

Technical English for Engineers
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Lecture – 12
Modals and Voice

We will continue with our discussion of verbs. So, we have already seen, what are auxiliaries.

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Now, there is another word that you, or term you should be familiar with, that is modals; **not**, pronounced not as models, but modals. Some of the major modals are almost like auxiliaries, can-could, may-might, will-would, shall-should, must-have to, must and have to. Now, modals are used with, what do they do, they are used with verbs, base form of verbs, basic verbs, to give an additional meaning to the sentence. Very certainly nuanced form and you are engineers, and you will be writing reports, or assignments, publish papers. So, you should know all these things that, how one modal can slightly alter the meaning of the sentence.

Now, let us look at, and we are also going to do modals and passive verbs. So, coming to the modals, let us look at this sentence, ‘the glass beaker’, then, I will write once, and then, I will keep changing the modals and just tell me how the meaning changes. So, ‘the glass beaker breaks, when dropped’, simple meaning. The glass beaker breaks, when dropped; the meaning is, it will definitely break. It is almost like a universal truth.

But, if I change this, see, we do not have a modal here; we just have a main verb. By now, you know what are main verbs and what are modals and what are auxiliaries. But, if I change the sentence slightly, by inserting a modal, ‘the glass beaker can break when dropped’, then, the probability of breaking comes down. So, when I say, it breaks, the first sentence, the glass beaker breaks, that is, almost like 99 to 100 percent it will break. If you are lucky, it will not break, but it is a universal truth; **it is, it is a given**, it is glass, when it is dropped, it will break. However, when I say can break, that means, it reduces the possibility of the beaker, the breaking of the beaker.

If I say, the glass beaker may break, there is lesser possibility; maybe, you know, in can, there is a greater degree of possibility; now, it reduces; may break; it may not break either. So, let us say possibility, probability is decreasing. And then, if I say, the glass beaker cannot break; it is made of a particular brand of glass, make of glass; it is a quality that is resistant to fall. So, the glass beaker cannot break, even if it is dropped; that is, 0 to 1 probability of breaking. So, you see how one modal changes, may, can, shall; all these things change the meaning of a sentence.

Now, if I give you a sentence like, let us say, ‘the new library will open within two years’; will open, but you can also say, ‘the new library’ and let us say, ‘should open within a year’, can, may open within a year. Then, you perhaps, you know, within 2 years it will definitely open, will open within 2 years. So, definitely; but it may open within a year, there is a possibility; there is a probability. The new library cannot open within 3 months. Now, you, if you are reducing, and if you are giving us, the builders, or the architects, only 3 months, there is a definite no; cannot. So, this is the way modals act.

Now, we are, we have been talking about variety of verbs, and, there is another category of grammar, that is, active and passive verbs, Active sentences and passive sentences.

Now, let us look at some passive sentences, and, in scientific English, it has been noted, and it is also desirable to use more passive sentences, rather than active form of the verb. So, for example, the gas is heated. It is being heated by any experimenter, or by any scientist, but it is heated; you do not have to say by whom; is heated. He is heating the gas, no; it is still the same meaning, but, we use passive in scientific writing, to make it more objective, and to make it clearer.

Again, another sentence, 'the bridge is constructed', is being constructed, or is constructed, by a group of engineers, yes, it is, by someone, but it is being considered as a passive. So, these are the sentences; I am just giving you examples. 'The survey will be collected this week'; 'Hot water should be handled with care'. So, you see, a consistent use of the verb form be, we have been doing, be; what is be, b e, be. So, is, am, are, was, were, those are the forms of the 'be' form of the verb. So, hot, sorry; and we then also have modals. So, modals are also very useful in construction of passive sentences.

Now, 'Hot water should be handled with great care'. So, should, hot water should be handled with great care; this is again, if I want to make it passive, oh sorry, active, I can say, 'Please handle the hot water with great care'. But, in scientific English, when in, when you are writing a report or something, or paper, it has to be in passive form. 'Her research cannot be published'; cannot; again, it is a one word, cannot; not is can and not, but one word, cannot be published. 'Is tea grown in Tamil Nadu?'

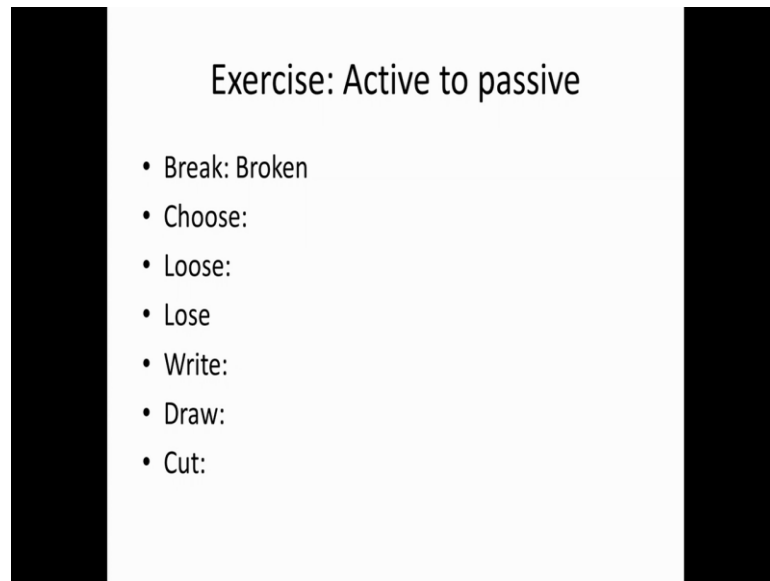
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Is tea, we are using. Look at the sentence, Is tea grown in, and whatever state you want to fill in, is tea grown in. So, is tea grown in, Do they grow tea, that is active; is tea grown in by the people of so and so state, by this state, it becomes a passive. You will find that, most parts of your text books, as I have been talking about scientific English, and you will find that, most of your texts and published papers that you read, they contain passive forms of verb. They are used in a present simple, or with modals. So, therefore, we have to understand what are modals. Again, make a note, will and would, can and could, may and might, shall and should, so, these are the modals. And, of course, have and be form is always there. So, scientific English prefers using the passive form.

Now, here is the list of verbs; the first one is done for you. Please look at it; look at the slide.

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Exercise: Active to passive

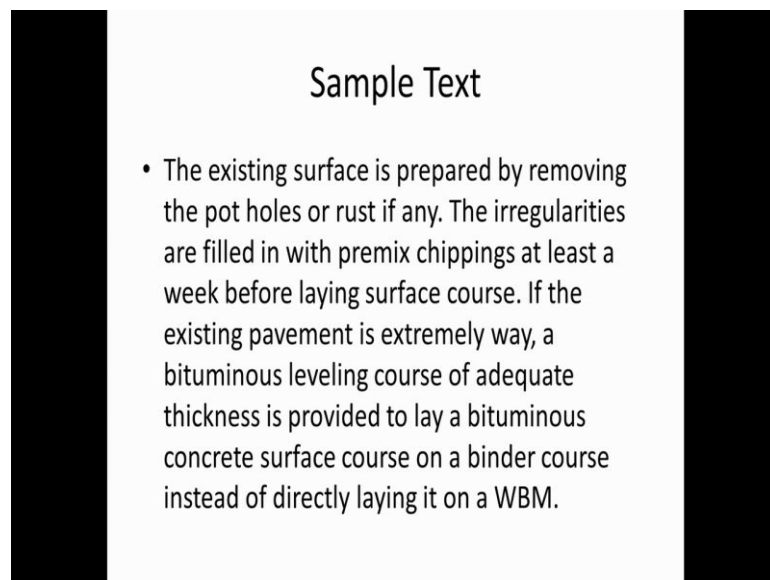
- Break: Broken
- Choose:
- Loose:
- Lose
- Write:
- Draw:
- Cut:

And, you are supposed to change active to passive. Please take down these words, and then, or verbs and complete the exercise. So, first one has been done for you; break and the passive form is broken. Then, you have choose, loose, lose; you see two different words and two very different meanings, although pronunciation maybe similar; write, draw, cut. How do you change these words into passive? We will come back to it.

In case, you have not able, not been able to figure it out, so, let me give you the answers. So, first one is break; then, choose becomes chosen; loose is loosen, and l o s e, lose, is lost. So, there is a change in pronunciation and change of words. They may be similar in pronunciation in the active form, but when they are changed into passive form, they, loose becomes loosen, and, this lose becomes lost, second one. Write, written, draw is drew and cut remains cut; there is no change in it. There are some words in English language, which always remain the same, whether they are in past or present; broadcast, 'the news is being broadcast'. So, it is not broadcasted, in its passive, or in past tense; it is always broadcast; put. So, you do not say I cutted it, or I putted it; I put it there, and yesterday also, you put it on the table. So, there is no change of, in the structure, in the construction of the verb.

Now, look at this sample text now, which has **a**, some interesting in construction of passive sentences. **Let us, let me read them out for you; let me read this out for you. Please look at the slide.**

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Sample Text

- The existing surface is prepared by removing the pot holes or rust if any. The irregularities are filled in with premix chippings at least a week before laying surface course. If the existing pavement is extremely way, a bituminous leveling course of adequate thickness is provided to lay a bituminous concrete surface course on a binder course instead of directly laying it on a WBM.

‘The existing surface is’, they are talking about the construction of roads here, ‘is prepared by’. So, look at the word ‘prepared by’, ‘is prepared by’, be form of the verb, ‘removing the pot holes or rust if any. The irregularities are filled in’. So, again, this is another example of passive sentence; ‘with premix chippings, at least a week before laying surface course. If the existing pavement is extremely way, a bituminous leveling course of adequate thickness is provided to lay a bituminous concrete surface course on a binder course, instead of directly laying it on a WBM’. So, look at it; no one is saying here that, you see, is provided is also your passive sentence; is prepared by, irregularities are filled in, thickness is provided to lay. So, all these are examples of passive sentences.

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- The premix is prepared in a hot mix plant of a required capacity with the desired quality control. The bitumen may be heated upto 150 – 177 deg C and the aggregate temperature should not differ by over 14 deg C from the binder temperature. The hot mixed material is collected from the mixture by the transporters, carried to the location is spread by a mechanical paver at a temperature of 121 to 163 deg C. the camber and the thickness of the layer are accurately verified. The control of the temperatures during the mixing and the compaction are of great significance in the strength of the resulting pavement structure.

Let us read on the next slide. ‘The premix is prepared’. So, no one is saying, he prepared the premix. ‘The premix is prepared’, again, passive, ‘in a hot mix plant of a required capacity with the desired quality control. The bitumen may be heated’. So, again, look at the modal auxiliary, and the modal verb and the auxiliary. So, ‘combine may be heated’ with the base verb; ‘upto this much degree and the aggregate temperature should not differ by over 14 degree Celsius from that binder temperature. The hot mixed material is collected from’; you know, no one is saying he collected the mixture, or she collected the mixture; ‘is collected from the mixture by the transporters, carried to the’. So, again, example of passive, ‘is collected from the mixture by’. So, this is again, yet another example of passive; ‘carried to the location’, again passive; ‘is spread by’ again passive. So, look at the number of passive sentences in such a simple passage. **And**, ‘spread by a mechanical paver at a temperature of 121 to 163 degree Celsius the camber and the thickness of the layer are accurately verified’, again, this is passive; ‘the control of the temperature during the mixing and the compaction are of great significance in the strength of the resulting pavement structure’. So, many examples of passive sentences.

Now, look at this exercise again, and same, something similar to what we just did, please change the given verbs into their passive forms.

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The slide features a white background with the word "Exercise" centered at the top. Below the title is a bulleted list of seven verbs: Bend, Take, Know, Feed, Lead, Wear, and Bring. The slide is framed by two vertical black bars on the left and right sides.

- Bend:
- Take:
- Know:
- Feed:
- Lead:
- Wear:
- Bring:

Bend, take, know, feed, lead, wear, bring. Your dictionary would be of great help to you. So, let me do them, do these for you. Bend is bent, with a 't', ending with a 't'. There are certain kinds of verbs which change the forms; when we start doing, when we start revising tenses, then, we are going to look at this also, in much detail, in greater detail. Take is taken; know is knew, k n e w; feed is fed; lead is led; wear is worn, yes, and brought, bring is brought. Now, I would like you to take this, a look at this exercise, and I have highlighted some of the passive verbs for you.

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Exercise

- In order for the tablet press to produce quality tablets, it is imperative that the blend of ingredients **sent** to the press be dry and of uniform particle size. In addition, it is important that the API **be evenly distributed** within each tablet that is produced. If this **cannot be done** simply through adequate blending, the ingredients **must be sent** through an additional granulation step prior to the compression step of the press in order to ensure an even distribution of the API in the final tablet.

Look at this. And, I am going to read it aloud, and the passive verbs are highlighted in bold. ‘In order for the tablet press to produce quality tablets, it is imperative that the blend of ingredients **sent** to’. So, see, send is present; sent becomes your past, and is also passive here; ‘press be dry and of uniform particle size. In addition, it is important that the API **be evenly distributed**’; these are all pharmaceutical terms; ‘within each tablet that is produced’; again, this is also, is produced is also a passive construction; ‘if this **cannot be done**, simply through adequate blending, the ingredients **must be sent** through an additional granulation step prior to the compression step of the press in order to ensure an even distribution’. So, this is the way we construct passive.

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Exercise

- i. Coperion K-Tron pharmaceutical screw feeders(supply) in either volumetric or gravimetric designs. However, due to the high accuracy requirements of feeding of continuous pharmaceutical processes, the gravimetric feeding principle via loss-in-weight feeding is mandatory.
- ii. It(note) that all of the above advantages improve overall profitability, a goal of significant importance to the pharmaceutical industry.

Here, I am going to give you. I am giving you a couple of exercises, fill in the blanks; please solve them. look at the task here. 'Coperion K-tron pharmaceutical screw feeders dash', you have to supply the right, appropriate form of the verb given in the bracket; 'in either volumetric or gravimetric designs. However, due to the high accuracy requirements of feeding of continuous pharmaceutical processes, the gravimetric feeding principle via loss in weight feeding is mandatory. It', again the right form of word note, 'that all of the above advantages improve overall profitability, a goal of significant importance to the pharmaceutical industry'.

Take a minute; look at it, and then, we will sort it; we will solve it. So, the answer for the first one is, can be supplied; Coperion K-tron pharmaceutical screw feeders can be supplied in, because can be supplied in, one, or this, or that; can is the best, a most appropriate form of the verb here. And then, second one, it must be noted. Now, you have to remember that, in many a scientific writing, you will find this construction, it must be noted; let me inform you; let us state this. So, all these are passive way constructions. Let us move on, and before we move on to doing another exercise, or before we move on to do another exercise, let us look at this, look at these examples.

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Examples

- Fresh water can be distilled from rain water.
- This can be expressed as a triangle.
- A lens can be used for reflection.
- This is known as Einstein's theory of relativity.

Fresh water can be distilled from rain water. This can be expressed as a triangle, whatever, **you know**, area that the person has in mind. So, this can be expressed as a triangle. So, **we are**, all these are examples for passive voice using modals. A lens can be used for reflection, or else for refraction, whatever we want it, and this is known as Einstein's Theory of Relativity. These are examples and now, let me show you some of the exercises that you are supposed to do. **Look at this.**

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Exercise: Complete using passing verbs,
use 'be'

- extracted from ore.
- obtained from crude oil.
- -----e=mc square
-obtained at 0 degree centigrade.
-taken as 22/7

So, **what I want you to do**, complete the following, using passive forms of the verbs and always use be. Dash extracted from ore; you know what is extracted from ore, **but you**, I want you to write the correct sentence. Dash obtained from crude oil. Dash **e equal to m** **c e=mc** square. Dash obtained at 0 degree centigrade, and dash taken as 22 by 7 or 3.14. So, how would you solve this? So, I will, show you one example. Iron can be extracted from ore. Iron can be, that is example. And, e equal to m c square, this is expressed as e equal to m c square. So, these are the common types of sentence constructions. Ice can be obtained at zero degree centigrade. And, this is expressed, or this is taken as, the value of pi is taken as 3.14 or 22 by 7. And, of course, the second one, whatever mineral, it can be obtained from crude oil. So, you can write the name of the substance that is obtained from crude oil; it can, the name of the substance can be obtained from. So, **these are the**, this is the way that **you** have to construct passive forms.

Now, look at this exercise.

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Sources://geology.com/articles/crater-of-diamonds/
http://www.arkansas.com/outdoors/unique/diamond-crystals/

- Diamonds(be) first discovered at this location in 1906 when John Huddlestone found two strange crystals in the soil of his farm. He didn't realize that his farm was right above a volcanic pipe filled with lamproite (a volcanic rock formed from partially melted mantle materials which sometimes contains diamond-bearing rocks known as xenoliths that(have) transported up from the mantle).

A longer passage: Source is given at the top. Again, you have to do the same; fill in the blanks using the appropriate form of the verbs given in the bracket.

'Diamonds dash first discovered at this location in 1906, when John Huddlestone found two strange crystals in the soil of his farm. He didn't not realize that his farm was right above a volcanic pipe filled with lamproite, (a volcanic rock formed from with 2209 partially melted mantle materials, which sometimes contains diamond-bearing rock known as xenoliths, that dash transported up from the mantle)?

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Exercise

- John Huddlestone sold his farm for \$36,000 and it was later(buy) and sold multiple times. It was temporarily (work) as a commercial diamond mine. It was not extremely productive and was not (reopen) after a fire destroyed the plant in 1919. Properties adjacent to the Huddlestone farm were also heavily prospected (prospect) with some attempts at diamond production, none of which (be) sustained.

‘John Huddlestone sold his farm for this much, and it was later dash, and sold multiple times. It was temporarily as a commercial diamond mine; it was not extremely productive and was not after a fire destroyed the plant in 1919. Properties adjacent to the Huddlestone farm were also heavily’ I have done it for you. So, you have to just ignore it; ‘prospected, with some attempts at diamond production, none of which dash sustained’. So, please look at the exercise and then, really, come back in a moment and solved them. And, this is the next slide.

Alright. So, let us look at, Let us do the answers. So, diamonds were first discovered at this location, whatever, and then, we move on to the next bracket.

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Answer

- i. Diamonds **were** first discovered at this location in 1906 when John Huddleston found two strange crystals in the soil of his farm.
- ii. sometimes contains diamond-bearing rocks known as xenoliths **that have been** transported up from the mantle).

That have been transported up from the mantle. So, **this, this is the,** this is the way you have to solve. First one is were; second is that have been. And then, John Huddleston sold his farm for this many dollar, and it was later bought and sold multiple times. It was temporarily worked as a commercial diamond mine. It was not extremely productive and was not reopened, the past form of this, and the last one is, none of which could be sustained.

I am going to give you a listening exercise, as we have been doing this. We are going to mix our **IQ** **iota** of learning a skill for this course. So, while we are doing comprehension and grammar, and writing, we will also be doing some listening thrown in. So, here are the, and, as usual, I am not going to give you or show you the passage, when I am reading out the listening part to you, or passage for you but, you have, you will be shown the questions here. So, first look at questions that you are supposed to write answers for.

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Listening

- i. What are the two major species of coffee?
- ii. What are coffee beans?
- iii. How are coffee beans processed?
- iv. Identify at least 5 passive verbs.

(Source for the text:

<http://www.orimi.com/en/potrebitelskaya-entsiklopediya-/kofe/kak-otsenivayut-kofe/>)

I have given you the source for the text also, but please do not look at it while solving the exercise. So, first question, what are the two major species of coffee? Second question, what are coffee beans? Third question, how are coffee beans processed? And, fourth, identify at least five passive verbs when I, as I read this passage for you. And, please pay attention, and listen to it carefully. This slide is not going to be shown to the students here.

So, I start now, and I hope you have taken down the questions. There are several botanical species of coffee plants. However, coffee consumers are interested in only two of them, Arabica or Arabian coffee that is valued for its bright flavor and mild taste and Robusta, or Congolese coffee that has a strong rich taste. Coffee beans are the seeds of coffee tree. They develop inside coffee berries and there are usually two beans in each berry. Coffee berries are harvested when they become red in color. Coffee is harvested mainly manually. Coffee harvesting season is different in each country, and usually takes several months. Coffee beans are processed by two major methods, wet and dry. Wet method is used for high quality grades and the dry method is applied to the beans with less flavor as it is simpler, and does not require expensive equipment.

Large beans of fine quality, Arabica may be referred to by a combination of letters, for example, Kenya A A. Grades may also be defined by the name of the territory, province, district area, where the coffee was grown; for example, Ethiopia - Sidamo, Sumatra - Mandheling. Grades may be determined depending on the location of plantations, relative to the sea level. The higher above the sea level, the plantation, the greater is the coffee value. The most expensive varieties grow at altitude over 1200 meters, and are often termed SHB; for example, Guatemala SHB, Costa Rica SHB.

So, you remember your questions? What are the two major species of coffee? The answer was given to you, Arabica and Robusta. What are coffee beans? The answer is coffee beans are the seeds of coffee tree. How are coffee beans processed? Coffee beans are processed by two major methods, wet and dry. And, the last question was, identify five passive constructions. So, I take you back to the passage, **please look at it; look the,** look at the passage again and I have highlighted them for you.

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- There are several botanical species of coffee plants. However coffee consumers are interested in only two of them: Arabica (or Arabian coffee) that **is valued** for its bright flavour and mild taste and Robusta (or Congolese coffee) that has a strong rich taste. Coffee beans are the seeds of coffee tree. They develop inside coffee berries and there are usually two beans in each berry. Coffee berries **are harvested** when they become red in colour.
- Coffee **is harvested** mainly manually. Coffee harvesting season is different in each country and usually takes several months.
- Coffee beans **are processed** by two major methods - wet and dry. Wet method is used for high-quality grades and the dry method is applied to the beans with less flavour as it is simpler and does not require expensive equipment.

Is valued, are harvested, is harvested, are processed; and then, in the next slide you have more.

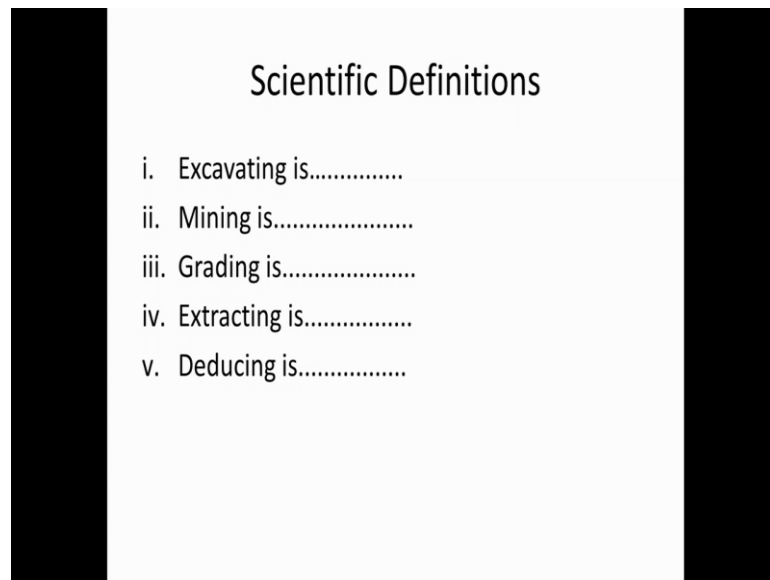
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- Large beans of fine quality arabica **may be referred** to by a combination of letters, for example, Kenya AA.
- Grades **may also be defined by** the name of the territory (province, district, area) where the coffee was grown. For example, Ethiopia Sidamo, Sumatra Mandheling.
- Grades **may be determined** depending on the location of plantations relative to the sea level. The higher above the sea level the plantation the greater is the coffee value. The most expensive varieties grow at altitudes over 1,200 meters and are often termed SHB. For example, Guatemala SHB, Costa Rica SHB.

May be referred to, may also be defined by, maybe determined. So, I hope you have been able to come up with the right answers for all these.

Now, before we wind up, this is another activity for you and this is going to be a do it yourself, or do at home. This is your home work. You will need your dictionary. I hope you are reading and consulting your dictionaries now, more frequently than ever before. So, these are the definitions that I want you to find out and write the meanings of.

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First one; excavating, so, excavating is; please look at the slide. This is the exercise and you have to find scientific definitions. Excavating is, mining is, third, grading is, fourth, extracting is, and the last one, deducing is. All these verbs, which you use in your day to day speaking, and writing, and in your, also in your reading. So, please do this exercise on yourself. I am sure that you are doing exercises on yourself also, as we are moving in to this course. It is very important; some amount of self learning is extremely, absolutely necessary, in order to benefit from this course, in a much better way.

So, thank you very much, and we will continue with 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

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