

A Career “IST” Search

Grade Level: 4-8

Lesson Overview

BUGS! Some people just don't like them and will swat, stomp, scream or run from them. But if you have students who find them “interesting,” maybe they should consider a career as an entomologist. Entomology is the study of insects and is a combination of agriculture, botany, zoology, biology and horticulture. Use this activity to explore the many different occupations that embrace the study of insects and agriculture.

Student Objectives

1. Identify occupations that may be related to insects.
2. Write a composition or develop a slide show to explain a career and how it relates to insects and agriculture.

Materials

- ✓ A Career “IST” Search Worksheet
- ✓ access to research (internet, school library, etc.)

Vocabulary

- **agronomist** - a person who studies soil management and crop development; often called a crop doctor.
- **arborist** – a person who studies the structure and function of trees.
- **apiculturist** - a person who studies bees and the art of beekeeping.
- **biochemist** - a person who studies the chemical and physical principles of living things and their biological processes.
- **biologist** - a person who studies living organisms.
- **biotechnologist** – a person who develops products & technologies that help fight disease, feed the hungry, use cleaner energy, etc.
- **botanist** - a person who studies the science of plants.
- **climatologist** – a person who studies weather patterns over a period of time to discover trends over months, years, or even centuries. Also researches the impacts of climate changes.
- **ecologist** – a person who studies relationships between living things and their environment.

- **economist** - a person who studies the production and distribution of goods and services.
- **entomologist** - a person who studies insects.
- **geneticist** – a person who studies the transmission of hereditary characteristics from one generation to the next.
- **horticulturist** - a person who studies the science of raising and caring for plants, flowers and greenery.
- **microbiologist** - a person who studies living things seen through a microscope.
- **nematologist** – A person who studies nematodes and their interaction with plants. Nematodes are microscopic roundworms that can transmit diseases and/or attack soil, water and insects.
- **paleontologist** – a person who studies the fossilized remains of once-living organisms.
- **pedologist (soil scientist)** – a person who studies all living and non-living aspects of soil, soil formation, and erosion.
- **taxonomist** – a person who studies the structure of a species, maps its DNA and groups organisms into categories.
- **toxicologist** – a person who studies the safety and biological effects of drugs, chemicals, agents, and other substances on living organisms.
- **zoologist** - a person who studies animals and how they interact with their ecosystems.

Background Information

Two-thirds of all known organisms on earth are insects – that is over 1.3 million species! Insects are all around us. There are more species of insects than of any other group of animals, and there are many that have not been discovered yet. Insects can be both harmful and beneficial. While some insects harm us by spreading disease, destroying plants, or damaging our homes, others help us by pollinating our crops, eating other insects, and recycling nutrients in nature.

Entomology is the study of insects and is a combination of botany, zoology, biology and horticulture. Entomologists study bees, ants, beetles, termites, mosquitoes and other insects, as well as other related animals such as spiders and scorpions (known as arthropods). Insects are also used to advance knowledge in many scientific fields, such as ecology, molecular biology, medical research, forensics, and even robotics!

Insects have been studied since prehistoric times and entomology has been considered a science since the 1600's. Did you know that there are many different kinds of entomologists? Each type of entomologist works on specific problems.

- **Agricultural entomologists** work with farmers to find ways to manage insect pests and protect their crops while simultaneously protecting beneficial insects.
- **Forensic entomologists** help the police by examining bodies to find insects, which may provide clues about time of death and whether or not the bodies have been moved.
- **Forest entomologists** specialize in insects that harm wild plants and forests and study ways to prevent and control them.
- **Medical entomologists** find ways to prevent insects from spreading diseases, and they work with doctors to develop methods for treating people after they are infected.
- **Structural entomologists** study and discover ways to keep insects out of buildings, and ways to get rid of them if they do get in. These entomologists work with pest-management professionals to teach them the best ways to deal with insects that invade our buildings.
- **Taxonomic entomologists** conduct field studies to discover new insects, especially in the tropical regions of Asia, Africa, and South America. In fact, about half of all plant and animal species are found in tropical rain forests.
- **Veterinary entomologists** work with zookeepers, ranchers, forest rangers, and veterinarians to help them protect animals from dangerous insects.

Retrieved from <https://entomology.unl.edu/scilit/discover.pdf>

Procedure

1. Introduce students to the topic of careers. Many careers contribute to the study of agriculture and insects.
2. Distribute the A Career "IST" Search Worksheet for students to complete. Students may use all available resources to complete the worksheet.
3. After completion, each student (or group of students) should write a composition or develop a slide show that identifies one specific career and its importance to agriculture and insects.

Questions that could be answered include:

- What is your career choice?
- How are agriculture and insects connected with this career?
- What type of workplace will this person be found? (outdoors in a forest or field, a lab, a classroom, etc.)
- What tools will this person need for their job?
- What challenges or obstacles will this person need to solve?

- What do you think would interest you in this career?
- What type of training is needed?

Extension Activities

1. I Would Rather Be A...Not everyone wants to delve into a career that deals with insects. Identify careers that interest individual students. Look through career resources to research careers that touch upon a particular interest. Examples include: What agriculture careers are there for students who are interested in mechanics and machines? OR What agriculture careers are available for students who want to work in food science?
2. Career Web - Develop a career web that highlights of all the different agriculture careers that are involved from the start on the farm to the finished product. The “Tassel to Table” lesson could serve as a model.
3. Tell Me More! - Invite individuals who have some of these jobs to visit your classroom as a speaker.

Additional Resources

- Agriculture Careers - www.mycaert.com/career-profiles
- USDA Living Science Food, Agricultural and Natural Resources Careers Packet: <https://www.agriculture.purdue.edu/usda/careers/>

Agriculture is one of the nation’s largest employers and a far more diverse field than people realize. These career packets feature 50 agriculture related occupations from veterinarians to soil scientists, to aquaculturists and florists. Each occupation sheet is downloadable and gives a description of the job, where the work is done, and the high school, college or trade school training necessary to pursue careers in these fields.

- Ag Explorer - <https://agexplorer.com/> Explore the broad range of careers within the industry of agriculture. Agriculture has a variety and abundance of careers that fit within nine exciting career focus areas. Careers may have you using advanced equipment, creating new hybrid seeds, raising animals, managing people or designing new products and packaging.

The industry of agriculture can open a world of possibilities, and the demand for professionals in every agricultural area is high. Learn more about which career may be right for you by watching the videos, exploring the career pages and completing the Career Finder interactive.

- Entomological Society of America www.entsoc.org

- Careers in Entomology (Iowa State University)
<https://www.ent.iastate.edu/careers>
- Careers in Entomology (Univ. of Nebraska-Lincoln)
<https://entomology.unl.edu/scilit/careers-entomology>
- What Does An Entomologist Do? (Career Explorer)
<https://www.careerexplorer.com/careers/entomologist/>
- Entomology Ag Mag - [Entomology Ag Mag \(agfoundation.org\)](http://agfoundation.org) This four page agriculture magazine for 3rd-5th grade students explores entomology, the science of insects. Learn about entomology careers, different insects and much more in this non-fiction text. The Ag Mag comes in a classroom set of 30.
- Journey 2050 School Program – www.journey2050.com Journey 2050 is a curriculum-based school program that takes students on a virtual simulation which explores food sustainability. One component in the simulation is a career exploration.

Standards

Illinois English Language Arts Standard

W2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly

Illinois Social Science Standard

SS.G.2.6-8.LC Explain how humans and their environment affect one another.

The **M**ultidisciplinary **A**gricultural **I**ntegrated **C**urriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in April 2021.



These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

Insect mAGic project update writers/reviewers: Rhodora Collins – Dekalb County; Suzi Myers – Kane County; Connie Niemann – Montgomery County; Debbie Ruff – Livingston County; Jennifer Waters – Sangamon County; and Dawn Weinberg – Hancock County.

Name _____

A Career “IST” Search Worksheet

There are many “ist” occupations that can be related to agriculture. Match the following careers with their related jobs. How would each of these contribute to the study of agriculture or insects?

- | | |
|------------------------|--|
| ___ 1. agronomist | A. a person who studies life and living organisms |
| ___ 2. arborist | B. a person who studies bees and the art of beekeeping |
| ___ 3. apiculturist | C. studies relationships between living things and their environment |
| ___ 4. biochemist | D. a person who studies the science of plants |
| ___ 5. biologist | E. a person who studies the transmission of hereditary characteristics from one generation to the next |
| ___ 6. biotechnologist | F. a person who studies insects |
| ___ 7. botanist | G. a person who studies living things seen through a microscope |
| ___ 8. climatologist | H. a person who studies the chemical and physical principles of living things and their biological processes |
| ___ 9. ecologist | I. a person who studies the science of raising and caring for plants, flowers and greenery |
| ___ 10. economist | J. a person who studies soil management and crop development; often called a crop doctor |
| ___ 11. entomologist | K. a person who studies the safety and biological effects of drugs, chemicals, agents, and other substances on living organisms |
| ___ 12. geneticist | L. a person who studies animals and other wildlife and how they interact with their ecosystems |
| ___ 13. horticulturist | M. studies the fossilized remains of all kinds of organisms |
| ___ 14. microbiologist | N. develops products & technologies that help fight disease, feed the hungry, use cleaner energy, etc. |
| ___ 15. nematologist | O. a biologist that groups organisms into categories. Studies the structure of species and maps its DNA |
| ___ 16. paleontologist | P. a person who studies the production and distribution of goods and services |
| ___ 17. pedologist | Q. a person who studies the structure and function of trees |
| ___ 18. taxonomist | R. a person who studies nematodes and their interaction with plants. Nematodes are microscopic roundworms that can transmit diseases and/or attack soil, water and insects |
| ___ 19. toxicologist | S. a person who studies soil, soil formation, and erosion |
| ___ 20. zoologist | T. a person who studies weather patterns over a period of time to discover trends over months, years, or even centuries. Also researches the impacts of climate changes |

A Career “IST” Search ANSWER KEY

There are many “ist” occupations that can be related to agriculture. Match the following careers with their related jobs. How would each of these contribute to the study of agriculture or insects?

- | | |
|-----------------------------|--|
| <u>J</u> 1. agronomist | A. a person who studies life and living organisms |
| <u>Q</u> 2. arborist | B. a person who studies bees and the art of beekeeping |
| <u>B</u> 3. apiculturist | C. studies relationships between living things and their environment |
| <u>H</u> 4. biochemist | D. a person who studies the science of plants |
| <u>A</u> 5. biologist | E. a person who studies the transmission of hereditary characteristics from one generation to the next |
| <u>N</u> 6. biotechnologist | F. a person who studies insects |
| <u>D</u> 7. botanist | G. a person who studies living things seen through a microscope |
| <u>T</u> 8. climatologist | H. a person who studies the chemical and physical principles of living things and their biological processes |
| <u>C</u> 9. ecologist | I. a person who studies the science of raising and caring for plants, flowers and greenery |
| <u>P</u> 10. economist | J. a person who studies soil management and crop development; often called a crop doctor |
| <u>F</u> 11. entomologist | K. a person who studies the safety and biological effects of drugs, chemicals, agents, and other substances on living organisms |
| <u>E</u> 12. geneticist | L. a person who studies animals and other wildlife and how they interact with their ecosystems |
| <u>I</u> 13. horticulturist | M. studies the fossilized remains of all kinds of organisms |
| <u>G</u> 14. microbiologist | N. develops products & technologies that help fight disease, feed the hungry, use cleaner energy, etc. |
| <u>R</u> 15. nematologist | O. a biologist that groups organisms into categories. Studies the structure of species and maps its DNA |
| <u>M</u> 16. paleontologist | P. a person who studies the production and distribution of goods and services |
| <u>S</u> 17. pedologist | Q. a person who studies the structure and function of trees |
| <u>O</u> 18. taxonomist | R. a person who studies nematodes and their interaction with plants. Nematodes are microscopic roundworms that can transmit diseases and/or attack soil, water and insects |
| <u>K</u> 19. toxicologist | S. a person who studies soil, soil formation, and erosion |
| <u>L</u> 20. zoologist | T. a person who studies weather patterns over a period of time to discover trends over months, years, or even centuries. Also researches the impacts of climate changes. |