



P R E S E N T S

PLANET X

'OUT OF THIS WORLD' OPPORTUNITIES
IN AGRICULTURE AND FOOD

AN EDUCATIONAL RESOURCE FOR GRADES 9 TO 12



PLANET X: 'OUT OF THIS WORLD' OPPORTUNITIES IN AGRICULTURE AND FOOD



This lesson focuses on the many professions within the Agriculture and Food sector. Students will gain appreciation and knowledge of the multitude of professions that exist within this realm, while also understanding the importance of every day food production and sustainability to the global population.

PLANET X

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Canada

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Overview

This lesson focuses on the many professions within the Agriculture and Food sector. Students will gain appreciation and knowledge of the multitude of professions that exist within this realm, while also understanding the importance of every day food production and sustainability to the global population.

Suggested Grade Level

Grades 9-12

Estimated Time

2-3 Class Periods (120-180 Minutes)

Materials Required

- **Appendix A:** Pizza Professions
- **Appendix B:** Mission Description
- **Appendix C:** Student Worksheet
- **Appendix D:** Answer Key
- Computers with internet access
- Research resources:
www.agexplorer.com (English Only)

Part A

1. **Conduct a pre-assessment to determine student knowledge of careers in agriculture in food.**
 - a. Ask students to name a career in agriculture. Assess the variety of responses.
 - b. Ask students to name careers involved in producing food. Does the variety of careers expand?
2. **Discuss with students how there are a variety of careers required to produce the food we all rely on every day.**
 - a. As a class, brainstorm a list of Food Professionals that may have had a part in making a pepperoni pizza. For example think of all of the ingredients that came together to make it the finished pizza (cheese, dough, pizza sauce, pepperoni, etc.).
 - b. After brainstorming the ingredient list with your students, get them to critically think about the journey that each of those items would take before they were used to create the pizza. For example, how is cheese made? Where does it start? Who needs to be involved in the production of cheese (professions)? This can be done as a whole class activity, or a jig-saw approach.
3. **After your class is done brainstorming the professions associated with making a pepperoni pizza, show them **Appendix A: Pizza Professions**.**
 - a. Discuss as a class whether they were surprised at just how many professions came together to make a simple pepperoni pizza.
4. **Compare the number of careers in 'primary production' (farming) to the other careers which support farmers, and the careers which transform the raw ingredients (e.g. tomato to tomato sauce). Discuss the concept of a 'food system' and the fact that many careers are needed to produce food for people. Highlight the importance of all of those careers supporting each other and fitting together, like pieces of a puzzle. Inform students that they are going to engage in a challenge to select a team of professionals to support food production on another planet**

Part B

5. As a class, watch the Planet X: Mission Description Hook video:
<https://youtu.be/mNvyfSGi1O4>
6. Review **Appendix B: Mission Description** with students to reinforce information in hook video.
7. Determine how the activity will be carried out:
 - i. Students individually complete research on all 8 situations and select their team of professionals
 - ii. Students complete research as a group on all 8 situations and select their team of professionals
 - iii. Students complete research as a group on 1 situation and present their selected profession to the whole class (8 situations are divided up among the class)
 - iv. Each student is assigned a unique career profile from the 8 situations (24 total). Students must then research the career and take on the role of that profession. Their task is to do a presentation to the class on why they should be chosen as the Food Professional best suited to address their specific situation. The 3 students for each situation will 'compete' against each other. Each person in the class will vote on which of the 3 is best suited (for each 8 situations).
8. Divide students into their groups, or individuals to begin their research.
9. Review **Appendix C** with students and reinforce the goal of the assignment: to select a team of Food Professionals best fit to handle the different situations occurring on Planet X.
10. Support students as they utilize the resources to choose their Food Professionals. Remind them to use the website provided:
www.agexplorer.com
11. Have students submit their completed worksheets (**Appendix C**) for assessment (see rubric) and/or present their selection to the class.

Extensions

If this activity is for a Careers class, or if the class wants to further explore Agriculture careers, the other resources provided can be used to do further research on the profession strands. Students could look at the educational requirements and the potential future that would accompany the career path they are interested in.

PLANET X ASSESSMENT



CRITERIA	4	3	2	1
<p>Understanding of content</p> <p>(Concept of addressing a scenario with a set of skills)</p>	demonstrates thorough knowledge of content	demonstrates considerable knowledge of content	demonstrates some knowledge of content	demonstrates limited knowledge of content
<p>Processing skills and strategies</p> <p>(Gathering research to address the problem in each scenario)</p>	uses processing skills and strategies with a high degree of effectiveness	uses processing skills and strategies with considerable effectiveness	uses processing skills and strategies with some effectiveness	uses processing skills and strategies with limited effectiveness
<p>Critical/Creative thinking processes, skills and strategies</p> <p>(analyzing data for each career; evaluating content and forming and justifying conclusions on the basis of evidence)</p>	uses critical/ creative thinking processes, skills, and strategies with a high degree of effectiveness	uses critical/ creative thinking processes, skills, and strategies with considerable effectiveness	uses critical/ creative thinking processes, skills, and strategies with some effectiveness	uses critical/ creative thinking processes, skills, and strategies with limited effectiveness
<p>Expression and organization of ideas and information</p> <p>(Clear expression and logical organization in oral, visual, and/or written forms)</p>	expresses and organizes ideas and information with a high degree of effectiveness	expresses and organizes ideas and information with considerable effectiveness	expresses and organizes ideas and information with some effectiveness	expresses and organizes ideas and information with some effectiveness

British Columbia

- **Career Life Education**
 - Use entrepreneurial and innovative thinking to solve problems in their personal life and community
 - Recognize and explore diverse perspectives on how work contributes to our community and society
- **Career Life Connections**
 - Explore and articulate career opportunities based on research and ways of knowing
- **Food Studies 10**
 - Identify criteria for success, intended impact, and any constraints
 - Critically analyze and prioritize competing factors, including social, ethical, and sustainability considerations, to meet community needs for preferred futures
 - Evaluate how the land, natural resources, and culture influence the development and use of tools and technologies
- **Food Studies 11**
 - Critically analyze how competing social, ethical, and sustainability considerations impact design solutions to meet global needs for preferred futures
- **Food Studies 12**
 - Critically analyze how competing social, ethical, and sustainability considerations impact design solutions to meet global needs for preferred futures
- **Science 10**
 - Connect scientific explorations to careers in science
- **Science for Citizens 11**
 - Consider scientific explorations to careers in science
- **Environmental Science 11**
 - Consider scientific explorations to careers in science

• **Environmental Science 12**

- Consider scientific explorations to careers in science

Alberta

- **Health and Wellness 9**
 - L-9.4 refine personal goals and priorities relevant to learning and career paths; e.g., investigate education programs including senior high school programs and those related to potential careers
- **Grade 9 CTF Career Exploration**
- **Science 10**
 - Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields
- **Career and Life Management**
 - Update and expand a personal profile related to potential career choices

Saskatchewan

- **Science 10**
 - Investigate career paths related to various branches and sub-branches of science.
 - Assess the consequences of human actions on the local, regional and global climate and the sustainability of ecosystems.
- **Environmental Science 20**
 - Analyze and explore physical science-related career paths in SK, Canada, and the world
 - Examine the role plants play in an ecosystem, including the ways in which humans use plants/
 - Recognize the need for intact habitat to support animal populations and biodiversity.
- **Physical Science 20**
 - Analyze and explore environmental science-related career paths in SK, Canada, and the world

- **Information Processing 10/20/30**
 - Investigate an occupational cluster to discover a variety of career pathways and related educational requirements
- **Career Work Education 30A, 30B**
 - Explore working conditions related to lifestyle, roles, and occupational choices

Manitoba

- **Grade 9 Life/Work Exploration**
 - Locate and effectively use life/work information
- **Select and review information resources that provide career information**
 - Understand the relationship between work and society/economy
 - Identify the factors that affect the availability of career opportunities
- **Grade 11 Agriculture**
 - Explore career opportunities in Agriculture
- **Life Works 10**
 - GLO D: Locate and effectively use life/work information.
- **Grade 10 Geography**
 - VL-005 Respect the Earth as a complex environment in which humans have important responsibilities.
 - S-107 Make decisions that reflect social responsibility.
- **Agriculture 30**
- **Ecology10/11**
 - GLO: B5, C4, C5, C8 Investigate how human activities affect an ecosystem and use the decision-making process to propose a course of action to enhance its sustainability.

Ontario

- **Grade 10 Career Studies**
 - identify a broad range of options for present and future learning, work, and community involvement
 - demonstrate the ability to research information about education and work opportunities, using print, electronic, and human resources
- **Grade 11 Designing your Future**
 - use research skills and strategies to gather and interpret relevant information about work and learning opportunities
 - describe, on the basis of research, opportunities in various occupational sectors and explain the requirements and challenges of selected occupations
- **Science 10**
 - Identify and describe a variety of careers related to the fields of science under study and the education and training necessary for these careers
- **SBI3U, SBI3C, SBI4U, SCH3U, SCH4U, SCH4C, SES4U, SVN3M, SVN3E, SNC4M, SNC4E**
 - Identify and describe a variety of careers related to the fields of science under study and the education and training necessary for these careers
- **Green Industries 10, 11, 12**
 - Identify careers in the green industries and describe the skills, education, and training required for entry into these positions.
- **HIP40 Personal Life Management, Grade 12:**
 - B2.1 identify occupations available in fields related to their personal skills, interests, values, and attributes
 - B2.2 summarize the steps required for obtaining desirable employment

Quebec

- **Exploration of Vocational Training**

- Consults different sources of academic and career information
- Learns about different trades and occupations
- Takes stock of his/her discoveries
- Personal Orientation Project
- Carries out a process of career exploration
- Contemplates his/her learning and work possibilities

- **Physics 12**

- Consider further studies and careers in science- and technology-related fields
- Use factual information and rational explanations when analysing and evaluating

- **Healthy Living 120**

- Identify career opportunities and the post-secondary education needed to pursue a career in nutrition

New Brunswick

- **Career Exploration 110**

- Identify potential career areas that might suit personal characteristics
- Identify gateways to a wide variety of careers –university, college, military, apprenticeship, entrepreneurship, work, etc.
- Understand how a variety of factors (e.g. supply and demand for workers. Demographic changes, environmental conditions, geographic location) may impact work opportunities.

- **Personal Development and Career Planning Grades 9-10**

- Demonstrate an understanding of how work relates to the needs and functions of economy and society

- **Science 10**

- Consider further studies and careers in science- and technology- related fields
- Identify and describe science- and technology-based careers related to the science they study
- Identify possible areas of further study related to science and technology

- **Physics 11**

- Consider further studies and careers in science- and technology-related fields
- Use factual information and rational explanations when analysing and evaluating

Nova Scotia

- **Science 10**

- Consider further studies and careers in science- and technology- related fields
- Use factual information and rational explanation when analyzing an evaluating

- **Agrifoods 11**

- Indicate careers and technologies that have developed to aid industries and production of the commodity
- Explain how effective management increases efficiency and responsible farming practices
- Identify the range of roles in supporting infrastructure at the farm, provincial, national, and international levels

Prince Edward Island

- **Grade 11/12 Agri-Science**

- compile career information and job opportunities in diverse agricultural enterprises and related services

- **Grade 11/12 Animal Science**

- compile career information and job opportunities in diverse agricultural enterprises and related services

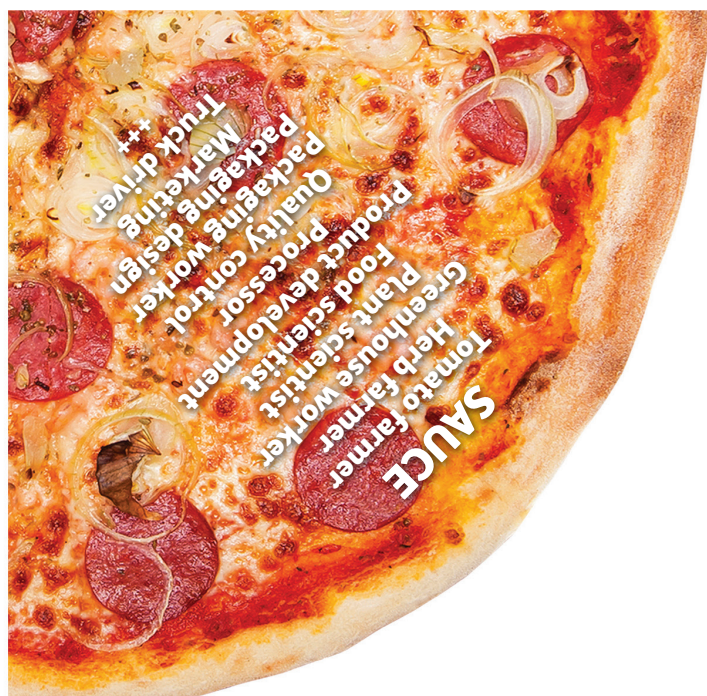
- **Grade 12 Agri-Science**

- research career information and job opportunities in diverse agricultural enterprises and related services

- **Grade 12 Animal Science**
 - compile career information and job opportunities in diverse agricultural enterprises and related services
- **Grade 11/12 Co-operative Education**
 - identify potential occupations that will support their personal skills, interests, values and traits

Newfoundland & Labrador

- **Environmental Science 3205**
 - Identify career opportunities related to the study of environmental issues



PLANET X: APPENDIX B

MISSION DESCRIPTION



The year is 2050, and Earth's population has topped 9 billion people.

Farmers and agriculture businesses are working hard to increase production of safe and sustainable food, using new technology and innovation. But they face challenges due to climate change and competition for land use.

The global science community partnered to form The Coalition For a Sustainable Future (CFSF). Together, we funded an advanced space exploration program to identify planets that we could use as food production outposts to supplement agriculture on earth. We have identified one such planet and have called it... Planet X.

For phase 1, we established a farm to produce food.

Currently on the Planet X farm there are:

- A livestock barn with 100 Dairy cows
- A livestock barn with 50 beef cattle
- A livestock barn with 1000 layer hens (producing eggs)
- A 50,000 square foot greenhouse growing fruits and vegetables
- A 500 acre crop area (currently growing 100 acres each of corn, wheat, soybeans, canola, and potatoes)

The farm is currently being run by a number of food production professionals, including:

- 2 Dairy Farm workers
- 2 Beef Farm workers
- 2 Poultry Farm workers
- 2 Greenhouse workers
- 2 Row Crop producers

All of the buildings are already in place, and all of the equipment needed to run the farm (e.g. tractors, planting equipment, harvesting equipment) is already here.

The farm has been producing food and it is being sent back to Earth at regular intervals using a special robot piloted spaceship.

But the situation is evolving on Planet X. It is time to send some additional professionals who can help address issues and maximize the efficiency and sustainability of the food production.

There are eight critical situations on Planet X. For each situation, you will receive an overview of the challenge being experienced. You will also receive a list of the qualifications that a person needs in order to address that issue. You will have three potential candidates to choose from for each situation, but you can only choose one.

Your mission is to select the best team of Food Production Professionals to travel to Planet X and address the issues. Who will you select?



PLANET X: APPENDIX B

MISSION DESCRIPTION



Your MISSION PLAN for each situation

There are 8 *Serious Situations* facing Planet X which need to be addressed:

- Animal Health
- Animal Productivity
- Crop Productivity
- Equipment Maintenance
- Data Interpretation
- Communications
- Environment
- Diversification

STEP 1 ►

On your worksheet (**Appendix C**), read the description of the situation. Make note of the most important requirements needed to address the challenge.

STEP 2 ►

Research the three Food Professionals listed for your situation. Record the strengths they would bring to address the challenge. Record any weaknesses or areas they don't address. Assess each professional to see if their job responsibilities match the qualifications needed for the situation.

STEP 3 ►

Consider your evaluation of the three Food Professionals. Make your selection based on who you would consider the top candidate. Record your rationale for your selection.

Mission Completion Checklist

DID YOU...

- ☐ Review the Mission Description to help you better understand the task at hand?
- ☐ Research the three Food Professionals and choose the best one for each of the situations?
- ☐ Use the graphic organizer to choose your Food Professional and then provide a rationale for why you chose them?

 Choose Team Member: **Animal Health**



1

Food Animal Veterinarian



2

Veterinary Assistant



3

Veterinary Pathologist

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____



Animal Health

Situation: Some of the animals on the farm have had minor health issues, such as infections and injuries. Each of the farm workers are trained to give simple vaccinations, but do not have the education to perform surgeries or diagnose illness and injuries.

Requirements: The Planet X farm business requires someone who can help keep all the animals as healthy as possible. This will include disease prevention, treatment of illness and injuries, and carrying out medical procedures.

CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Food Animal Veterinarian https://www.agexplorer.com/career/food-animal-veterinarian		
Veterinary Assistant https://www.agexplorer.com/career/veterinary-assistant		
Veterinary Pathologist https://www.agexplorer.com/career/veterinary-pathologist		
RATIONALE		

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____



Animal Productivity

Situation: The beef calves on Planet X have grown to point where they can consume food other than their mothers milk. The beef farm workers want to make sure that the calves are getting the proper nutrition they need to grow healthy and strong.

Requirements: The Planet X farm business requires someone who can design a feeding program for the various ages of beef cattle, as well as the other animals that are on the planet (chicken, dairy cattle, pigs).


CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Feed Mill Operator https://www.agexplorer.com/career/feed-mill-operator		
Herd Nutritionist https://www.agexplorer.com/career/herd-nutritionist		
Ruminant Nutritionist https://www.agexplorer.com/career/ruminant-nutritionist		
RATIONALE		

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____

 Crop Productivity		
<p>Situation: Some of the crops on Planet X have shown some signs of nutrient deficiencies, related to the health of the soil. There is also a weed growing in the canola and the potatoes which the crop farmers can not identify.</p> <p>Requirements: The Planet X farm business requires someone who can help them identify the pests (weeds, insects, fungus) which are affecting their crops and make a plan to reduce their negative impact. They also need someone who can test their soil and make recommendations of how to improve soil health.</p>		
CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Agronomist https://www.agexplorer.com/career/agronomist		
Crop Scout https://www.agexplorer.com/career/crop-scout		
Plant Pathologist https://www.agexplorer.com/career/plant-pathologist		
RATIONALE		

Name: _____



Equipment Maintenance

Situation: The Planet X farm has a lot of equipment in place to produce crops, as well as move feed and manure for the livestock operation. One of the tractors, as well as one of the seed drills have experienced some mechanical issues. When this equipment is not working properly it reduces the efficiency of all aspects of the farm.

Requirements: The Planet X farm business requires someone who can fix both the tractor, and the other machinery. It is expected that further issues with other equipment will happen, so it would be useful to have someone who is also able to do general maintenance to prevent serious issues.

CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Mechanical Engineer https://www.agexplorer.com/career/mechanical-engineer		
Welder https://www.agexplorer.com/career/welder		
Maintenance / Service Technician https://www.agexplorer.com/career/maintenance-technician		
RATIONALE		

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____



Data Interpretation

Situation: The equipment being used to grow the crops on Planet X is the same sophisticated equipment being used on earth. Different pieces of equipment have technology which capture data such as moisture and nutrients in the soil, as well as the yield (amount of production) of a crop at harvest. The issue is that the farm workers are having trouble sorting through all the information and using it in ways which can improve their future production.

Requirements: The Planet X Farm business requires someone who can help them to interpret the data they are collecting. This person needs to be able to help the farmers develop maps for planting, and plans to ensure that products like pesticides and fertilizers are only applied where they are needed in the field.


CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Geospatial Analytics Scientist https://www.agexplorer.com/career/geospatial-analytics-scientist		
Information Technology Specialist https://www.agexplorer.com/career/information-technology-specialist		
Precision Agriculture Specialist https://www.agexplorer.com/career/precision-agriculture-specialist		
RATIONALE		

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____


 Communications		
<p>Situation: People on earth have a lot of questions about what is happening with food production on Planet X. There are some rumours that the animals are not being cared for, and that the farm workers are conducting 'experiments' with people's food.</p> <p>Requirements: The Planet X Farm business requires someone who can communicate the truth about what is happening on the farm to consumers back on earth. They need someone who has the ability to use various mediums (social media, articles, websites, etc) to share the story of the farm.</p>		
CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Social Media Strategist https://www.agexplorer.com/career/social-media-strategist		
Marketing Specialist https://www.agexplorer.com/career/marketing-specialist		
Communications Specialist https://www.agexplorer.com/career/communications-specialist		
RATIONALE		

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____

 Environment		
<p>Situation: The first phase of the Planet X mission is going well and food is being produced. Scientists from the team on Earth are suggesting that amount of production increase. But before any more barns can be built, or land prepared for crops, it must be determined that there will be no negative impacts on the natural environment of Planet X.</p> <p>Requirements: Planet X Farm Business requires a person who can conduct and evaluate tests in the local environment to determine the environmental features which are present. They must be able to provide reports of their assessment, give recommendations and ensure that regulations are followed during and after construction.</p>		
CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Environmental Engineer https://www.agexplorer.com/career/environmental-engineer		
Conservation Officer https://www.agexplorer.com/career/conservation-officer		
Hydrologist https://www.agexplorer.com/career/hydrologist		
RATIONALE		

PLANET X - APPENDIX C

STUDENT WORKSHEET



Name: _____



Diversification

Situation: The greenhouse on Planet X is producing well. However, there is a desire to explore ways to provide nutrients to the plants without using synthetic (human-made) fertilizer. The team of scientists on earth have suggested an aquaponics set up in the greenhouse. This would allow for production of fish, as well as provide a source of nutrients (fish waste) for the plants.









Requirements: Planet X farm business requires someone who can collaborate with the greenhouse workers to plan and construct an aquaponics system. They will need to keep the fish healthy and maintain any of the equipment.

CAREER	SKILLS THAT WILL BE USEFUL	SKILLS THAT ARE MISSING
Aquaculture Hatchery Manager https://www.agexplorer.com/career/aquaculture-hatchery-manager		
Aquaculturist https://www.agexplorer.com/career/aquaculturist		
Saltwater Husbandry Technician https://www.agexplorer.com/career/saltwater-husbandry-technician		
RATIONALE		

PLANET X - APPENDIX D

ANSWER KEY



SITUATION	BEST PROFESSIONAL FOR THE JOB	RATIONALE
 Animal Health	Food Animal Veterinarian	A Food Animal Veterinarian has the training to deal with all the animals on the Planet X Farm. As well, they can perform duties ranging from prevention of illness, to diagnoses, and treatment.
 Animal Productivity	Herd Nutritionist	The farm requires someone who can design a feeding program for several species of animals. A Herd Nutritionist meets this requirement. A ruminant nutritionist specializes in ruminant animals and would not be as qualified to deal with the chicken and pigs.
 Crop Productivity	Agronomist	An Agronomist has qualifications to assess soil, plant and pest issues. They are also able to provide recommendations on how to address pest issues and minimize damage to the crops.
 Equipment Maintenance	Maintenance / Service Technician	The technician has the advantage in being able to perform both maintenance and repair. A mechanical engineer is mostly focused on the design aspect of machinery, and a welder may not be able to work on equipment components that are not metal.
 Data Interpretation	Precision Agriculture Specialist	The Precision Agriculture specialist would be best suited because they are able to consider multiple points of data to make recommendations. They are trained in how to work with the equipment and data. Precision Agriculture specialists also have the knowledge of plant science/agronomy to make appropriate maps for use in the field.
 Communications	Communications Specialist	The Communications Specialist would be a well-rounded professional who could develop communication pieces in a variety of mediums (web, articles, social media, etc.). They would be effective at using communication to build positive relationships with consumers.
 Environment	Environmental Engineer	The Engineer would be able to use the data from assessments to make plans and recommendations. They are also qualified to monitor the construction of new facilities and make sure that everything is developed in an environmentally appropriate way. A conservation officer is more focused on conservation, and a hydrologist specializes in water only.
 Diversification	Aquaculturist	The Aquaculturist is best suited to this job because they are familiar with the equipment used in aquaculture systems. Therefore they would be qualified to help design and build the aquaponics system in the greenhouse, and could keep the fish healthy once it was up and running.



AGRICULTURE IN THE CLASSROOM - CANADA

For more educational resources, visit www.aitc-canada.ca
or email us at info@aitc-canada.ca