

**CAREER
PATHS**

Environmental Science

Virginia Evans
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Express Publishing

**CAREER
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Book

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Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	The Earth: Structure and Spheres	Textbook	atmosphere, biosphere, core, crust, geosphere, hydrosphere, lithosphere, mantle, stratosphere, troposphere	Correcting yourself
2	Landforms	Webpage	canyon, cliff, glacier, hill, island, mountain, peninsula, plain, plateau, valley	Wishing someone luck
3	Ecosystems: Components	Article	abiotic, biotic, community, component, ecosystem, genetic diversity, habitat, organism, population, species	Talking about the past
4	Trophic Levels	Textbook	autotroph, consumer, decomposer, detritus feeder, heterotroph, omnivore, primary consumer, producer, secondary consumer, trophic level	Describing consequences
5	Terrestrial Biomes	Report	biome, chaparral, coniferous forest, deciduous forest, desert, grassland, high mountain, rainforest, savanna, tundra	Checking for understanding
6	Aquatic Systems 1	Brochure	aquatic life zone, coastal wetland, coastal zone, coral reef, estuary, intertidal zone, ocean, ocean bottom, open sea, saltwater	Describing mixed results
7	Aquatic Systems 2	Poster	floodplain zone, flowing, freshwater, inland wetland, lake, pond, river, source zone, standing, stream, transition zone	Reacting to bad news
8	The Scientific Method	Textbook	conclusion, control group, evaluate, experiment, experimental group, hypothesis, independent variable, observation, problem, result, testable, the scientific method	Asking about progress
9	Measurements	Conversion chart	acre, convert, gallon, hectare, imperial, kilogram, kilometer, liter, metric, mile, pound	Agreeing to a suggestion
10	Climate: Factors	Magazine article	average, climate, current, elevation, latitude, pattern, prevailing wind, range, rotation, terrain	Describing averages
11	Climate: Zones	Webpage	arid, cool temperate, Equator, highland, humid, polar, subarctic, tropical, warm temperate, zone	Estimating time
12	Weather	Webpage	cloud cover, humidity, meteorology, moisture, precipitation, pressure, short-term, temperature, weather, wind speed	Stating probability
13	Matter	Guide	atom, atomic number, compound, electron, element, ion, mass number, matter, molecule, neutron, proton	Describing common errors
14	Energy	Textbook	conserve, electromagnetic radiation, energy, energy efficiency, energy quality, heat, kinetic energy, potential energy, transfer, work	Introducing a difference
15	Basic Units of Life	Magazine article	cell, chromosome, DNA, eukaryotic, gene, genetic information, multicellular, nucleus, prokaryotic, unicellular	Introducing unexpected results

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Unit	Topic	Reading context	Vocabulary	Function
1	The Water Cycle	Article	advection, aquifer, condensation, evaporation, hydrologic cycle, infiltration, liquid, precipitation, residence time, sublimation, transpiration, vapor, water cycle	Describing negative results
2	Energy Flow	Article	biomass, carnivore, consume, ecological efficiency, energy flow, food chain, food web, herbivore, lose, photosynthesis, solar energy, trophic transfer, vegetarian	Describing limited time
3	Nitrogen Cycle	Article	ammonia, denitrification, eutrophication, fixation, mineralization, nitrates, nitrification, nitrites, nitrogen cycle, nitrous oxide, nutrient-poor	Describing cause and effect
4	Rock Cycle	Textbook chapter	crystallization, deposition, erosion, igneous rock, magma, melt, metamorphic rock, rock, rock cycle, sedimentary rock, sedimentation	Describing a process
5	Carbon Cycle	Lecture description	aerobic respiration, break down, carbohydrates, carbon, carbon cycle, circulate, CO ₂ , diffuse, dissolve, oxygen	Correcting an error
6	Plate Tectonics	Article	boundary, continent, continental, continental drift, convergent boundary, divergent boundary, fault, oceanic, plate tectonics, seafloor spreading, tectonic plate, transform boundary	Asking about differences
7	Resources 1	Webpage	environmental degradation, extract, fishery, forest, log, metal, mine, ore, resource, sustainable yield, timber	Asking about limitations
8	Resources 2	Webpage	coal, fossil fuel, gasoline, hydrogen, metallic mineral resource, natural gas, nonmetallic mineral resource, nuclear power plant, oil, petroleum, potential resource, stock resource, uranium	Describing mixed results
9	Evolution	Textbook chapter	adaptation, biological evolution, coevolution, differential reproduction, fossil, geographic isolation, mutation, natural selection, reproductive isolation, speciation, theory of evolution, trait	Bringing up a topic
10	Biodiversity	Article	aquarium, biodiversity, botanical garden, ecosystem diversity, endangered species, extinct, functional diversity, gene bank, hotspot, species diversity, threatened species, variation, wildlife refuge, zoo	Describing optimism
11	Extinctions	Letter	background extinction, biological extinction, ecological extinction, extinction, fossil record, generalist species, Holocene extinction, local extinction, mass extinction, niche, specialist species	Describing possible consequences
12	Classification System	Encyclopedia entry	class, classification, common name, domain, family, genus, kingdom, nomenclature codes, order, phylum, scientific name, taxonomy	Questioning purpose
13	Energy: Non-renewable	Website	butane, crude, liquefied natural gas, liquefied petroleum gas, non-renewable, nuclear energy, oil sand, propane, radioactive, reactor, refine, shale	Asking for an opinion
14	Energy: Renewable	Pamphlet	biodiesel, geothermal, hydroelectric dam, hydropower, renewable, solar panel, solar power, steam, tidal power, wind farm, wind power	Making recommendations
15	Recycling	Newspaper article	aluminum, compost, consumption, glass, paper, plastics, postconsumer, preconsumer, primary recycling, recycle, recycling code, reduce, reuse, secondary recycling, Styrofoam	Describing limitation

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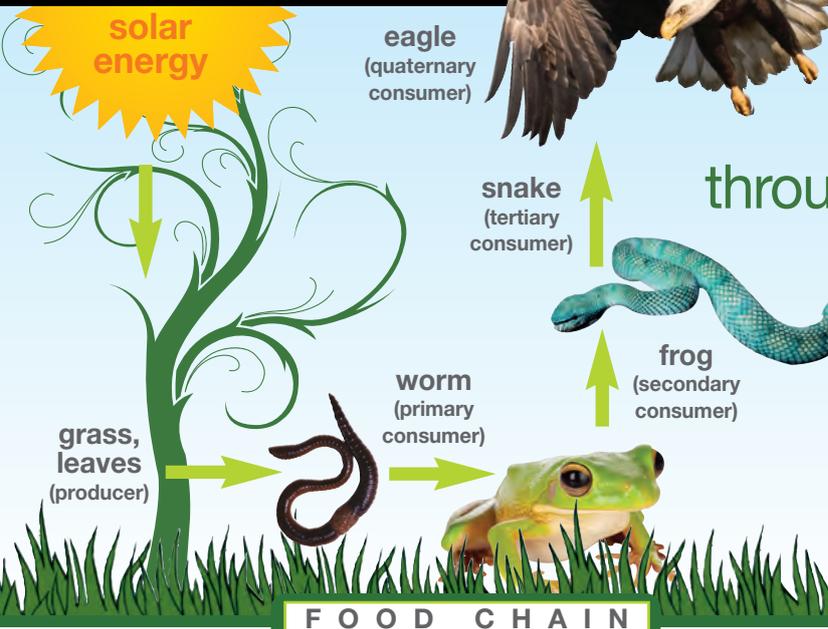
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Energy Conservation through Wise Consumption

Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- | | |
|-----------------|----------------------------|
| 1 __ carnivore | 4 __ energy flow |
| 2 __ vegetarian | 5 __ photosynthesis |
| 3 __ food chain | 6 __ ecological efficiency |

- A the process by which plants utilize the energy of sunlight to synthesize nutrients
- B the measurement of usable energy that moves between trophic levels
- C the movement of energy from one level to the next
- D a system in which each organism is consumed by another organism
- E an organism that eats consumers
- F a diet without meat

4 Fill in the blanks with the correct words and phrases from the word bank.

Word BANK

biomass consume lose food web
solar energy trophic transfer herbivore

- Food chains _____ energy from one trophic level to the next.
- Most producers rely on _____ to provide nutrients.
- A _____ does not eat other consumers.
- Humans are omnivores, so they _____ plants and animals.
- The _____ is a complex network of many organisms.
- _____ measures the energy that is available to the next trophic level.
- A certain amount of energy gets lost during each _____.

Saving energy is a common topic these days. The science community and the public both strive to use less energy. A simple way to do this is to eat a **vegetarian** diet. **Energy flow** diminishes whenever one organism **consumes** another organism. The trophic system **loses** energy during each **trophic transfer**. Therefore, higher organisms on a **food chain** have a smaller supply of energy. The highest organisms in a **food web** can only exist in small numbers.

The most energy exists at the lowest trophic level. Plants use abundant **solar energy** to perform **photosynthesis**. When a **herbivore** eats a plant, some energy is lost. When a **carnivore** eats a herbivore, more energy is lost. Humans can eat both producers and consumers. However, a vegetarian diet improves our **ecological efficiency**. More **biomass** is available at a lower trophic level. We lose energy by letting another organism consume that level first.

Get ready!

1 Before you read the passage, talk about these questions.

- What kind of energy do plants use?
- Are humans omnivores or carnivores?

Reading

2 Read the article. Then, mark the following statements as true (T) or false (F).

- ___ The article stresses the advantages of being a carnivore.
- ___ More energy is available to herbivores than to carnivores.
- ___ Humans can save energy by consuming plants.



- 5 Listen and read the article again. What happens when excessive energy is lost at a low trophic level?

Listening

- 6 Listen to a conversation between two scientists. Choose the correct answers.

- What is the main idea of the conversation?
 - how to improve ecological efficiency in an ecosystem
 - where organisms can find abundant biomass
 - why an ecosystem is experiencing energy loss
 - which organisms are improving the energy flow
- What is killing the algae in the bay?
 - a decreased fish population
 - local fishing industries
 - excessive consumption of algae
 - a chemical from an unknown source

- 7 Listen again and complete the conversation.

- Scientist 1:** Now there's not 1 _____ to support the fish population.
- Scientist 2:** So the fish consume the algae. What 2 _____ ?
- Scientist 1:** Humans, mostly. The fish provide food for the local community out there.
- Scientist 2:** So that must be 3 _____ for the fishing industry.
- Scientist 1:** It sure is. There's hardly any 4 _____ left in the ecosystem.
- Scientist 2:** The effect of that chemical has really moved 5 _____ . Where's it coming from?
- Scientist 1:** We don't know yet. But we'd better figure it out, before 6 _____ .

consume



Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

Have you heard ...?

There's not enough ...

What consumes ...?

Student A: You are a scientist. Talk to Student B about:

- energy loss in an ecosystem
- the cause of the energy loss
- the consequences of the energy loss

Student B: You are a scientist. Talk to Student A about energy loss in an ecosystem.

Writing

- 9 Use the article and the conversation from Task 8 to fill out the memo to a government agency.



memo

To: The Regional Ecological Authority
 From: Dr. P. Nelson
 Subject: Threatened Ecosystem

Hello,
 I discovered a threat to the ecosystem on _____
 _____ . The threat is caused by
 _____ . This is a problem
 because _____ .
 This also affects _____ .
 I hope your organization will look into this further.

Rufford Heights Bulletin



biotic

abiotic

Keep Our Waterways Clean!

A disaster hit Rufford Lake last week. Chemical waste killed hundreds of fish. Remember, we are all responsible for taking care of local **ecosystems**.

Biotic creatures rely on **abiotic** materials like water. A damaged **component** threatens the entire **community**. The lake is a **habitat** for many creatures. That particular **species** of fish is very important. It eats algae and other **organisms**. Without the fish **population**, there is too much algae. Some smaller creatures can barely survive.

Fortunately, some fish are still alive. It's up to us to save these fish and preserve the **genetic diversity** of Rufford Lake. Let's avoid another incident. Support anti-dumping laws.



organism

Get ready!

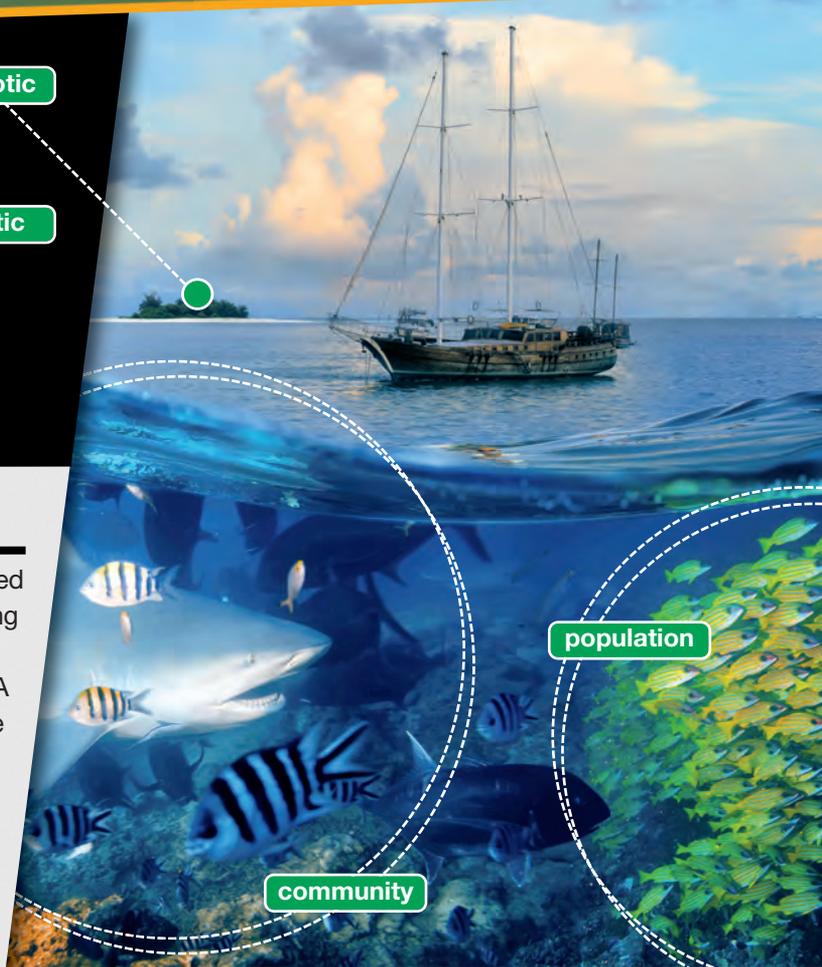
1 Before you read the passage, talk about these questions.

- 1 What is an example of a habitat?
- 2 What does a community contain?

Reading

2 Read the article. Then, mark the following statements as true (T) or false (F).

- 1 ___ Too many fish were removed by fishermen.
- 2 ___ The lack of fish harmed the algae population.
- 3 ___ Some of the fish population survived the incident.



community

population

Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- | | |
|-----------------|-------------------------|
| 1 ___ abiotic | 4 ___ population |
| 2 ___ organism | 5 ___ community |
| 3 ___ component | 6 ___ genetic diversity |

- A a group of individuals from different species
 B the variation among individuals in a species
 C an important piece or part of something
 D an individual living thing
 E not a living thing
 F a group of individuals from the same species

4 Read the sentences and choose the correct words.

- 1 A(n) **organism / species** is a large group of individuals.
- 2 Ponds and forests are examples of **genetic diversity / habitats**.
- 3 Both living and nonliving things make up a(n) **ecosystem / community**.
- 4 Humans and trees are both **abiotic / biotic**.

- 5 Listen and read the article again. Why are fish important to their habitat?

Listening

- 6 Listen to a conversation between two scientists. Choose the correct answers.

- What is the main idea of the conversation?
 - how to identify missing components of an ecosystem
 - what is causing the death of a fish population
 - where to find a better fish habitat
 - which type of waste is destroying a species of fish
- According to the man, what will happen to the fish?
 - They will all die out soon.
 - The strong ones will keep the population going.
 - They will move to a thriving habitat.
 - They will be removed by scientists.

- 7 Listen again and complete the conversation.

Scientist 1: Have you been to Rufford Lake recently?

Scientist 2: Yes. There aren't very many fish in the water anymore.

Scientist 1: Five years ago, that lake was a thriving **1** _____. What happened?

Scientist 2: They're dying. It's because people **2** _____ in the lake.

Scientist 1: Really? That's terrible. Do you think the fish will **3** _____ eventually?

Scientist 2: I doubt it. The species has a lot of **4** _____.

Scientist 1: You mean that some fish **5** _____ than others?

Scientist 2: Exactly. I think there are enough left to keep the **6** _____.

Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

Have you been to ...?

It's because of ...

You mean that ...

Student A: You are a scientist. Talk to Student B about:

- an ecosystem
- how the ecosystem has changed
- what you think will happen in the future

Student B: You are a scientist. Talk to Student A about changes in an ecosystem.

Writing

- 9 Use the article and the conversation from Task 8 to fill out the ecological report.

City of Cork Municipal Ecology Report

Area: _____

List populations that are threatened: _____

What is threatening the population? _____

What will probably happen to the population? _____

habitat

Glossary

- abiotic** [ADJ-U3] If something is **abiotic**, it is not a living thing.
- acre** [N-COUNT-U9] An **acre** is an imperial unit of area equal to about 0.002 square miles or about 0.40 hectares.
- aquatic life zone** [N-COUNT-U6] An **aquatic life zone** is an area in a body of water with a particular set of characteristics.
- arid** [ADJ-U11] If something is **arid**, it has air that contains very little moisture.
- atmosphere** [N-COUNT-U1] The **atmosphere** is the thin layer of air around the Earth.
- atom** [N-COUNT-U13] An **atom** is the smallest piece of matter that can exist by itself.
- atomic number** [N-COUNT-U13] An **atomic number** is a measure of the number of protons in an atom, and is used to identify atoms from different elements.
- autotroph** [N-COUNT-U4] An **autotroph**, also called a producer, is an organism that gets its nutrients from compounds in the environment.
- average** [ADJ-U10] If something is **average**, it has qualities that are typical or most common in a particular group or category.
- biome** [N-COUNT-U5] A **biome** is an area of the planet with a particular set of characteristics, including levels of temperature and precipitation.
- biosphere** [N-COUNT-U1] The **biosphere** is the layer on the Earth that supports all living organisms.
- biotic** [ADJ-U3] If something is **biotic**, it is a living thing.
- canyon** [N-COUNT-U2] A **canyon** is a very deep valley that often has a river or stream running along the bottom.
- cell** [N-COUNT-U15] A **cell** is a unit of life that is very small.
- chaparral** [N-COUNT or UNCOUNT-U5] **Chaparral** is a dry, temperate region with shrubs and small trees.
- chromosome** [N-COUNT-U15] A **chromosome** is a thread in a DNA molecule that contains genes.
- cliff** [N-COUNT-U2] A **cliff** is a place where a high area of land abruptly meets a lower area, so that the edge of the land is very steep.
- climate** [N-COUNT-U10] A **climate** is the pattern of weather conditions over a long period of time.
- cloud cover** [N-COUNT-U12] **Cloud cover** is a measure of how dense the clouds are in a particular area.
- coastal wetland** [N-COUNT-U6] A **coastal wetland** is an area of land along a coast that is sometimes or always covered in water.
- coastal zone** [N-COUNT-U6] A **coastal zone** is a warm, shallow area in an ocean that is along the edge of land.
- community** [N-COUNT-U3] A **community** is a group of all the living things in a particular area.
- component** [N-COUNT-U3] A **component** is an important piece or part of something.
- compound** [N-COUNT-U13] A **compound** is a combination of two or more elements.
- conclusion** [N-COUNT-U8] A **conclusion** is a decision or determination that is made after an experiment.
- coniferous forest** [N-COUNT-U5] A **coniferous forest** is a cold, dry region with tall trees that retain their leaves or needles throughout the year.
- conserve** [V-T-U14] To **conserve** something is to use little or none of something so that it will be available at a later time.
- consumer** [N-COUNT-U4] A **consumer**, also called a heterotroph, is an organism that gets its nutrients by feeding on other organisms.
- control group** [N-COUNT-U8] The **control group** is the part of an experiment that does not receive the substance or treatment that is being tested.
- convert** [V-T-U9] To **convert** something is to change it into a different form.
- cool temperate** [ADJ-U11] If the climate of an area is **cool temperate**, it is an area with a mild climate that typically has cold winters and moderately warm summers.

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Career Paths: Environmental Science is a new educational resource for environmental science professionals who want to improve their English communication in a work environment. Incorporating career-specific vocabulary and contexts, each unit offers step-by-step instruction that immerses students in the four key language components: reading, listening, speaking, and writing. **Career Paths: Environmental Science** addresses topics including the parts of the environment, natural resource management, biodiversity, pollution, and climate change.

The series is organized into three levels of difficulty and offers a minimum of 400 vocabulary terms and phrases. Every unit includes a test of reading comprehension, vocabulary, and listening skills, and leads students through written and oral production.

Included Features:

- A variety of realistic reading passages
- Career-specific dialogues
- 45 reading and listening comprehension checks
- Over 400 vocabulary terms and phrases
- Guided speaking and writing exercises
- Complete glossary of terms and phrases

The **Teacher's Book** contains a full answer key and audio scripts.

The **Teacher's Guide** contains detailed lesson plans, a full answer key and audio scripts.

The **audio CDs** contain all recorded material.



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