



MAINTENANCE Teacher 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

About Maintenance

Learning to run an aquaponics system is a wonderful way to provide hands-on experience with science concepts, job experience and general life skills like responsibility, time management, etc.

It is very important to do regular maintenance of this system to keep it running smoothly.

The **Task List** provided can be laminated or put in a plastic sleeve so students and staff can have an easy to understand set of instructions right at hand.

It is important for students and staff to be familiar with the parts of the aquaponics units so the attached **Mini Poster** should be shared. A **“Learn the Parts” worksheet** is also included for this reason.

Finally, it is important to track the maintenance and make sure it is being done. A **Testing/Monitoring Log Sheet** is provided for this. A blank is included but there are copies available in EXCEL at the 3NE Learning site described at the right.

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.

Exploring Employment - Two articles discussing aquaponics as a possible home business and training opportunities.

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.

TASK LIST

How to Take Care of the Aquaponics Unit

DAILY Tasks (except on weekends)

IF ANYTHING LOOKS WRONG contact a teacher or office right away.

Inspect air pump

- Is it turned on?
- Are the air stones in the water making bubbles?

Inspect water heater

- Is it turned on?
- Is the water thermometer in the fish tank reading between 20 - 22°C? (If cycling*, 24-30°C)

Inspect water pump

- Is it turned on?
- Is water flowing into the grow bed?
- If needed, EMPTY & RINSE out any fish waster from the small net where the water flows into the grow bed.

Inspect the bell siphon

- Make sure there are no blockages in the upper bell siphon or lower drain pipe.
 - Does the bell siphon “turn on” and “turn off”.
- (Water will flow out of the lower drain pipe and back into the fish tank. This flow stops when the grow bed is filling back up with water. Then it drains again.)

IMPORTANT - INSPECT THE MAIN DRAIN EVERY DAY BEFORE LEAVING THE SCHOOL.

A blocked main drain pipe could cause a flood.

IN CASE OF FLOOD:

Shut off all power (using the power bar switch below the grow bed). NOTIFY THE OFFICE.

Once a Week

Top up the water in the fish tank once a week. FOLLOW THESE STEPS

- 1. **TO AVOID A FLOOD - Wait until all the water from the grow bed has drained into the fish tank** (wait until you hear the “gulp” from the drain line.).
- 2. Turn off the power to the system by using the power bar switch underneath the grow bed (this ensures that water stops flowing back into the grow bed).
- 3. Pour 5 ml of Chlor De-tox into the white 5-gallon RONA bucket. Fill the bucket with water from the tap.
- 4. Pour this mixture of water and Chlor De-tox into the fish tank.
- 5. Repeat steps 3 - 4 until the water level in the fish tank reaches 3 - 5 cm below the drain pipe exit (this is the drain pipe from the grow bed that sits above the fish tank water).
- 6. Turn the power back on and be sure the water is flowing from the fish tank and into the grow bed.

Once a Week (every 2-3 days if cycling*)

Use the API water test kit to test the levels of:

- nitrate
- ammonia
- nitrite
- pH

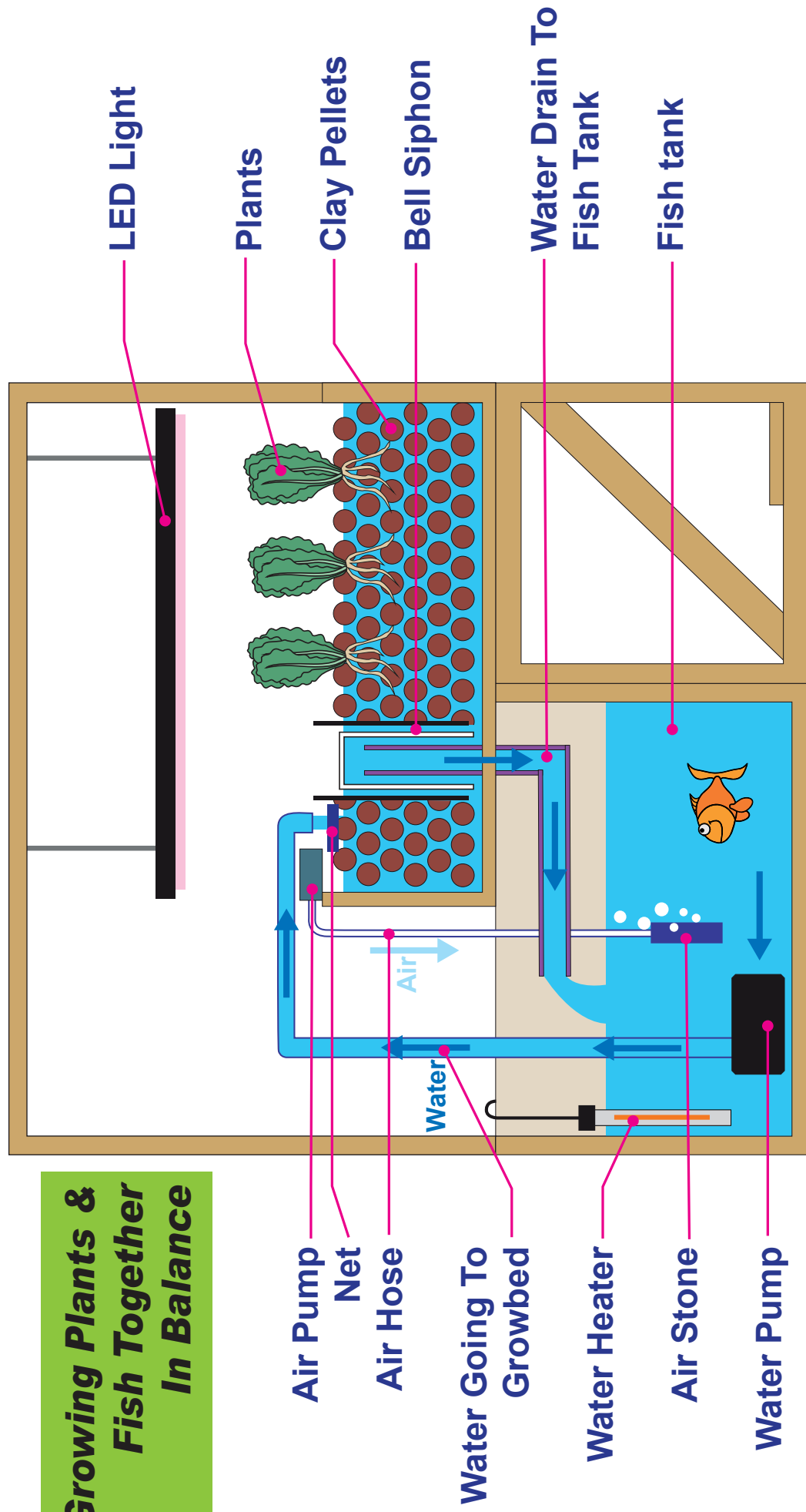
*Cycling is the special procedure followed when you first start up an aquaponics unit.

See the instruction sheet or manual for this.

Record the numbers on the monthly log sheet.

Check off each item as you do it and record on the log sheet.

Growing Plants & Fish Together In Balance



Aquaponics

aquaculture + **hydroponics**
 (fish farming) (growing plants using water, not soil).

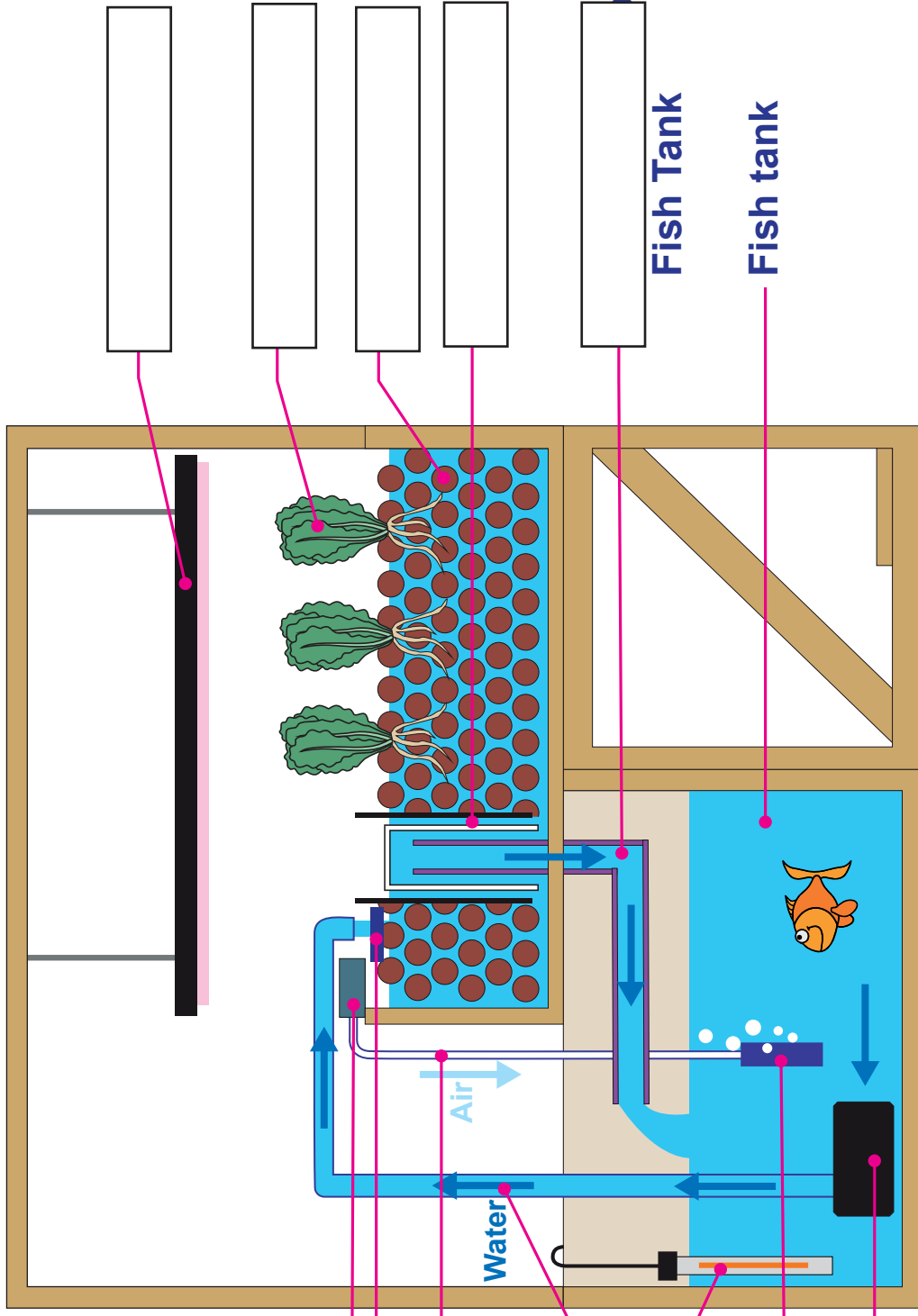
Learn The Parts

(10 points)

Name: _____

Write in the missing names from the list below .

Growing Plants & Fish Together In Balance



Aquaponics

Drain Pipe
Water Heater
Bell Siphon

LED Light
Air Pump
Growbed

Air Hose
Air Stones

Water Pump

Clay Pellets



