

## MODULE

## 3

LIVING THINGS OTHER  
THAN PLANTS & ANIMALS

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**Overview**

This module contains activities that will introduce learners to living things other than the animals and plants they studied in Grades 3-6, or, if they have some knowledge about them already, bring such knowledge to the classroom to be shared, further added to, and organized in a useful way. They will also use a magnifying lens in their study, or even a microscope, if their school has one. Many representatives of the groups Fungi, Algae and Bacteria are quite beneficial to humans and may cause disease and harm too. The common members of these groups and most visible ones will be studied first before proceeding to members that are very small in size, needing the use of a microscope to become visible to us, hence the term **microorganisms** to refer to them.

Through the activities, learners will develop their inquiry skills of observing, communicating, inferring, comparing, classifying, and gathering, recording, and organizing data in a table.

More than that, they will be getting to know their immediate environment more closely so that it may be protected, conserved, and made safe and useful for their own and the community's benefit.

**Advance preparation**

1. Collect one kind of mushroom and lichen. You may usually find the latter on trunks of trees.
2. Buy from the market *ar-arusep* or *lato* (*Caulerpa*) or whatever seaweed is available locally. If you are in a mountainous or landlocked area, you may collect green algae or *lumot* from rocks, ponds, or even your aquarium in school.
3. Allow molds to grow on some fruit peelings (banana) or a piece of moistened bread.
4. Grow a bacterial colony on a slice of potato or *kamote* which you have dropped in boiling water for 3 minutes. Do this by getting a clean cotton bud (Q tip) wiped against your tongue or the inside of your cheek. Then streak it across the potato surface as a big letter Z. Keep this slice inside a clean, see-through plastic bag and seal with tape inside a dark cabinet for 2-3 days.

## DAY 1

Activity

1

### Are these also plants?

1. Recall that during the elementary grades, they learned about animals and plants---the different kinds, their characteristics and needs. Say: “Today we will examine some living things which may also be found in our environment. Ask yourself the question: ‘Are they also plants?’”
2. Distribute Activity 1 and tell them to answer Q1 to Q11 initially. Show them live specimens of mushrooms and *ar-arusep* (*Caulerpa*) or other edible algae found in the local market, if possible. In the absence of edible seaweed, show *lumot*, or the green scum that forms in shallow ponds or places that are always wet. Give them a few minutes to observe the specimens and write down their answers.
3. When they are done, show them a specimen of a lichen (#4 in the Student Activity). This can be collected from trunks of trees. Tell them to answer Q12 to Q14. Following are some photos of lichens from internet sources. Tell them they can use their magnifying lenses.



<http://www.ppd1.purdue.edu/ppdl/weeklypics/1-12-04.html> downloaded 9 March 2012



<http://visual.merriam-webster.com/images/plants-gardening/plants/lichen/examples/lichens.jpg>

You may take photos of your own and project these. The ones shown here may or may not be the same kinds found in your locality. Look at trunks of trees that are in shady and moist places.

5. Then, show them the bacterial colony in the form of the letter Z on potato, the fungus on rotting banana peel **or** the mold on old bread, and green algae or *lumot*. Tell them to answer Q15 to Q17. Ask if they know what each is. Encourage them to use their magnifying lenses. They will see something similar to the following:

Q15. (a)



Photo by A. Encarnacion 2012

Q16. (b) Fungus on rotting banana peeling



Rotting banana peeling as seen through the naked eye



Rotting banana peeling as seen through a magnifying lens  
(photos by R.L. Reyes)

Or, (c)



Old bread with mold seen through the naked eye



Old bread seen with a magnifying lens  
(photos by R.L. Reyes)

and, (d)



Green algae or *lumot* in a freshwater aquarium  
<http://www.guitarfish.org/algae> downloaded 12 March 2012

6. Conduct a discussion of the answers they wrote. Do not give them the answers, though you can confirm at the end, after eliciting answers from all, those who mentioned the correct answers.

Expected answers

- Q1. Yes, it is a plant.
- Q2. Mushrooms (Correct!)
- Q3. Answers will vary. Example: They have “stems” and a “crown” like miniature trees.
- Q4. Yes, it is a plant.
- Q5. Answers will vary. They may answer “seaweed” or the local name. (Correct!)
- Q6. Because it’s green.
- Q7. One is green, the other is white, brown, or grey.
- Q8. Both have root-like, stem-like or fruit-like parts.
- Q9. Answers will vary. If they have, they may describe light brown slices of button mushrooms or pieces of black *taingang daga*. If it’s seaweed, they may describe other seaweeds like *guso* on the cover of this module.
- Q10. They may have eaten dishes with mushrooms or salads with seaweeds.
- Q11. Answers will vary; common names are different in the different dialects.
- Q12. Answers may vary; many will probably answer “plant.”
- Q13. Yes.
- Q14. Because its color is greenish; it has leaf-like parts.
- Q15. (a) The letter Z in a different color from the potato. It’s white.
- Q16. (b) Cottony, thread-like growth (on banana peel). Some may mention *amag* (correct).

**Or, if you showed them the moldy bread,**

- (c) There are tiny black dots and growth like cotton. (This is also *amag*.)
- Q17. Dark green, slimy stuff.
- Q18-19. Answers will vary depending on what the students already know or have experienced. Elicit all the different answers then **affirm the correct ones**. It is not expected that any student would guess that the Z is a bacterial colony (Q18). Students may correctly guess Q19 (b) or (c) as *amag* which both are.

Q20. (d) May be correctly identified as *lumot*. In English the word “moss” is used but mosses are very small plants that have thin stems and grow on land. *Lumot* are actually green algae, not plants. They float in water or cling to wet rocks. They have no roots, stems or leaves.

### Advance preparation for Day 2

Survey the school grounds beforehand so you know where to take them to find mushrooms, puddles or rocks with algae (*lumot*), tree trunks with lichens and whatever there is to find that is not recognizably or doubtfully a plant for Activity 2.

### DAY 2

Activity

2

What other living things are found in the school grounds?

1. Distribute Activity 2. Tell them to wear their gloves; bring tweezers, tongs, or forceps; plastic bags or glass jars. Give them a maximum of 10 minutes outside. Each student need only collect **one** living thing similar to the ones you showed them yesterday or which they are not sure about being a plant.

In the grounds:

2. Bring them to shady, moist areas with decaying plant matter. Point out cottony, powdery material on decaying logs and leaves as well as green stuff on wet surfaces. Fruiting bodies of mushrooms are easy to spot and would be the obvious choice of students to collect.
3. Prompt them to get a sample of green algae (*lumot*), lichens, fuzzy or hairy patches.

Back in the classroom:

4. Allow them to describe the specimens they collected and to show their drawings (Q1) to the class. Discuss their answers to Q2, and Q3.

Expected answers:

Q1. Drawings will vary, depending on what they collected.

Q2. Answers will depend on the exact place of collection.

Q3. Answers will depend on the conditions of the place of collection, e.g., if it was collected in a moist, shady place, the specimen must need moisture to live. It may be inferred that it will not thrive under intense sunlight and dry conditions. They should also give air as a need.

5. When they have heard and seen what others have collected, tell them to answer Q4 and Q5.

Q4. Answers will vary, but they are expected to collect something they had seen the previous day in the classroom because you pointed out the places where they were to go and suggested what to collect. They may collect the same kind of living thing but of a different species or form.

6. At this point (as you discuss answers to Q4), give the names of all the organisms they observed in Activities 1 and 2: mushrooms, molds, algae, and lichens. Tell them that the Z in the potato is actually a bacterial colony from human saliva. The lichen is a combination of fungus and alga.

Allow students to group the living things they have seen so far. Ask them for their reasons for grouping together the living things. See if they see the similarities between different kinds of mushrooms and molds and the different kinds of algae (seaweeds) if they are by the sea, and *lumot*.

Q5. Their answers may include the following: Mushrooms and molds are different from plants because they are not green; they are white, grey, brown, black. They only have stem-like, fruit-like, and leaf-like parts just as plants do but their bodies are very much softer and smaller. Seaweeds may be green but they only have stem-like, fruit-like, leaf-like parts not the real parts.

7. For their homework, tell them to find reference books or search the internet for the big groups these organisms belong to based on the names you gave them. The names of the big groups are Fungi, Protists or just Algae or Seaweeds, and Monerans or just Bacteria. Lichens are combinations of a fungus and an alga. Tell them to find out the characteristics of these groups, their uses to humans and the environment, and negative effects, if any. Tell them they can give other examples they find out about in the course of their readings.

Tell that what they did (collecting specimens in the school grounds) is already part of an investigation.

8. Discuss information they gathered that may not be in agreement. Review their sources. Give them the opportunity to evaluate and judge their sources. Explain to them that through this process, their critical thinking skills will be honed. There should not just be one source of information. Encourage them to refer to several sources.

Expected answers to questions after the activity:

Q. What are the similarities among these groups? They are close to the ground (small, e.g., the fungi and *lumot*). They need moisture to live. They grow on living things or once-living things and in fact, cause decay and decomposition, in the case of fungi.

- Q. How are they different from each other? The algae are green, they make their own food, while mushrooms are white, cream, grey and get food from decaying living things. Lichens are often found on trunks of trees and are greyish green.
- Q. How are these big groups different from the plants studied in Grades 3-6? These big groups are mostly smaller than plants. They have no true leaves, true roots, true stems, true flowers.

### DAY 3

On a table like the one below, allow the students to enter the information they gathered as homework the previous day.

Expected information:

Name of living thing or organism	Big group/ Other Examples	Characteristics	Uses/ Benefits	Harmful Effects
Mushroom	Fungi / yeast, mold	Not green; cannot make its own food	Food; decomposes living matter	Some species can cause disease, e.g. athlete's foot, ringworm; some are poisonous when eaten
Green algae, e.g. <i>Caulerpa</i> or <i>ar-arusep</i> ,	Protist (Algae)/ Red algae, e.g., <i>Kappaphycus</i> or <i>Eucheuma</i>	Has green, and other colors; can make their own food; some are one-celled, some are multicellular	Food for humans; food for fish in ponds	Some considered pests in aquariums and recreation beaches
Lichen	Partly fungus and partly alga	Algal part can photosynthesize ; fungal part cannot	Algal part provides food for the fungal part; fungal part provides a home for the alga ; acts as indicator of air pollution; lichens act as seed bed or spore bed	

Molds	Fungi	Has root-like, stem-like, fruit-like parts; has spores	Break down once living matter into its simplest components	Responsible for spoiled food
Bacteria	Bacteria or Monera	Can be seen only when in colonies or big numbers	Making fermented products: also decomposes once-living matter	May cause disease like TB, diarrhea, pneumonia, some sexually transmitted diseases, urinary tract infection or UTI, leprosy, typhoid, rheumatic fever

2. Teach them how to list down their references. Enabling them to seek and gather information on their own is a valuable skill students need to learn. They should also be engaged in evaluating credibility of various sources and determining acceptable information. These skills are part of critical thinking.
3. Discuss disease-carrying and beneficial members of these big groups. Settle differences by evaluating their sources.
4. End the lesson by saying they have just classified certain living things under three big groups apart from the groups of Animals and Plants they have learned about in the elementary grades. Say that other members of these groups, especially the microscopic and single-celled representatives, **will be studied in the higher grades.**
5. Administer the posttest.

## References

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- Pundasyon sa Pagpapaunlad ng Kaalaman sa Pagtuturo ng Agham, Ink. 1996. *Plants of the Philippines*. 2<sup>nd</sup> Ed. Quezon City: Pundasyon sa Pagpapaunlad ng Kaalaman sa Pagtuturo ng Agham, Ink.
- Trono, G.C. Jr. (2009). *Tropical Marine Macrobenthic Algae: A Lecture Series*. Bicutan, Taguig, Metro Manila: Department of Science and Technology, Philippine Council for Aquatic and Marine Research and Development.
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## Teaching Guide for Activity 3 (for schools with microscopes)

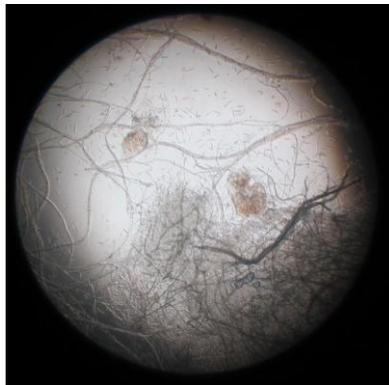
Activity

3

What do these living things look like under the microscope?

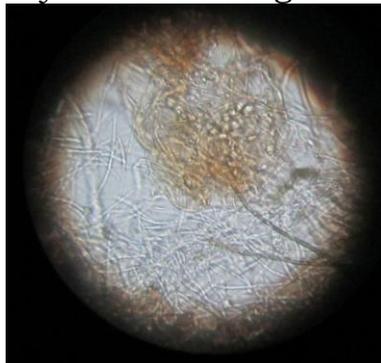
1. Distribute Activity 3. Supervise their preparation of slides. Each group should have slides of each of the specimens: banana peeling mold, bread mold, *lumot*, bacterial colony, and lichen.
2. Help them also in the manipulation of the microscope.

For Q1, they may see something like this:



Growth on banana peeling under LPO  
Photo by R Reyes

For Q2, they may see something like this:



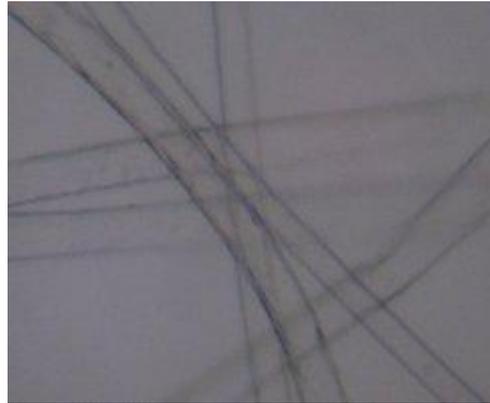
Growth on banana peeling under HPO  
Photo by R Reyes

Q3. Sample answer:

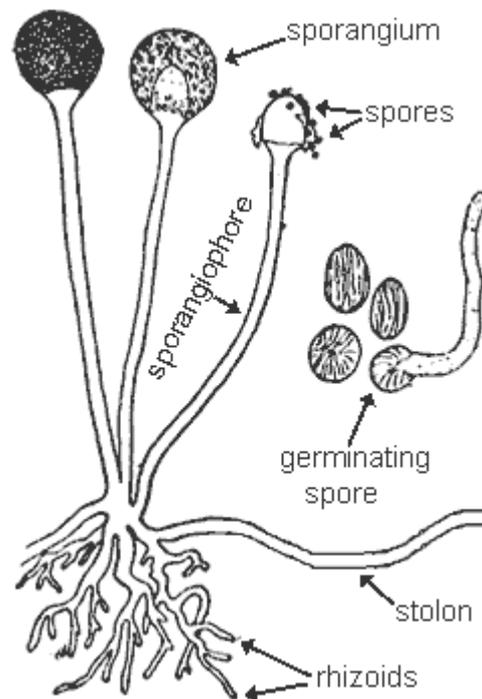
Under the LPO, I see threadlike structures and two roundish, yellowish forms.

Under the HPO, this yellowish, roundish form has smaller round things inside and a stalk or stem-like part

Q4. Show this to students and ask them to label their drawings:



Fungal **hyphae** (plural of hypha) – fine branching, colorless threads; together they form a tangled web called a **mycelium**  
(<http://www.countrysideinfo.co.uk/fungi/struct.htm> downloaded 21 March 2012)

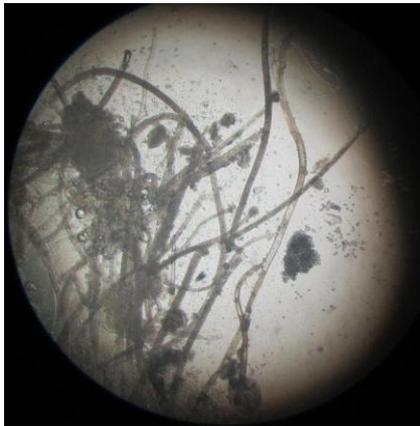


The **stolon** is a kind of hypha connecting fruiting bodies. The stemlike part is called a **sporangiophore**. The roundish yellowish shapes are **sporangia** (plural for sporangium) the structures which bear the small round **spores**. Each spore that lands in a warm, dark, moist place “germinates” and form hyphae all over again.

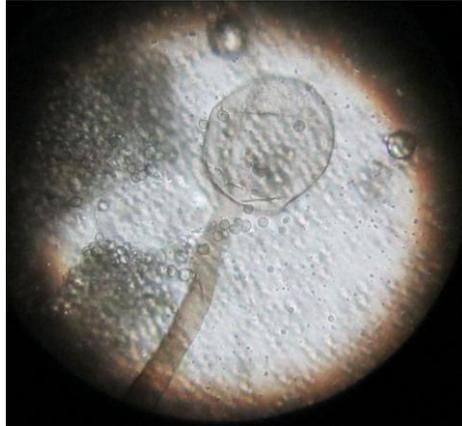
Source: <http://www.backyardnature.net/f/bredmold.htm> downloaded 21 March 2012

7. The mold on bread is similar to the mold on the old banana peeling.

LPO



HPO



Example of *Lumot*



<http://www.microscopyuk.org.uk/mag/indexmag.html?http://www.microscopy-uk3>