Career Paths: Science is a new educational resource for scientific 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: Science addresses topics including laboratory equipment, safety procedures, the scientific method, research activities, and career options.

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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<td>Magazine article</td>
<td>branch, discover, evaluate, improve, lab, progress, question, research, science, study</td>
<td>Showing agreement</td>
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<td>Manual</td>
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<td>Asking for help</td>
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<td>6</td>
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<td>7</td>
<td>Measurements 1</td>
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<td>Asking for clarification</td>
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<td>Measurements 2</td>
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<td>9</td>
<td>SI Units</td>
<td>Poster</td>
<td>amount, base unit, derived unit, force, joule, molar mass, mole, newton, pascal, pressure, SI</td>
<td>Making a realization</td>
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<td>10</td>
<td>Numbers and Basic Math</td>
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<td>Working with numbers</td>
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<td>Large Numbers</td>
<td>Email</td>
<td>cubed, exponent, integer, leading zero, rounding error, scientific notation, significant figure, squared, to the nth power, trailing zero</td>
<td>Describing expectations</td>
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<td>Newspaper article</td>
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<td>Education</td>
<td>Webpage</td>
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<td>Describing requirements</td>
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<td>Textbook excerpt</td>
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<td>Correcting oneself</td>
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<td>2</td>
<td>Energy</td>
<td>Webpage</td>
<td>chemical energy, conserve, electromagnetic radiation, energy efficiency, energy quality, frame of reference, heat, kinetic energy, potential energy, thermal energy, transfer, work</td>
<td>Asking about a process</td>
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<td>3</td>
<td>The Periodic Table</td>
<td>Poster</td>
<td>atomic radius, block, electron affinity, electron configuration, electron shell, element symbol, group, ionization energy, noble gas, period, periodic table, valence shell</td>
<td>Asking for more time</td>
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<td>4</td>
<td>Rate Processes</td>
<td>Report</td>
<td>diameter, driving force, flow rate, flux, inlet, outlet, rate, rate process, resistance, viscosity</td>
<td>Listing conditions</td>
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<td>5</td>
<td>Chemical Reactions</td>
<td>Instructions</td>
<td>catalyst, concentration, in excess, limiting reactant, reactant, reaction, reagent, product, solute, solution, solvent, yield</td>
<td>Describing order</td>
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<td>6</td>
<td>Reactors</td>
<td>Webpage</td>
<td>activated sludge, batch reactor, bioreactor, cooling jacket, CSTR, impeller, membrane bioreactor, plug flow reactor, reactor, rotating biodisk tank, tank, tubular reactor</td>
<td>Making a recommendation</td>
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<tr>
<td>7</td>
<td>The Scientific Method</td>
<td>Abstract</td>
<td>conclusion, control group, experiment, experimental group, hypothesis, independent variable, observation, problem, result, scientific method, testable</td>
<td>Expressing interest</td>
</tr>
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<td>8</td>
<td>Research Activities</td>
<td>Magazine Article</td>
<td>double blind, experimentation, external validity, field experiment, natural experiment, observational study, peer review, placebo effect, reproducibility, safeguard, selection bias, skew, research</td>
<td>Talking about potential problems</td>
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<tr>
<td>9</td>
<td>Statistics</td>
<td>Email</td>
<td>central tendency, deviation, mean, mean absolute deviation, median, mode, population, range, raw data, sample, statistics, variance, variation</td>
<td>Comparing results</td>
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<td>10</td>
<td>Systems</td>
<td>Textbook excerpt</td>
<td>closed system, consumption, extensive quantity, final, generation, initial, input, intensive quantity, open system, output, system, universal accounting equation</td>
<td>Clarifying information</td>
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<td>11</td>
<td>Mathematics</td>
<td>Webpage</td>
<td>abstract algebra, applied mathematics, arithmetic, calculus, elementary algebra, Euclidean geometry, geodesy, geometry, non-Euclidean geometry, probability, pure mathematics, topology, trigonometry</td>
<td>Expressing enthusiasm</td>
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<td>12</td>
<td>Design Theory</td>
<td>Webpage</td>
<td>assemble, constraint, construct, criteria, detailed design, estimate, feasibility study, identify, narrow down, preliminary design, sketch, verify</td>
<td>Asking about progress</td>
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<td>13</td>
<td>Logic</td>
<td>Textbook excerpt</td>
<td>abductive reasoning, deductive reasoning, formal logic, inductive reasoning, informal logic, logic, logical form, mathematical logic, predicate logic, propositional logic, symbolic logic</td>
<td>Describing opposites</td>
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<td>14</td>
<td>Career Options</td>
<td>Newsletter</td>
<td>academia, administrator, advisor, engineer, inspector, internship, lab technician, nonacademic, nonprofit, patent, professor, researcher, scientist</td>
<td>Discussing wants/desires</td>
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<td>15</td>
<td>Ethics</td>
<td>Editorial</td>
<td>application, commercial interest, debate, ethical, moral, neutral, patient welfare, profit, regulation, responsibility, thorough, trial</td>
<td>Sharing opinions</td>
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<td>Physics</td>
<td>Course description</td>
<td>conservation, constant, electromagnetism, equilibrium, gravity, law, magnetism, momentum, motion, thermodynamics, vibration, waves</td>
<td>Expressing a concern</td>
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<td>2</td>
<td>Biology</td>
<td>Review sheet</td>
<td>biology, cell, cell division, evolution, homeostasis, meiosis, metabolism, mitosis, natural selection, organ, organelle, organism, physiology, taxonomy, tissue</td>
<td>Talking about future events</td>
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<td>3</td>
<td>Chemistry</td>
<td>Chapter summary</td>
<td>chemical bond, chemistry, covalent bond, endothermic, enthalpy, exothermic, heat capacity, ionic bond, phase, polarity, stoichiometry, VSEPR theory</td>
<td>Describing opposites</td>
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<tr>
<td>4</td>
<td>Biochemistry</td>
<td>Magazine article</td>
<td>biochemistry, biocompound, biotechnology, carbohydrate, cellular respiration, energy pathway, interaction, ion channel, lipid, membrane, phospholipid, protein</td>
<td>Asking for information</td>
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<td>5</td>
<td>Anatomy</td>
<td>Syllabus</td>
<td>anatomy, bone, cardiovascular system, joint, ligament, muscle, muscular system, nerve, nervous system, organ system, respiratory system, skeleton, tendon</td>
<td>Introducing bad news</td>
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<td>6</td>
<td>Botany</td>
<td>Textbook excerpt</td>
<td>angiosperm, autotroph, botany, bryophyte, chlorophyll, gymnosperm, leaf, photosynthesis, plant, root, seed, spore, stem</td>
<td>Asking for clarification</td>
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<td>7</td>
<td>Zoology</td>
<td>Webpage</td>
<td>animal, behavioral ecology, entomology, ethology, habitat, herpetology, ichthyology, mammalogy, migration, ornithology, primatology, zoology</td>
<td>Talking about experience</td>
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<tr>
<td>8</td>
<td>Social Science</td>
<td>Flyer</td>
<td>anthropology, archaeology, criminology, economics, geography, international relations, linguistics, political science, psychology, social science, society, sociology</td>
<td>Making recommendations</td>
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<td>9</td>
<td>Behavioral Science</td>
<td>Webpage</td>
<td>agent-based model, behavioral science, cognitive science, consumer behavior, informational science, media psychology, microsimulation, neural network, operations research, psychobiology, relational science, social cognition, social network</td>
<td>Asking about a process</td>
</tr>
<tr>
<td>10</td>
<td>Environmental Science</td>
<td>Newspaper article</td>
<td>atmosphere, biome, climate, climate change, community, ecosystem, environmental science, natural resource, pollution, population, water cycle, weather</td>
<td>Reacting to good news</td>
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<td>11</td>
<td>Geology</td>
<td>Textbook excerpt</td>
<td>absolute dating, chronological, continental drift, erosion, geology, igneous rock, magma, metamorphic rock, plate tectonics, pressure, relative dating, rock cycle, sedimentary rock</td>
<td>Giving a reminder</td>
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<td>Oceanography</td>
<td>Webpage</td>
<td>chemical oceanography, current, divergent boundary, marine, marine biology, marine geology, ocean, oceanography, physical oceanography, seafloor spreading, thermohaline circulation, tide</td>
<td>Expressing reservations</td>
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<td>13</td>
<td>Astronomy</td>
<td>Encyclopedia entry</td>
<td>astronomy, Big Bang, black hole, cosmology, formation, galaxy, moon, nebula, nova, orbit, planet, space, star, supernova, telescope</td>
<td>Politely interrupting</td>
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<td>14</td>
<td>Genetics</td>
<td>Textbook introduction</td>
<td>bacteriophage, clone, DNA, gel electrophoresis, gene, gene structure, genetics, plasmid, RNA, sequence, transcription, translation, vector</td>
<td>Describing a process</td>
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<tr>
<td>15</td>
<td>Computer Science</td>
<td>Blog</td>
<td>algorithm, binary, bus, chip, computer science, control system, electronics, hardware, memory, network, operating system, programming language, software, storage</td>
<td>Describing difficulty</td>
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Get ready!
1 Before you read the passage, talk about these questions.
1 What features are shared by all branches of science?
2 What are some important qualities in a scientist?

Reading
2 Read the magazine article. Then, choose the correct answers.
1 What is the main idea of the article?
A predictions about the future of science
B the most important branches of science
C preparing for a career in science
D similarities between different areas of science
2 Which of the following is NOT mentioned in the editor’s letter?
A articles about various branches of science
B a historical overview of different fields
C ongoing experiments in various labs
D features shared by all branches of science
3 According to the article, what makes a good scientist?
A an ability to work well with other scientists
B a desire to start his or her own lab
C a habit of seeking information
D an understanding of current technology

Vocabulary
3 Match the words (1-6) with the definitions (A-F).
1 ___ lab 4 ___ branch
2 ___ study 5 ___ discover
3 ___ science 6 ___ question
A to learn about something in a formal context
B a broad field that examines various processes
C to find new information about something
D a place where experiments are conducted
E to assess the truth of something
F an area or subfield of a larger field

From the Editor
This week’s issue is all about the history of science. You’ll find articles on everything from paleontology to computer technology. Each branch has its own properties and applications. However, some features are common to all of them.

Every branch of science seeks to study or evaluate something. Some people naturally question the world around them. Those people make excellent scientists. They are eager to discover new ideas. But they know it’s not easy. Science requires extensive time and research. Most scientists spend countless hours in the lab. But that’s how we make progress. When you actually improve something, it’s worth the effort.

So enjoy our special history issue!

Ed.
4 Read the sentence pairs. Choose which word best fits each blank.

1 improved / evaluated
   A After the developers ______________, the drink formula, it tasted much better.
   B Several scientists ______________ the problem before investigating further.

2 research / progress
   A The student performed extensive ______________ for her final report.
   B After months of inactivity, the project finally started to make ______________.

5 Listen and read the magazine article again.
What leads to successful experiments?

Listening

6 Listen to a conversation between two scientists. Mark the following statements as true (T) or false (F).

1 ___ The scientists in the lab made a major discovery.
2 ___ The man performed some research for the experiment.
3 ___ The results of the experiment will likely be widely useful.

7 Listen again and complete the conversation.

Scientist 1: Hey, Kim. Did you hear about the experiment at Finmooore Labs?
Scientist 2: Yes, it sounds really interesting.
   1 ______________ fuel efficiency in cars, right?
Scientist 1: Well, they're trying. So far, 2 ________________
   ________________ .
Scientist 2: I suppose that's 3 ________________
   ________________ .
Scientist 1: Of course. Successful experiments require 4 ________________
   ________________ . And lots of time in the lab.
Scientist 2: Exactly. In any case, 5 ________________
   to hear what they discover.
Scientist 1: Yeah, so am I. Their findings will be 6 ________________ .

Speaking

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

USE LANGUAGE SUCH AS:

Did you hear ...?
They're ..., right?
So am I.

Student A: You are a scientist. Talk to Student B about:
   • an experiment
   • the purpose of the experiment
   • the progress of the experiment

Student B: You are a scientist. Talk to Student A about the purpose and progress of an experiment.

Writing

9 Use the magazine article and the conversation from Task 8 to fill out the article about a current experiment.

A Journal of Science and Technology

Scientists at Fillmore labs are working on a new experiment. Its purpose is ____________________________ .

According to the lead scientist, Dr. Jennifer Tyler, their progress is ____________________________ .

Dr. Tyler expects the experiment to be a success because ____________________________ .

Read more at stellarmonthly.org.
Get ready!

Before you read the passage, talk about these questions.

1. What are some visual ways to organize data?
2. What are some different parts of a graph?

Reading

Read the report. Then, choose the correct answers.

1. What is the main idea of the report?
   - A which graphs in a set need corrections
   - B how to identify the different parts of a graph
   - C why particular graphs are more effective than others
   - D which results are displayed in several graphs

2. Which of the following does NOT address costs?
   - A line graph
   - B bar graph
   - C table
   - D pie chart

3. What shows the strengths of the parts?
   - A x-axis
   - B y-axis
   - C rows
   - D columns

Vocabulary

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

1. row
2. table
3. y-axis
4. legend
5. bar graph
6. line graph

A a display in which data is organized into a grid of boxes
B a display in which the size of each section is relative to its value
C the line that runs up and down along a graph
D a horizontal series of boxes from side to side
E information about a chart’s features and symbols
F a display in which data is represented by connected points

Sharpe DATA Analysts

Client: Actola Manufacturing, Inc.
Results for: New Machine Component Test
Summary of Results:

We tested the strength of each part. This appears on the line graph. The x-axis represents months and the y-axis represents performance. Part A’s line remains steady, while Part B’s line declines sharply. The scatter plot shows individual tests. (See the legend for information about reading plots.)

Part A is stronger, but it is also more expensive. The bar graph shows a cost comparison. However, Part A is still more efficient. See the cost-analysis table. The rows show each part. The columns show yearly replacement costs. Part A is more expensive at first. But Part B requires more frequent replacement. The pie charts break down replacement costs versus maintenance costs.
4 Read the sentence pairs. Choose which word or phrase best fits each blank.

1 scatter plot / pie chart
   A A _______________________ displays multiple points along x and y axes.
   B A circular graph is called a ___________________.

2 x-axis / column
   A On many graphs, the _______________________ is a scale of time.
   B A(n) _______________________ is a series of boxes on a table.

5 Listen and read the report again. What is the difference between a line graph and a scatter plot?

Listening

6 Listen to a conversation between two scientists. Mark the following statements as true (T) or false (F).

1 ___ The woman tried to use a scatter plot.
2 ___ The man suggests using two separate graphs.
3 ___ The woman plans to use a line graph.

7 Listen again and complete the conversation.

Scientist 1: Yes. Rounds of testing are along 1 _____________ - ___________. And performance is on the y-axis.

Scientist 2: So you want to show both components on the 2 _____________?

Scientist 1: Right. I tried a 3 _____________, but there’s just too much data.

Scientist 2: I see. I don’t think you need to include 4 _____________ . Just show the averages per round.

Scientist 1: Oh, and maybe connect them on a 5 _____________?

Scientist 2: Yeah. It’ll be 6 _____________ to read.

Speaking

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

USE LANGUAGE SUCH AS:

I could use some help with ...
So you want to ...?
I don’t think ...

Student A: You are a scientist. Talk to Student B about:
- presentation materials you are creating
- what you tried already
- his or her suggestions

Student B: You are a scientist. Talk to Student A about presentation materials he or she is creating.

Writing

9 Use the report and the conversation from Task 8 to fill out the report summary.

Client: _______________________________________________________________
Report on: ____________________________________________________________

Display 1: Line Graph
Features shown: ______________________________________________________
Conclusions: _________________________________________________________

Display 2: ____________________________________________________________
Features shown: ______________________________________________________
Conclusions: _________________________________________________________
add [V-T-U10] To \textit{add} a quantity to another quantity is to increase it by that amount.

amount [N-COUNT-U9] An \textit{amount} is a physical quantity of a substance.

analytical balance [N-COUNT-U4] An \textit{analytical balance} is an enclosed device that is used to find very precise measurements of mass.

arm [N-COUNT-U5] The \textit{arm} of a microscope is the part that extends from the base to the head.

bachelor's degree [N-COUNT-U15] A \textit{bachelor's degree} is a certificate indicating that someone has completed an educational degree program, usually after four years of study.

balance [N-COUNT-U4] A \textit{balance} is a device that determines the mass of something.

bar graph [N-COUNT-U13] A \textit{bar graph} is a graph that displays data in a series of sections, the lengths of which are proportional to their values.

base [N-COUNT-U5] The \textit{base} of a microscope is the lower part that supports the rest of the device, and typically holds the light source as well.

base unit [N-COUNT-U9] A \textit{base unit} is one of seven standard SI units that is the foundation of other SI units.

beaker [N-COUNT-U2] A \textit{beaker} is a cylindrical, wide-mouthed container with a flat base that is used to store, measure, and pour substances.

branch [N-COUNT-U1] A \textit{branch} is one area of study or subfield of a particular subject.

buret [N-COUNT-U2] A \textit{buret} is a very narrow, tall glass cylinder that is used to accurately measure volume.

burner [N-COUNT-U3] A \textit{burner} is a device that produces heat or flames.

Celsius [N-UNCOUNT-U8] If a measurement is \textit{Celsius}, it uses the temperature scale in which water boils at 100 degrees and freezes at 0 degrees.

centrifuge [N-COUNT-U4] A \textit{centrifuge} is a device that spins substances very quickly in order to separate heavy particles from lighter ones.

clamp [N-COUNT-U3] A \textit{clamp} is a device that is used to secure something in a particular place and prevent it from moving.

climb [V-I-U14] To \textit{climb} is to increase at a steady rate.

column [N-COUNT-U13] A \textit{column} is a group of boxes that extends from the top to the bottom of a table.

convert [V-T-U7] To \textit{convert} something is to change it into a different form or system.

coarse focus [N-UNCOUNT-U5] \textit{Coarse focus} is a microscope mechanism that moves the objective lens toward or away from the specimen.

coveralls [N-PLURAL-U6] \textit{Coveralls} are a full-length protective garment that are worn to prevent hazardous substances from contacting the skin or the clothes.

cubed [ADJ-U11] If a quantity is \textit{cubed}, it is multiplied by itself two times, or raised to the power of three.

cubic centimeter [N-COUNT-U8] A \textit{cubic centimeter}, also called a milliliter, is a metric unit of volume equal to 1/1000 liter or about 0.03 fluid ounces.

decimal number [N-COUNT-U12] A \textit{decimal number} is an expression in a numbering system based on the number 10, with digits on both sides of the decimal point.

decline [N-COUNT-U14] A \textit{decline} is the process of becoming worse or smaller in amount.

decrease [V-I-U14] To \textit{decrease} is to become smaller in number or value.

degree [N-COUNT-U8] A \textit{degree} is a unit in a system of measuring temperature.

derived unit [N-COUNT-U9] A \textit{derived unit} is a unit that is derived from a base unit.

desiccator [N-COUNT-U4] A \textit{desiccator} is a sealable container that is used to preserve items that are sensitive to moisture.

discover [V-T-U1] To \textit{discover} something is to find new information about something, or determine that it exists.

divide by [V-T-U10] To \textit{divide} a quantity (A) by another quantity (B) is to split quantity A evenly into B number of parts.
Career Paths: Science is a new educational resource for scientific 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: Science addresses topics including laboratory equipment, safety procedures, the scientific method, research activities, and career options.

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