



# WATCH & LEARN: SCIENCE AND NATURE LABORATORY EXPERIMENTS: COVID-19 LIVING FOSSILS AND VACCINES (4:07 min) VIDEO Script & Vocabulary (page 1 of 2/v1152)

## INTERMEDIATE (B1 - B2) AND ABOVE

- ◊ Read the script and note new vocabulary
- ◊ Write three sentences using new vocabulary
- ◊ Prepare for the discussion questions

### Starting Off

*Horseshoe crabs have a unique type of blood that makes sure any medical product we put in our body is free of bacteria. But scientists say the horseshoe population is vulnerable and are very concerned about the next decade.*

- 1 Read the **Video Script** below. The words in **bold** are defined in the **Vocabulary** section. Look up any new words in a dictionary.
- 2 Go to the **Your Turn** section at the end of this document. Practice using new words and expressions from the video script to prepare for your next class.
- 3 Look at the **Discussion Questions** and prepare your responses for the next class.

### Video Script:

**TV Journalist:** This morning we continue our “Eye on Innovation” series on the increasing role science and technology play in our lives. We’re learning how **horseshoe crabs** could play a key role in the development of a vaccine for the Corona Virus. But scientists are increasingly concerned about their survival. Tom Hanson shows us the fight to save these extraordinary animals.



**Tom Hanson, TV Journalist:** Each year from Maine to Mexico guided by the moon countless horseshoe crabs complete an annual journey older than the dinosaurs. One that is crucial in developing a Covid-19 vaccine.

**John Tanacredi, Molloy College Cercom Director:** These animals have been on the planet for over 445 million years **give or take** a week or two in there.

**Journalist:** This is a **living fossil**.

**Tanacredi:** Yes it is. That’s the male...

**Journalist:** Scientist, John Tanacredi has dedicated his life to studying these so called “living fossils”.

**Tanacredi:** Pretty active, very healthy, that’s good.

**Journalist:** He runs the Center for Environmental Research and Coastal Oceans Monitoring Program at Malloy College, the largest horseshoe crab **breeding lab** in the Western Hemisphere. His team **tracks** 115 beaches around Long Island. They say the Horseshoe crab population is in **dire straits**. How much time are we looking at here before we lose horseshoe crabs?

**Tanacredi:** I’d say the next 10 years...the next decade is of critical concern.

**Journalist:** Critical concern not just for the **eco-system**, but also for modern medicine. Pharmaceutical companies have relied on these pre-historic creatures for decades to the **dismay** of conservationists. It’s all because of how their blue blood keeps them safe. A unique feature that helps scientists quickly detect deadly bacterial toxins.

*Video Script continued on next page...*

### Discussion Questions:

- ◊ Have you ever seen a horseshoe crab in the wild or know what one looks like?
- ◊ What are some examples of human activities that are placing a major burden on wildlife habitat and biodiversity?
- ◊ Many scientists agree that massive loss of biodiversity represents a major threat to the planet. How can we balance the need to produce medications and goods for the human population with the need to restore biodiversity on Earth?

### Vocabulary:

- **horseshoe crabs** - a large marine arthropod with a domed horseshoe-shaped shell, a long tail spine, and ten legs, little changed since the Devonian
- **give or take** - to within a specified amount
- **living fossil** - an extant taxon that closely resembles organisms otherwise known only from the fossil record. To be considered a living fossil, the fossil species must be old relative to the time of origin of the extant clade. Living fossils commonly are of species-poor lineages, but they need not be.
- **breeding lab** - laboratory where the mating and production of offspring by animals is routinely performed
- **track** - follow the trail or movements of (someone or something), typically in order to find them or note their course
- **dire straits** - in a very bad or difficult situation
- **ecosystem** - a community of living organisms in conjunction with the nonliving components of their environment, interacting as a system
- **dismay** - concern and distress

*Vocabulary continued on next page...*





- ◊ Read the script and note new vocabulary
- ◊ Write three sentences using new vocabulary
- ◊ Prepare for the discussion questions

### Video Script continued...

**John Dukcheck:** We recognize, and most people recognize, that this is a valuable resource.

**Journalist:** John Dukcheck is an executive director at Charles River Laboratories.

**Dukcheck:** It really represents, you know, lots of evolution and the horseshoe crab blood is **exquisitely** sensitive to these **endotoxin pyrogens**.

**Journalist:** You've likely never heard of these dangerous toxins, but it all started with a professor at Johns Hopkins University named Dr. Frederick Bang. In 1956 he observed a horseshoe crab become naturally infected with vibrio bacteria and then witnessed the crab's blood actually **clotting** around that bacteria.

**Dukcheck:** When they're in the **shallow** water they're **awash** in these bacteria, so if they get injured the **hemocytes** recognizes these bacteria, they recognize it as an opportunity to get an infection so they clot.

**Journalist:** That reaction became the basis for this test which checks for bacterial contamination in any medical product that goes into the body before the manufacturer **ships** them out including IV drugs, heart valves and, yes, vaccines.

**Dukcheck:** We have a 450-million-year-old creature that for the last 45 years has improved the safety of medicines for humans and animals.

**Journalist:** In the US limits have been put on how many horseshoe crabs can be **harvested** each year. And while the **humble** horseshoe crab's cells can be removed with no apparent harm to the creatures, studies show biomedical harvesting, overfishing for bait collection and coastal development are causing a **drop** in the population raising major questions about their survival.

**Tanacredi:** There is a public concern, a real concern about these animals that if we lose their habitat or we lose them coming to shore, once you lose them, they're gone. Extinction is forever.

**Journalist:** But with a global push for a Covid-19 vaccine **underway**, horseshoe crabs are once again in the **spotlight** which Tanacredi hopes will help conservation efforts.

If enough people can hear about it and talk to it that helps in getting the attention. This has been going on long before a pandemic as issues and concerns for these animals and our health so I'm optimistic. You have to be.

**Journalist:** For CBS This Morning, Tom Hanson, West Sayville, New York.

### Vocabulary continued...

- **exquisite** - intensely felt
- **endotoxin pyrogens** - substances (usually of biological origin) that cause fever
- **clotting** - form thick masses of coagulated liquid especially blood
- **shallow** - of little depth
- **awash** - covered or flooded with water, especially seawater or rain
- **hemocytes** - a cell of the haemolymph of various invertebrates, especially arthropods
- **ship** - (of a product) be made available for purchase or use
- **harvest** - catch or kill (animals) for human consumption
- **humble** - having or showing a modest or low estimate of one's importance
- **drop** - decline
- **underway** - having started and in progress; being done or carried out
- **spotlight** - intense scrutiny or public attention

### Your Turn! Using new vocabulary is the best way to learn and remember it.

- 1 Choose three words or expressions from the video that are new to you and write a sentence using each one in your notebook.
- 2 Try to use them in a context that is familiar to you to help you retain them.
- 3 Please ask for feedback on your sentences in the next lesson.