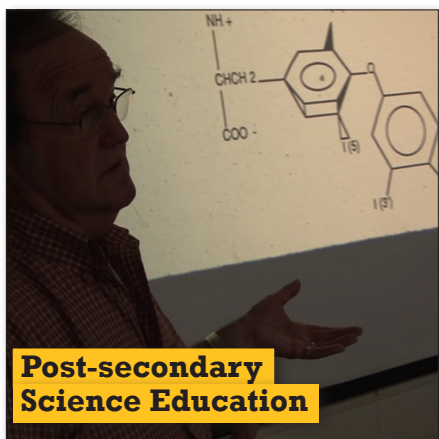




Eye Care



Nursing



**Post-secondary
Science Education**

RU↑4 the JOB?

Careers in Post-secondary Science Education

Teacher Resource Guide



This resource was made possible by a grant from eTech Ohio and the State of Ohio.

RU↑4 the JOB?

Module Synopsis

How do cows grazing in a field lead to a career in science? Watch and listen carefully as Dr. Lee and his student Nicole tell you all about the scientific field. Supplemented with cartoons and animations you are sure to learn about how science is greatly related to biomedical research and how becoming a scientific expert can make for an exciting career.

As a science professor a person is able to teach the skills and abilities needed to become a professional in the scientific and medical fields. Careers in science fields are one of the most important for medical researching as well as healthcare. A background in the sciences including chemistry, physiology and anatomy can lead to a plethora of different jobs and career paths.

With the supplementary materials included in this Teacher Resource Guide, the teacher will be able to help students learn more about the field of science as a post-secondary educator as well as qualifications needed for this career. The activities, quiz and resources included in this brochure will help you find out if your students have what it takes to teach and research the field of science.

Terms

Professor: A teacher of highest ranking usually found in a college environment.

Assistant Professor: A professor who is working directly under a main professor usually in a university setting.

Instructor: A professional teacher who generally has a Master's degree but is not expected to do research.

Graduate Assistant: An assistant teacher who works under a professor or assistant professor and is still attending classes as they earn their Master's or Ph.D.

Biological science: Science that studies and examines living organisms.

Biomedical science: The use of natural science being applied to medicine.

Laboratory: A room or facility where scientists can conduct research or experiments.

Anatomy: The science of studying living things such as humans and animals, often exhibited by dissection.

Chemistry: Science that deals with varying compounds, matter, and properties, as well as how they interact and combine with one another.

RU↑4 the JOB?

Pre & Post Assessment

1. To become a science professor, one must first obtain what kind of education?
 - a. An associate's degree.
 - b. A bachelor's degree.
 - c. A high school diploma.
 - d. Training from a vocational school.
2. Science educators need to have good English skills for what reason?
 - a. English and communication are not critical for science educators.
 - b. Science educators often read novels in their spare time.
 - c. To communicate with students and colleagues.
 - d. All of the above.
3. College teachers are projected to be in great demand in what fields?
 - a. Writing/language arts
 - b. Geography
 - c. Health/science
 - d. Art History
4. A career in Science Education involves which of the following?
 - a. Reading
 - b. Dissection
 - c. Performing tests and experiments
 - d. All of the above
5. Students of science professors often go on to become what?
 - a. Physicians, dentists, optometrists and pharmacists
 - B. Advisors, secretaries and psychologists
 - C. Accountants, engineers, electricians and technicians
 - D. Dairy farmers, agricultural farmers and economists
6. What is recommended to keep in mind when considering pursuit of a scientific career?
 - a. Develop strong social relationships with a wide variety of students.
 - b. Make sure you always stick to the same research methods
 - c. Be sure you are not going into this career for a big paycheck.
 - d. Consider shadowing a scientist at least once a semester.
7. What is considered a downfall of scientific research?
 - a. Learning to grow new organs.
 - b. Coming up with new ideas and inventions.
 - c. Continuing the scientific education.
 - d. Learning to deal with dead animals and dissection.
8. Which of the following is not true?
 - a. Science educators typically go on to further their educational through a master's degree program.
 - b. Science educators are always travelling to different laboratories.
 - c. Science educators must pay attention to fine points of their research.
 - d. Science educators often encourage students to perform hands-on research.

9. Describe a typical day as a science professor?

10. What kind of skills does it take to be a secondary educator in the science field?

Are YOU interested in a career in science education?

Some careers will be interesting to you and some may not. How interested are you in THIS career?

1 2 3 4 5

Very Interested ←—————→ Not Interested

RU↑4 the JOB?

Pre & Post Assessment - Answer Key

- To become a science professor, one must first obtain what kind of education?
 - An associate's degree.
 - A bachelor's degree.**
 - A high school diploma.
 - Training from a vocational school.
- Science educators need to have good English skills for what reason?
 - English and communication are not critical for science educators.
 - Science educators often read novels in their spare time.
 - To communicate with students and colleagues.**
 - All of the above.
- College teachers are projected to be in great demand in what fields?
 - Writing/language arts
 - Geography
 - Health/science**
 - Art history
- A career in science education involves which of the following?
 - Reading
 - Dissection
 - Performing tests and experiments
 - All of the above**
- Students of science professors often go on to become what?
 - Physicians, dentists, optometrists and pharmacists**
 - Advisors, secretaries and psychologists
 - Accountants, engineers, electricians and technicians
 - Dairy farmers, agricultural farmers and economists
- What is recommended to keep in mind when considering pursuit of a scientific career?
 - Develop strong social relationships with a wide variety of students.
 - Make sure you always stick to the same research methods
 - Be sure you are not going into this career for a big paycheck.**
 - Consider shadowing a scientist at least once a semester.
- What is considered a downfall of scientific research?
 - Learning to grow new organs.
 - Coming up with new ideas and inventions.
 - Continuing the scientific education.
 - Learning to deal with dead animals and dissection.**
- Which of the following is not true?
 - Science educators typically go on to further their educational through a master's degree program.
 - Science educators are always travelling to different laboratories.**
 - Science educators must pay attention to fine points of their research.
 - Science educators often encourage students to perform hands-on research.

9. Describe a typical day as a science professor?

Answers will vary, but should include some of the following,

- *Teaching classes and lectures.*
- *Assisting students in field research.*
- *Grading tests, projects and papers.*
- *Furthering one's scientific knowledge.*

10. What kind of skills does it take to be a secondary educator in the science field?

Answers will vary, but should include some of the following,

- *Close attention to details.*
- *Knowledgeable.*
- *Able to demonstrate memorization skills.*
- *Inventive.*

RU↑4 the JOB?

Activity 1

Research into Sciences

Scientists are often called on to do research in the lab, but they also do research online, as well as through specialized libraries and through primary documents.

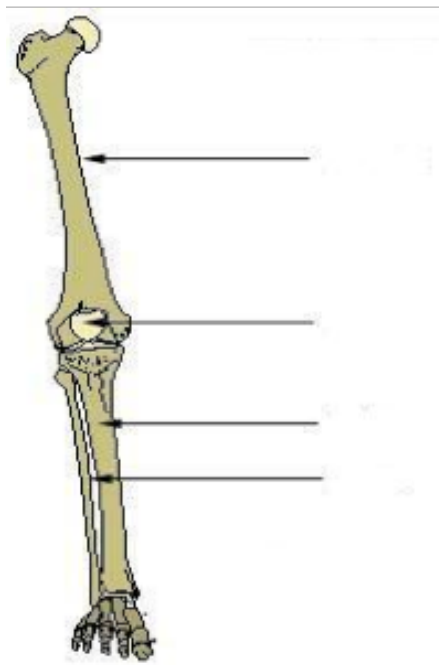
In this activity you will research to find the answers. These websites may help with your research:

<http://www.learnbones.com/leg-bones-anatomy>

<http://www.galleries.com/minerals/byname.htm>

1A. Bone Anatomy

Professionals in the science world have a lot of terms and concepts to learn and memorize. The femur, fibula, tibia and patella are all bones in the human leg. Based on the diagram below, try to place the listed bones to the correct places in the picture.



1B. Identifying Minerals

Terminology is not only key to success as a scientist but also necessary for a science professor to master when grading papers, conducting experiments or designing projects for their students. Out of the list of minerals below, cross out the ones that do not belong.

Quartz

Gold

Retinol

Copper

Acid

Ruby

Topaz

Flint

Fluorite

Calcite

Amino

Zinc

Diamond

Omega



Activity 2

Comparing Different Careers in Science Education

You will make a three-column list of the tasks and responsibilities of teachers who teach science to different ages of students – elementary, secondary and adult levels.

Tasks for Elementary Science Teachers	Tasks for Secondary Science Teachers	Tasks for Adult (College) Science Teachers
Design hands-on lessons	Set up labs	Do research to discover new facts in science

Look at the lists you have constructed. Share you lists with others in your class, add anything from their lists that you do not have on your list. Highlight all the items that are the same on all three columns.

Write 3-5 paragraphs that compare the things that are the same in all columns and those that are different. Decide which of these careers might suit you best and write a concluding sentence that describes the reasons for your choice.



Activity 3

Become a Science Teacher

Here is your task: Develop a short science lesson for an elementary school class. Pick a topic from your science book or other resources, search online for elementary school science lessons on that topic, or think of an activity that you can do to teach elementary students the topic you chose. Decide what materials and resources you will need. Present the lesson to your class.

Your teacher can help with materials and resources.



Activity 4

Science Education. Is this career for me?

Use the resources and websites listed in the Teacher Resource Guide, as well as other resources, to explore and analyze your reasons for determining which career in science education would be best suited for your abilities, talents and desired income level.

Include educational requirements and graph to interpret median income levels of these occupations in your state, town or country. Graph and interpret median income levels of various occupations in your state, town or county.

Please cite your references including source, author and date of publication.

Be prepared to present your information to a larger group.



Activities - Answer Key

1. Research into Sciences

1A. (In order top from bottom) Femur, Patella, Tibia, Fibula

1B. Retinol, Acid, Amino, Omega

<http://www.learnbones.com/leg-bones-anatomy>

<http://www.galleries.com/minerals/byname.htm>

2. Comparing Different Careers in Science Education

Answers will vary.

<http://www.ohiorc.org/> (Ohio Resource Center)

<http://www.infohio.org/default20091028.asp>

<http://www.proteacher.com/110015.shtml>

<http://www.interactivescienceteacher.com/elementary-science-lesson-plan.asp>

3. Become a Science Teacher

Answers will vary.

This activity can be completed by an individual student or as a small group.

<http://www.ohiorc.org/> (Ohio Resource Center)

<http://www.infohio.org/default20091028.asp>

<http://www.proteacher.com/110015.shtml>

<http://www.interactivescienceteacher.com/elementary-science-lesson-plan.asp>

4. Science Education. Is this career for me?

Answers will vary.

<http://www.ohiorc.org/> (Ohio Resource Center)

<http://www.infohio.org/default20091028.asp>

<http://www.proteacher.com/110015.shtml>

<http://www.interactivescienceteacher.com/elementary-science-lesson-plan.asp>

<http://quickfacts.census.gov/qfd/index.html>



Resources

INFOhio

<http://www.infohio.org/default20091028.asp>

Online lesson planning resources.

INFOhio, the information network for Ohio schools is an online resource for lesson plans. The resources are divided into groups specialized to k-5, 6-8 and 9-12 as well as multiple other curriculum categories. Through a username and password all Ohio teachers and students have access to INFOhio.

Interactive Science Teacher

<http://www.interactivescienceteacher.com/elementary-science-lesson-plan.asp>

Interactive Science Teacher provides teachers with lesson plans focusing on science related fields including general, physical, earth, space and life sciences as well as chemistry. The interactive lessons include hands-on ideas, terminology and themes for every chosen topic.

Ohio Resource Center

<http://www.ohiorc.org/>

Ohio Resource Center for mathematics, science and reading is handy for k-12 teachers and educators in any of these subjects. The website provides state standard as well as national standard project ideas and resources. Provided on the website are links to affiliates and partners to ORC for additional information.

ProTeacher Community

<http://www.proteacher.com/110015.shtml>

This ProTeacher directory provides multiple categories to topics in science related fields and contains lessons and activities for the given categories. Teachers can choose from activities in topics such as light, sound and magnets or choose a more broad area to explore like science, math and technology.

U.S. Census

<http://quickfacts.census.gov/qfd/index.html>

U.S. Census Bureau Quick provides for easy access to facts about people, business, and geography in any chosen state within the United States. Teachers and students can use this to explore demographics as well as statistics on employment in certain areas.

University System of Ohio Board of Regents

<http://www.ohiohighered.org/>

This Ohio-funded website provides information for students, educators and businesses. The options to explore include tips on applying for college, planning for college, paying for college and furthering education.



Common Core State Standards for Science Education

Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects

College and Career Readiness Anchor Standards for Writing:

1. Write arguments focused on discipline-specific content.
WHST.11-12.1.a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence.
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
WHST.11-12.2.d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers.

Reading Standards for Literacy in Science and Technical Subjects 6–12

Craft and Structure - RST.6-8.4

4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

Integration of Knowledge and Ideas - RST.6-8.7

7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table)..

Integration of Knowledge and Ideas - RST.6-8.8

8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

Integration of Knowledge and Ideas - RST.6-8.9

9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.