen, smelled, or tasted. In fact, **it's** not even considered a pollutant. Plants use carbon dioxide in combination with chlorophyll, water, and sunshine for photosynthesis, which is a process essential to life. Besides aiding in photosynthesis, it also absorbs the earth's radiation. This gas occurs naturally in the atmosphere, however, man has dramatically increased the concentration of carbon dioxide over the last twenty years.

Give up?

Congratulations, you have found the paragraph's third mistake.

Discussion: unclear pronoun reference (CSW, pages 93-94; or [Writing Center](#)).

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The gas that contributes most to the greenhouse **effect is** carbon dioxide [Houghton, 1990]. Carbon dioxide cannot be seen, smelled, or tasted. In fact, **it's** not even considered a pollutant. Plants use carbon dioxide in combination with chlorophyll, water, and sunshine for photosynthesis, which is a process essential to life. Besides aiding in photosynthesis, **carbon dioxide** also absorbs the earth's radiation. This gas occurs naturally in the atmosphere, however, man has dramatically increased the concentration of carbon dioxide over the last twenty years.

Give up?

Congratulations, you have found the paragraph's final mistake.

Discussion: run-on sentence (*CE*, page 129; *CSW*, page 258).

The gas that contributes most to the greenhouse effect, is carbon dioxide [Houghton, 1990]. Carbon dioxide cannot be seen, smelled, or tasted. In fact, it's not even considered a pollutant. Plants use carbon dioxide in combination with chlorophyll, water, and sunshine for photosynthesis, which is a process essential to life. Besides aiding in photosynthesis, carbon dioxide also absorbs the earth's radiation. This gas occurs naturally in the atmosphere. However, man has dramatically increased the concentration of carbon dioxide over the last twenty years.

You have reached the end of this exercise.

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The web site for “Punctuation Exercise 1” has moved to

<http://writing.eng.vt.edu/exercises/punctuation1.html>

Please update your links.

Last updated: July 2004

Punctuation Exercise #1 (Commas)



Exercise Links:

[Punctuation Exercise #2](#)

[Grammar Exercises](#)

[Usage Exercises](#)

[Advanced Exercises](#)

Site Links:

[Writing Guidelines](#)

[Writing Exercises](#)

In the following sentences, click on the places where the comma is undesired, is missing, or should be changed to another piece of punctuation. Note that each sentence has at most one punctuation error. If no error exists, click on "No error." Corresponding information for this exercise can be found in [*The Craft of Editing*](#) (denoted *CE*) and [*The Craft of Scientific Writing*](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not underline links and do not override this document's choice of font colors.

-
1. The new material, which will be available next week is composed of plastic and iodine.

(No error)

#1. Congratulations, you have found an error.

Revision: The new material, which will be available next **week, is** composed of plastic and iodine.

Discussion: missing parenthetical comma for "which" clause.

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2. As World War II escalated the United States became locked into a race with Germany to develop the first atomic bomb.

(No error)

#2. Congratulations, you have found an error.

Revision: As World War II **escalated, the** United States became locked into a race with Germany to develop the first atomic bomb.

Discussion: missing comma following introductory clause. Note that without the comma, the reader does not know where the introductory clause ends.

3. The three largest earthquakes occurred in San Francisco, Tokyo, and
Lima.

(No error)

#3. Congratulations, you have answered correctly.

Original: The three largest earthquakes occurred in San Francisco, Tokyo, and Lima.

Discussion: While the comma following "Tokyo" is optional, it is certainly not incorrect.

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4. On February 5, 1990 Mount St. Helens had another eruption, this one smaller than the eruption 10 years before.

(No error)

#4. Congratulations, you have found an error.

Revision: On February 5, **1990**, Mount St. Helens had another eruption, this one smaller than the eruption 10 years before.

Discussion: missing parenthetical comma. The year "1990" is parenthetical information about the date February 5. Although some publications treat this comma as optional, many more (including the *Wall Street Journal* and the *New York Times*) do not. Note that if the date had been written as "5 February 1990," then a simple comma following "1990" would have been appropriate. Also note that the comma following "eruption" is correct because what follows is a phrase.

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5. Every year, an earthquake of magnitude between 8.0 and 8.9 on the Richter scale, will be experienced somewhere in the world [Haughton, 1989].

(No error)

#5. Congratulations, you have found an error.

Revision: Every year, an earthquake of magnitude between 8.0 and 8.9 on the Richter scale **will** be experienced somewhere in the world [Haughton, 1989].

Discussion: undesired comma. Note that while the comma following "year" is optional, it is certainly not incorrect. Also note that the punctuation for the reference listing at the end of the sentence depends upon the format.

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6. As the flame front propagates hot combustion products expand,
resulting in a rapid pressure increase.

(No error)

#6. Congratulations, you have found an error.

Revision: As the flame front **propagates**, **hot** combustion products expand, resulting in a rapid pressure increase.

Discussion: missing comma following the introductory clause. Without the comma, the audience does not know when the clause ends.

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7. The concentrations of these gases, which are called greenhouse gases control how much infrared radiation escapes.

(No error)

#7. Congratulations, you have found an error.

Revision: The concentrations of these gases, which are called greenhouse **gases**, **control** how much infrared radiation escapes.

Discussion: missing parenthetical comma for the "which" clause.

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8. After 1987 parachuting accidents decreased significantly because instructors started teaching novices with tandem jumps rather than static lines.

(No error)

#8. Congratulations, you have found an error.

Revision: After **1987**, **parachuting** accidents decreased significantly because instructors started teaching novices with tandem jumps rather than static lines.

Discussion: missing comma following the introductory phrase. Without the comma, the audience trips.

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9. On May 18, 1980, a cloud of hot rock and gas surged northward

from Mount St. Helens.

(No error)

#9. Congratulations, you have answered correctly.

Revision: On May 18, 1980, a cloud of hot rock and gas surged northward from Mount St. Helens.

Revision: This sentence is punctuated correctly.

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10. The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with limestone, see Appendix A.

(No error)

#10. Congratulations, you have found an error.

Revision: The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with **limestone, as discussed in** Appendix A.

Discussion: The original is a run-on. One solution (given here) is to make the reference to Appendix A a verb phrase. Another solution is to create a separate sentence. Still a third is to use parentheses to refer to Appendix A.

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11. The local economy should benefit from the operation. Local property taxes would decrease for area residents and the Nicolet Minerals Company, formally the Crandon Mining Company, is expected to spend more than \$40 million on local good and services.

(No error)

#11. Congratulations, you have found an error.

Revision: The local economy should benefit from the operation. Local property taxes would decrease for area **residents, and** the Nicolet Minerals Company, formally the Crandon Mining Company, is expected to spend more than \$40 million on local good and services.

Discussion: Without the comma before "and," the audience doesn't know where the first independent clause ends and the second one begins.

You have reached the end of this exercise.

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Punctuation Exercises #2 (Colons, Semicolons, and Dashes)



Exercise Links:

[Punctuation Exercises #1](#)

[Grammar Exercises](#)

[Usage Exercises](#)

[Advanced Exercises](#)

Site Links:

[Writing Guidelines](#)

[Writing Exercises](#)

In the following sentences, click on the places where punctuation is undesired, is missing, or requires change. Mistakes include missing, unwanted, or misplaced colons, semicolons, parentheses, and quotation marks. Note that each sentence has at most one punctuation error. If no error exists, click on "No error."

Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not override this document's choice of font colors.

-
1. The three largest earthquakes occurred in: San Francisco, Tokyo,
and Lima.

(No error)

#1. Congratulations, you have found an error.

Revision: The three largest earthquakes occurred **in** San Francisco, Tokyo, and Lima.

Discussion: undesired colon (it breaks a continuing thought). Note that while the comma following "Tokyo" is optional, it is certainly not incorrect. (*CE*, p. 103)

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2. According to Dr. D. Simpson [1986], a biologist at the Harvard Medical School, "Only 30,000 rads are needed for interphase death to occur in yeast cells".

(No error)

#2. Congratulations, you have found an error.

Revision: According to Dr. D. Simpson [1986], a biologist at the Harvard Medical School, "Only 30,000 rads are needed for interphase death to occur in yeast **cells.**"

Discussion: Quotation marks appear outside commas and periods in the United States. (CE, pp. 124-125)

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3. The synergistic reactor contains a [chamber in](#) which the exhaust from the burning coal mixes with [limestone; see Appendix A.](#)

[\(No error\)](#)

#3. Congratulations, you have found an error.

Revision: The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with **limestone, as discussed in** Appendix A.

Discussion: A semicolon cannot join the two independent clauses because what would be on the left side of the semicolon (a sentence in the indicative mood) would not be parallel to what is on the right side (a sentence in the imperative mood). One solution (given here) is to make the reference to Appendix A a verb phrase. Another solution is to create a separate sentence. Still a third is to use parentheses to refer to Appendix A. (*CE*, p. 130)

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4. The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with limestone - see Appendix A.

(No error)

#4. Congratulations, you have found an error.

Revision: The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with **limestone**--see Appendix A.

Discussion: The em-dash can be represented by two hyphens, but not one as in the original. (*CE*, pp. 106-107)

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5. The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with limestone(See Appendix A.)

(No error)

#5. Congratulations, you have found an error.

Revision: The synergistic reactor contains a chamber in which the exhaust from the burning coal mixes with **limestone** (see **Appendix A**).

Discussion: The punctuation associated with the parentheses was incorrect. First a space precedes the left parenthesis. Second, for parenthetical expressions that are part of the sentence, the first word is not capitalized. Finally, for parenthetical expressions that are part of the sentence, the sentence's punctuation (a period in this case) appears outside the parentheses.

- The absorption A is calculated by:

$$A = 1 - kR,$$

where k is the correction factor and R is the measured reflectance.

(No error)

#6. Congratulations, you have found an error.

Revision: The absorption A is calculated **by**

$$A = 1 - kR,$$

where k is the correction factor and R is the measured reflectance.

Discussion: undesired colon (it breaks a continuing thought). Note that if the words "the following" had followed the word "by," then the colon would have been correct. (*CE*, p. 108)

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Which of the following appear in italics?

[book title and title of journal article](#)

[book title and title of periodical](#)

[chapter title and title of periodical](#)

[chapter title and title of journal article](#)

Congratulations, you have answered #7 correctly.

Discussion: Use italics for large documents: titles of books; titles of journals, periodicals, and newspapers; titles of reports longer than 75 pages; titles of full-length films; titles of record albums; and titles of large web sites. (*CE*, pp. 126-128)

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Which of the following appear in quotation marks?

[book title and title of journal article](#)

[book title and title of periodical](#)

[chapter title and title of periodical](#)

[chapter title and title of journal article](#)



Congratulations, you have answered #8 correctly.

Discussion: Use quotation marks for short documents: chapter titles of books; article titles from journals, periodicals, and newspapers; titles of reports shorter than 75 pages; titles of short films; titles of songs; and titles of individual web pages.

You have reached the end of this exercise.

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Last updated 2/00

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The web site for the “Advanced Exercise” has moved to

<http://writing.eng.vt.edu/exercises/grammar4.html>

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Last updated: July 2004

Word Choice (Basic)



Usage Exercises:

[Usage #2](#)

[Usage #3](#)

[Usage #4](#)

[Usage #5](#)

Click on the correct usage in the sentences below. Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*).
Note: In the general preferences of your browser, please do not underline links and do not override this document's choice of font colors.

Site Links

[Writing Guidelines](#)

[Writing Exercises](#)

1. We produced a small ([amount](#), [number](#)) of automobiles this year, even (fewer, less) than last year.

#1. Congratulations, you have answered correctly.

Exercise: We produced a small (amount/ **number**) of automobiles this year, even (fewer/less) than last year.

Discussion: The word "number" is appropriate because the sentence refers to a quantity that can be counted (for more information, see page 270 in *CSW* or page 109 in *CE*).

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2. We produced a small number of automobiles this year, even (fewer, less) than last year.

#2. Congratulations, you have answered correctly.

Exercise: We produced a small number of automobiles this year, even (**fewer**/less) than last year.

Discussion: The word "fewer" is appropriate because the sentence refers to a quantity that can be counted (for more information, see page 270 in *CSW* or page 109 in *CE*).

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3. The serum had serious side (affects, effects).

#3. Congratulations, you have answered correctly.

Exercise: The serum had serious side (affects/ **effects**).

Discussion: See page 269 in *CSW* or page 97 in *CE*.

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4. Every 250 years, Pluto completes (its, it's) orbit about the sun.

#4. Congratulations, you have answered correctly.

Exercise: Every 250 years, Pluto completes (**its**/it's) orbit about the sun.

Discussion: See page 271 in *CSW* or page 117 in *CE*.

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5. When a photon in that energy range strikes the atom, the atom (looses, loses) one of its outer electrons.

#5. Congratulations, you have answered correctly.

Exercise: When a photon in that energy range strikes the atom, the atom (looses, **loses**) one of its outer electrons.

Discussion: The verb "lose" means to part with or to miss from one's possession. The word "loose" is generally used as an adjective, meaning not rigidly fastened. When used as a verb, "loose" means to let loose and implies a conscious act, something an electron does not perform.

6. The talk centered (around, on) the (principal, principle) of virtual work.

#6. Congratulations, you have answered correctly.

Exercise: The talk centered (around/ **on**) the (principal/principle) of virtual work.

Discussion: See page 269 in *CSW* or page 102 in *CE*.

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7. The talk centered on the ([principal](#), [principle](#)) of virtual work.

#7. Congratulations, you have answered correctly.

Exercise: The talk centered on the (principal/ **principle**) of virtual work.

Discussion: See page 272 in *CSW* or page 124 in *CE*.

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8. This report discusses how the eruption (affected, effected) the surrounding terrain.

#8. Congratulations, you have answered correctly.

Exercise: This report discusses how the eruption (**affected**/effected) the surrounding terrain.

Discussion: See page 269 in *CSW* or page 124 in *CE*.

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9. Last year, Japan (lead, led) the world in automobile sales.

#9. Congratulations, you have answered correctly.

Exercise: Last year, Japan (lead/ **led**) the world in automobile sales.

Discussion: The word "led" is the past tense of the verb "to lead" (see page 118 in *CE*).

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10. We then sent the broken part to John Brooks, (who, whom) the laser group had recommended.

#10. Congratulations, you have answered correctly.

Exercise: We then sent the broken part to John Brooks, (who/ **whom**) the laser group had recommended.

Discussion: The word "who" is used for the subject of the dependent clause; "whom" is used for the direct object, indirect object, or object of a preposition in the dependent clause. See pages 140-141 in *CE*.

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11. Reduced weight was the (principal, principle) reason for choosing aluminum.

#11. Congratulations, you have answered correctly.

Exercise: Reduced weight was the (**principal**/principle) reason for choosing aluminum.

Discussion: See page 272 in *CSW* or page 124 in *CE*.

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12. Neither the engineers (nor, or) the technicians were hurt in the blaze.

#12. Congratulations, you have answered correctly.

Exercise: Neither the engineers (**nor**/or) the technicians were hurt in the blaze.

Discussion: The convention is that "neither" goes with "nor" and that "either" goes with "or."

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13. All the bombings involved explosives (that / , which) contained the chemicals PETN and RDX.

#13. Congratulations, you have answered correctly.

Exercise: All the bombings involved explosives (**that** / , which) contained the chemicals PETN and RDX.

Discussion: See page 272 in *CSW* or page 134 in *CE*.

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14. All the bombings involved Semtex (that / , which) contains the

chemicals PETN and RDX.

#14. Congratulations, you have answered correctly.

Exercise: All the bombings involved Semtex (that / , **which**) contains the chemicals PETN and RDX.

Discussion: See page 272 in *CSW* or page 134 in *CE*.

15. To treat a bite from the puff adder, select the anti-venom serum (which counteracts the adder's poison. / that counteracts the adder's poison.)

#15. Trick question--the answer depends on the meaning of the sentence.

Exercise: To treat a bite from the puff adder, select the anti-venom serum (, which counteracts the adder's poison / that counteracts the adder's poison).

Discussion: The answer depends on the situation. If there is only one anti-venom serum and the information about counteracting the adder's poison is additional information for the reader's knowledge, then use the "which" clause. If there are several anti-venom serums and the information about counteracting the adder's poison identifies which serum to select, then use the "that" clause. See page 272 in *CSW* or page 134 in *CE*.

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16. (Hopefully, / It is hoped that) the antibodies will destroy the cancer cells.

#16. Congratulations, you have answered correctly.

Exercise: (Hopefully, / **It is hoped that**) the antibodies will destroy the cancer cells.

Discussion: The word *hopefully* means in a manner full of hope, not it is hoped that. A correct use would be as follows: "We looked hopefully to the courts for a ruling on the contract dispute." See page 115 in *CE*.

You have reached the end of this exercise.

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Verb Agreement and Tense



Usage Exercises:

[Usage #1](#)

[Usage #3](#)

[Usage #4](#)

[Usage #5](#)

Click on the correct verb in the sentences below. Corresponding information for this exercise can be found in [*The Craft of Editing*](#) (denoted *CE*) and [*The Craft of Scientific Writing*](#) (denoted *CSW*).

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Site Links

[Writing Guidelines](#)

[Writing Exercises](#)

1. In the past three months, a new series of low-priced computers ([has been released](#), [have been released](#)).

Congratulations, you have answered #1 correctly.

Exercise: In the past three months, a new series of low-priced computers (**has been released**, have been released).

Discussion: Because the subject "series" is singular in this sentence, the correct verb is "has."

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2. The insurance company hopes that neither the architect nor the construction firm (are held, is held) liable.

Congratulations, you have answered #2 correctly.

Exercise: The insurance company hopes that neither the architect nor the construction firm (are held, **is held**) liable.

Discussion: With a "neither/nor" construction of the subject, the number of the noun closest to the verb determines the number of the verb. In this case, because the noun "firm" is singular, the verb is singular.

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3. In the next section, the criteria for assessing each system (are given, is given).

Congratulations, you have answered #3 correctly.

Exercise: In the next section, the criteria for assessing each system (**are given**, is given).

Discussion: The noun "criteria" is plural.

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4. To connect a temperature measurement circuit to the HC11 microcontroller, we added new hardware and developed new software. The added hardware controlled both the measurement and the display of the temperature. This hardware (included, includes) light emitting diodes that (attach, attached) to Port B.

Congratulations, you have answered #4 correctly.

Exercise: To connect a temperature measurement circuit to the HC11 microcontroller, we added new hardware and developed new software. The added hardware controlled both the measurement and the display of the temperature. This hardware (**included**, includes) light emitting diodes that (attach, attached) to Port B.

Discussion: In the first two sentences, the author has adopted a reference frame in which the circuit existed in the past. Therefore, for the rest of the document, that

reference frame must be maintained. In reports that document the completion of a project, engineers and scientists usually adopt a reference frame that exists after the experiment or design has been disassembled. In progress reports, engineers and scientists usually adopt a reference frame in which the experiment or design still exists.

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5. To connect a temperature measurement circuit to the HC11 microcontroller, we added new hardware and developed new software. The added hardware controlled both the measurement and the display of the temperature. This hardware included light emitting diodes that (attach, attached) to Port B.

Congratulations, you have answered #5 correctly.

Exercise: To connect a temperature measurement circuit to the HC11 microcontroller, we added new hardware and developed new software. The added hardware controlled both the measurement and the display of the temperature. This hardware included light emitting diodes that (attach, **attached**) to Port B.

Discussion: In the first two sentences, the author has adopted a reference frame in which the circuit existed in the past. Therefore, for the rest of the document, that reference frame must be maintained. In reports that document the completion of a project, engineers and scientists usually adopt a reference frame that exists after the experiment or design has been disassembled. In progress reports, engineers and scientists usually adopt a reference frame in which the experiment or design still exists.

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6. To connect a temperature measurement circuit to the HC11 microcontroller, we added new hardware and developed new software. The added hardware controlled both the measurement and the display of the temperature. This hardware included light emitting diodes that attached to Port B. Figure 1 (showed, shows) a schematic of this hardware.

Congratulations, you have answered #6 correctly.

Exercise: To connect a temperature measurement circuit to the HC11 microcontroller, we added new hardware and developed new software. The added hardware controlled both the measurement and the display of the temperature. This hardware included light emitting diodes that attached to Port B. Figure 1 (showed, **shows**) a schematic of this hardware.

Discussion: Present tense is used here because the figure continues to show the readers a schematic of the hardware, even though the actual hardware has been disassembled. Such a use of present tense in the same paragraph that contains verbs in the past tense is not a tense error because the *reference frame* for the document remains constant.

7. **Conclusion.** This report (has presented, presented, presents) a design of a temperature measurement circuit for the HC11 microcontroller.

Congratulations, you have answered #7 correctly.

Exercise: Conclusion. This report (**has presented**, presented, presents) a design of a temperature measurement circuit for the HC11 microcontroller.

Discussion: The present perfect tense is used here because most of the "presenting" has occurred in the past, but some "presenting" still remains. Note that in the "Introduction" of this report the tense choice for this sentence would be the present tense.

You have reached the end of this exercise.

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Possessives

Usage Exercises:

[Usage #1](#)

[Usage #2](#)

[Usage #4](#)

[Usage #5](#)

Click on the correct possessive form in the sentences below.

Corresponding information for this exercise can be found in [The Craft of Editing](#) (denoted *CE*) and [The Craft of Scientific Writing](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not underline links and do not override this document's choice of font colors.

Site Links

[Writing Guidelines](#)

[Writing Exercises](#)

1. According the Department of Energy, if we were to set up an area of solar cells equal to 0.25 the area currently covered by our roads, these cells could supply our entire ([nations](#) / [nation's](#) / [nations'](#)) electrical needs.

#1. Congratulations, you have answered correctly.

Exercise: According the Department of Energy, if we were to set up an area of solar cells equal to 0.25 the area currently covered by our roads, these cells could supply our entire (nations / **nation's** / nations') electrical needs.

Discussion: In general, to form the singular possessive of a noun, add 's.

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2. With a rear-facing child seat, the top of the seat and the (infants / infant's / infants') head will be in the deployment zone of the air bag.

#2. Congratulations, you have answered correctly.

Exercise: With a rear-facing child seat, the top of the seat and the (infants / **infant's** / infants') head will be in the deployment zone of the air bag.

Discussion: In general, to form the singular possessive of a noun, add 's.

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3. When you receive my (boss / bosses / boss's / boss' / bosses') memo requesting your participation, please respond to her that your job description, as written, will not allow you to perform that type of

work.

#3. Congratulations, you have answered correctly.

Exercise: When you receive my (boss / bosses / **boss's** / boss' / bosses') memo requesting your participation, please respond to her that your job description, as written, will not allow you to perform that type of work.

Discussion: In general, to form the singular possessive of a noun, add 's. Occasionally, you will have a noun, such as "Moses" or "Mount St. Helens" with an s-sound ending

such that addition of the possessive does not cause an extra *s* syllable in the pronunciation. In such unusual cases, the singular possessive is formed by the addition of an apostrophe. Note that "boss" is *not* one of these cases. The possessive form adds an extra syllable and therefore 's.

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4. This section explains the function of each technique and describes (its / it's / its') advantages and disadvantages.

#4. Congratulations, you have answered correctly.

Exercise: This section explains the function of each technique and describes (**its** / **it's** / **its'**) advantages and disadvantages.

Discussion: See page 271.

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5. Since 1981, when the air traffic (controller's / controllers') strike occurred, the number of controllers decreased from 16,200 to 14,300 [Krasner, 1997].

#5. Congratulations, you have answered correctly.

Exercise: Since 1981, when the air traffic (controller's / **controllers'**) strike occurred, the number of controllers decreased from 16,200 to 14,300 [Krasner, 1997].

Discussion: In general, to form the possessive of a plural noun, simply add an apostrophe to the plural form.

You have reached the end of this exercise.

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Last updated 2/99

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Word Choice (Advanced)



Usage Exercises:

[Usage #1](#)

[Usage #2](#)

[Usage #3](#)

[Usage #5](#)

Click on the correct usage in the sentences below. Corresponding information for this exercise can be found in [*The Craft of Editing*](#) (denoted *CE*) and [*The Craft of Scientific Writing*](#) (denoted *CSW*).

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Site Links

[Writing Guidelines](#)

[Writing Exercises](#)

1. During the past decade, our division has made ([continuous](#), [continual](#)) improvements to the automobile's exhaust system.

#1. Congratulations, you have answered correctly.

Exercise: During the past decade, our division has made (continuous, **continual**) improvements to the automobile's exhaust system.

Discussion: If the team were to make "continuous" improvements on the exhaust system over the past decade, then they would be making those improvements day and night without interruption for sleep or food. Such a scenario is highly unlikely. For that reason, the correct word choice is "continual." For more information, see page 269.

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2. Using geothermal energy does not pollute the environment (as, like) the burning of fossil fuels does.

#2. Congratulations, you have answered correctly.

Exercise: Using geothermal energy does not pollute the environment (**as**/like) the burning of fossil fuels does.

Discussion: The word "as" is appropriate because a clause, rather than a phrase, follows (for more information, see page 271).

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3. The new material is (composed, comprised) of plastic and iodine.

#3. Congratulations, you have answered correctly.

Exercise: The new material is (**composed**/comprised) of plastic and iodine.

Discussion: See page 269.

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4. From the den, the male wolf ventured much (farther, further) than the female.

#4. Congratulations, you have answered correctly.

Exercise: From the den, the male wolf ventured much (**farther**/further) than the female.

Discussion: See page 270.

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5. John is (adverse, averse) to that type of solution.

#5. Congratulations, you have answered correctly.

Exercise: John is (adverse/ **averse**) to that type of solution.

Discussion: The word "averse" means "unwilling"; "adverse" means "unfavorable."

6. The truss had spans of 210 feet and was (more than, over) 20 feet deep.

#6. Congratulations, you have answered correctly.

Exercise: The truss had spans of 210 feet and was (**more than**/over) 20 feet deep.

Discussion: Use "greater than" or "more than" when referring to quantity. Otherwise, confusion could result because "over" is often used to indicate position.

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7. The values of the transfer coefficients were lowered (because of, due to) outgassing.

#7. Congratulations, you have answered correctly.

Exercise: The values of the transfer coefficients were lowered (**because of**/due to) outgassing.

Discussion: Strictly speaking, "due" is not a preposition and therefore cannot introduce a prepositional phrase. However, "due" can certainly act as an adjective followed by the preposition "to," as in the following sentence: "The temperature increase is due to global warming." If you are unsure of whether "due" is acting as an adjective followed by the preposition "to," then use "because of."

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8. The (enormity, enormousness) of the solar receiver's tower surprised the visiting officials.

#8. Congratulations, you have answered correctly.

Exercise: The (enormity/ **enormousness**) of the solar receiver's tower surprised the visiting officials.

Discussion: The word "enormousness" refers to a great size; the word "enormity" means "horror."

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9. Compared (to, with) molten salt, liquid sodium is a much more dangerous heat transfer fluid.

#9. Congratulations, you have answered correctly.

Exercise: Compared (to/ **with**) molten salt, liquid sodium is a much more dangerous heat transfer fluid.

Discussion: You compare things of the same class "with" each other and things of different classes "to" each other. For instance, you compare three automobiles **with** each on the criteria of performance, cost, and safety, but Freud compared the ego and the id **to** a horse and his rider.

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10. The turbulence values of that report were different (from, than) the results of ours.

#10. Congratulations, you have answered correctly.

Exercise: The turbulence values of that report were different (**from**/than) the results of ours.

Discussion: Use "different from"--the word "than" requires a comparative such as "higher" or "less."

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11. The new antidote made the patients feel (nauseated, nauseous).

#11. Congratulations, you have answered correctly.

Exercise: The new antidote made the patients feel (**nauseated**/nauseous).

Discussion: The word "nauseated" means feeling sick to one's stomach, while the word "nauseous" means causing one to feel sick to one's stomach. For that reason, you would write that "the patients were nauseated," and that "the acrid odors were nauseous."

12. Thank you for the job offer. I am (anxious, eager) to begin work next month.

#12. Congratulations, you have answered correctly.

Exercise: Thank you for the job offer. I am (anxious, **eager**) to begin work next month.

Discussion: The word "anxious" means to expect with anxiety, while the word "eager" means to expect with enthusiasm. While the new hire in the example might feel anxiety about the new job, he or she most likely intends to convey the feeling of enthusiasm to the employer. Therefore, "eager" is the appropriate choice in this situation.

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13. The fourth design option was ([rather unique](#), [unique](#), [very unique](#)).

#13. Congratulations, you have answered correctly.

Exercise: The fourth design option was (rather unique/ **unique**/very unique).

Discussion: See page 272.

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14. Chicken is (healthful, healthy) to eat.

#14. Congratulations, you have answered correctly.

Exercise: Chicken is (**healthful**/healthy) to eat.

Discussion: The word "healthy" means in a state of good health. This meaning does not apply here--chances are that the chicken is dead. The appropriate word is "healthful," which means promoting good health.

You have reached the end of this exercise.

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Expressing Numbers

Usage Exercises:

[Usage #1](#)

[Usage #2](#)

[Usage #3](#)

[Usage #4](#)

Site Links

[Writing Guidelines](#)

[Writing Exercises](#)

Although no universal convention exists in scientific writing for expressing numbers, several aspects are common to all conventions. This exercise tests you on those common aspects. In the exercise below, decide the appropriate way to express the number. Corresponding information for this exercise can be found in [*The Craft of Editing*](#) (denoted *CE*) and [*The Craft of Scientific Writing*](#) (denoted *CSW*). Note: In the general preferences of your browser, please do not override this document's choice of font colors.

1. The Titanic was nearly 900 feet long, stood (25 / twenty-five stories) high, and weighed an incredible 46 thousand tons.

Congratulations, you have answered #1 correctly.

Correct version: The Titanic was nearly 900 feet long, stood **25** stories high, and weighed an incredible 46 thousand tons.

Discussion: Because the sentence contains two other numerals that present parallel information, the number "twenty-five" should also be expressed as a numeral, "25." Note that if the other two numerals were not presenting parallel information in the same paragraph, then the format's convention would dictate whether "twenty-five" should be written out or expressed as a numeral.

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2. The Charpy test is run by holding the coupon against a steel backing and striking the coupon with a 67-pound pendulum on a (2-foot arm / two-foot arm).

Congratulations, you have answered #2 correctly.

Correct version: The Charpy test is run by holding the coupon against a steel backing and striking the coupon with a 67-pound pendulum on a 2-foot arm.

Discussion: Measurements are expressed as numerals.

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3. (1522 people perished when the Titanic sank. / When the Titanic sank, 1522 people perished.)

Congratulations, you have answered #3 correctly.

Correct version: When the Titanic sank, 1522 people perished.

Discussion: In English, it is improper to begin a sentence with a numeral. Note that writing the number out here would have been technically correct, but difficult for the audience to read. For that reason, it is better to rearrange the sentence. Also note that having a comma after the first digit (1,522) depends on your format's convention.

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4. **The maximum amperage for each of the two devices is (3 A / three A).**

Congratulations, you have answered #4 correctly.

Correct version: The maximum amperage for each of the two devices is 3 A.

Discussion: Writing out the number "two" here is appropriate in most conventions because the number is simply arrived at by counting, and in most conventions, counted numbers can be written out if they can be expressed in a single word. On the other hand, the numeral "3" is appropriate because it was arrived at by measuring, and measurements are always expressed as numerals when the units are abbreviated.

5. In its day, the Titanic cost more than ([\\$7.5 million](#) / [\\$7,500,000](#) / [seven and one-half million dollars](#)) to construct.

Congratulations, you have answered #5 correctly.

Correct version: In its day, the Titanic cost more than \$7.5 million to construct.

Discussion: With large numbers, it is acceptable to write out part of the number to avoid a string of zeroes. Note that "7.5" has to be a numeral on two counts--it contains a decimal, and it represents a monetary figure.

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6. **During that time the water temperature dropped ([.6K](#) / [0.6K](#) / [zero point six degrees Kelvin](#)).**

Congratulations, you have answered #6 correctly.

Correct version: During that time the water temperature dropped 0.6K.

Discussion: A digit has to appear before the decimal.

You have reached the end of this exercise.

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[Language](#)
[Illustration](#)

Given below are four beginnings to pieces of correspondence. Each of the pieces of correspondence requests employment with a company or laboratory. For each beginning, consider the following areas: structure, language, format, and mechanics (grammar, punctuation, and usage). Identify the area that is the weakest. The purpose of this exercise is two-fold: (1) to help you identify writing problems in a more precise fashion, and (2) to make you comfortable with the writing terms *structure*, *language*, *format*, and *mechanics*. The numbers in parentheses refer to page numbers in *The Craft of Scientific Writing*. Note: Please do not override this document's choice of font colors.

These exercises work best with Netscape.

1. The first piece of correspondence is weakest in the following area:

1. [Structure \(pages 173-176\)](#)
2. [Language \(pages 176-177\)](#)
3. [Format \(pages 221-227\)](#)
4. [Mechanics: grammar, punctuation, and usage \(pages 257-273\)](#)

**5939 Seminole Court, #206
Madison, Wisconsin 53711
November 13, 1997**

Dr. Patricia N. Smith
Director of Personal
Sandia National Laboratories
Livermore, California 94550

Dear Dr. Smith:

In last months *Engineering Educator*, Sandia National Laboratories advertised positions beginning next June for undergraduate researchers. Would you please consider me for one of those positions? I am a junior in chemical engineering at the University of Wisconsin-Madison, however, I am deeply interested in engineering research. Because Sandia is such a prestigious research laboratory, I would like a position at one of it's facilities. I have two major areas of research interests; how chemical kinetics effects the design of reactors and heat transfer.

#1. Congratulations, you have made an accurate choice.

Discussion: weak in grammar, punctuation, and usage. This piece of correspondence has the following mechanical errors:

1. Wrong word: "personal" should be "personnel"
2. Possessive error: the word "months" should be "month's"
3. Run-on sentence: "however" is not a coordinating conjunction
4. Wrong word: "it's" should be "its"
5. Incorrect use of semi-colon in fourth sentence--writer should use a colon
6. Wrong word: "effects" should be "affects"
7. Faulty parallelism: "heat transfer" is not parallel to first item in list, "how chemical..."

2. The second piece of correspondence is weakest in the following area:

1. Structure (pages 173-176)
2. Language (pages 176-177)
3. Format (pages 221-227)
4. Mechanics: grammar, punctuation, and usage (pages 257-273)

**Engine Research Center
College of Engineering
University of Wisconsin
November 13, 1997**

To: Professor Karen Thole

From: Jim Harrington *JTH*

Subject: A Small Request

I am an undergraduate research assistant working with Professor Farrell in the Engine Research Center. My project is the interaction of gas-fuel phase injection with a strong swirling flow. This project also considers the effect of swirl on homogeneous combustion. In this work we have made two-component velocity measurements using laser doppler velocimetry. I have enjoyed the experimental work in the Engine Research Center very much, and if I were interested in automobile engines, I would continue my work there after my baccalaureate degree. The truth of the matter, though, is that I am much more interested in airplane engines, particularly the new generation of gas turbine engines used on fighter jets.

#2. Congratulations, you have made an accurate choice.

Discussion: weak in structure. This piece of correspondence has the following structural errors:

1. Subject line does not accurately identify subject of memo
2. Opening paragraph of memo does not identify the purpose

3. The third piece of correspondence is weakest in the following area:

1. Structure (pages 173-176)
2. Language (pages 176-177)
3. Format (pages 221-227)
4. Mechanics: grammar, punctuation, and usage (pages 257-273)

[Back to Top of Page](#)

**5939 Seminole Court, #206
Madison, Wisconsin
November 13, 1997**

Mr. Stephen Archer
Manager of Operations
The Trane Company
3650 Highpoint Drive
San Antonio, Texas 78217

Dear Mr. Archer:

Are you inundated with job application requests? Well, I'm sorry to say that this letter is yet another for your pile, but here it goes: I am a forthcoming graduate in mechanical engineering and am interested in the design position that you have advertised for your company. Academically, I stand well within the top half of my class. A failure to be glib on exams prevented me from qualifying for Tau Beta Pi. However, this failure has not prevented me from succeeding in any other endeavor.

#3. Congratulations, you have made an accurate choice.

Discussion: weak in language. This piece of correspondence has the following language errors:

1. Tone in first two sentences is cute--not the appropriate attitude for a job application letter
2. Tone goes out of control in fourth sentence--"failure to be glib" smacks of sour grapes
3. Last word of paragraph is pretentious

[Back to Top of Page](#)

4. The fourth piece of correspondence is weakest in the following area:

1. [Structure \(pages 173-176\)](#)
2. [Language \(pages 176-177\)](#)
3. [Format \(pages 221-227\)](#)
4. [Mechanics: grammar, punctuation, and usage \(pages 257-273\)](#)

2116 MONROE STREET
MADISON, WISCONSIN 53711
SEPTEMBER 15, 1997

DR. DAVE CABE
MANAGER
AIR QUALITY SERVICES
1515 CAPITAL OF TEXAS HIGHWAY SOUTH
AUSTIN, TEXAS 78746

DEAR DR. CABE,

PROFESSOR KEN POTTER AT THE UNIVERSITY OF

WISCONSIN-MADISON RECOMMENDED YOU AS A CONTACT PERSON FOR A POSSIBLE POSITION AT AIR QUALITY SERVICES. I AM A GRADUATING SENIOR IN CIVIL ENGINEERING WITH A MAJOR EMPHASIS IN ENVIRONMENTAL ENGINEERING (PLEASE SEE THE ENCLOSED RESUME). THE PAST TWO SUMMERS I HAVE GAINED EXPERIENCE WORKING WITH MONTGOMERY WATSON, A COMPANY THAT SPECIALIZES IN GROUNDWATER TESTING. BECAUSE YOUR COMPANY IS A NATIONAL LEADER IN REDUCING AIR POLLUTION FROM COAL PLANTS, AN AREA THAT INTERESTS ME GREATLY, I WOULD LIKE YOU TO CONSIDER ME FOR A POSSIBLE POSITION.

#4. Congratulations, you have made an accurate choice.

Discussion: weak in format. This piece of correspondence has the following format problems:

1. Having all capital letters makes the reading difficult
2. Little white space exists either vertically (between address and greeting, for example) or horizontally (no indents on paragraphs)--for that reason, the letter appears crowded
3. The comma following the greeting should be a colon
4. A more professional choice for the typeface exists. While Helvetica is acceptable in some correspondence situations, a serif typeface such as Times is accepted in all correspondence, especially in a job-application letter where you want to convey a professional appearance. In this situation, using Helvetica is analogous to wearing casual dress for a job interview, while using Times is analogous to wearing a suit.

You have completed the exercise.

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Recognizing Logical Fallacies



[Exercise Contents](#)
[Writing Workbook](#)
[Writing Courses](#)

Presented in this exercise are arguments for various assertions about the downing of TWA Flight 800. Assess what logical fallacy, if any, each argument has. Given below are the names of common logical fallacies. The definitions can be learned by clicking on the link.

[*ad hominem*](#)

[bandwagon](#)

[begging the question](#)

[either-or fallacy](#)

[equivocation](#)

[false analogy](#)

[false authority](#)

[false cause](#)

[guilt by association](#)

[non sequitur](#)

[red herring](#)

[slippery slope](#)

Note: In the general preferences of your browser, please do not override this document's choice of font colors.

1. The missile theory has expert witnesses. For example, just before Flight 800 broke into flames, private pilot Sven Faret reported that he saw "a little pin flash on the ground." In his view, that flash "looked like a rocket launch."

[No fallacy](#)

[*ad hominem*](#)

equivocation

false authority

red herring

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

2. If we begin considering theories other than the one the NTSB is pursuing, the investigation will run in so many directions that we'll never solve anything.

[No fallacy](#)

[begging the question](#)

[equivocation](#)

[guilt by association](#)

[slippery slope](#)

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

3. Mr. Kadlec believes that this downing won't be solved. "Amelia Earhart crashed," he said. "No one knows why she crashed."

[No fallacy](#)

[*ad hominem*](#)

[false analogy](#)

[false cause](#)

[slippery slope](#)

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

4. The FBI is still convinced that it was a bomb that brought down the aircraft. "The public believes it was a bomb," said Agent John Hunt. "Polls taken the day after the crash indicate that more than 75% of Americans believe it was terrorist's bomb."

No fallacy

bandwagon

either/or fallacy

equivocation

slippery slope

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

5. Now that we know explosives had been placed aboard the plane for dog-sniffing tests five weeks before the crash, the FBI's discovery of bomb traces in the cabin is a "dud."

[No fallacy](#)

[bandwagon](#)

[either/or fallacy](#)

[equivocation](#)

[false analogy](#)

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

6. If it wasn't a missile, a bomb, or mechanical failure, then all that's left is a meteorite.

[No fallacy](#)
[begging the question](#)

either/or fallacy

false authority

guilt by association

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

7. The missile theory has no merit. It arose from Pierre Salinger, and he's a kook. Not only is he a reporter, but he's French.

[No fallacy](#)

[*ad hominem*](#)

[begging the question](#)

[false analogy](#)

[slippery slope](#)

Congratulations, you have identified the logical fallacy.

[Top of Page](#)

8. One thing that people aren't considering enough is that the plane went down during an election year. Elections bring out the worst in people, a clear example being the Teapot Dome Scandal of 1920.

[No fallacy](#)

[*ad hominem*](#)

[either/or fallacy](#)

[equivocation](#)

[red herring](#)

Congratulations, you have identified the logical fallacy and reached the end of this exercise.

[Next Exercise](#)
[Main Contents](#)

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You have made an **incorrect** choice

To return to the exercise, click on the "back" button on your browser.

A better choice exists

To return to the exercise, click on the "back" button on your browser.

Multiple Choices

The document name you requested (`/exercises/grammar.html`) could not be found on this server. However, we found documents with names similar to the one you requested.

Available documents:

- </exercises/grammar1.html> (character missing)
- </exercises/grammar2.html> (character missing)
- </exercises/grammar3.html> (character missing)
- </exercises/grammar4.html> (character missing)

Please consider informing the owner of the [referring page](#) about the broken link.



Structure Exercises (Titles)

[Exercise Contents](#)
[Writing Workbook](#)
[Writing Courses](#)

In the following exercise, determine what problem, if any, exists with the given titles. Information for this exercise can be found on pages 17-20 in *The Craft of Scientific Writing*.

Exercise Links:
[Exercises on Headings](#)
[Language Exercises](#)
[Illustration Exercises](#)

1. Practice-Related Improvements in Motor Performance

[Title succeeds](#)

[Title does not establish area of work](#)

[Title does not establish perspective of work](#)

[Title is too long](#)

Congratulations, you have made a logical choice.

Possible Revision: Role of Practice in Improving Performance of Human Motor Functions

[Top of Page](#)

2. An Investigation Into Degradable Polymers

Title succeeds

Title does not establish area of work

Title does not establish perspective of work

Title is too long

Congratulations, you have made a logical choice.

Possible Revision: Comparison of Three Degradable Polymers for Six-Pack Rings on Canned Beverages

[Top of Page](#)

3. 10 MWe Solar Thermal Central Receiver Barstow Power Pilot Plant Transfer Fluid Conversion Study

[Title succeeds](#)

Title does not establish area of work

Title does not establish perspective of work

Title has too many stacked details

Congratulations, you have made a logical choice.

Possible Revision: Proposal to Use a New Heat Transfer Fluid in the Solar One Power Plant

You have reached the end of this exercise.

[Contents for Exercises](#)

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Structure Exercises (Headings)

[Exercise Contents](#)
[Writing Workbook](#)
[Writing Courses](#)

Exercise Links:
[Exercises on Titles](#)
[Language Exercises](#)
[Illustration Exercises](#)

The following table of contents has several headings or subheadings that either should be specified more or should be made parallel. Click on those headings or subheadings in the order that they appear. Information related to this exercise can be found on pages 37 to 40 in *The Craft of Scientific Writing*. For this exercise to work effectively, do not override the default colors of this page.

Evaluation of a Neurosurgery That Treats Symptoms of Parkinson's Disease

[Introduction](#)
[Background](#)
[Pallidotomy Treatment of Parkinson's](#)

[Test Results of Pallidotomy](#)
[Alternative Treatments of Pallidotomy](#)
[L-Dopa Drug Therapy](#)
[Implanting Fetal Tissue](#)
[Comparison of Treatments](#)
[Effectiveness of Treatments](#)
[Side Effects of Treatments](#)
[What Are the Costs?](#)
[Conclusions and Recommendations](#)
[Appendix](#)

Congratulations, you have identified the first problem.

Discussion: The heading "Background" just doesn't communicate enough. The revised heading "Symptoms of Parkinson's Disease" conveys much more.

Find the next problem.

[Top of Page](#)

Evaluation of a Neurosurgery That Treats Symptoms of Parkinson's Disease

[Introduction](#)

[Symptoms of Parkinson's Disease](#)

[Pallidotomy Treatment of Parkinson's](#)

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[Implanting Fetal Tissue](#)

[Comparison of Treatments](#)

[Effectiveness of Treatments](#)

[Side Effects of Treatments](#)

[What Are the Costs?](#)

[Conclusions and Recommendations](#)

[Appendix](#)

Congratulations, you have identified the second problem.

Discussion: The subheading "Results of Pallidotomy" is inherently non-parallel because a single subheading has nothing to be parallel with. There are two ways to revise: one being to remove the subheading, the other being to add a second subheading.

Find the next problem.

[Top of Page](#)

Evaluation of a Neurosurgery That Treats Symptoms of Parkinson's Disease

[Introduction](#)

[Symptoms of Parkinson's Disease](#)

[Pallidotomy Treatment of Parkinson's](#)

Theoretical Principles of Pallidotomy

Test Results of Pallidotomy

Alternative Treatments of Pallidotomy

L-Dopa Drug Therapy

Implanting Fetal Tissue

Comparison of Treatments

Effectiveness of Treatments

Side Effects of Treatments

What Are the Costs?

Conclusions and Recommendations

Appendix

Congratulations, you have identified the third problem.

Discussion: The subheading "Implanting Fetal Tissue," a participial phrase, is not parallel with the first subheading, "L-Dopa Drug Therapy," which is a noun phrase. One solution, to convert this second subheading to a noun phrase, is given below.

Find the next problem.

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Evaluation of a Neurosurgery That Treats Symptoms of Parkinson's Disease

[Introduction](#)

[Symptoms of Parkinson's Disease](#)

[Pallidotomy Treatment of Parkinson's](#)

[Theoretical Principles of Pallidotomy](#)

[Test Results of Pallidotomy](#)

[Alternative Treatments of Pallidotomy](#)

[L-Dopa Drug Therapy](#)

[Fetal Tissue Implants](#)

[Comparison of Treatments](#)

[Effectiveness of Treatments](#)

[Side Effects of Treatments](#)

[What Are the Costs?](#)

[Conclusions and Recommendations](#)

Appendix

Congratulations, you have identified the fourth problem.

Discussion: The subheading "What Are the Costs" is not parallel with the first two subheadings. One solution, to convert this third subheading to a noun phrase, is given below.

Find the final problem.

Evaluation of a Neurosurgery That Treats Symptoms of Parkinson's Disease

[Introduction](#)

[Symptoms of Parkinson's Disease](#)

[Pallidotomy Treatment of Parkinson's](#)

[Theoretical Principles of Pallidotomy](#)

[Test Results of Pallidotomy](#)

[Alternative Treatments of Pallidotomy](#)

[L-Dopa Drug Therapy](#)

[Fetal Tissue Implants](#)

[Comparison of Treatments](#)

[Effectiveness of Treatments](#)

[Side Effects of Treatments](#)

[Costs of Treatments](#)

[Conclusions and Recommendations](#)

[Appendix](#)

Congratulations, you have identified the final problem.

Discussion: The heading "Appendix" does not communicate enough information. One solution is to assign a title.

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Evaluation of a Neurosurgery That Treats Symptoms of Parkinson's Disease

[Introduction](#)

[Symptoms of Parkinson's Disease](#)

[Pallidotomy Treatment of Parkinson's](#)

[Theoretical Principles of Pallidotomy](#)

[Test Results of Pallidotomy](#)

[Alternative Treatments of Pallidotomy](#)

[L-Dopa Drug Therapy](#)

[Fetal Tissue Implants](#)

[Comparison of Treatments](#)

[Effectiveness of Treatments](#)

[Side Effects of Treatments](#)

[Costs of Treatments](#)

[Conclusions and Recommendations](#)

[Appendix: Regions of the Brain Affected by Parkinson's Disease](#)

You have reached the end of this exercise.

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[Language Exercises:](#)
[Being Familiar](#)
[Being Concise](#)
[Being Fluid](#)

Click on the main precision or clarity problem in each of the following sentences. This exercise is important because if you can precisely identify writing problems, you are in a much better position to identify solutions. Specific problems are as follows:

1. Precision problem (pages 73-82)
2. Clarity problem: Needless Complexity (pages 83-90)
3. Clarity problem: ambiguity (pages 90-96)

If you are unsure about the category, click on the place in the sentence where the specific problem occurs. The numbers in parentheses refer to pages in *The Craft of Scientific Writing* that provide corresponding information.

1. On that flight, the right booster's aft field joint's primary O-ring eroded 0.053 inches.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#1. Congratulations, you have found the main problem.

Clarity problem: needlessly complex phrase. The modifier string ("the right booster's aft field joint's primary O-ring") is too long for the reader to comprehend in one pass.

Possible solution: Break up the string ("the primary O-ring on the aft field joint of the right booster..."). For further discussion, see pages 85-86.

2. Within the master control there are four computers and approximately 1943 microprocessors.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#2. Congratulations, you have found the main problem.

Precision problem: imprecise level of detail. Given the use of "approximately," the number of microprocessors is overspecified.

Possible solutions: Either make the number less specific ("about two thousand microprocessors") or cut the modifier ("Within the master control there are four computers and 1943 microprocessors"). For further discussion, see pages 80-81.

Top of Page

3. The proposed schedule is discussed below for the next four years.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#3. Congratulations, you have found the main problem.

Clarity problem: ambiguity arising from syntax. Was the schedule *discussed* for four years or was there a four-year schedule?

Possible solution: Move the prepositional phrase ("The proposed four-year schedule is discussed below"). For further discussion, see pages 92-93.

Top of Page

4. The beams are positioned with respect to the chopper blade so that while one beam passes the output of the opposite beam is completely blocked.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#4. Congratulations, you have found the main problem.

Clarity problem: ambiguity arising from punctuation problem. The reader trips thinking that one beam has passed the output of the opposite beam.

Solution: Place a comma after word "passes." For further discussion, see pages 94-96.

5. The goal of the silver/polymer reflector research is to develop and verify the technical feasibility of at least one durable silver/polymer reflector material for use in constructing low-cost, lightweight concentrators--a material that is resistant to ultraviolet radiation, resistant to pollution attack, has a specular reflectance of greater than 90 percent, a specularity comparable to that for silver/glass mirrors, and a useful life of at least 15 years.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#5. Congratulations, you have found the main problem.

Clarity problem: needlessly complex sentence. The sentence contains too many ideas.

Possible solution: Break up the sentence into two or three sentences. First revision:
"The goal of this research on silver/polymer reflectors is to develop and test at least one durable material for use in a low-cost, lightweight concentrator. This reflector material must be resistant to ultraviolet radiation and pollution attack. It must also have a useful life of 15 years and a specular reflectance of greater than 90 percent, which is comparable to that for silver/glass mirrors." For further discussion, see pages 86-90.

Top of Page

6. The Lunar Module was only designed to hold two astronauts and to have a life time of forty-five hours.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#6. Congratulations, you have found the main problem.

Clarity problem: ambiguity arising from syntax. The placement of the word "only" causes an ambiguity. Was the lunar module designed for only two purposes (to hold two astronauts and to exist for forty-five hours)? Or was the lunar module designed to hold only two astronauts?)? Or was the lunar module designed to exist for only forty-five hours?

Possible solution: Rethink the position and use of the word "only." First revision: "The Lunar Module was designed to accommodate at most two astronauts and to operate at most for forty-five hours." For further discussion, see pages 92-93.

7. A physician named Irving Selikoff credited asbestos with causing two types of lung cancer: asbestosis and mesothelioma.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#7. Congratulations, you have found the main problem.

Precision problem: imprecise word choice. The word "credited" has a positive connotation, which is out of place in the sentence.

Possible solution: Replace the word "credited" with the word "blamed." Revision: "A physician named Irving Selikoff blamed asbestos with causing two types of lung cancer: asbestosis and mesothelioma." For further discussion, see pages 77-78.

Top of Page

8. Scientists at the biosphere had to deal with problems ranging from pest invasions to lack of oxygen. Because of this, the project has begun to accept offers for researchers to enter the dome for anywhere from a few days to several months.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#8. Congratulations, you have found the main problem.

Clarity problem: ambiguity arising from pronoun. What does the word "this" refer to? Only the writer knows for sure. Note that this problem could be considered a discontinuity (see pages 137-138).

Possible solution: Add specific details that help make the transition from the problems encountered to the decision about the length of time that researchers can work in the biosphere. For further discussion, see pages 92-93.

Top of Page

9. Enormous, high-tech, modern mining companies are both continuing operations at old gold mines, such as the case of the Homestake Mine in Lead, South Dakota, which has operated continuously since 1877 and is continuing to increase its operations [Hinds and Trautman, 1983], and opening new gold mines, often in

very disturbing locations, such as the proposed, and for now, postponed, New World Mine, whose proposed location was about 2.5 miles from the border of Yellowstone National Park, near Cooke City, Montana.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#9. Congratulations, you have found the main problem.

Clarity problem: needlessly complex sentence. The sentence contains too many ideas (reflected by the number of parenthetical commas).

Possible solution: Break up the sentence into two or three sentences. First revision:
"Modern mining companies, which are enormous and high-tech, are both continuing operations at old gold mines and opening new ones. An example of an old gold mine is the Homestake Mine in Lead, South Dakota. This mine has operated continuously since 1877 and is continuing to increase its operations [Hinds and Trautman, 1983]. An example of a new gold mine is the proposed New World Mine, which is to be about 2.5 miles from the border of Yellowstone National Park, near Cooke City, Montana. The construction of this mine has been postponed." For further discussion, see pages 86-90.

Top of Page

10. If an airplane waits too long to take off the de-icing fluid can dissipate.

Imprecision

Needless Complexity

Ambiguity

No precision or clarity problem

#10. Congratulations, you have found the main problem.

Clarity problem: ambiguity arising from punctuation problem. The reader trips thinking that the airplane has waited too long to take off de-icing fluid.

Possible solution: Place a comma after word "off." For further discussion, see pages 94-96.

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You have reached the end of this exercise.

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Illustration Exercise #1 (Choosing Illustrations)

[Exercise Contents](#)

[Writing Workbook](#)

[Writing Courses](#)

Exercise Links:

[Structure Exercises](#)

[Language Exercises](#)

[Illustration Exercise #2](#)

Given below are situations that call for certain types of illustration. Choose the illustration that best serves each situation. Possible choices and their corresponding discussions in [*The Craft of Scientific Writing*](#) include

Tables (page 146)

Graphs (page 148)

Photographs (page 152)

Drawings (page 153)

Diagrams (page 156)

Note: In the general preferences of your browser, please do not override this document's choice of font colors.

-
1. In a progress report to your sponsor, you want to include an illustration depicting a laser doppler velocimetry experiment that your laboratory has up and running. Which type of figure would you choose to depict this image?

[photograph](#)

[drawing](#)

[diagram](#)

Congratulations, you have made a logical choice.



Figure 1. New laser doppler velocimetry experiment to measure flow in wind tunnel.

[Top of Page](#)

2. In a formal report to a varied audience, you want to point out the areas of the brain affected by Parkinson's disease. Which type of figure would you choose to depict this image?

[photograph](#)

[drawing](#)

[diagram](#)

Congratulations, you have made a logical choice.

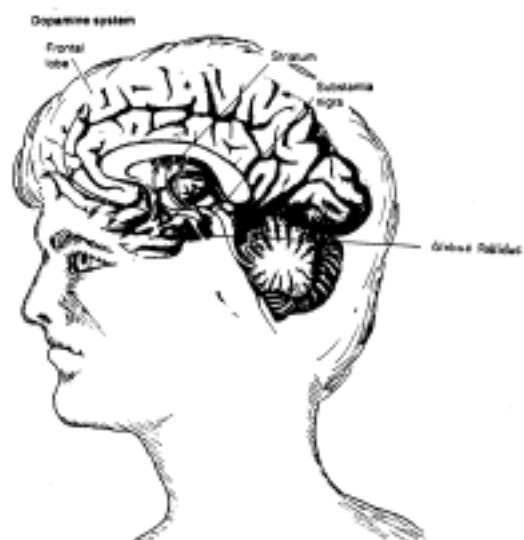


Figure 2. The region of the brain affected by Parkinson's disease.

Top of Page

3. In a formal report to a varied audience, you depict the process of cyanide leaching to extract gold from ore. Which type of figure would you choose to depict this image?

photograph

drawing

diagram

Congratulations, you have made a logical choice.

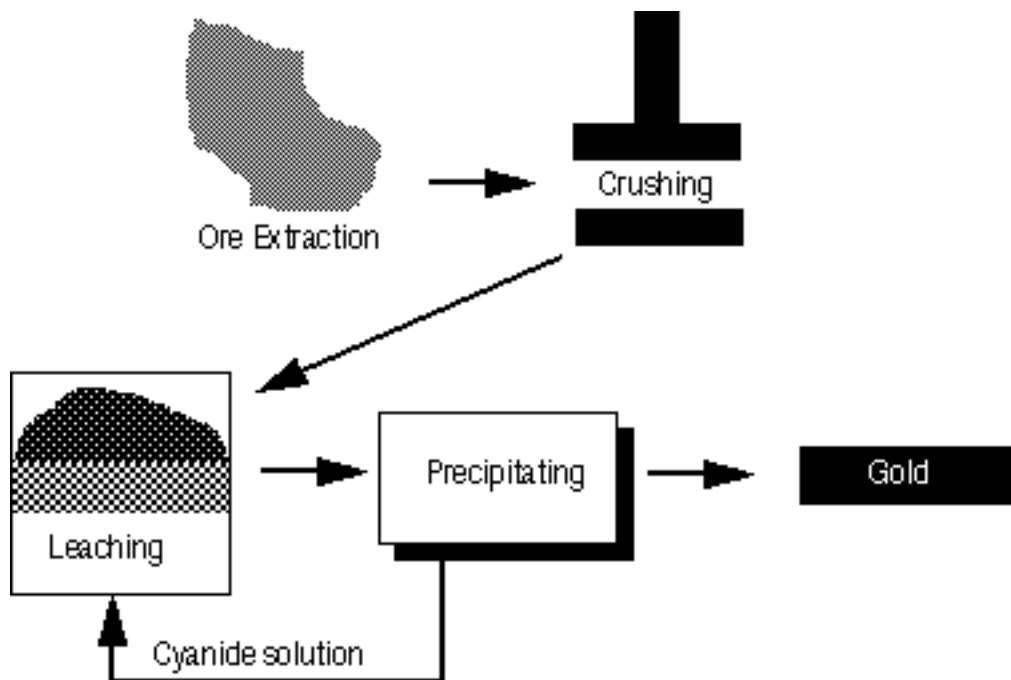


Figure 3. The basic steps of the cyanide leaching process.

You have reached the end of this exercise.

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[Writing Guidelines](#)
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Language Exercises:
[Being Precise and Clear](#)
[Being Concise](#)
[Being Fluid](#)

Defining terms is important in scientific writing. In many instances, such as in a glossary, you define terms in a formal way. The following formal definitions from a glossary may have one of the following common problems:

1. does not identify the term's class
2. does not distinguish term from other members of class
3. is circular
4. has a structure incorrect for this term's part of speech

In the exercise, identify the problem, if any, with each formal definition. These problems are discussed on pages 112-115 in *The Craft of Scientific Writing*. For this exercise to work effectively, do not override this file's choice of colors.

1. **ductility:** property of a material.

[\(a\) Formal definition does not identify the term's class](#)

[\(b\) Formal definition does not distinguish term from other members of class](#)

[\(c\) Formal definition is circular](#)

[\(d\) Formal definition has a structure incorrect for this term's part of speech](#)

[\(e\) Formal definition succeeds](#)

#1. Congratulations, you have found the main problem.

ductility: property of a material. (*original*)

ductility: property of a material that enables it to stretch without fracturing or cracking.
(*possible revision*)

2. **breaching:** process by which a ship's exterior hull fractures and allows water to penetrate.

(a) Formal definition does not identify the term's class

(b) Formal definition does not distinguish term from other members of class

(c) Formal definition is circular

(d) Formal definition has a structure incorrect for this term's part of speech

(e) Formal definition succeeds

#2. Congratulations, you have answered correctly.

breaching: process by which a ship's exterior hull fractures and allows water to penetrate. (*original*)

Discussion: No major problem.

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3. **occlusion:** obstructing or inhibiting the natural tendencies of similar particles to attract.

(a) Formal definition does not identify the term's class

(b) Formal definition does not distinguish term from other members of class

(c) Formal definition is circular

(d) Formal definition has a structure incorrect for this term's part of speech

(e) Formal definition succeeds

#3. Congratulations, you have found the main problem.

occulsion: obstructing or inhibiting the natural tendencies of similar particles to attract.
(original)

occlusion: substance that obstructs or inhibits the natural tendencies of similar particles to attract. *(possible revision)*

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You have reached the end of this exercise.

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Exercise Contents
Writing Workbook
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Language Exercises:
Being Precise and Clear
Being Familiar
Being Fluid

In the paragraph below, click on the first word or phrase that can be cut or reduced. Once you have located that word or phrase, you will view a discussion of that reduction and then see an edited version of the paragraph. At that point, click on the next word or phrase that can be cut or reduced. For this exercise to work effectively, please remove the underlining-of-links option from your browser's list of preferences.

The objective of this subsection is to present experimental data that can be used in conjunction with a comprehensive computational modeling study to determine a rather detailed understanding of whether explosions could occur in the fuel tank environments of Boeing 747s. Temperature measurements made in the course of a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a first cut.

This subsection presents experimental data that can be used in conjunction with a comprehensive computational modeling study to determine a rather detailed understanding of whether explosions could occur in the fuel tank environments of Boeing 747s. Temperature measurements made in the course of a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a second cut.

This subsection presents experimental data that can be used with a comprehensive computational modeling study to determine a rather detailed understanding of whether

explosions could occur in the fuel tank environments of Boeing 747s. a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a third cut.

This subsection presents experimental data that can be used with a computational model to determine a rather detailed understanding of whether explosions could occur in the fuel tank environments of Boeing 747s. Temperature measurements made in the course of a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a fourth cut.

This subsection presents experimental data that can be used with a computational model to determine whether explosions could occur in the fuel tank environments of Boeing 747s. Temperature measurements made in the course of a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a fifth cut.

This subsection presents experimental data that can be used with a computational model to determine whether explosions could occur in the fuel tanks of Boeing 747s. Temperature measurements made in the course of a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a sixth cut.

This subsection presents experimental data that can be used with a computational model to determine whether explosions could occur in the fuel tanks of Boeing 747s. Measurements during a Boeing 747's flight revealed the presence of high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made a seventh cut.

This subsection presents experimental data that can be used with a computational model to determine whether explosions could occur in the fuel tanks of Boeing 747s. Measurements during a Boeing 747's flight revealed high-temperature conditions in the tank during the take-off phase of the flight.

Congratulations, you have made an eighth cut.

This subsection presents experimental data that can be used with a computational model to determine whether explosions could occur in the fuel tanks of Boeing 747s. Measurements during a Boeing 747's flight revealed high temperatures in the tank during the take-off phase of the flight.

Congratulations, you have made the sentences concise.

This subsection presents experimental data that can be used with a computational model to determine whether explosions could occur in the fuel tanks of Boeing 747s. Measurements during a Boeing 747's flight revealed high

temperatures in the tank during take-off.

You have reached the end of this exercise.

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Language Exercises:
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One aspect of being fluid is to vary sentence rhythms, and one easy way to vary sentence rhythms is to vary the way that sentences begin. For the following sentences, decide what type of sentence opener is used. Openers include subject-verb, prepositional phrase, adverb, dependent clause, infinitive phrase, participial phrase, introductory series, gerundial phrase, and dependent clause used as a subject. Most of these openers are discussed on pages 130-133 in *The Craft of Scientific Writing*. For this exercise to work effectively, please do not override this page's selection of colors.

1. At the time of her construction, the Titanic was the largest ship ever built.

[Subject-Verb](#)

[Prepositional Phrase](#)

[Adverb](#)

[Dependent Clause](#)

[Participial Phrase](#)

#1. Congratulations, you have made the correct choice.

Discussion: [page 130](#).

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-
2. The Titanic was nearly 900 feet long, stood 25 stories high, and weighed an incredible 46 thousand tons.

[Subject-Verb](#)

Prepositional Phrase

Adverb

Dependent Clause

Participial Phrase

#2. Congratulations, you have made the correct choice.

Discussion: [pages 130-131.](#)

3. However, on April 15, 1912, the Titanic sideswiped a massive iceberg and sank in less than three hours.

Subject-Verb

Prepositional Phrase

Adverb

Dependent Clause

Participial Phrase

#3. Congratulations, you have made the correct choice.

Discussion: [pages 130-131.](#)

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4. Although human factors contributed to the sinking of the Titanic, this report will focus on material failures and design flaws.

[Subject-Verb](#)

[Prepositional Phrase](#)

[Adverb](#)

[Dependent Clause](#)

[Infinitive Phrase](#)

#4. Congratulations, you have made the correct choice.

Discussion: [pages 130-131.](#)

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5. Brittle fracture of hull, failure of the rivets, and flaws in the watertight compartment--all of these aspects will be analyzed in this report.

[Gerundial Phrase](#)

[Dependent Clause serving as the Subject](#)

[Infinitive Phrase](#)

[Prepositional Phrase](#)

[Introductory Series](#)

#5. Congratulations, you have made the correct choice.

Discussion: [page 275](#).

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6. What the survivors of the disaster then described was a loud noise that sounded like breaking china.

Gerundial Phrase

Dependent Clause serving as the Subject

Infinitive Phrase

Prepositional Phrase

Introductory Series

#6. Congratulations, you have made the correct choice.

Discussion: This particular opener, which is not difficult to master, does an excellent job of varying the rhythm.

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7. Falling nearly vertically at about 4 mph, the stern crashed into the ocean floor 27 minutes later.

Participial Phrase

Dependent Clause serving as the Subject

Infinitive Phrase

Prepositional Phrase

Adverb

#7. Congratulations, you have made the correct choice.

Discussion: [pages 130-132.](#)

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8. To measure the brittleness of the Titanic's steel, scientists conducted a Charpy test.

[Participial Phrase](#)

[Dependent Clause](#)

[Infinitive Phrase](#)

[Prepositional Phrase](#)

[Subject-Verb](#)

#8. Congratulations, you have made the correct choice.

Discussion: pages 130-131.

[Top of Page](#)

9. When the iceberg tore through the hull plates, huge holes were created that allowed water to flood the hull of the ship.

Prepositional Phrase

Dependent Clause

Infinitive Phrase

Participial Phrase

Adverb

#9. Congratulations, you have made the correct choice.

Discussion: [pages 130-131.](#)

10. Like a giant lever, the hull plates transferred the inward forces to the rivets along the plate seams.

Participial Phrase

Dependent Clause

Infinitive Phrase

Prepositional Phrase

Adverb

#10. Congratulations, you have made the correct choice.

Discussion: [pages 130-131.](#)

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You have reached the end of this exercise.

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Illustration Exercise #2 (Designing Illustrations)

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[Writing Workbook](#)
[Writing Courses](#)

Given below are situations that call for you to design illustrations. On a piece of paper, sketch out a design for each situation and then read what professionals have come up with for the same situations.

Exercise Links:
[Structure Exercises](#)
[Language Exercises](#)
[Illustration Exercise #1](#)

1. Imagine that it is 1964 and that you are working for the Warren Commission and helping prepare the report on the assassination of President John F. Kennedy. One section that you are writing involves presenting a scenario in which Oswald shot the President. Design an illustration or illustrations for the following set of details that you assume to be true:

Shots were fired at 12:30 p.m. Witnesses claimed that shots came from a window (southeast corner) of the Depository's sixth floor. A rifle was found on the sixth floor near the stairs, which are located at the northwest corner of building. All floors in the building have a floor area of 96 feet by 96 feet. The sixth floor has supporting pillars, but no inner walls. Motorcycle officer Marrion Baker, coming up the northwest corner stairs, sees Oswald in the second floor vestibule at 12:31:30. Oswald was walking down a corridor toward a Coke machine. After Supervisor Roy Truly vouches for Oswald, Truly

and Baker proceed up the stairs. At 12:32, Mrs. Robert Reid sees Oswald in the second floor office space. He is walking toward the front stairway, which connects the first and second floors only. The front stairway leads to the building's main entrance on Elm Street. At 12:33, Oswald is stopped by Robert MacNeil (of NBC) and asked for directions to a phone. This meeting occurs on Elm Street almost directly below the window where the shots were supposedly fired.

(possible answer)

One such illustration would be a cutaway of the Texas School Book depository featuring the sixth floor, the second floor, and the first floor. Oswald's possible path is shown in a broken line (beginning with the sixth floor window at 12:30 p.m. and ending with Oswald leaving MacNeil at 12:33 p.m.). Oswald's witnessed paths are then represented by solid lines. Inset clocks show the times at which established events occurred: the shots firing; Baker spotting Oswald; Reid seeing Oswald; and MacNeil stopping Oswald. For an actual depiction of this illustration, see Gerald Posner's book *Case Closed: Lee Harvey Oswald and the Assassination of JFK* (New York: Random House, 1993), pages 480-481.

2. Imagine that it is 1985 and that the wreckage of the R.M.S. Titanic has just been located on the ocean floor. Surprisingly, the ship is in two pieces, separated by a distance of 0.4 miles. Create an illustration that shows what happened to the Titanic based on the following events that you assume to be true [Gannon, *Popular Science*, February 1995]:

At 11:40 p.m. on the night of April 12, 1912, the Titanic on its maiden voyage sideswipes an iceberg. The collision causes a huge gash in the ship's hull. By midnight, the first six compartments of the hull have filled to the point at which water was sloshing over from one compartment to the next. At 1:20, the bow dips to the point that water floods through the anchor chain

holes. By 2:00, the bow has submerged so much that the three mammoth propellers in the stern lift free from the water. One of the stacks topples. At 2:10, the Titanic is tilted at least 45 degrees. The bending moment on the ship is immense, for a huge portion of the ship hangs unsupported. Suddenly, at a point at or just beneath the surface, the topside pulls apart, while the hull girder near the ship's center fails. The keel bends, and the bottom plating buckles. Within minutes, the stern angles high above the water. At 2:18, the bow, dangling beneath fills with water, grows heavier, and rips loose. Free from that weight, the stern rises sharply, holds almost a vertical position, and then fades downward again. At 2:20, the stern gently slides beneath the surface. Meanwhile the bow has been coasting down at a maximum speed of about 13 mph. At 2:29, it strikes the bottom, 12,612 feet beneath the ocean surface. At 2:56, the stern, having fallen nearly vertically at about 4 mph, crashes (nearly 36 minutes after submerging) two-fifths of a mile from the bow.

(possible answer)

One such illustration would be a staged drawing showing the Titanic at different times. See [Robert Gannon's article](#) in *Popular Science* (February 1995).

3. Design an illustration to represent the stages in the life cycle of lymphocytes in the human immune system. The human immune system is made up of several parts: the bone marrow, the thymus gland, the lymph nodes, and the spleen. In the red bone marrow, certain cells, called lymphocytes, originate. Upon being released from the bone marrow, these lymphocytes are essentially identical, but may mature into one of two types of protective cells: T cells or B cells. Whether a given lymphocyte matures into a T cell or B cell depends on where in the body it becomes immunocompetent (able to recognize specific antigens). T cells arise from lymphocytes that migrate to the thymus gland, where they undergo a maturation process of two to three days. When this process is complete, immunocompetence in T cells is achieved. B cells are believed to develop immunocompetence while still in the bone marrow, but very little is known about the factors that control B cell maturation in humans.

Immunocompetence by a lymphocyte is signaled by the appearance of a single, unique type of cell surface receptor on each T cell or B cell that enables the lymphocyte to recognize and bind to a specific antigen. After becoming immunocompetent, both T cells and B cells disperse to the lymph nodes and spleen where they encounter antigens. When lymphocytes bind with recognized antigens, they complete their differentiation into fully mature T cells and B cells. Note that lymphocytes, particularly T cells, are extremely mobile and circulate continuously throughout the body. their circulatory pattern greatly increases their chances of coming into contact with antigens located in different parts of the body.

(possible answer)

One such illustration would be a combination drawing/diagram that shows key areas: immature lymphocytes in the bone marrow, some of these lymphocytes becoming immunocompetent T cells in the spleen, other lymphocytes becoming immunocompetent B cells in the bone marrow, the lymph nodes and spleen where both T cells and B cells migrate through, and the circulation of both mature T and B cells and immunocompetent T and B cells in the blood. An example exists in Elaine Marieb's *Human Anatomy and Physiology* (Benjamin /Cummings, 1989).

You have reached the end of this exercise.

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The web site for “Grammar Exercise 1” has moved to

<http://writing.eng.vt.edu/exercises/grammar1.html>

Please update your links.

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