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Basic Patterns and Elements of the Sentence

David McMurrey

Chapter Objectives

Upon completion of this chapter, readers will be able to:

1. Explain and apply basic patterns of the sentence as they relate to technical writing.
2. Explain and apply basic elements of the sentence as they relate to technical writing.

This section is a quick review of the fundamentals of the sentence. If you encounter unfamiliar terminology in this textbook or in your class, refer to this section for help. For more on grammar, see the Purdue Online Writing Lab.

Basic Sentence Patterns

Subject + Verb

The simplest of sentence patterns is composed of a subject and verb without a direct object or subject complement. It uses an intransitive verb, that is, a verb requiring no direct object.

Control rods remain inside the fuel assembly of the reactor.

The development of wind power practically ceased until the early 1970s.

All amplitude-modulation (AM) receivers work in the same way.

The cross-member exposed to abnormal stress eventually broke.

Only two types of charge exist in nature.

Subject + Linking Verb + Subject Complement

Another simple pattern uses the linking verb, any form of the to be verb without an action verb.

The chain reaction is the basis of nuclear power.

The debate over nuclear power has often been bitter.

Folding and faulting of the earth's surface are important geologic processes.

Windspeed seems to be highest during the middle of the day.

The silicon solar cell can be difficult and expensive to manufacture.

Subject + Verb + Direct Object

Another common sentence pattern uses the direct object.

Silicon conducts electricity in an unusual way.

The anti-reflective coating on the the silicon cell reduces reflection from 32 to 22 percent.

Prestressing of the concrete increases the load-carrying capacity of the members.

Subject + Verb + Indirect Object + Direct Object

The sentence pattern with the indirect object and direct object is similar to the preceding pattern.

The walls are usually painted black.

The plant shutdown left the entire area an economic disaster.

The committee declared the new design a breakthrough in energy efficiency.

The low cost of the new computer made competition much too difficult for some of the other companies.

Passive Voice Pattern

The passive voice is not ordinarily considered a "pattern," but it is an important and often controversial construction. It reverses the subject and object and, in some cases, deletes the subject. Compare these example active and passive voice sentences.

Passive vs Active Voice

Passive voice	Active voice
Saccharin is now permitted as an additive in food.	The FDA now permits saccharin as an additive in food.
This report is divided into three main sections.	I have divided this report into three main sections.
Windmills are classified as either lift or drag types.	Engineers classify windmills as either lift or drag types.
The valves used in engine start are controlled by a computer.	A computer usually controls the valves used in an engine start.
The remains of Troy were destroyed by later builders on the site.	Later builders on the site of Troy destroyed the remains of citadel.
Some restaurant locations can be leased.	You can lease some restaurant locations.

Simple Sentences

A simple sentence is one that contains subject and a verb and no other independent or dependent clause.

One of the tubes is attached to the manometer part of the instrument indicating the pressure of the air within the cuff.

To measure blood pressure, a device known as a sphygmomanometer and a stethoscope are needed. (*compound subject*)

There are basically two types of stethoscopes. (*inverted subject and verb*)

The sphygmomanometer is usually covered with cloth and has two rubber tubes attached to it. (*compound verb*)

Compound Sentences

A compound sentence is made up of two or more independent clauses joined by a coordinating conjunction (*and, or, nor, but, yet, for*) and a comma; an adverbial conjunction and a semicolon; or a semicolon.

In sphygmomanometers, too narrow a cuff can result in erroneously high readings, and too wide a cuff can result in erroneously low readings.

Some cuffs hook together; others wrap or snap into place.

Compound Predicates

A predicate is everything in the verb part of the sentence *after* the subject (unless the sentence uses inverted word order). A compound predicate is two or more predicates joined by a coordinating conjunction. Traditionally, the conjunction in a sentence consisting of just two compound predicates is not punctuated.

Another library media specialist has been using Accelerated Reader for ten years and has seen great results.

This cell phone app lets users share pictures instantly with followers and categorize photos with hashtags.

Basic Parts of the Sentence

Subject

The subject of a sentence is that noun, pronoun, or phrase or clause about which the sentence makes a statement.

Einstein's general theory of relativity has been subjected to many tests of validity over the years.

Although a majority of caffeine drinkers think of it as a stimulant, heavy users of caffeine say the substance relaxes them.

Surrounding the secure landfill on all sides are impermeable barrier walls. (*inverted sentence pattern*)

In a secure landfill, the soil on top and the cover block storm water intrusion into the landfill. (*compound subject*)

Verb Phrase

The main verb, or verb phrase, of a sentence is a word or words that express an action, event, or a state of existence. It sets up a relationship between the subject and the rest of the sentence.

The first high-level language to be widely accepted, FORTRAN, was implemented on an IBM 704 computer.

Instruction in the source program must be translated into machine language. (*passive construction*)

The operating system controls the translation of the source program and carries out supervisory functions. (*compound verb*)

Predicate

The predicate is the rest of the sentence coming after the subject. It can include the main verb, subject complement, direct object, indirect object, and object complement.

The pressure in a pressurized water reactor varies from system to system.

The pressure is maintained at about 2250 pounds per square inch to prevent steam from forming.

The pressure is then lowered to form steam at about 600 pounds per square inch.

In contrast, a boiling water reactor operates at constant pressure.

Subject Complement

The subject complement is that noun, pronoun, adjective, phrase, or clause that comes after a linking verb (some form of the *be* verb):

The maximum allowable concentration is ten parts H₂S per million parts breathable air.

The deadening of the sense of smell caused by H₂S is the result of the effects of H₂S on the olfactory nerves of the brain. Continuous exposure to toxic concentrations of H₂S can be fatal.

Direct Object

A direct object—a noun, pronoun, phrase, or clause acting as a noun—takes the action of the main verb. A direct object can be identified by putting *what?*, *which?*, or *whom?* in its place.

The housing assembly of a mechanical pencil contains the mechanical workings of the pencil.

Lavoisier used curved glass discs fastened together at their rims, with wine filling the space between, to focus the sun's rays to attain temperatures of 3000° F.

The dust and smoke lofted into the air by nuclear explosions might cool the earth's atmosphere some number of degrees.

A 20 percent fluctuation in average global temperature could reduce biological activity, shift weather patterns, and ruin agriculture. (*compound direct object*)

The cooler temperatures brought about by nuclear war might end all life on earth.

On Mariners 6 and 7, the two-axis scan platforms provided much more capability and flexibility for the scientific payload than those of Mariner 4. (*compound direct object*)

Indirect Object

An indirect object—a noun, pronoun, phrase, or clause acting as a noun—receives the action expressed in the sentence. It can be identified by inserting *to* or *for*.

In the application letter, tell *[to]* the potential employer that a resume accompanies the letter.

The company is designing *[for]* senior citizens a new walkway to the park area.

Do not send *[to]* the personnel office a resume unless someone there specifically requests it.

Object Complement

An object complement—a noun or adjective coming after a direct object—adds detail to the direct object. To identify object complements, insert *[to be]* between the direct object and object complement.

The supervisor found the program [to be] faulty.

The company considers the new computer [to be] a major breakthrough.

Most people think the space shuttle [to be] a major step in space exploration.

Parts of Speech and Other Sentence Elements

Nouns

A noun is the name of a person (Dr. Sanders); place (Lawrence, Kansas, factory, home); thing (scissors, saw, book); action (operation, irrigation); or idea (love, truth, beauty, intelligence). Remember that, while a word may look like a noun, it must function in the sentence as a noun:

The one experiment that has been given the most attention in the debate on saccharin is the 1977 Canadian study done on rats.

The Calorie Control Council, a group of Japanese and American manufacturers of saccharin, spent \$890,000 in the first three months of the 1977 ban on saccharin on lobbying, advertisements, and public relations.

A flat-plate collector located on a sloping roof heats water which circulates through a coil and is pumped back to the collector.

The blades start turning when the windspeed reaches 10 mph, and an anemometer is attached to the shaft to measure windspeed.

The multifuel capacity of the Stirling engine gives it a versatility not possible in the internal combustion engine.

The regenerative cooling cycle in the engines of the space shuttle is made up of high pressure hydrogen that flows in tubes connecting the nozzle and the combustion chamber.

Pronouns

A pronoun stands in the place of a noun. There are several types: personal pronouns, demonstrative and indefinite pronouns, and relative and interrogative pronouns. Pronouns have antecedents, a reference to a word they take the place of.

Personal pronouns include nominative case, objective case, and possessive case pronouns.

Nominative Case

Nominative case pronouns are used in the positions of subjects or subjective complements; they include

Nominative Case Pronouns

I	we
you	you
he, she, it	they

Objective Case

Objective case pronouns are used as direct objects, indirect objects, and objects of prepositions; they include

Objective Case Pronouns

me	us
you	you
him, her, it	them

Possessive Case

Possessive case pronouns show possession; they include

Possessive Case Pronouns

my, mine	our, ours
your, yours	your, yours
his	their, theirs
her, hers	its

Demonstrative and Indefinite Pronouns

Demonstrative pronouns substitute for things being pointed out; indefinite pronouns substitute for unknown or unspecified things:

Demonstrative and Indefinite Pronouns

Demonstrative pronouns	Indefinite pronouns
this, these	each, either
that, those	any, neither
	anybody, some
	every, somebody
	everybody, someone

Relative and Interrogative Pronouns

Relative and interrogative pronouns link dependent to independent clauses; they link adjective or noun clauses to simple sentences. Relative pronouns include

Relative and Interrogative Pronouns

who	when	which
whom	where	whether
whose	why	that

Here are some examples of relative pronouns in use

Until the early 1960s, desk calculators, which performed only the basic arithmetic operations, were essentially mechanical in operation.

The invention of the transistor in 1948 and the integrated circuit in 1964 were two events that formed the basis of the electronic calculator revolution.

The form in which memory is presented to the software is sometimes called local address space.

George Boole, who was a self-taught man, is famous for his pioneering efforts to express logical concepts in mathematical form.

In 1855, Boole married Mary Everest, a niece of Sir George Everest after whom Mount Everest was named.

Lemaître proposed that all the matter in the Universe was concentrated into what he termed the primeval atom, whose explosion scattered material into space to form galaxies, which have been flying outward ever since.

Interrogative pronouns, similar to relative pronouns, are used in question sentences:

What is the fundamental unit of storage in a computer?

When did the first exhibit of computer graphics occur?

Who were the mathematicians that arranged that first exhibit

Where was the first computer graphics exhibit held?

Why is computer-aided art not considered art by some?

Verbs

Traditionally, verbs are divided into four groups: active verbs, linking verbs, auxiliary verbs, and modals.

Active Verbs

Active verbs express some sort of action and can be subdivided into intransitive and transitive verbs. Intransitive verbs do not take direct objects while transitive verbs do, as these two sets of examples show:

Active Verbs

Intransitive verbs	The rearrangement or division of a heavy nucleus may occur naturally (spontaneous fission) or under bombardment with neutrons.
	The probability of an accident leading to the melting of the fuel core was estimated to be one chance in 20,000 reactor-years of operations.
	The fuels used in ramjet engines burn in only a narrow range of fuel-air ratios.

Transitive verbs	<p>The generation of electric energy by a nuclear power plant requires the use of heat to produce steam or to heat gases in order to drive turbogenerators.</p> <p>In an auxiliary relay, when the applied current or voltage exceeds a threshold value, the coil activates the armature, which either closes the open contacts or opens the closed contacts.</p> <p>The solar power satellite absorbs the energy in geosynchronous orbit.</p> <p>In the photovoltaic solar power system, solar cells convert the light energy into electricity.</p>
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Linking Verbs

A linking verb is any form of the verb *to be* without an action verb; it sets up something like an equal sign between the items it links. Linking verbs of a sentence can be longer than one word:

Linking Verbs

had been	would have been
was being	might have been
had to have been	will have been

A few linking verbs do not use *to be* but function like it:

That word processing program seems adequate for our needs.

This calculus problem looks difficult.

Since the oil spill, the beach has smelled bad.

He quickly grew weary of computer games.

Auxiliary Verbs

Auxiliary verbs "help" the main part of the verb. Here are some auxiliary verbs:

By 1967, about 500 U.S. citizens had received heart transplants.

Better immunosuppression management in transplant operations has yielded better results.

Researchers have found propranolol to be effective in the treatment of heartbeat irregularities.

Modals

Modal verbs change the meaning of the verb in a variety of ways as illustrated in the examples below:

Cracks in the welding can only be detected by x-rays.

Liquid oxygen could have leaked into the turbine and cause the fire.

The light metal fast-breeder reactor must be operated under extreme safety precautions.

Verbs are used together in a complex variety of tenses. In the chart below, keep in mind that "continuous" tenses are those that use *-ing* and "perfect" tenses are those that use some form of the auxiliary verb *have*.

Variety of Tenses

Simple present	works
Present continuous	is working
Present perfect	has worked
Simple past	worked
Past continuous	was working
Past perfect	had worked
Simple future	will work
Future continuous	will be working
Future perfect	will have worked
Present perfect continuous	has been working
Past perfect continuous	had been working
Future perfect continuous	will have been working

Adjectives

An adjective provides more detail about a noun; that is, it modifies a noun. Adjectives occur just before the nouns they modify, or after a linking verb:

The armature is a rectangular ring about which another coil of wire is wound.

The generator is used to convert mechanical energy into electrical energy.

The steel pipes contain a protective sacrificial anode and are surrounded by packing material.

Adverbs

An adverb provides more information about a verb, adjective, or another adverb; that is, it "qualifies" the verb, adjective, or adverb:

The desk is made of an especially corrosion-resistant industrial steel.

The drilling bit actually tears rock apart to get at the oil.

The power company uses huge generators which are generally turned by steam turbines.

The debate over nuclear power has often been bitter.

Conjunctions

Conjunctions link words, phrases, and whole clauses to each other and are divided into coordinating, adverbial, and subordinating conjunctions. In this list, only the list of coordinating conjunctions is complete.

Conjunctions

Coordinating conjunctions	Subordinating conjunctions	Adverbial conjunctions
and	although	therefore
or	since	however
nor	because	in other words
but	when	thus
yet	while	then
for	if	otherwise
whereas	as if	nevertheless
as		on the other hand

Coordinating Conjunctions

Coordinating conjunctions link words, phrases, and clauses. Here are some examples:

Nuclear-powered artificial hearts proved to be complicated, bulky, and expensive.

In the 1960s, artificial heart devices did not fit well and tended to obstruct the flow of venous blood into the right atrium.

The blood vessels leading to the device tended to kink, obstructing the filling of the chambers and resulting in inadequate output.

The small clots that formed throughout the circulatory system used up so much of the clotting factor that uncontrolled bleeding from external or internal injury became a risk.

Current from the storage batteries can power lights, but the current for appliances must be modified within an inverter.

Adverbial Conjunctions

Adverbial conjunctions link two separate sentences, but require a semicolon or colon:

The Kedeco produces 1200 watts in 17 mph using a 16-foot rotor; on the other hand, the Dunlite produces 2000 watts in 25 mph winds.

The first artificial hearts were made of smooth silicone rubber which apparently caused excessive clotting and, therefore, uncontrolled bleeding.

(This example does not contain two sentences; no semicolon, therefore, is needed.) For short periods, the fibers were beneficial; however, the eventual buildup of fibrin on the inner surface of the device would impair its function.

The atria of the heart contributes a negligible amount of energy; in fact, the total power output of the heart is only about 2.5 watts.

Subordinating Conjunctions

Subordinating conjunctions combine separate sentences in a different way: they turn one of the sentences into an adverb clause. Here are some examples of subordinating conjunctions:

The heart undergoes two cardiac cycle periods: a diastole, when blood enters the ventricles, and systole, when the ventricles contract and blood is pumped out of the heart.

Whenever an electron acquired enough energy to leave its orbit, the atom is positively charged.

If the wire is broken, electrons will cease to flow and current is zero.

Phrases and Clauses

Phrases and clauses are groups of words that act as a unit and perform a single function within a sentence. A phrase may have a partial subject or verb but not both; a dependent clause has both a subject and a verb (but is not a complete sentence). Here are a few examples (not all phrases are highlighted because some are embedded in others):

Phrases and Clauses

Phrases	Clauses
<p>Electricity has to do with those physical phenomena involving electrical charges and their effects when in motion and when at rest. (<i>Involving electrical charges and their effects</i> is also a phrase.)</p> <p>Electricity manifests itself as a force of attraction, independent of gravitational and short-range nuclear attraction, <u>when two oppositely charged bodies are brought close to one another.</u></p> <p>In 1800, A. Volta constructed and experimented with the voltaic pile, <u>the predecessor of modern batteries.</u></p> <p>In 1833, Faraday's experimentation with electrolysis indicated a natural unit of electrical charge, thus pointing to a discrete rather than continuous charge. (<i>to a discrete rather than continuous charge</i> is also a phrase.)</p> <p>The symbol that denotes a connection to the grounding conductor is three parallel horizontal lines, each of the lower ones being shorter than the one above it</p>	<p>Electricity manifests itself as a force of attraction, independent of gravitational and short-range nuclear attraction, <u>when two oppositely charged bodies are brought close to one another.</u></p> <p>The symbol that denotes a connection to the grounding conductor is three parallel horizontal lines, <u>each of the lower ones being shorter than the one above it.</u></p> <p>These studies led Planck to postulate that <u>electromagnetic radiation is emitted in discrete amounts,</u> called quanta.</p> <p><u>Since the frequency is the speed of sound divided by the wavelength,</u> a shorter wavelength means a higher wavelength.</p> <p>Nuclear units planned or in construction have a total capacity of 186,998 KW, <u>which, if current plans hold, will bring nuclear capacity to about 22% of all electrical capacity by 1995.</u> (<i>if current plans hold</i> is a clause within a clause)</p>

Prepositional Phrases

A prepositional phrase, composed of a preposition and its object, shows relationships involving time, direction, or space:

An artificial heart was installed in a human subject for the first time in 1969.

The current leads to the field coils and into an external circuit. Alternators are not compatible with wind systems because of their high rpm requirements.

The operation of a wind generator is based upon Faraday's law of induced voltage which states that the voltage between the ends of a loop of wire is proportional to the rate of change in the magnetic field lines within the loop. (four prepositional phrases in the last highlighted area.)

Appositives

An appositive, a word or phrase that renames a noun or pronoun, adds information about a noun but in a way different than do adjectives:

In 1972, Richard Nixon, president of the U.S., approved the development of a reusable space vehicle, the Space Shuttle.

Broad principles about space flight were laid down by the Austrian aeronautical pioneer, Dr. Eugen Sanger.

The external tank of the Space Shuttle's main engines is composed of two tanks—a large hydrogen tank and a smaller oxygen tank.

An upper air inversion, a layer of stable air, is usually present over large areas of the tradewinds as a hurricane develops.

Participial Phrases

A participial phrase is a group of words acting as an adjective and modifying a noun or pronoun. A participle is the *-ed* or *-ing* form of a verb:

The Eagle Generator uses a 6-pole, shunt-wound generator designed to reach maximum power at 20 mph.

Because of the design created by Kwan-Gett, endothelial cells could grow on the fibrin layer, making the interior surfaces of the artificial heart similar to those of the natural heart.

The wire is wrapped around field cores made of steel laminations.

Gerunds and Gerund Phrases

Similar in appearance to a participial phrase, the gerund plays the role of noun. A gerund is a single word with *-ing* used as a noun. A gerund phrase is a single word with *-ing* accompanied by its objects, complements, and modifiers; it is a group of words acting as noun.

In the iron-core type transformer, the winding is wrapped around an iron bar.

The splitting of an atom produces a great amount of energy.

The cloning of a cell produces an identical cell.

Jarvik changed his artificial heart design in 1974 by fitting his model with a highly flexible three-layer diaphragm made of smooth polyurethane.

The Jarvik-7 design then in 1979 achieved a record time of sustaining life in a calf for 221 days.

Reversing the rotation of the electrohydraulic heart pump reverses the direction of the hydraulic flow.

Adjective Clauses

An adjective clause is almost a complete sentence—but not quite. It functions the same way a single-word adjective does: both modify, that is, add more information to our understanding of a noun. Adjective clauses contain (1) a relative pronoun, (2) in some cases, a subject, (3) a complete verb, and (4) any other accompanying predicates or objects.

Typically, one portable drilling rig, which requires two tug boats to bring it to the site, and several other boats are used in the exploratory drilling phase.

The company holds many patents on its wind energy systems, such as the flyball governor which varies the pitch of the blades in high winds and the slow-speed generator whose performance curve matches that of the propeller.

The idea of the artificial heart arose in part from the need to treat people who cannot receive a donor heart.

Nose designed a "biolized" heart in which the surfaces that came into contact with blood were made from natural tissues treated with chemical fixatives to make them tougher and immunologically inert. (an adjective clause within another adjective clause)

The regular CPR class people are taking everywhere now only lasts an evening.

Adverb Clauses

An adverb clause is also nearly a complete sentence; it functions like an adverb does by explaining the how, when, where, and why of the discussion. The adverb clause usually contains a subordinating conjunction, a subject, a complete verb, and any other related phrases or clauses:

Because the shortage in donor hearts is so severe, transplant surgery is limited to people with the best chances of surviving.

As long as the wind speed is sufficient, the electrical energy will be continuously generated.

If an oil spill occurs away from shore, it is unlikely to affect many birds, unless they are directly in a major migratory path at a migrating season.

Noun Clauses

A noun clause is a group of words used as a noun. Introduced by a relative pronoun, a noun clause can play any of the functions a noun plays: subject, direct object, object of preposition, subjective or object complement. Here are example noun clauses, with their functions labelled:

Estimates indicate that 20 million Americans owned hand-held calculators by 1974. (direct object)

Computer systems are often measured by how much main memory their architectures allow and by how fast that memory can be accessed. (object of preposition—two of them!)

Lemaitre proposed that all matter in the Universe was once concentrated into what he termed the primeval atom. (direct object; in this sentence, *what he termed the primeval atom* is also a noun clause.)

The choice of furnace wall construction depends on how sophisticated the gas-cleaning equipment is and on whether a large amount of waste is to be recovered. (object of preposition—two of them)

Most microcomputers use what are called flexible diskettes for program and data storage. (direct object)

The major disadvantage of sequential files is that they are slow. (subject complement)

Coordinated Elements

Many of the sentence elements described above can be "coordinated"; that is, they can be doubled, tripled, or even quadrupled and linked with coordinating conjunctions like *and* and *or*. For example, in the phrase "a black and white Datsun 240Z," two adjectives are coordinated. Here are some examples of coordinated sentence elements:

In 1800, A. Volta constructed and experimented with the voltaic pile, the predecessor of the modern battery. (two verbs)

Maxwell's theory not only synthesized theories about electricity and magnetism, but also showed optics to be a branch of electromagnetism. (two predicates)

Heat exchangers can be so designed that chemical reactions or energy-generation processes can be carried out in them. (two noun phrases)

Heat exchangers find wide applications in the chemical process industries, in the food industry, in the generation of steam for production of power and electricity, in aircraft and space vehicles, and in the field of cryogenics for low-temperature separation of gases. (nine total prepositional phrases)