



GREEN Employment Program

Developed by Greenplanet Energy Analytics for Athabasca Chipewyan First Nation
with financial support from Athabasca Tribal Council and the Alberta Government AIGEP

AQUAPONICS - Teacher's Guide

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Curriculum Connections

Science 14

Unit C: Investigating Matter and Energy in the Environment

- Describe the relationship between photosynthesis and cellular respiration in terms of biological energy storage
- Identify life functions common to living systems

CrossWord Key (13 points)

1 l o 2 w

3 p Answers will vary

4 l e t 5 h b r i d g e

a o

n m

6 s

7 h e 8 a l t h 9 y

q a o

u r u

a t n

p e g

10 p

a

11 b l o o d

n

12 e v e r y t h i n g

c

13 s a v i d o v

Treasure Hunt

Optional: Answers will vary

Unit D: Investigating Matter and Energy in the Environment

- Assess the impact of modern agricultural technology on the natural pathways of recycling matter
- Explain how various factors influence the size of populations
- Describe the relationship between land use practices and altering ecosystems

Science 20

Unit D: Changes in Living Systems

General Outcome 3: Students will analyze and describe the adaptation of organisms to their environments, factors limiting natural populations, and evolutionary change in an ecological context.

Science 30

Unit D: Energy and the Environment

General Outcome 1: Students will explain the need for balancing the growth in global energy demands with maintaining a viable biosphere.

Useful Resources

Please see the other Aquaponics resources available at <https://www.3ne.ca/learning-resources/>

This includes:

What, How, Why - This is the introduction to aquaponics covering the basics including a question sheet, answer key and Alberta curriculum connections.

Activity 1: How to Test the Water - includes step-by-step on how to run chemical tests for Nitrates, Nitrites, pH and Ammonia. Also includes Excel Aquaponic Log Sheets for recording results. These can be used as printouts or in electronic form.

Coming Soon - Activity 2: What Water Tests Tell You - Taking the information collected from Activity 1 and learning the basics of how to interpret the data to make decisions about the care of the aquaponics unit. Includes questions and graph sheets.

Be sure to check out the videos listed on the student pages!





EXPLORING EMPLOYMENT

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AQUAPONICS

Blood Tribe Aquaponics Farming Project Could Hold Key To First Nations Food Security

Adapted from Global News, January 18, 2021

Blood Tribe resident Dan McGinnis is hoping to address some of the problems in rural Indigenous communities with the help of aquaponics technology.

“We’re hoping this can be a stepping stone to even greater things,” McGinnis said.



McGinnis said this idea was sparked by a lecture he sat in on at Lethbridge College that opened his eyes to the real possibility of aquaponics farming.

He is now growing high-quality, low-cost produce and fish for his family and hopes to eventually do the same for his entire community.



Dan McGinnis
Ginnis
Thunderbird Farms

“We’ve run them off-grid here now for a couple of years. [These systems] work” he said, adding that the project could help young people on reserves access agriculture careers more easily.

Nick Savidov, senior research scientist with the Integrated Aquaponic Technology Centre at Lethbridge College, said a good indicator of this project’s future success is that it comes at a time when major corporations are investing millions of dollars into aquaponic technology.

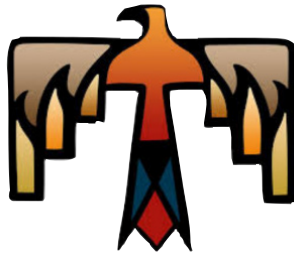
“It’s the only technology in the world [that] can produce food without producing waste and without any negative environmental impact,” Savidov said.

He added, it is “the future of agriculture,” because it uses the best technologies from greenhouses, aquaculture, and waste treatment.

Savidov also said the systems can run almost independently, and there are courses available to train people in setting up aquaponics on a small or large scale.

McGinnis said the system he was able to create used low-cost materials. His hope is that they can be set up in reserves across Canada to solve problems with shortages of food and freshwater. See a video at:

<https://globalnews.ca/news/7584482/aquaponics-first-nations-food/>



What is Aquaponics?

Aquaponics is a system for growing food:

- ◆ Fish are raised in tanks of water where plants are also grown.
- ◆ The waste from the fish provides food for the plants.
- ◆ The plants keep the water clean for the fish.

aquaculture
(fish farming)

+

hydroponics
(growing plants using water, not soil).

Lethbridge College Launches Aquaponics Training For All

Adapted from LethbridgeCollege.ca, Mar 16, 2021

As aquaponics grows in popularity, the expert scientists in Lethbridge College's Aquaculture Centre of Excellence (ACE) have launched new courses that will provide training in this area.

The courses are designed for everyone from high school students to home gardeners to experienced greenhouse technicians.

The first two "micro-credentials" are available now. Aquaponics grows fish and plants together in a circulating system. Each of the nine courses focuses on a different parts of aquaponics. Students can pick and choose which courses they take to meet their needs.



The program is flexible and can be done at any time at the user's own pace. When finished, the user receives a badge showing they have completed the course.

Aquaponics research in Lethbridge College's Aquaculture Centre of Excellence (ACE) began in 2003. The centre's expertise is often sought out by everyone from large-scale producers to individuals



looking for an affordable, sustainable way to grow their own vegetables.

"Especially with COVID, we've seen more people become interested in the idea of producing their own healthy food," says Derksen. "Aquaponics is an extremely healthy way of growing food – it's a self-contained ecosystem, so you know everything that is going into your food, which I think is appealing to a lot of people."

For more information, visit the Lethbridge College website at lethbridgecollege.ca:

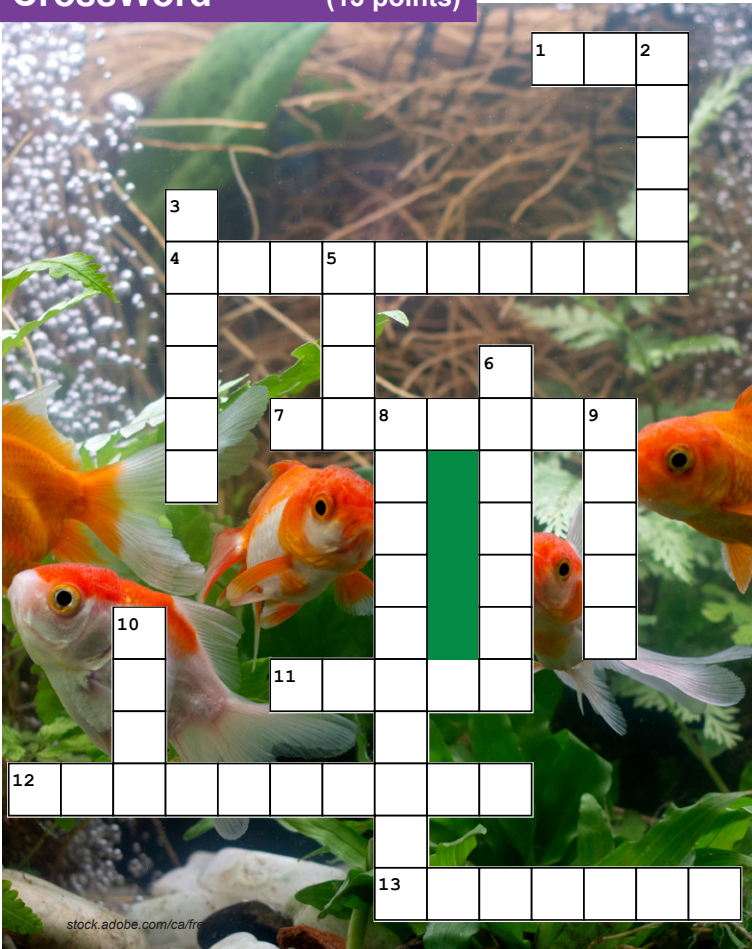
<https://lethbridgecollege.ca/news/research/lethbridge-college-launches-aquaponics-training-all>

Also, see the video from Global News:

<https://globalnews.ca/video/7712851/lethbridge-college-launches-aquaponics-micro-credentials/>

CHECKPOINT: Exploring Employment in Aquaponics (20 points)

CrossWord (13 points)



Across

1. McGinnis said the system he was able to create used ___ cost materials
4. McGinnis got the idea to try aquaponics after going to a lecture at ___ college
7. With COVID, more people become interested in the idea of producing ___ food
11. Dan McGinnis is a member of the ___ tribe
12. With aquaponics you know ___ that is going into your food
13. Nick's last name at the Aquaponics Centre at Lethbridge College

Down

2. Aquaponics is the only technology that can produce food without producing ___
3. The waste from the fish provides food for the ___
5. The courses offered are for everyone from high school students to ___ gardeners
6. Aquaponics research ___ in 2003 at Lethbridge College
8. Grows fish and plants together in a circulating system
9. McGinnis said the project could help ___ people on reserves access agriculture careers more easily
10. The program is flexible and can be done at any time at the user's own ___

Short Answer (7 points)

On a separate sheet of paper, decide if you would be interested in a job in aquaponics. Explain TWO reasons why or why not.

BONUS: Treasure Hunt

Search the Internet for commercial aquaponic businesses.

For each one you find, write down:

1. Business name
2. Website address
3. One interesting fact about them (who runs it, how large is the farm, who they sell to, etc.)

Double Bonus: Save one photo from the website to share.

