



# COME DIVE WITH ME

Leonie McIlvenny

## CURRICULUM SUPPORT DOCUMENT

This Curriculum Support Document is designed to be used in conjunction with the picture book “Come Dive with Me” by Leonie McIlvenny. Learn all about symbiotic relationships in the marine ecosystem. Links with the Australian Curriculum Year 4 Science Understanding and Biological Sciences

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## INTRODUCTION

This curriculum support document supports the development of key understandings around **Symbiosis**. Using literature and inquiry-based learning children will gain an understanding of the key concepts around this phenomenon.

The document has the following key elements:

- Links to the relevant Australian Curriculum learning areas, strands, sub-strands and content descriptors
- Provides a detailed Lesson Sequence
- Includes a Resource List
- Provides background information including:
  - key words,
  - focus questions,
  - definitions,
  - stimulus pictures, and
  - worksheet templates

Where can I get a copy of the book **Come Dive with Me**?

**Come Dive with Me** is available from the following sources (Click for link)

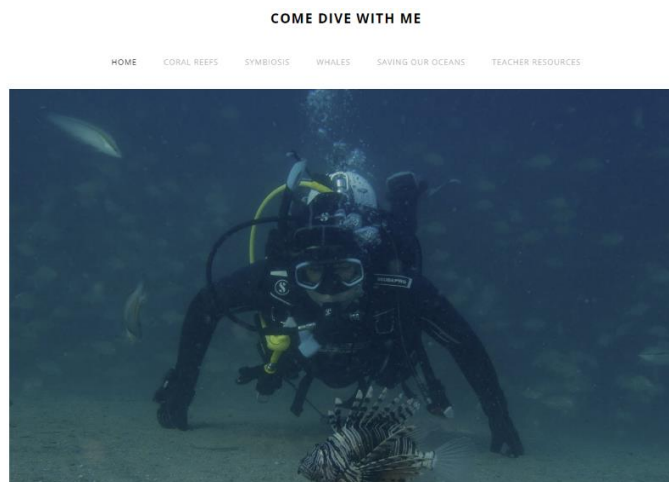
[Austin Macauley Publishers](#)

[Amazon](#)

[Amazon Australia](#)

For further resources and ideas, you can also visit the **Come Dive with Me** website.

<http://www.comedivewithme.com.au>



## CURRICULUM LINKS

[The following curriculum links can be found in the Australian Curriculum Version 9](#)

### Science - Year 4

#### [Science Understanding](#)

##### ***Biological Sciences***

Explain the roles and interactions of consumers, producers and decomposers within a habitat and how food chains represent feeding relationships. (AC9S4U01)

#### **Science Inquiry**

##### ***Questioning and Predicting***

Pose questions to explore observed patterns and relationships and make predictions based on observations (AC9S4I01)

##### ***Planning and Conducting***

Use provided scaffolds to plan and conduct investigations to answer questions or test predictions, including identifying the elements of fair tests, and considering the safe use of materials and equipment (AC9S4I02)

##### ***Processing Modelling and Analysing***

Construct and use presentations, including tables, simple column graphs and visual and physical models, to organize data and information, show simple relationships and identify patterns (AC9S4I04)

##### ***Evaluating***

Compare findings with those of others, consider if investigations were fair, identify questions for further investigation and draw conclusions (AC9S4I05)

##### ***Communicating***

Write and create texts to communicate findings and ideas for identified purposes and audiences, using scientific vocabulary and digital tools as appropriate (AC9S4I06)

#### **NOTE:**

Teachers might also consider outcomes from the following **General Capabilities** depending on what the skill focus of the unit is:

[Critical and Creative Thinking](#)

[Digital Literacy](#)

## LESSON SEQUENCE (May be completed across three of four sessions)

### Lesson Title: Exploring Symbiotic Relationships in the Marine Ecosystem

This lesson plan is designed to engage students in hands-on activities and discussions to deepen their understanding of symbiotic relationships in the marine ecosystem. It can be expanded to include skills and knowledge from any number of learning areas at the teacher's discretion.

**Objective:** Students will understand the concept of symbiotic relationships and identify different types of symbiotic interactions in the marine ecosystem.

#### Materials Needed:

1. Picture Book "Come Dive with Me" by Leonie McIlvenny
2. Visual stimuli resources (pictures, diagrams, videos of marine organisms)
3. Printed worksheets
4. Whiteboard and markers
5. Chart paper and markers
6. Internet access for research (optional)

#### Introduction (20 minutes)

1. Begin the lesson by discussing what students already know about the ocean and marine life. Ask questions such as:
  - What types of animals live in the ocean?
  - How do these animals interact with each other?
2. Suggest that today you will be reading a story about animals that live in the ocean. Suggest to students that after you have finished the story you will be asking them what is special about these animals.
3. Read the story "Come Dive with me" and then ask children what they learned from the story.
4. Introduce the concept of **symbiotic relationships**. Explain that symbiosis is a close and long-term interaction between two different species. Reread the poem stanza by stanza discussing the symbiotic relationship of the animals being described.
5. Discuss the three main types of symbiotic relationships: **mutualism**, **commensalism**, and **parasitism**. Use the examples from the book to group them.

#### Activity 1: Categorising symbiotic relations into groups (20 mins)

1. On the whiteboard, chart paper or an A3 sheet, create a chart with three columns labelled: Mutualism, Commensalism, and Parasitism.
2. Provide students with images of various symbiotic relationships (see examples provided).

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3. Ask the students to place each partnership image into the correct column. (Note: this can be done as a whole class, in small groups or individually).
4. Provide feedback / check that students have correctly placed images. (Note: some partnerships can be considered more than one type of symbiosis. Discuss as this issue arises).

**Extension:** For more able students allow them to add extra examples relationships they can find using available resources such as non-fiction books, videos, encyclopedias or online resources.

### **Activity 3: Research and Presentation (60 + mins)**

This activity can be short or extended depending on what inquiry skills you are seeking to teach. Specific inquiry skills related to each step have been added in brackets.

1. Assign each student or group a specific marine organism involved in a symbiotic relationship.
2. Have students research the organism's characteristics, its role in the symbiotic relationship, and how it benefits or is affected by the interaction. (Brainstorming, developing focus questions, undertaking key word searches using search engines, note taking).
3. Using the information that has been researched, have students create an information product. Examples include infographic, written report, digital presentation, oral talk. Scratch animation.
4. Allow time for students to create short presentations or an information product to share their findings with the class.

### **Conclusion (10 mins)**

1. Review the main concepts of symbiotic relationships in the marine ecosystem.
2. Discuss the importance of these relationships in maintaining balance and diversity within the marine environment.
3. Have students predict the implications if one of the partners in a symbiotic relationship were to be removed. How would this affect the biodiversity in the impacted habitat?
4. Encourage students to share any interesting facts they discovered during their research.
5. This initial introduction might be a springboard into other learning areas such as art, English (creative writing), and music.

**Assessment:** Assessment will depend on what skills and understandings have been targeted. For example, you might evaluate students based on their participation in class discussions, their accuracy in matching marine organisms to symbiotic relationships, and the quality of their research presentations. If you have also targeted other skills (e.g. ability to write effective research questions) then ensure you collect data on this as well.

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Assessment could include:

- A knowledge quiz on the various types of symbiotic relationships
- Ability to match various symbiotic partnerships.
- Inquiry process stages (e.g. ability to use search engines to locate required information)

For more ideas and a step by step through the Inquiry process why not visit [The Research Safari](http://researchsafari.com.au) (researchsafari.com.au).

# THE RESEARCH SAFARI

HOME   A-Z   INQUIRY PROCESS   DEFINING   LOCATING   SELECTING   ORGANISING   PRESENTING   EVALUATING  
MINI SAFARIS   TRAIL BLAZERS   TEACHER ZONE   LINKS

Helping you find your way through the jungle of information

It's a jungle out there..... a '*Jungle of Information*' that is, and when you have a research assignment to do you must navigate your way through a maze of resources to find what you are looking for. The Research Safari will help you find what you are looking for.



## BACKGROUND INFORMATION

### Key Words

Symbiosis, mutualism, commensalism, parasitism, host, symbiont, interaction, cooperation, associations, dependency, ecosystem, microbiome, mimicry, obligate,

### Definitions

**Symbiotic relationships** are close and long-term interactions between individuals of different species. These interactions can be categorized into three main types: mutualism, commensalism, and parasitism. Here's a definition for each:

### Mutualism

Mutualism is a symbiotic relationship in which both participating species benefit from the association. Each organism provides something that the other needs, resulting in a mutual advantage.

### Mutualism Examples

1. **Coral and Zooxanthellae:** Coral polyps and the photosynthetic algae (zooxanthellae) have a mutualistic relationship. The algae provide the coral with nutrients through photosynthesis, and in return, the coral offers protection and a place to live for the algae.
2. **Anemone and clownfish:** Clownfish seek refuge in the tentacles of sea anemones. The clownfish are protected from predators by the stinging tentacles, while they, in turn, provide the anemones with food scraps and protection from polyp-eating fish.
3. **Goby Fish and Shrimp:** Some species of gobies form mutualistic partnerships with snapping shrimp. The shrimp excavate and maintain a burrow in the sand, providing a safe shelter for both. The goby acts as a lookout for predators, and the shrimp shares the burrow.

### Commensalism

Commensalism is a symbiotic relationship in which one species benefits while the other is neither significantly harmed nor helped. The relationship is often characterized by one organism utilizing the resources or habitat of the other without causing harm.

### Commensalism Examples:

1. **Remoras and Sharks:** Remoras, also known as suckerfish, attach themselves to sharks using a suction cup on their head. They benefit from the shark's movement, gaining access to food scraps when the shark feeds, without harming the shark.

2. **Barnacles and whales:** Barnacles attach themselves to the skin of whales. They benefit by getting a free ride through nutrient-rich waters, and the whale is not significantly affected by their presence.
3. **Sea cucumbers and Pearlfish:** Pearlfish seek refuge inside the anus of sea cucumbers. While this may sound unpleasant, the relationship is commensal, as the sea cucumber is not notably harmed, and the pearlfish gains protection.

## **Parasitism**

Parasitism is a symbiotic relationship in which one organism (the parasite) benefits at the expense of the other (the host). The parasite usually harms the host to varying degrees, often by extracting nutrients, causing damage, or affecting the host's reproductive success.

### **Parasitism Examples**

1. **Parasitic Isopods and Fish:** Some parasitic isopods attach themselves to the tongues of fish, feeding on the blood and mucus. The isopod essentially replaces the fish's tongue but does not cause significant harm to the overall health of the host.
2. **Flatworms and Coral:** Some flatworms parasitize corals, feeding on coral tissue. This parasitic relationship can be harmful to the coral, affecting its health and growth.
3. **Lice and Fish:** Various species of fish can be hosts to parasitic lice. These lice attach themselves to the skin and gills of the fish, feeding on their blood and causing irritation and potential harm to the host.

*In summary, mutualism involves mutual benefit, commensalism involves one-sided benefit without significant harm, and parasitism involves one organism benefiting at the expense of the other. These types of symbiotic relationships are essential components of ecosystems and play a crucial role in the balance and functioning of natural environments.*

## **USEFUL SITES**

Kids Britannica - Symbiosis

<https://kids.britannica.com/kids/article/symbiosis/400286>

Symbiosis - The Art of Living Together

<https://education.nationalgeographic.org/resource/symbiosis-art-living-together/>

Symbiosis - Kiddle

<https://kids.kiddle.co/Symbiosis>

Video resources can be found at <http://www.comedivewithme.com.au/resources.html>

## FOCUS QUESTION

Many of these questions can be customized to a specific symbiotic partnership.

1. **What is a symbiotic relationship in the ocean?**

*Explanation:* Allow students to define the term based on their understanding of the relationships discussed.

2. **How do clownfish and sea anemones help each other in their symbiotic relationship?**

Encourage students to describe the mutual benefits that clownfish and sea anemones provide each other.

3. **Why do cleaner fish and client fish have a mutual relationship in the ocean?**

Have students explain the advantages that both cleaner fish and client fish gain from their symbiotic interaction.

4. **What does a hermit crab gain from having sea anemones on its shell?**

Explore the protective and mobile benefits that hermit crabs receive from their relationship with sea anemones.

5. **Why do some fish attach themselves to larger marine animals like sharks?**

Discuss the reasons behind commensal relationships, specifically focusing on remora fish and their attachment to sharks.

6. **How does the relationship between zooxanthellae and coral benefit both organisms?**

Help students understand the role of photosynthetic algae in coral reefs and the mutual benefits they share.

7. **What is unique about the interaction between manta rays and cleaner fish?**

Explore the cleaning stations and how manta rays and cleaner fish benefit from this mutual relationship.

8. **Why do barnacles attach themselves to whales, and how does it affect both organisms?**

Discuss commensal relationships and how barnacles benefit from attaching to whales without harming them.

9. **What would happen to a symbiotic partner if the other partner was no longer there?** Give an example. Shows how the removal of a species from the food chain can impact the biodiversity in that ecosystem.

10. **Why is it important for marine animals to form symbiotic relationships?**

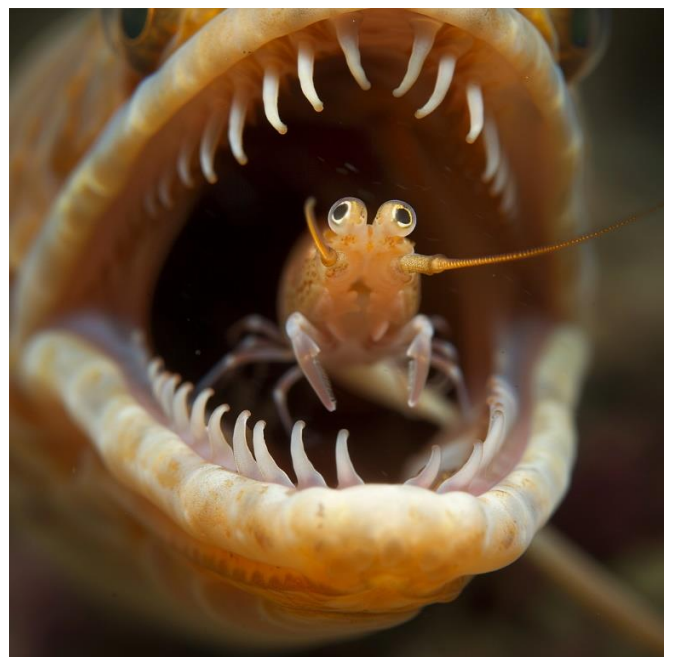
Encourage students to think about the advantages of symbiotic relationships in the ocean and how it contributes to the balance of marine ecosystems.

**Categorizing symbiotic partnerships**

Mutualism	Commensalism	Parasitism

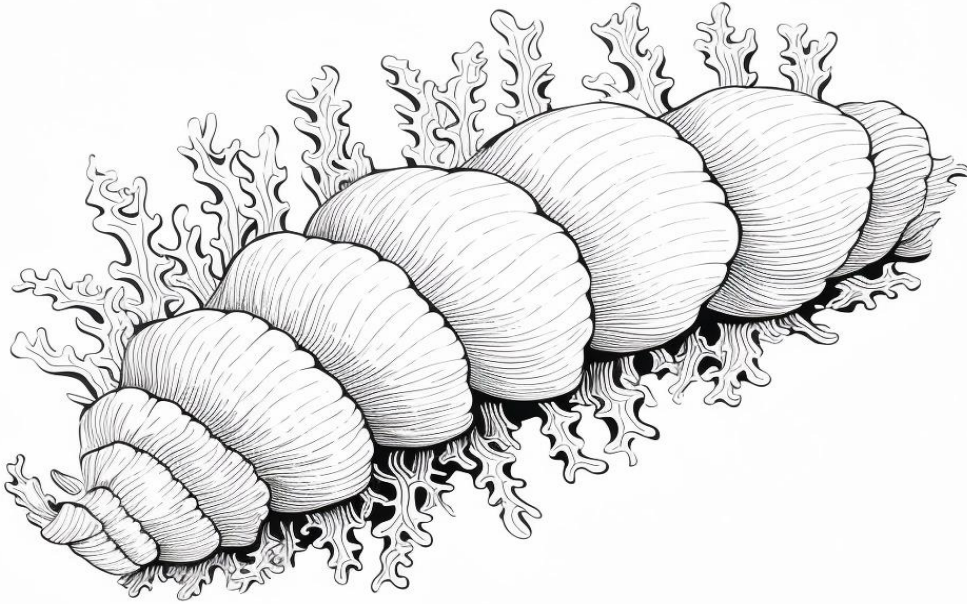
## Image Gallery

These images can be printed and cut out as flash cards for sorting or duplicated for SNAP or CONCENTRATION games or similar. See the **Come dive with Me** website for more images.

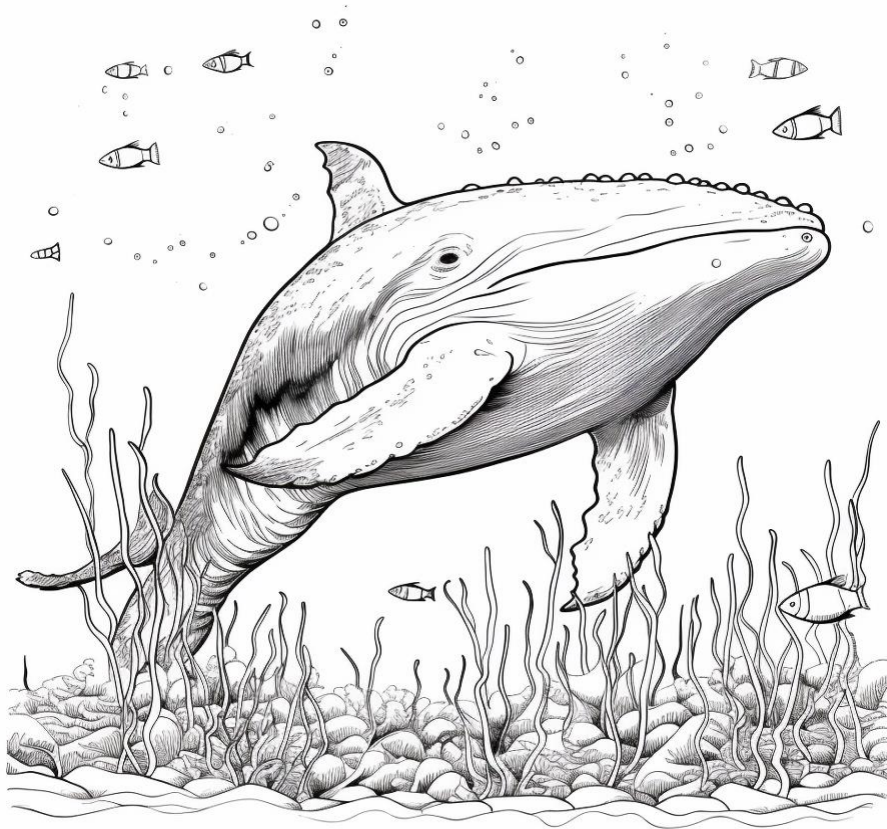


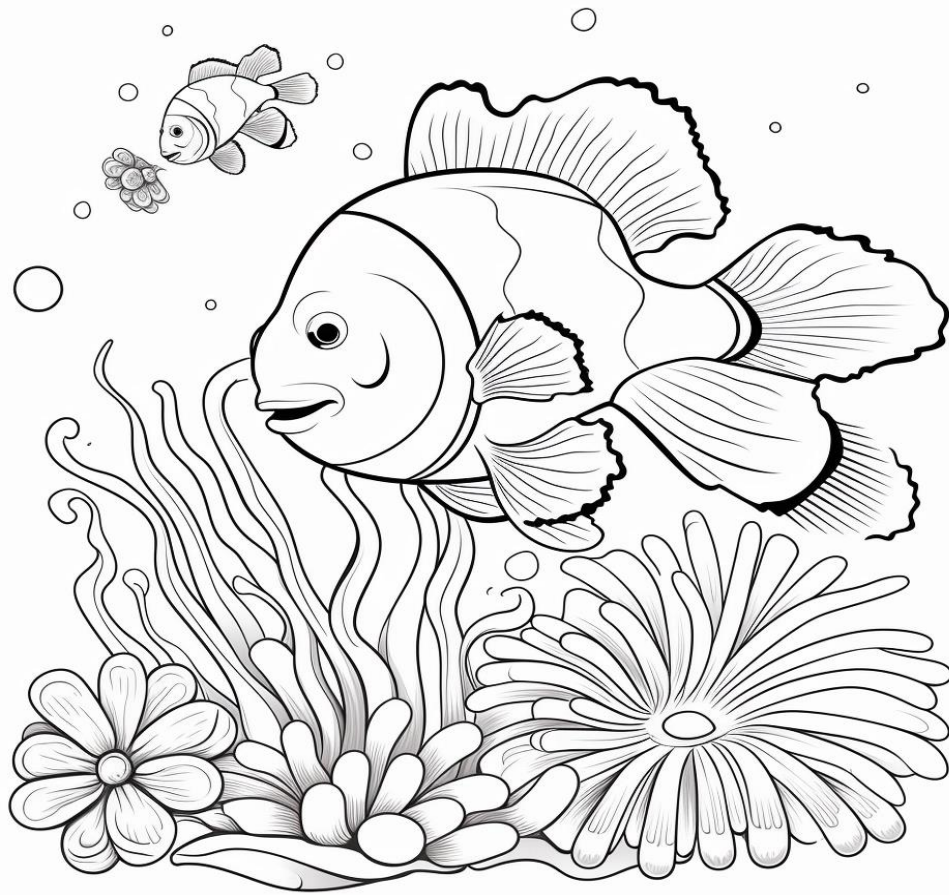
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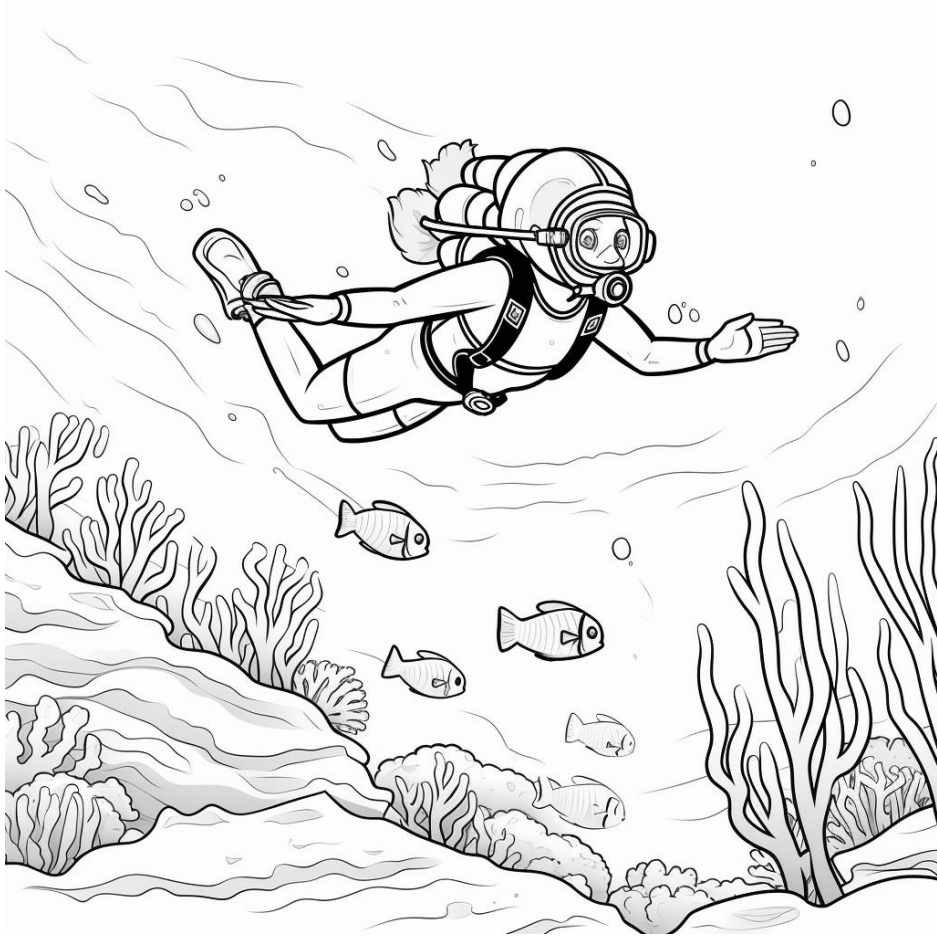

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Name: \_\_\_\_\_

Description	Food
Habitat	Protection
Symbiotic partner	Key Words

**NOTES**