

Consider this:

\$7/hour	=	\$14,560 per year
\$10/hour	=	\$20,800
\$12/hour	=	\$24,960
\$22.50	=	\$45,000

\$23,624 is considered poverty
level in America
(family of four with two children, 2013)

\$53,046 is the median US
household income
(could be two wage earners, 2009–2013)

\$58,821 is the median Utah
household income
(2009–2013)

US Census Bureau

Career Activity Scenario

1. A family goes to the grocery store to pick up some groceries. The food exists because of farmers and ranchers who manage natural resources like soil and water carefully in order to grow the raw ingredients to fill the grocery stores. At the beginning of the season, a farmer (also known as a grower or producer) needs to test the soil to check for nutrients and to determine which fertilizers are necessary. The farmer needs the services of a _____ (Soil Scientist).
2. The fertilizer plant that produces the fertilizer to sell to the farmer wants to reduce its environmental impact. Who could the plant hire to help monitor waste discharge and assess environmental quality of the surroundings? _____ (Environmental Scientist)
3. The farmer is concerned that when it rains fertilizer from the fields may be getting washed into a nearby river. The farmer goes to the Natural Resources Conservation Service to enlist the help of a _____ (Hydrologist).
4. The farmer notices that the sheep are skinny despite having healthy appetites, and the alfalfa in the hay field is stunted and has swollen stems. The farmer suspects different kinds of worms have infected the sheep and the alfalfa. Who can help identify and treat these worms? _____ (Nematologist)
5. A new seed hybrid that is better suited for the farmer's climate or soil has been developed. Who developed that seed? _____ (Plant Geneticist)
6. A couple of months after planting, the plants are growing, but the farmer notices holes in the leaves. They may be the result of an insect. Who can help identify the problem? _____ (Entomologist)
7. The insects have been identified and sprayed, but now there are weeds threatening to take over the field. If the weeds are not controlled soon, they will begin to outcompete the crop plants for sunlight, water, and soil nutrients. Who can help the farmer control this problem? _____ (Weed Scientist)
8. The weeds are gone, but the plants aren't growing well. The farmer calls the University Extension office in the county. The Extension Educator referred the farmer to a _____ (Plant Physiologist).
9. The Plant Physiologist says that the plants are stressed by either too little water or high soil salinity. Who can help the producer determine where irrigation is not reaching the plants across the hundreds of acres of fields? _____ (Remote Sensing Specialist)
10. The crop is ready to harvest, and the farmer delivers it to the processing plant. The processor will turn the wheat, corn, cherries, etc. into bread, cookies, chips, pies, and so many other products. Who develops these food products? _____ (Food Scientist)
11. Who works with the food processor to ensure that the food produced is wholesome, safe, and sound? _____ (Food Safety Specialist)
12. Who determines the nutritional values of the food products? _____ (Nutritionist/Dietitian)
13. What if the corn is bound for animal consumption rather than human consumption? Who helps determine feed rations? _____ (Animal Nutritionist)
14. If an animal gets sick from eating too much corn, who will a rancher call? _____ (Veterinarian)

Career Matching Activity

Name _____

Match the agricultural or natural resource career with the correct description.

_____ Agronomist	_____ Florist	_____ Nematologist	_____ Soil Scientist
_____ Animal Nutritionist	_____ Food Process Engineer	_____ Nutritionist/Dietitian	_____ Toxicologist
_____ Aquaculturist	_____ Food Safety Specialist	_____ Plant Pathologist	_____ Turf Scientist
_____ Biotechnologist	_____ Food Scientist	_____ Plant Geneticist	_____ Veterinarian
_____ Conservation Biologist	_____ Forest Engineer	_____ Plant Physiologist	_____ Virologist
_____ Entomologist	_____ Forester	_____ Range Manager	_____ Weed Scientist
_____ Environmental Scientist	_____ Horticulturist	_____ Renewable Energy Specialist	_____ Wildlife Biologist
_____ Fisheries Scientist	_____ Hydrologist	_____ Remote Sensing Specialist	_____ Wood Scientist

1. Works to develop new products and processes based on specialized understanding of biological processes.
2. Uses specialized knowledge to develop and promote new ways to meet the world's energy needs.
3. Researches ways to produce crops and manage soils in a productive and environmentally friendly way.
4. Designs floral arrangements, works with customers, and delivers flowers.
5. Protects our food supply by working with food services, restaurants, and federal agencies to ensure that foods being sold are wholesome and safe.
6. Raises a diverse array of aquatic plants and animals in controlled or semi-controlled settings for food or the stocking of public bodies of water.
7. Studies the effects of potentially harmful chemicals on people, animals, and the environment.
8. Studies viruses, how they interact with cells, and how they infect living things.
9. Works in food, chemical, biochemical, and pharmaceutical industries to engineer new processes and products and ensure quality and safety.
10. Helps farmers and ranchers produce crops and livestock more efficiently by using sound pest management strategies.
11. Maps and classifies soils and provides interpretations for land planners and managers.
12. Dedicated to effective management, use, and conservation of aquatic plants and animals.
13. Creates diets that must be nutritionally sound, good-tasting, and economical for the ages and types of animals that will use them.
14. Assesses and protects our water supplies and quality.
15. Ensures the flavor, color, texture, and quality of our food supply and develops new food products.
16. Studies roundworms, which play important roles in soil ecology and plant and animal agriculture.
17. Works primarily with nursery and greenhouse crops.
18. Spends time managing timberland.
19. Protects threatened and endangered species and habitats.
20. Works with plants at a genetic level.
21. Helps people look and feel well by making the connection between food, nutrition, and health.
22. Interprets and analyzes many types of aerial photographs and satellite images.
23. Studies the physical, chemical, and biological functions of living plants.
24. Researches animals in their natural environments.
25. Works to improve golf greens, park lawns, athletic fields, or other public or private grounds.
26. Specializes in converting wood to wood products.
27. Protects the environment by working with hazardous waste management, land use, and air or water quality.
28. Deals with the symptoms, causes, damage, spread, and control of plant diseases.
29. Diagnoses, treats, and helps prevent diseases and disabilities in animals.
30. Researches ways to improve weed control and helps develop regulations for weed control agents.
31. Cares for our country's vast rangelands.
32. Designs timber transportation and harvesting systems.

Key: Career Matching Activity

Match the agricultural or natural resource career with the correct description.

__3__	Agronomist	__4__	Florist	__16__	Nematologist	__11__	Soil Scientist
__13__	Animal Nutritionist	__9__	Food Process Engineer	__21__	Nutritionist/Dietitian	__7__	Toxicologist
__6__	Aquaculturist	__5__	Food Safety Specialist	__28__	Plant Pathologist	__25__	Turf Scientist
__1__	Biotechnologist	__15__	Food Scientist	__20__	Plant Geneticist	__29__	Veterinarian
__19__	Conservation Biologist	__32__	Forest Engineer	__23__	Plant Physiologist	__8__	Virologist
__10__	Entomologist	__18__	Forester	__31__	Range Manager	__30__	Weed Scientist
__27__	Environmental Scientist	__17__	Horticulturist	__2__	Renewable Energy Specialist	__24__	Wildlife Biologist
__12__	Fisheries Scientist	__14__	Hydrologist	__22__	Remote Sensing Specialist	__26__	Wood Scientist

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Emerging Agricultural Technologies

Animal Technology

- Genetic Engineering in Animal Agriculture and Aquaculture
- Reproduction and Embryo Transfer
- Transgenic Poultry
- Transgenic Fish
- Transgenic Swine
- Transgenic Ruminants
- Animal Health
- Steroid-like Growth Promotants

Plant Technology

- Genetic Engineering in Crop Agriculture
- Genetic Technology for Resistance to Insect Pests
- Genetic Modification for Weed Control
- Genetic Modification for Disease Resistance
- Biocontrol for Weeds
- Pathogens for Insect Control
- Use of Parasites and Predators to Control Insect and Mite Pests in Agriculture
- Microbial Biocontrol of Plant Diseases
- Temperature and Water Stress
- Evolution of Resistance by Weeds and Pests to Herbicides and Pesticides
- Genetic Exchange between Genetically Engineered Crops and Close Relatives

Emerging Computer and Systems Technology

- Knowledge-based Systems for Agriculture
- Use of Expert Systems in Animal Agriculture
- Sensor Technology
- Robotics and Intelligent Machines
- Nanotechnology

Food Safety and Quality

- Biotechnology in Food Processing
- Assessing the Safety of Genetically Engineered Foods and Feeds

Bioenergy

- Algae Fuels
- Biomass Fuels

Living Science Careers Equipment Bags

Note: Careers identified for each group are only suggestions; some careers may fall into one or more groups. Kit includes some, not all, of the items listed below. You may wish to collect the additional items listed.

Group 1: Aquaculturist, Fisheries Scientist

Fish net
Plastic aquatic plants
Measuring tape
Fish food
Photos of shrimp, trout, or other aquatic life
Stuffed fish
Eye dropper
Test tube
pH tester

Group 2: Hydrologist, Conservation Biologist, Environmental Scientist, Range Manager, Remote Sensing Specialist

Compass
Resource books, e.g., *Common Native Trees of Utah*, noxious weed guide, land use guide, environmental manual
Aerial photo
Clipboard
GPS photo
Small bag of grass seed

Group 3: Florist, Turf Scientist, Plant Geneticist, Agronomist, Soil Scientist, Horticulturist, Plant Pathologist, Weed Scientist, Renewable Energy Specialist, Plant Physiologist

Plant bulbs
Small bag of grass seed
Plant fertilizer, e.g. Osmocote
Jar of soil sample
Flask
Pruners
Plant markers
pH strips
Sample of seeds

Group 4: Wildlife Biologist, Veterinarian, Animal Nutritionist, Virologist, Biotechnologist, Toxicologist

Stethoscope
Small plastic or stuffed animal
Small bag of hay or alfalfa
Latex examination gloves
Small bag of feed
Test tube, plastic vials
Petri dish
Safety glasses
Photos of animals

Group 5: Entomologist, Nematologist

Hand lens
Plastic insects
Plastic worms
Butterfly net
Tweezers
Microscope slides
Handheld microscope
Photos of insects in natural habitats, e.g., bees in hives

Group 6: Food Process Engineer, Food Scientist, Food Safety Specialist, Nutritionist/Dietician

Flattened cereal box
Portion Distortion poster
Ear of corn
Test tube
Beaker
Plastic fruit or vegetables
Paper food models
MyPlate activity guide
Food thermometer

Group 7: Wood Scientist, Forest Engineer, Forester

Piece of tree trunk e.g., one that shows growth rings
Small piece of lumber
Compass
Pinecones
Small evergreen branch
Red plastic “tape”—the kind used to mark trees
Tape measure