

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РФ
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ
БЮДЖЕТНОЕ ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ
ВЫСШЕГО ОБРАЗОВАНИЯ
«ВОРОНЕЖСКИЙ ГОСУДАРСТВЕННЫЙ
УНИВЕРСИТЕТ»

С.Н. Черникова

**INTRODUCTION
TO ENVIRONMENTAL SCIENCE**

Учебно-методическое пособие

Воронеж
Издательский дом ВГУ
2018

ПОЯСНИТЕЛЬНАЯ ЗАПИСКА

Целью учебно-методического пособия **Introduction to Environmental Science** является развитие у студентов продуктивных и рецептивных видов речевой деятельности: говорения, чтения и аудирования в рамках профессиональной сферы общения. Тренируются различные стратегии чтения (просмотровое, поисковое, детальное), развиваются навыки диалогической и монологической речи. В качестве сопутствующей задачи предполагается развитие умений группового и парного взаимодействия.

Пособие рассчитано на 54 часа аудиторной и 58 часов самостоятельной работы.

Пособие состоит из 6 разделов (Units), охватывающих основную тематику общения в профессиональной сфере, приложений, текстов аудиозаписей и списка использованной литературы. В данном пособии рассматриваются основные понятия и термины, используемые в экологической науке: биосфера, экосистема, биомы, биологическое разнообразие и пищевые цепи.

Каждый раздел (Unit) содержит предтекстовые упражнения; аутентичные письменные тексты и тексты для аудирования; послетекстовые упражнения, направленные на проверку понимания; блок упражнений на обсуждение информации, полученной из текстов; а также упражнения, направленные на формирование и развитие навыков письменной речи.

a) 100 million years ago

c) 750 million years ago

b) 370 million years ago

d) 1.2 billion years ago

9. The first modern plants - vascular plants with roots that carry water and nutrients to the rest of the plant - first began to appear on Earth about:

a) 470 million years ago

c) 1.3 billion years ago

b) 850 million years ago

d) 370 million years ago

Reading

2a Scan the text below and say what ingredients for life are mentioned.

THE INGREDIENTS FOR LIFE

(i) Earth is the only planet that can support life. This is amazing because it is made out of the same matter as other planets in our solar system, it was formed at the same time and through the same processes as every other planet, and it gets its energy from the sun. To a universal traveller, Earth may seem to be a harmless little planet in one of spiral galaxies in the universe. It has an average size star



of average brightness and is joined by eight other planets - which support no known life forms - in its solar system. However, Earth is a planet teeming with vitality and is home to billions of plants and animals.

(ii) How and why did we get here? What processes made this to happen? And where do we go from here? No one knows exactly what led to the

origin of life, and we may never know. But scientists have made significant progress in understanding what chemical processes may have led to the origins of

life.

(iii) There are many theories about how things came to be the way they are. It is thought that the biosphere evolved at least some 3.5 billion years ago. Biologists agree on one thing. Liquid water is absolutely essential for life to evolve and survive. But why is water so precious? For life to evolve, simple chemicals must combine to form more complex ones. Many chemicals dissolve in water allowing them to mix together and react. Liquid water has the right temperature for chemical reactions to happen. Many chemicals have parts which are attracted to water and parts which are repelled by it. These forces also help reactions happen.

(iv) Carbon is important because of its ability to form long chain-like molecules. Carbon chains form the backbone of organic molecules. Hydrogen and oxygen can both bond with carbon in lots of different ways. These two elements make up water molecules. So if water is present, hydrogen and oxygen will already be there. Like hydrogen and oxygen, nitrogen can also combine with carbon in lots of different ways. Large molecules made from carbon, hydrogen, oxygen and nitrogen also tend to be very stable. Sulphur, phosphorus, sodium, potassium, magnesium, calcium, manganese, iron, cobalt, copper and zinc are all needed for life as we know it on Earth.

(v) All chemical reactions need an energy source to drive them. On Earth, most primitive animals and plants get their energy by absorbing ultraviolet light from the Sun. This is called photosynthesis. Humans and other animals get their energy by eating plants, or other animals. All animals ultimately rely on energy from the Sun to live. Until recently, it was thought that life couldn't exist anywhere that was shaded from the Sun's light. However, scientists have recently discovered organisms living deep beneath the ocean. These organisms absorb energy directly from chemicals in the water around them. Three moons in our Solar System (Europe, Calisto and Titan) may all harbour deep underground

oceans. Could they also harbour extra-terrestrial life?

2b Match up the beginning of the sentence (column A) with the ending (column B).

A	B
a) Planet Earth	1) evolved at least some 3.5 billion years ago.
b) Liquid water	2) make up water molecules.
c) Organisms living deep beneath the ocean	3) is able to form long chain-like molecules.
d) All chemical reactions	4) is teeming with life.
e) The biosphere	5) absorb energy directly from chemicals in the water around them
f) Carbon	6) need an energy source to drive them.
g) Hydrogen and oxygen	7) is absolutely essential for life to evolve and survive.

2c Answer the questions.

1. What do all planets in the Solar System have in common?
2. What information about the Solar System does the text provide?
3. What part of the Solar System abounds with life?
4. When did the biosphere on the Earth evolve?
5. Why is the liquid water so precious?
6. What ability does carbon have?
7. What are the elements that are important for the development of life?
8. What energy source do you know?
9. How do animals and plants get their energy from the Sun?
10. Can life exist in the places that are shaded from the Sun's light?

2d Say whether the following statements true or false. Correct the false ones.

- 1) Earth is made out of the different matter as other planets in our solar system.
- 2) Earth is situated in one of spiral galaxies in the Universe.
- 3) Scientists were able to come close to knowing exactly what led to the origins of life.
- 4) Scientists have made little progress in understanding what chemical processes that may have led to the origins of life.
- 5) So if water is present, hydrogen and nitrogen will already be there.
- 6) Very few chemicals dissolve in water allowing them to mix together and react.
- 7) Large molecules made from carbon, hydrogen, oxygen and nitrogen are unstable.
- 8) Organisms living deep beneath the ocean absorb energy from chemicals in the water around them.

2e Put the following words in the correct order to make up a sentence.

- 1) need, all, them, chemical reactions, to drive, an energy source;
- 2) that, is, only, life, support, the, Earth, planet, can;
- 3) and, survive, absolutely, is, for life, water, to evolve, essential, liquid.
- 4) the Sun, animals, from, to live, all, rely on, energy.
- 5) combine, ones, to form, simple, more complex, chemicals, must.
- 6) the ocean, living, recently, deep, scientists, organisms, beneath, have discovered.

Vocabulary Practice

3a Match up and explain the meaning.

- | | |
|----------|-------------|
| • solar | • molecules |
| • spiral | • water |

- chemical
- primitive
- liquid
- organic
- ultraviolet
- extra terrestrial
- organisms
- life
- light
- system
- galaxies
- reactions

3b Write down the chemical formulas for the following.

- sulfur
- carbon
- hydrogen
- oxygen
- magnesium
- calcium
- manganese
- iron
- water
- cobalt
- copper
- zinc

Listening

4a Match up the words with their explanations.

A	B
1. orbit	a. the central part of an object
2. massive	b. what something is made of: solid, liquid or gas
3. core	c. the surface of a star
4. energy	d. be created
5. matter	e. the ability of a physical object or process to work
6. photosphere	f. very large and heavy
7. come into being	g. circle around a bigger object, for example another planet or star