Technical English for Engineers

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Lecture – 28
Describing and Explaining Processes

We know that, in your day-to-day writing you have to do a lot of description of processes and explain plenty of again processes and experiments that you have been involved in. So, describing and explaining is an important part of your writing. In today's class, this is what we are going to do Describing and Explaining Processes. While doing this, we are going to touch upon the kinds of verbs, necessary or commonly used for describing processes and experiments.

And also, those kinds of verbs and nouns and language that you may use when you describe let us say, an instrument or equipment, what is the appropriate voice to use when you are describing and explaining processes? I have received a query regarding explanation about adverbs, so I am going to explain something about adverbs also and will try to integrate it with our overall lecture, and then essential vocabulary necessary for describing and explaining.

So, good morning and this is the title of our lecture today Describing and Explaining Processes and Experiments.

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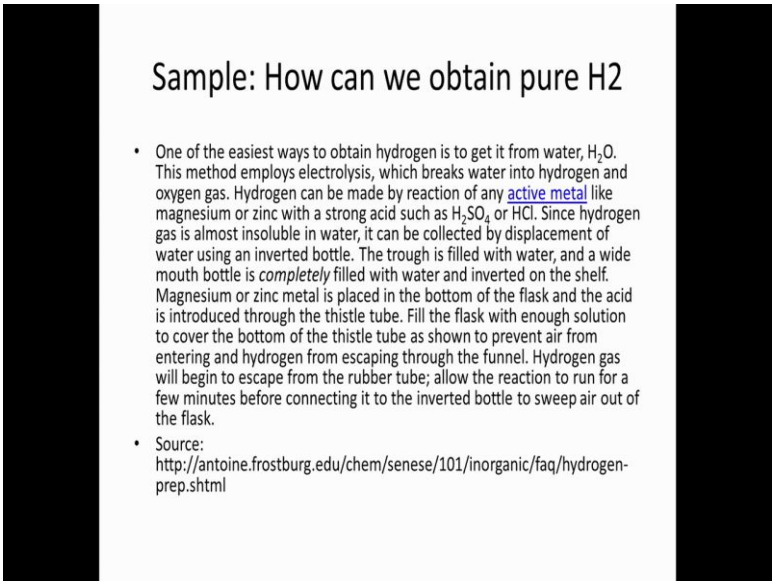

Look at the slide here, and read the passage with me. This is the sample text, title: How can we obtain pure hydrogen? This is a process. One of the easiest ways to obtain hydrogen is to get it from water, H 2 O. This method employs electrolysis, which breaks water into hydrogen and oxygen gas. Hydrogen can be made by reaction of any active metal like magnesium or zinc with a strong acid such as sulfuric acid or hydro chloric acid. Since hydrogen gas is almost insoluble in water, it can be collected by displacement of water using an inverted bottle. The trough is filled with water, and a wide mouth bottle is completely filled with water and inverted on the shelf. Magnesium or zinc metal is placed in the bottom of the flask and the acid is introduced through the thistle tube. Fill the flask with enough solution to cover the bottom of the thistle tube as shown to prevent air from entering and hydrogen from escaping through the funnel. Hydrogen gas will begin to escape from the rubber tube; allow the reaction to run for a few minutes before connecting it to the inverted bottle to sweep air out of the flask.

Please look at the slide, and Let us do some analysis of this passage. One of the easiest ways to now, I am just revising whatever we have been doing so far. So please look at the slide, and notice the sentence structure, the constructions, the vocabulary, and the linking words. Please look at it and read with me, one of easiest ways. Now remember, you are talking about your subject verb agreement, please revise it. Easiest ways, not easiest way; one of the easiest ways; therefore, it has to be ways it is one of the many, so

it has to be ways and not a way. To obtain hydrogen is to get it from water, this method now 'this method' which method is? To get it from water; so, we have to pay attention to the reference words now, you remember the reference words 'this', 'that', 'it', 'which', those are the words that stand for a noun or pronoun already been talked about. So, here we are talking about a way, and what is the a way to obtain hydrogen from water and this method? So, therefore, the use of this method employs electrolysis which breaks.

So, 'which' is for electrolysis method; into hydrogen and oxygen gas, hydrogen can be made by reaction of any active metal. Now, there are 2 ways of doing this passage, you can either say hydrogen can be made like; now this is your voice and your passive voice, remember. You can also use second person narrative voice here and say, you can make hydrogen by doing so and so thing. But then try doing that, if you use the second person plural voice by using the second person singular voice, then look at the difference between that style of writing and this style of writing.

So, let us go on looking at the slide again and notice how everything is in passive voice. Since hydrogen gas, and now this is your connective word, linking word 'since', is almost insoluble. Look at the way the word has been formed soluble, insoluble this is making a word into a negative or antonym or opposite of a given word; you will also find another word displacement, a displace. So, this is you use in and im and dis and un, in order turn a word into its opposite. So, remember these things. Completely filled, 'completely' here is an adverb not an adjective.

And, then go on fill the flask with enough solution to cover the bottom of the thistle tube as shown to prevent air from entering a hydrogen from escaping you; if you want to look at the entire process go to this link and you will be shown the diagram as well. Hydrogen gas will begin to escape; 'to escape' is your verb here, from the rubber tube. Allow the reaction to run for a few minutes before connecting it to the inverted bottle to sweep air out of the flask.

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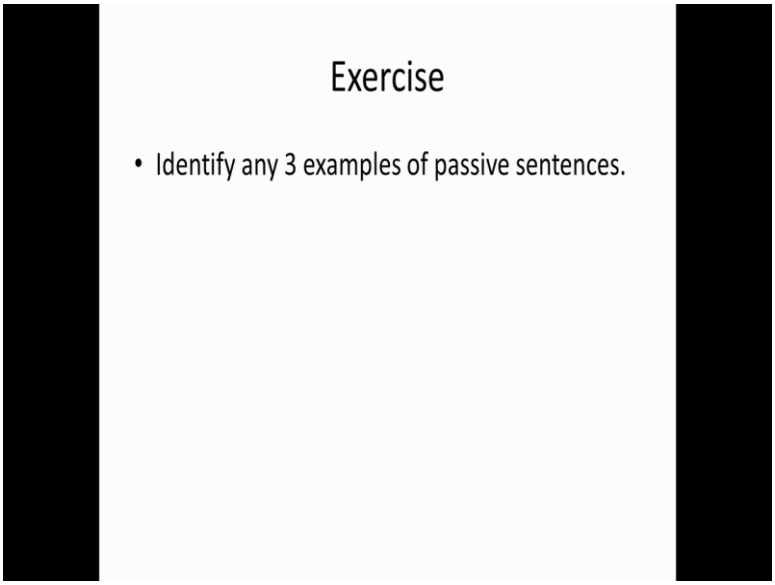

Now, your exercise here is to identify any 3 examples of passive sentences. There are plenty of passive sentences here, you have to use. I would like you to identify those passive sentences. I would also like you to notice the use of Imperative Sentences.

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Imperative sentences, are those sentences that tell you what to do, sit down, write it, open the door, switch on the air conditioner, these are imperatives. So notice, how this passage

that you have just seen is; and the way it makes ample use of imperative and passive constructions. Imperative sentences are like request, suggestion, advise, command, etcetera. So, when you say you have to do this; that means, this is an imperative sentence. 'Put it down', imperative; 'fill the flask', imperative; 'see to it that the bottle is completely filled with water', this is your imperative sentence.

Imperative sentences often appear to have missing subjects and the use a verb to begin the sentence. So, you will not find it as you filled the bottle, there is a subject missing or we fill the bottle; is fill in the bottle. 'Open the door' it is not 'you open the door', so therefore, it is imperative. You have to remember, the subject is the person listening or the audience. In other words, if an imperative sentences or sentence is directed towards you, then you are the subject of the sentence, remember that.

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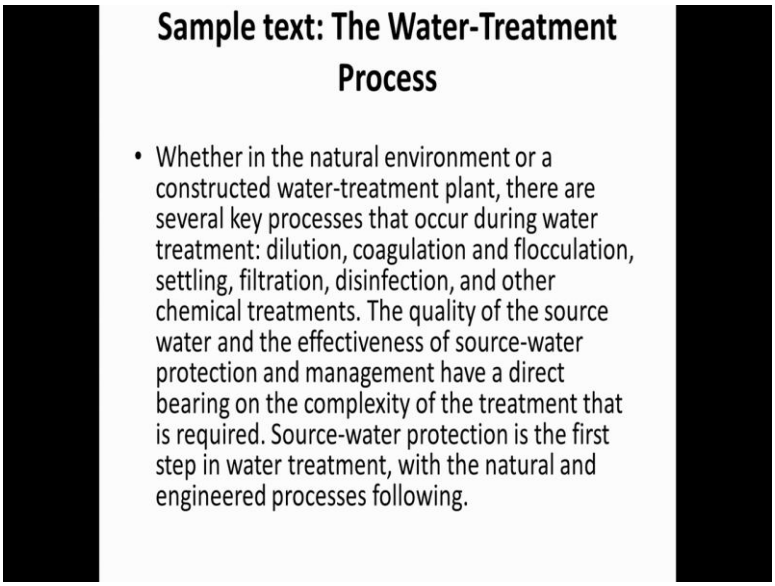

Look at this second sample text: The Water-Treatment Process. Look at the slide, and let us read it. Whether in the natural environment or a constructed water-treatment plant, there are several key processes that occur during water treatment. Now, look at this very interesting use of punctuation. Recall your earlier classes on punctuation, here is a, what is it? This is a colon; and when do we use a colon among other things? We use a colon when we are making a list of something; so, dilution, coagulation, flocculation, settling, filtration, disinfection and other chemical treatments. Look at the effective use this punctuation mark; that is a colon. The quality of the source water and the effectiveness of

source-water protection and management have a direct bearing on the complexity of the treatment that is required. Source-water protection is the first step in water-treatment, with the natural and engineered processes following.

Now, look at the last 2 lines; which is the noun? Processes. What are the adjectives here? Natural and engineered. So, this is the difference between adverb and adjective. Adjective always adds something to the noun. Adverb, I will do some adverb with you as we go on deeper into today's class. So, in this water and how water-treatment process works, what have we seen? We have seen tenses, the use of tenses; remember while describing processes, and experiments, tenses should be by and large consistent. A tense is consistence here, right? What sort of a tense is it? You must have noticed this, all in present tense. It describes a universal process, tense remains in the present.

Kind of sentences, these are simple; I do not mean simple as in simple and complex, I mean straight forward declarative. These are assertive sentences, which are making some sort of a declaration. We have done declaration and declarative sentences in the earlier parts of this course, so please refer to that. They are also in affirmative tones, you do not use negatives while writing or describing a process, generally speaking. And then, you have vocabulary which is very technical, very specific all those listed words dilution, coagulation, flocculation, settling, filtration, disinfection, effectiveness. I will repeat these words and I would want you to form different parts of speech with these words and then use them in sentences of your own. This is your exercise, do it in pairs consult a dictionary.

I will repeat dilution, coagulation, flocculation, settling, filtration, disinfection, effectiveness. I will repeat what I want to you to do; I want you to open your dictionaries, look at the earlier lecture on various kinds of a word formation how the same word identifying the root word can be chained into different from of word. So, from noun you turn a word into adjective and into a verb or adverb as the case may be. So, try to do this exercise with your friends.

Some common or usual examples of describing processes and describing how things work; I can give you a list. It is like these are some common sentence and a sentences

and expressions. And, you can decide for yourself that what is the pattern here; what is the pattern here when we describe certain processes and experiments. For example, you can take this down; turn a gas jar upside down, turn a gas jar upside down. Second, replace the cover, shake the jar. Next, the phosphorus is carefully dried. Next, the circuit is completed. Next, the air is then pumped through the tire valve. Now, when you say turn a gas jar upside down, this is your imperative; you turn the gas, we turn the gas jar upside down. Replace that cover shake the jar, you do it or I will do it or we will do it; so the subject is missing, but when you say the circuit is completed the prosperous is carefully dried what are we doing? We; it is not an imperative; it is a declarative sentence in affirmative, not negative. So, this is the common pattern or a structure of sentences used. Now please, look at this slide.

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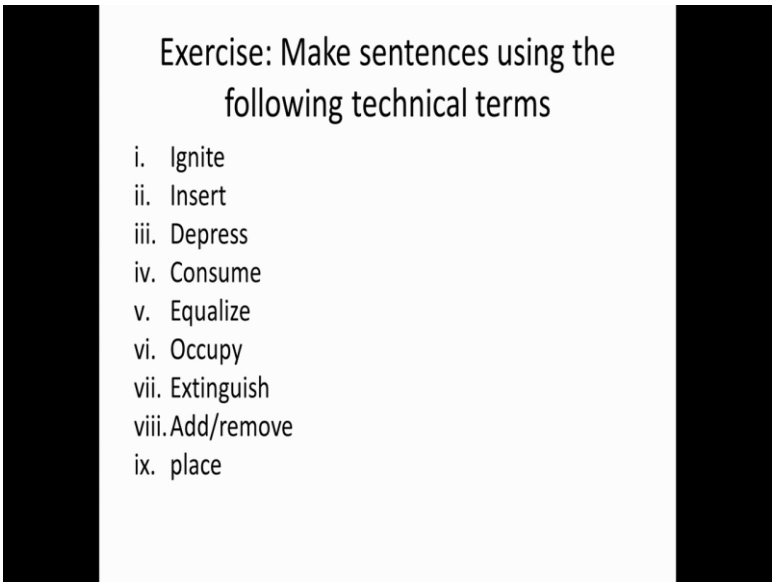

Make sentences using the following technical terms, these are extremely important for you. Use these words in sentences of your own from your daily experience; ignite, insert, depress, depress as in scientific term and not an emotional terms please; consume, equalize, occupy, extinguish, add or remove, place, these are verbs I want you to use them in sentences of your own. Now, here is an exercise please look at the slide.

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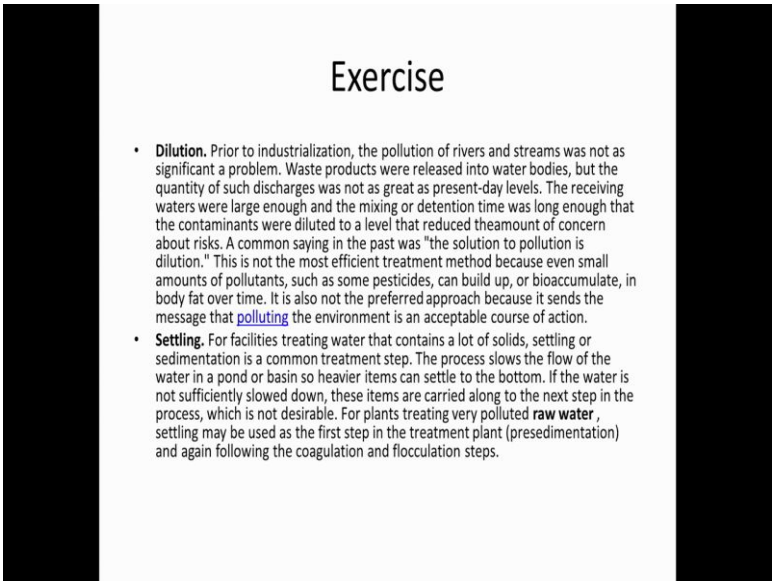

Let us read. Prior to industrialization, in the pollution of rivers and streams was not as significant a problem. Waste products were released into water bodies, but the quantity of such discharges was not as great as present-day levels. The receiving waters were large enough and the mixing or detention time was long enough that the contaminants were diluted to a level that reduced the amount of concern about risks. A common saying in the past was "the solution to pollution is dilution." This is not the most efficient treatment method because even a small amounts of pollutants, such as some pesticides, can build up, or bio-accumulate, in body fat over time. It is also not the preferred approach because it sends the message that polluting the environment is an acceptable course of action.

Settling; For facilities treating water that contains a lot of solids, settling or sedimentation is a common treatment step. The process slows the flow of the water in a pond or basin so heavier items can settle to the bottom. If the water is not sufficiently slowed down, these items are carried along to the next step in the process, which is not desirable. For plants treating very polluted raw water, settling may be used as the first step in the treatment plant presedimentation and again following the coagulation and flocculation steps.

Look at the slide take a movement, look at the language. 'Prior to' this is adverb of time, prior to what? Industrialization; industrialization is nothing but your noun. Look at the

various words that you can derive from industrialization. Please keep looking at these things also, while learning to write something. So, look at the way the passage is written, look at the sentences structure; now this is simple description, and 'using plenty of' declarative sentences and also passive voice. So, while describing processes and experiments, this is what you are supposed to write. Use assertive, affirmative, declaratives, imperatives and employ passive voice as much as possible. You need not use passive voice while speaking, but for this kind of writing, yes, you do need the passive voice.

Again, look at some of the adjectives such as let us say, approach and preferred approach. Acceptable course of action, this is an adjective, but when you look at a word like 'sufficiently slowed down' here you have your adverb. It is qualifying slowdowns or slowing down that is your verb. So, adverb qualifies verb, simple definition. Adjectives qualified nouns or pronouns. So, use the very effective way the paragraphing has been done, although I had given you only two paragraphs. Every paragraph has a straight forward topics sentence. Now, based on this passage that we have just seen dilution and settling, I would like you to do some exercises please look at the slide.

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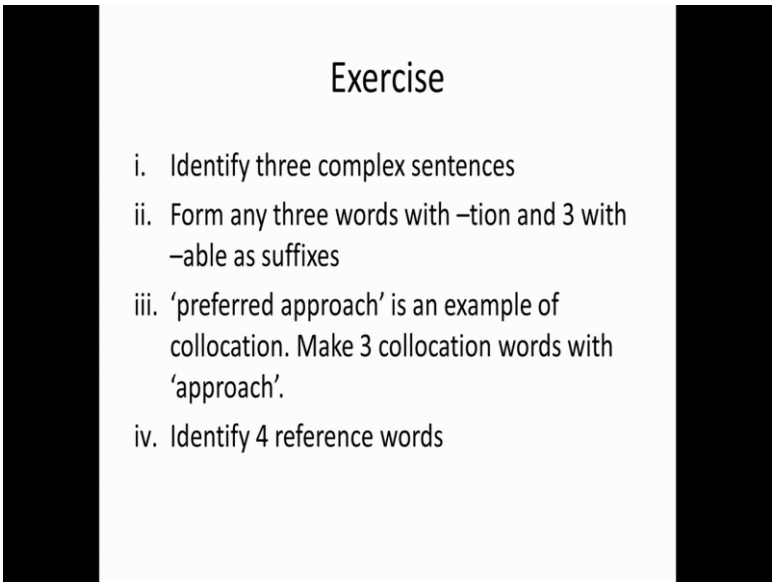

Identify any three complex sentences. Next, form any three words with -tion and three words with -able as suffixes; you have already done suffixes and prefixes. Look at the

word 'preferred approach' is an example of collocation. Make three collocation words with 'approach'. Use the right kind of word before approach, so that it collocates well. You may use your dictionaries of course, and identify 4 reference words.

Now, let us move on to talk about -ing clauses. Now -ing clauses are particularly useful in description of how things work because they help us avoid describing a series of process and events otherwise, we may end up using several ands, ands and ands this is what I mean by -ing clause.

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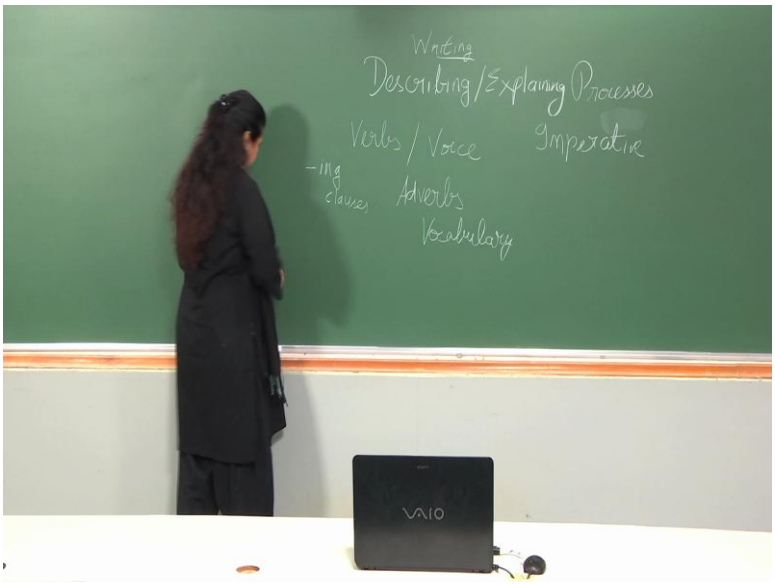

Look at the exercise here.

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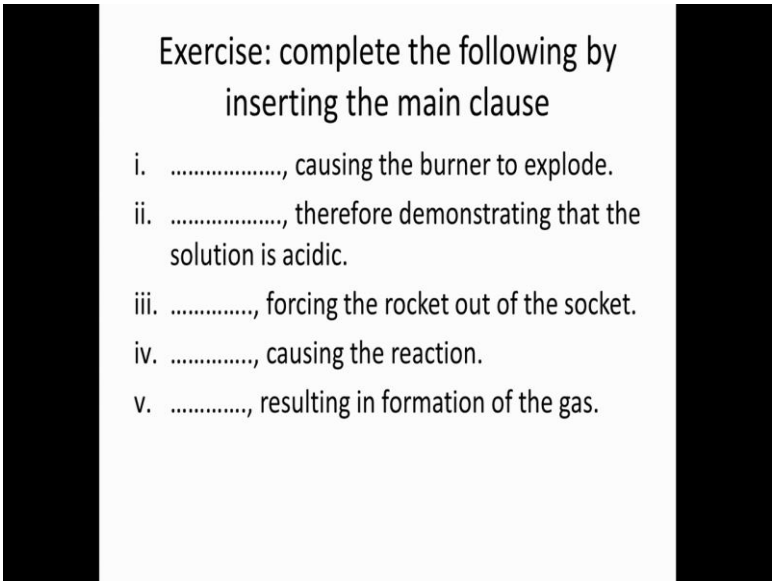

Complete the following by inserting the main clause. Look at the sentences. Dash so main clause and then you have -ing causing the burner to explode. You have to fill in the appropriate main clause. Dash, therefore demonstrating, so here is again your -ing clause that the solution is acidic; Dash, forcing the rocket out of the socket; -ing clause forcing; Next, causing the reaction; Last, resulting in formation of the gas. So, what should be the more appropriate clause in the beginning? So, fill in the sentences using your own knowledge.

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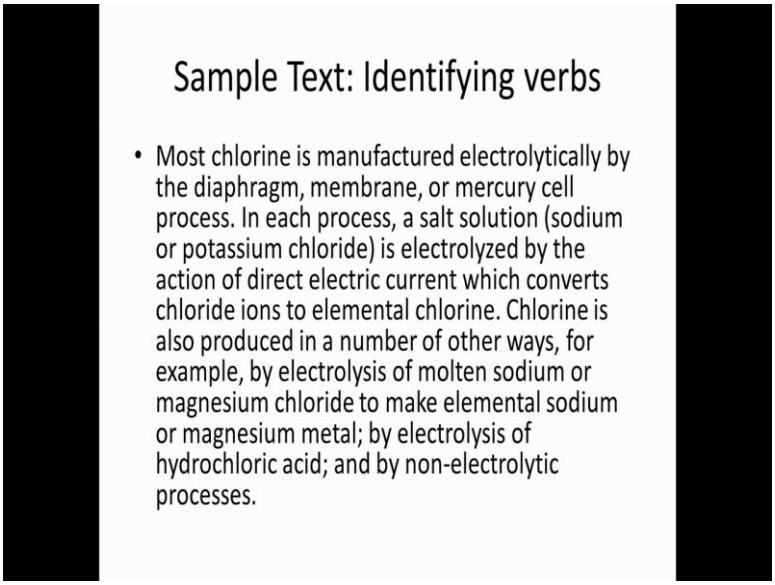

Now, here is another sample text for you, I would like you to identify verbs here because, your verbs are very integral to your writing, particularly when you describe and explain and write reports. So, pay attention to the way verbs are used.

Most chlorine is manufactured electrolytically by the diaphragm, membrane, or mercury cell process. In each process, a salt solution is electrolyzed by the action of direct electric current, which converts chloride ions to elemental chlorine. Chlorine is also produced in a number of other ways, for example, by electrolysis of molten sodium or magnesium chloride to make elemental sodium or magnesium metal; by electrolysis of hydrochloric acid; and by non-electrolytic processes. How many verbs did you see here? Please make a list.

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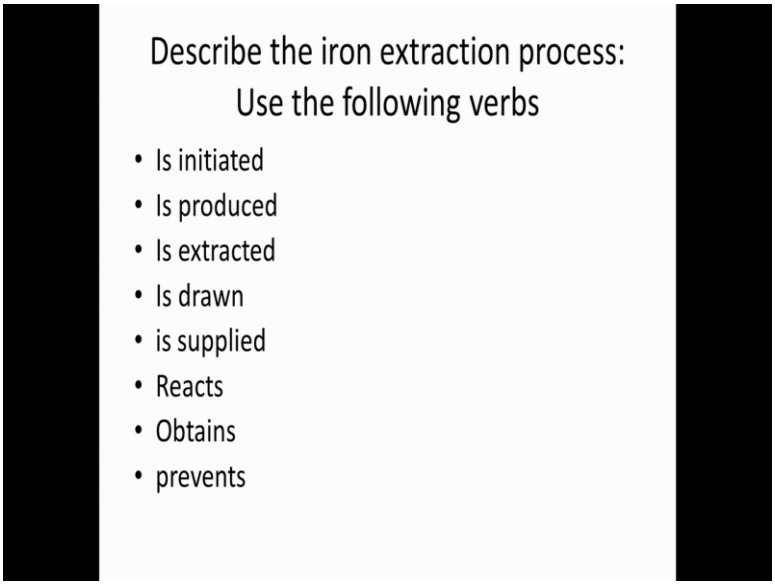

And here, is another exercise for you; look at the slide I want you to describe the process of iron extraction and use the following verbs. Please listen to my question again, look at slide I want you to describe the iron extraction process and use the following verbs. You can consult some scientific writings in your text books or even given online, but try to write and use your own description using the following verbs as far as possible. See there is no hard and fast compulsion here, if one or two verbs are left out do not worry too much about that, but use most of these verbs in your explanation and your description. Is initiated, Is produced, Is extracted, Is drawn, Is supplied, Reacts, Obtains, Prevents.

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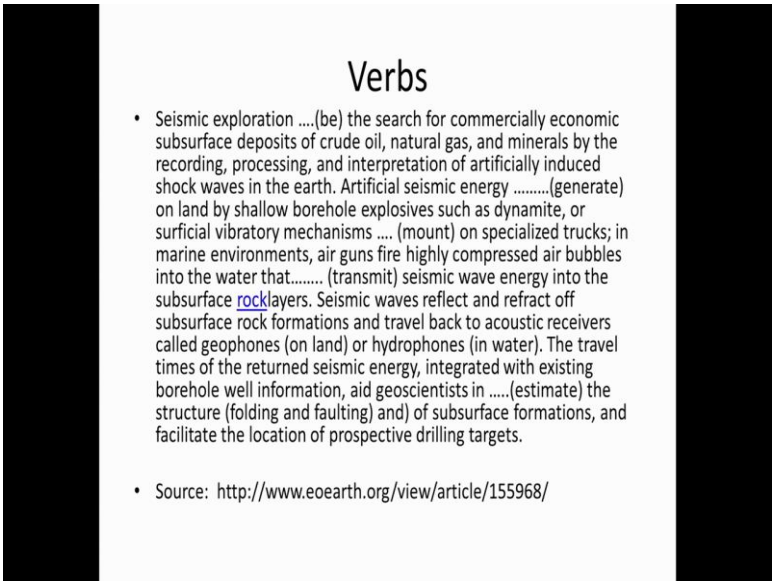

Look at the passage here. Let us read it, look at the slide and I want you to use appropriate form of the verbs given in the brackets here. Seismic exploration the search for commercially economic subsurface deposits of crude oil, natural gas and minerals by the recording, processing, and interpretation of artificially induced shock waves in the earth. Artificial seismic energy generate on land by shallow borehole explosives such as dynamite, or surficial vibratory mechanisms mount on a specialized trucks; in marine environments, air guns fire highly compressed air bubbles into the water that transmit seismic wave energy into the subsurface rock layers. Seismic waves reflect and refract off subsurface rock formations and travel back to an acoustic receivers called geophones or hydrophones. The travel times of the returned seismic energy, integrated with existing borehole well information, aid geoscientists in the structure of substance formations, and facilitate the location of prospective drilling targets.

Take a movement, Look at the verbs. This should not be too difficult for you at this stage we have done plenty of such exercises before, but here I want you to describe a phenomenon that is seismic exploration and pay attention to the way language is used, the way verbs are used, the way nouns are used, the way the writer collocates and makes very effective use of other parts of the speech, such as adverbs and adjective. But verbs are important, and please pay attention.

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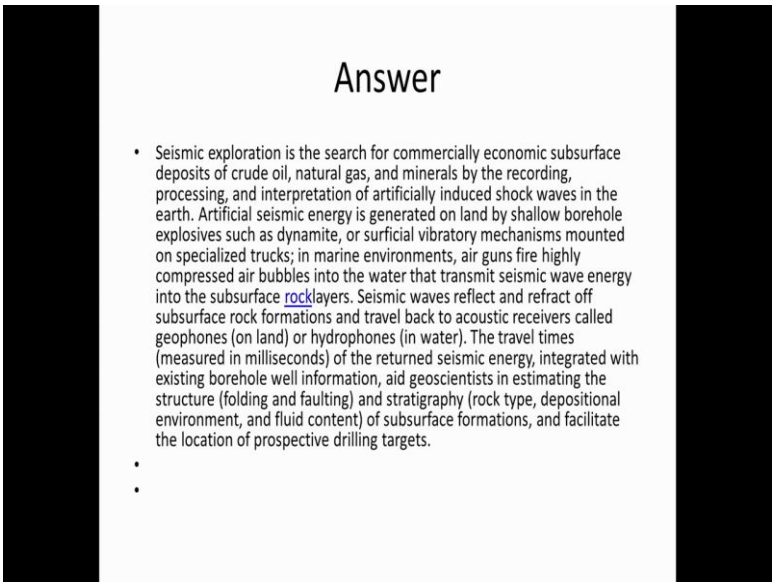

And here is your answer, please look and tally your answers with what you have just seen. Please read the slide carefully and tally your answers, alright. Now, as I told you in the beginning of the class we will be talking about adverbs, and what are adverbs? Adverbs modify verbs; they add something to the already existing verb and where as adjectives qualify nouns or pronouns. Now, when I give you sentences like, he ran fast; he comes here often or he often comes here; I always go to the central library or she sings well; then fast, often, always, well, these are adverbs they add something to the verb here. He ran very fast or ran fast, so 'ran' is a verb and 'fast' manner of running, so that is your adverb.

He comes here often, so 'comes' is your verb and 'often' how often and how many times does he come here? Twice a week, once a week, often, that is adding to the qualifying the verb here. I always go; 'go' is your verb and 'always' is your adverb. I always go to the central library whenever I need a book; she sings very well, how does she sing? Adverb of manner 'sings' is a verb, she sings well. But, if you say she is a pretty singer, 'singer' is a noun and 'pretty' is your adjective. Here is a list of adverbs, please look at it, look at the slide.

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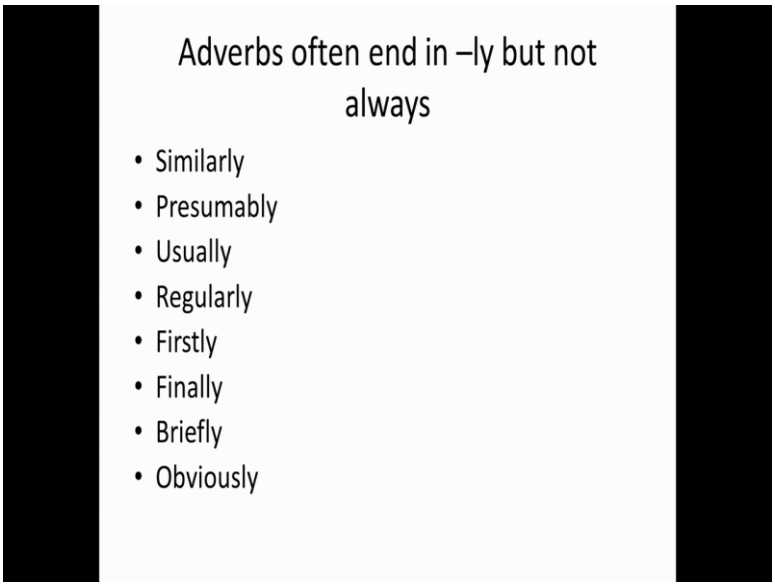

Adverbs often, please note; Adverbs often end in -ly but not always. So, look at this list where adverbs end in -ly, very basic list. Similarly, presumably, usually, regularly, frequently, firstly, secondly, finally, briefly, obviously, all these are adverbs. Remember that, when you use an adverb like 'she hardly reads', it is a negative sentence; it means that she does not read at all. She hardly works; it is a negative sentence; that means she does not work at all. But, she works hard. Now, it is used to qualify her work, in what manner? Hard working manner, so, that is a very positive treat. There is no such word as alwaysly or oftenly, please remember these common mistakes that students may make sometimes.

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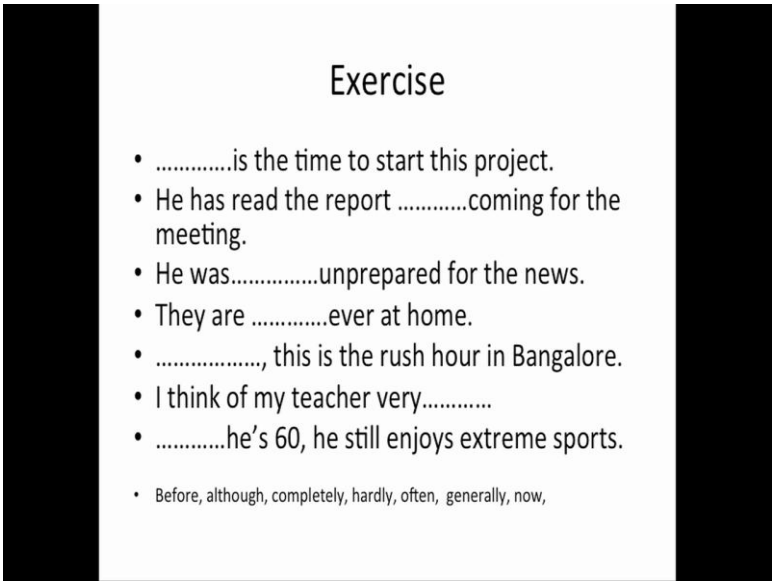

Here is an exercise for you, please take a look at the slide. Use the words given below to fill in the blanks. List of words is already given to you; before, completely, hardly, often, generally, now, look at the sentences. Dash is the time to start this project. Which adverbs? So, all these are adverbs; please note, , these please pay attention to what we are doing, we are doing adverbs and the list of words given to you here is a list of adverbs.

Now is the time to start this project. He has read the report before coming for the meeting. He was completely unprepared for the news. They are hardly ever at home. Generally, this is the rush hour in Bangalore. I think of my teacher very often. Dash he is 60, he still enjoys extreme sports. What should you write here? The answer should be, although he's 60, he still enjoys extreme sports. Please tell tally your answers here.

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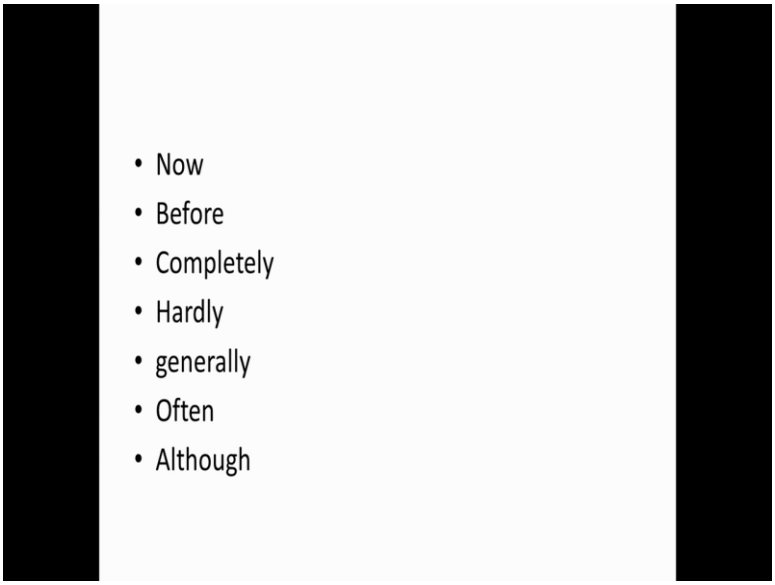

Now, Before, Completely, Hardly, Generally, Often, Although. Here is another exercise for you, please look at the slide.

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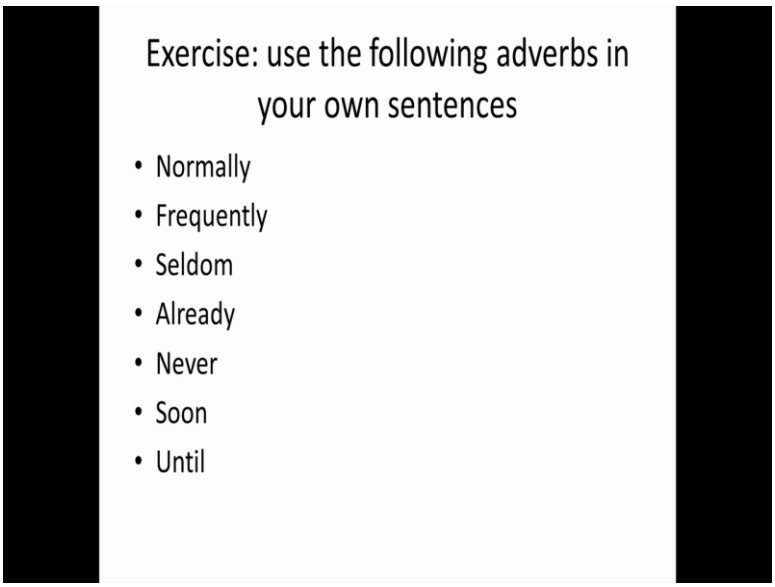

Use the following adverbs in your own sentences Normally, Frequently, Seldom, Already, Never, Soon, Until; make sentences using these words adverbs.

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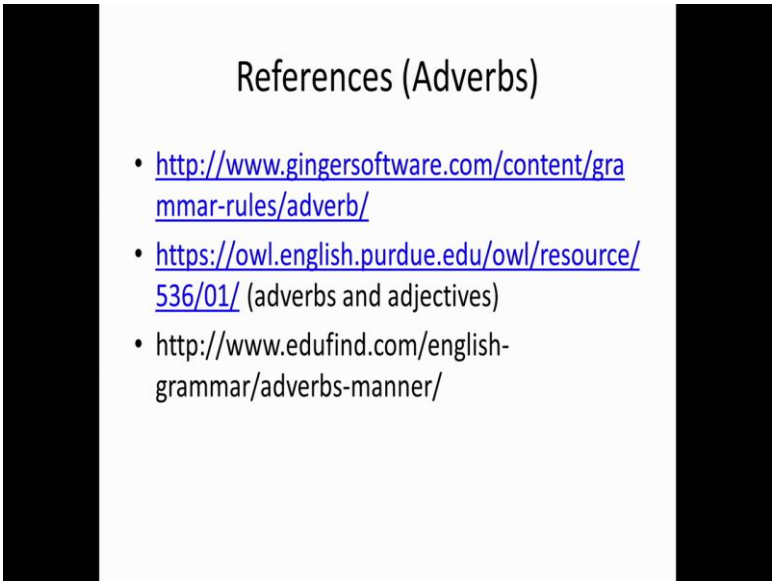

Here is a reference for you on adverbs, you can look up these links to know more about adverbs and there is also one link of purdue that gives you distinction between adverbs and adjectives, the second bullet point. Now, I would like you to complete the following sentences, look at the slide here.

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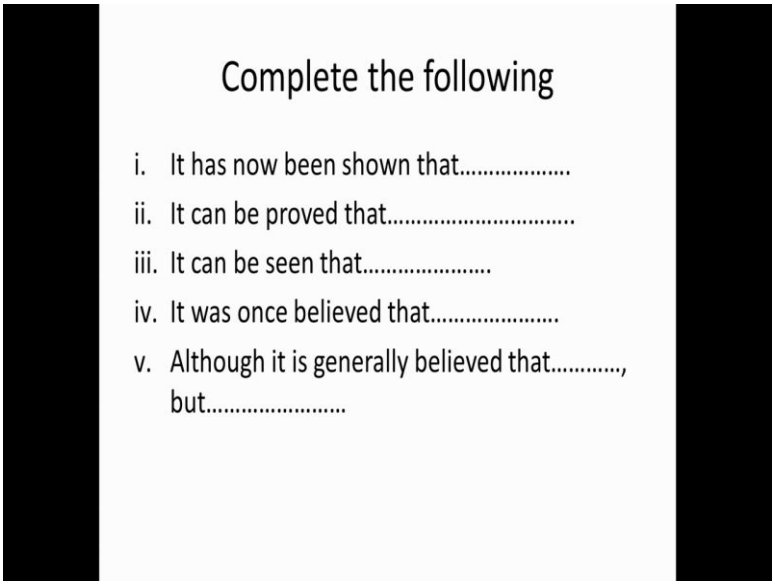

Using your own knowledge of describing experiments and processes, I would like you to

complete the sentences here. I am not giving you any hints or clues; I would like to know how you will use your own language in order to complete these very common expressions. These are the kinds of sentences you may use in your or you may use frequently in your writings. So, please use them appropriately and effectively. It has now been shown that dash, and you have to write a complete from your own knowledge. It can be proved that dash. It can be seen that dash. It was once believed that dash. Although it is generally believed that dash, but dash. So, use the best possible sentences structure in these sentences.

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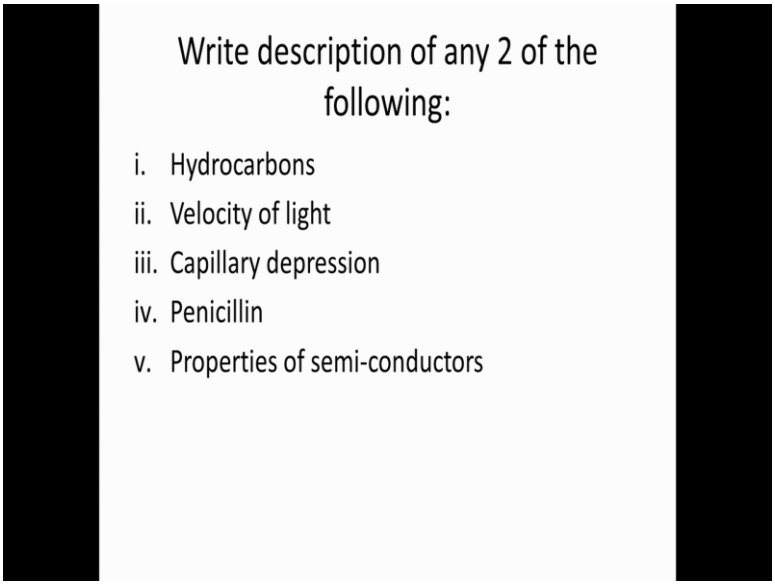

Here is another exercise for you. I want you to write description of any two of the following; Hydrocarbons, Velocity of light, Capillary depression, Penicillin, Properties of semi-conductors. Write description on any two of the following. Let us move on to do something else now.

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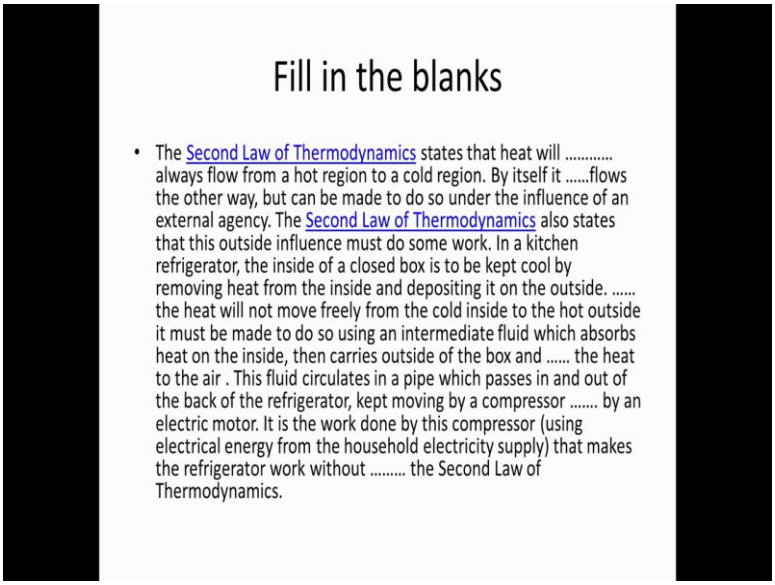

Look at this passage, read the slide. You have to use or you have to fill in the blanks and I will give you a list of words soon, using what words and fill in the blanks using those words.

The Second Law of Thermodynamics states that heat will dash always flow from a hot region to a cold region. By itself it dash flows the other way, but it can be made to do so under the influence of an external agency. The Second Law of Thermodynamics also states that this outside influence may do some work. In a kitchen refrigerator, the inside of a closed box is to be kept cool by removing heat from the inside and depositing it on the outside. Dash the heat will not move freely from the cold inside to the hot outside it must be made to do so using an intermediate fluid which absorbs heat on the inside, then carries outside of the box and dash the heat to the air. This fluid circulates in a pipe which passes in and out of the back of the refrigerator, kept moving by a compressor dash by an electric motor. It is the work done by this compressor using electrical energy from the household electricity supply that makes the refrigerator work without dash the Second Law of Thermodynamics.

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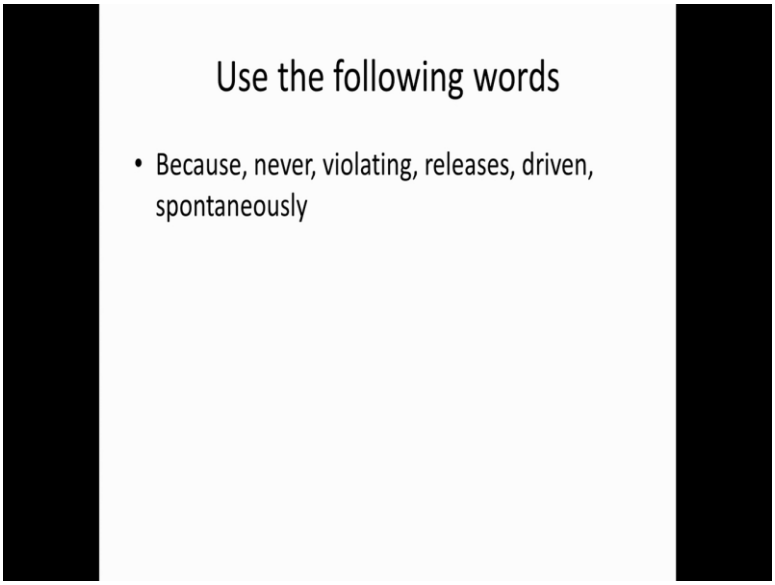

I want you to use the following words, not necessarily in this order; because, never, violating, releases, driven, spontaneously.

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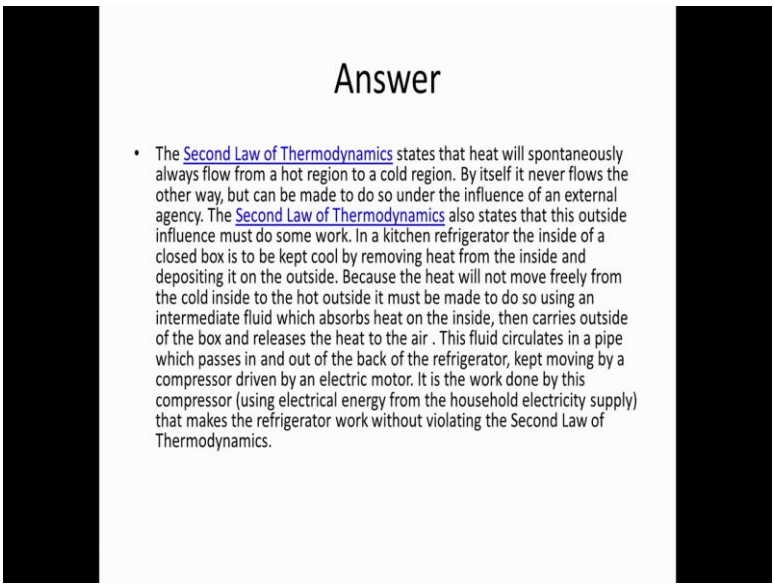

And here is the answer, please tally your answer with what you have done in the passage. Now, let us move on to talk about some words which are easily confused. In the English language, there are several words that sound alike and very often they are even

pronounced alike and even their spellings look very similar with just a minor difference for example, we have affect and effect, right?

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Affect and Effect; what is the difference? I was affected by something; I was affected when there was a par break down in my house a couple of weeks back. So, we were all affected by that, it means to alter the state of something, impact. Affect is also mood, an emotional mood that is very poetic, whereas effect is the impact of some action. So, remember affect is mood or emotion and it is very poetic.

Effect is the impact of some action, whereas affect also means to alter the state of something that is already happening for example, I was affected when there was traffic congestion on the street, alright. You say effect this is the effect of not studying. So, then that becomes e double f e c t. So, there are many such words in the English language, I would like you to solve this exercise of course, you will have to consult your dictionary these words look alike sound alike often, but they have different meanings.

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Apiary and aviary, aural and oral, biannual - biennial, complement - compliment, canvas - canvass, contagious - contiguous, defuse - diffuse, index - indices, resister - resistor.

Thank you very much and please practice writing. You have already been given some exercises; please try to do those things at home and we will soon meet for our next class.

Tags

Reading English, English for Engineers, English words, English Exercise, Exercises in English, Grammar usage, English Grammar, vocabulary, words and phrases, spoken communication, written communication, English writing, English speaking, scientific English, report writing, CV, formal letter, Speech-Preposition, Noun Phrases, Countable and uncountable nouns, singular, plural, Modals and Voice, Tenses, Effective Speaking

Essay writing, word categories, word formation, formal tone, paragraph writing, tone in writing, speaking tone, signal words, Letter writing, understanding essays, Mechanics of Essays, publishable essays, nouns, pronouns, verbs, adverbs, adjectives, propositions, determiners, linking words, 'be' form, linking words, reading, listening, sentence, Subject, Verb, Object, Articles, comparatives, passive voice, Dictionary skills,

Presentation, Punctuation, collocation