



## Teachers Mini-Module Lesson Plan

### Underwater Symbiosis - Mutualism

#### Mini-Module Summary

This five-minute lesson introduces symbiosis and what it means for different organisms to be in a symbiotic relationship, with a special focus on mutualism within this mini-module. Using the video, students will be guided through differences of the three types of symbiotic relationships and how to properly identify them, whether they are found on land or in the sea. The CCMI educator will then take the students on a short underwater tour of a diverse coral reef, pointing out common examples of mutualistic symbiotic relationships. Teachers using this mini-module are encouraged to follow up the lesson with a nature walk or a brief snorkel to encourage students to discover and record their own examples of mutualism.

#### Curriculum Aim - Year 4

##### Learning objectives

- Explain symbiosis
- Define mutualism, commensalism, and parasitism
- Describe examples of both terrestrial and marine symbiotic relationships
- Recognize and identify “mutualism” in real-life scenarios
- Investigate potential mutualistic relationships in a local natural area (terrestrial or marine)

##### The Cayman Islands - Science National Curriculum Alignment

- Observe similarities and differences among animals and among plants (Year 4).
- Find out about other animals, including how they grow, feed, move and use their senses (Year 4).
- Investigate a local habitat, including the relationship between the animals and plants found there, and develop skills in classifying animals and plants by observing external features, *for example, classify minibeasts by observing the number of legs and note the conditions in which they were found* (Year 4).

##### Necessary materials

Internet connection, YouTube.com classroom account, computer, projector, speakers, note paper, pencils or pens, and activity sheet (one per student)

##### Useful resources

- [www.reefresearch.org/reefs-go-live](http://www.reefresearch.org/reefs-go-live)
- [www.projectaware.org](http://www.projectaware.org)
- [www.doe.ky](http://www.doe.ky)
- [www.education.gov.ky/education/curriculum](http://www.education.gov.ky/education/curriculum)
- [www.oceanservice.noaa.gov/kids/](http://www.oceanservice.noaa.gov/kids/)



## Teachers Mini-Module Glossary

### Underwater Symbiosis - Mutualism

**Commensalism** - relationship between two organisms of different species in which one organism derives some benefit while the other is unaffected

**Coral reef** - marine structure composed of a layer of living coral atop coral skeletons, minerals, and organic matter

**Ecosystem** - naturally occurring system made up of organisms and their like environment

**Hermatypic coral** - stony coral, corals that help build the reef and become limestone over time

**Mutualism** - relationship between two species of organisms where both benefit

**Organism** - any living thing, such as a plant, animal, fungus, or bacteria

**Parasitism** - interaction between two organisms in which one organism benefits and the other is harmed

**Symbiosis** - close associations between two or more different organisms of different species that may, but does not necessarily, benefit each member

**Symbiotic relationship** - interaction between two organisms where at least one of the organisms' benefit; however, the other may be harmed, be unaffected, or benefit as well

**Zooxanthellae** - symbiotic algae that live in the tissues of coral polyps (and several other marine animals) providing them with 90% of their needed energy and nutrients



## Teachers Mini-Module Vocabulary Assessment

### Underwater Symbiosis - Mutualism

Below is a list of 10 vocabulary terms used in our Reefs Go Live Mini-Module “Underwater Symbiosis - Mutualism”. Show the CCMI Educator that you understand mutualism and can match the definition on the right with the correct term on the left. Thanks for your help and good luck!

- |                                  |                                                                                                                                                             |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Commensalism: _____           | a) interaction between two organisms where at least one of the organisms’ benefit; however, the other may be harmed, be unaffected, or benefit as well      |
| 2. Coral reef: _____             | b) symbiotic algae that live in the tissues of coral polyps (and several other marine animals) providing them with 90% of their needed energy and nutrients |
| 3. Hermatypic coral: _____       | c) marine structure composed of a layer of living coral atop coral skeletons, minerals, and organic matter                                                  |
| 4. Mutualism: _____              | d) stony coral; a coral that helps build the reef and becomes limestone over time                                                                           |
| 5. Organism: _____               | e) relationship between two organisms of different species in which one organism derives some benefit while the other is unaffected                         |
| 6. Ecosystem: _____              | f) any living thing, such as a plant, animal, fungus, or bacteria                                                                                           |
| 7. Parasitism: _____             | g) close associations between two or more different organisms of different species that may, but does not necessarily, benefit each member                  |
| 8. Symbiosis: _____              | h) relationship between two species of organisms where both benefit                                                                                         |
| 9. Symbiotic relationship: _____ | i) naturally occurring system made up of organisms and their like environment                                                                               |
| 10. Zooxanthellae: _____         | j) interaction between two organisms in which one organism benefits and the other is harmed                                                                 |

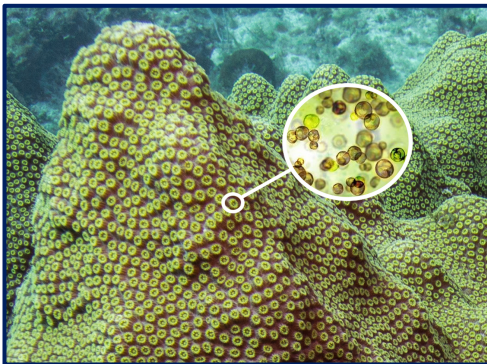


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## Teachers Mini-Module Activity Sheet

### Underwater Symbiosis - Mutualism

Today, you're the scientist! We need your help to investigate, describe, and record mutualistic symbiotic relationships found on a snorkel or nature walk. Below are a few examples of mutualism that you may come across; however, there are many more out there! Use the spaces below to illustrate and record information about at least three other mutualistic symbiotic relationships that you discover. Thanks for your help, and enjoy your scientific investigation!



Corals and zooxanthellae



Bees and flowers



Groupers and cleaning gobies

Organism 1: \_\_\_\_\_

Organism 2: \_\_\_\_\_

Describe the relationship:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Organism 1: \_\_\_\_\_

Organism 2: \_\_\_\_\_

Describe the relationship:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Organism 1: \_\_\_\_\_

Organism 2: \_\_\_\_\_

Describe the relationship:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_