**Lesson:** How Memories Form (and Get Lost).

**Text Source:** <https://www.youtube.com/watch?v=yOgAbKJGrTA>

**Level:** B2 C1

**Warm Up** (5 min)

* Are you good at remembering things? What’s your memory like?
* Do you know the difference between short-term and long-term memory?
* Which one works better for you?

**1. Vocabulary: Before you go! (10 min)**

**Directions:** All of the following words are used in the lesson video that will be used as a learning basis for this lesson. With the help of your teacher, make sure to get familiar with their meanings and pronunciation.

**1.1. Standard English**

• falter /ˈfɔl-tɚ/ (v.): start to lose strength.

• zip (v.): to move very speedily

• shrinkage/ˈʃrɪŋ-kɪdʒ/ (n.): the process, fact, or amount of shrinking.

• culprit /ˈkʌl-prɪt/ (n.): a person who is responsible for a crime or other misdeed.

• arousal /əˈraʊ-zəl/ (n.): the action or fact of arousing or being aroused.

• dwell /dwɛl/ (v.): live in or at a specified place.

**1.2.**  **Neuroscience Terms**

• hippocampus (n.): the elongated ridges on the floor of each lateral ventricle of the brain, thought to be the center of emotion, memory, and the autonomic nervous system.

• synapse (n.): a junction between two nerve cells, consisting of a minute gap across which impulses pass by diffusion of a neurotransmitter.

• neurotransmitter (n.): a chemical substance that is released at the end of a nerve fiber by the arrival of a nerve impulse and, by diffusing across the synapse or junction, causes the transfer of the impulse to another nerve fiber, a muscle fiber, or some other structure.

• acetylcholine (n.): a compound which occurs throughout the nervous system, in which it functions as a neurotransmitter.

• serotonin (n.): a compound present in blood platelets and serum, which constricts the blood vessels and acts as a neurotransmitter.

**1.3. Latin-rooted Words (Pronunciation)**

**Directions:** The following Latin-rooted words can be easily inferred.What about their pronunciation? Are you familiar with it? Read and practice out loud!

• mechanism (n.): /ˈmɛ-kəˌnɪ-zəm/

• deterioration (n.): /dɪ-ˌtɪriəˈreɪʃən/

• neuron (n.): /ˈnʊ-rɑn/

• physiological (adj.): /ˌfɪ-ziə-ˈlɑ-dʒɪ-kəl/

• hyperalert (n.): /ˈhaɪ-pɚ-rəˈlɝt/

**2. Comprehension: Lesson Video** (10 min)

**2.1. General**

**Question:** *What are the key points presented throughout the test?*

**2.2. Specific**

**Directions:** *Watch the video again and**answer the following specific questions.*

**a)** What happens in our brain when we experience something?

**b)** What are the three factors affecting memory storage?

**c)** What did the Harvard School of Public Health find out regarding memory loss?

**d)** What can we do to avoid memory loss?

**3. Meaning in Context: Video Transcript** (10 min)

**Directions:** *Under your teacher’s supervision, read the video transcript outload for pronunciation purposes. In addition, rephrase in oral form the bolded words/phrases with contextual synonyms.*

*Think back to a really* ***vivid*** *memory. Got it? Okay, now try to remember what you had for lunch three weeks ago. That second memory probably isn't as strong, but why not? Why do we remember some things, and not others? And why do memories eventually* ***fade****? Let's look at how memories* ***form*** *in the first place.*

*When you* ***experience*** *something, like dialing a phone number, the experience is* ***converted*** *into a pulse of electrical energy that zips along a network of neurons. Information first* ***lands*** *in short-term memory, where it's available from anywhere from a few seconds to a couple of minutes. It's then* ***transferred*** *to long-term memory through areas such as the hippocampus, and finally to several storage regions across the brain. Neurons throughout the brain communicate at dedicated sites called synapses using specialized neurotransmitters. If two neurons communicate repeatedly, a* ***remarkable*** *thing happens: the efficiency of communication between them increases.*

*This process, called long term potentiation, is* ***considered*** *to be a mechanism by which memories are* ***stored*** *long-term, but how do some memories get lost? Age is one factor. As we get older, synapses begin to falter and weaken,* ***affecting*** *how easily we can* ***retrieve*** *memories. Scientists have several theories about what's behind this deterioration, from actual brain shrinkage, the hippocampus loses 5% of its neurons every decade for a total loss of 20% by the time you're 80 years old to the drop in the production of neurotransmitters, like acetylcholine, which is* ***vital*** *to learning and memory. These changes seem to affect how people retrieve stored information. Age also affects our memory-making* ***abilities.*** *Memories are encoded most strongly when we're paying attention, when we're deeply* ***engaged****, and when information is* ***meaningful*** *to us. Mental and physical health problems, which tend to increase as we age, interfere with our ability to pay attention, and thus act as memory thieves.*

*Another leading cause of memory problems is chronic stress. When we're constantly* ***overloaded*** *with work and personal responsibilities our bodies are on hyperalert. This response has evolved from the physiological mechanism designed to* ***make sure*** *we can* ***survive*** *in a crisis. Stress chemicals help mobilize energy and* ***increase*** *alertness. However, with chronic stress our bodies become flooded with these chemicals, resulting in a loss of brain cells and an inability to form new ones, which affects our ability to* ***retain*** *new information.*

*Depression is another culprit. People who are depressed are 40% more likely to develop memory problems. Low levels of serotonin, a neurotransmitter connected to arousal, may make depressed* ***individuals*** *less attentive to new information.* ***Dwelling*** *on sad events in the past, another symptom of depression, makes it difficult to pay attention to the present, affecting the ability to store short-term memories. Isolation, which is* ***tied*** *to depression, is another memory thief.*

*A study by the Harvard School of Public Health* ***found*** *that older people with high levels of social integration had a slower rate of memory* ***decline*** *over a six-year period. The exact reason remains unclear, but experts* ***suspect*** *that social interaction gives our brain a mental workout. Just like muscle strength, we have to use our brain or risk losing it.*

*But don't* ***despair****. There are several steps you can take to* ***aid*** *your brain in preserving your memories. Make sure you keep physically active. Increased blood flow to the brain is* ***helpful****. And eat well. Your brain needs all the right nutrients to keep* ***functioning*** *correctly. And finally, give your brain a workout. Exposing your brain to challenges, like learning a new language, is one of the best defenses for keeping your memories* ***intact****.*

**5. Grammar: Embedded Questions**

In English, sometimes we need to use a question as part of another question or a statement. This is called an “embedded” or “indirect” **question** and is often used as a polite form. See the chart below:



|  |  |
| --- | --- |
| **Type of Question** | **Embedded Questions as Part of Other Questions** |
| **WH Questions** | **Yes/No Questions** |
| **Direct:**  | What did you have for lunch? | Did you have lunch? |
| **Indirect (Embedded):**  | Can you remember **what you had for lunch**? | *Could you tell me****if you had lunch****?* |

**Note the following rules to form embedded/indirect questions!**

* If there is a question word, as in WH questions, we keep it.
* If there is no question word, as in yes/no questions, we use '**if**'.
* We use normal sentence word order (subject + verb). This is perhaps the most important rule you should keep in mind.
* We use a full stop and not a question mark at the end of the sentence.

**5. Grammar Practice: Using Embedded or Indirect Questions**

**5.1. Using Embedded Questions as Part of Conversations**

**Directions:** *Change the following direct questions into indirect or embedded questions, as in the example.*

**a) Robert:** *What is Susan doing here on a Sunday?*

 **Answer:** Robert is asking *what Susan is doing here on a Sunday*.

**b)** Brian:*Where can I place these boxes?*

Brian doesn’t now \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**c)** Chloe: What time do I have to be here tomorrow?

 Chloe: Chloe wants to know \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**d)** Lucas: *Should I sign the receipt?*

 Lucas needs to know \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**e)** Mary: *What was the issue with the new employee?*

Mary is interested in knowing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**f)** Sandra: *Would you mind helping me finish this project?*

 Sandra asked \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 **g)** Grandpa: *Where are you gonna take the kids this Summer?*

 Grandpa is wondering \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**h)** Pat: *Have you eaten yet?*

 Pat is asking \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**i)** Rodney: *What do you typically do on Sunday’s mornings?*

 Rodney would like to know\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**j)** Clark: *Had you been here before?*

 Clark forgot\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**k)** Laura: *What has the new manager said about our salaries?*

 Laura doesn’t remember\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**l)** Amy:*Is this really the best choice?*

Amy is wondering \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**6. Speaking: Monologue** (15-20 mins)

**Directions:** Answer the following question in the form of an oral presentation.

**6.1. Stress: Silent Killer**

* The text states that chronic stress is one of the main causes of memory loss. Do you agree?
* What do you think chronic stress is?
* Do you think it can be considered a diagnosis?
* What could be other consequences of chronic stress?
* Does it only affect our mind? What about our physical body?
* What are other good examples (other than the ones mentioned in the video) to have a healthier life stye?
* Is stress inevitable in our lives?
* Can someone learn how to manage stress?
* Do you think “able to work under stress” is a good presentation to include on a work resume nowadays?
* Have you known anyone suffering from chromic stress? What’s his/her life like? Tell us about it!

**6.2. Healthy Aging**

* Have you been able to keep your memories intact as you’ve grown older?
* Other than learning a language, what are some other ways to avoid memory loss when getting older?
* What do you do now to keep your memory alive? Crosswords? Sudokus? Writing?
* Other than preventing memory loss, what are some other healthy habits we should consider as we grow old?
* In your opinion, are there any benefits to growing old? If so, what are they?
* Can age change your perspective on the world?
* Personally, how do you feel about getting old?

**7.** **Homework:** **Finding Out Information Over the Phone**

**Directions:** *Change the following direct questions into indirect or embedded questions, as in the example.*

**Example:** What are your hours?

**Indirect Question:** Can you please tell me what your hours are?

**a)** What’s your address?

**Indirect Question:** Could you tell me\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**b)** What time do you open?

**Indirect Question:** Can you tell me \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**c)** Is your company hiring?

**Indirect Question:**  Would you be so nice to tell me \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**d)** Do you have a dress code?

**Indirect Question:** Could you please tell me \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**e)** Where’s your building?

**Indirect Question:** Can you please tell me \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**f)** Do you have a Customer Service Department?

**Indirect Question:** Do you know \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**g)** Where can I park my park around here?

**Indirect Question:** Would you be so kind to tell me \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**h)** Are you closing earlier today?

**Indirect Question:** Do you happen to know\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**i)** What products do you have on sale?

**Indirect Question:** Could you please tell me \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

**j)** Do you have a Customer Service number?

**Indirect Question:** Please, let me know \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.