



Our Island Environment

Commonwealth of the Northern Mariana Islands



Wildlife Conservation & Restoration Program, U.S. Fish & Wildlife Service
CNMI Division of Fish & Wildlife, Department of Lands & Natural Resources

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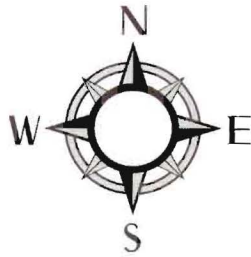
Standards and Benchmarks (Grade 3)

Content and activities are aligned with the following CNMI Science Standards and Benchmarks (Grade 3)

Standard	Benchmark
Science as Inquiry	<ul style="list-style-type: none">• Understand observation and investigation skills as a way to learn more• Question the nature of things and seek answers by collecting, counting, measuring, observing, describing, and discussing findings• Work individually and in teams to collect/share information and ideas
Habits of Mind	<ul style="list-style-type: none">• Know that learning can come from careful observations and simple experiments
Matter: Its Structure and Changes	<ul style="list-style-type: none">• Give examples of three states of matter• Demonstrate that matter can undergo physical changes
Planet Earth – Oceans and Land	<ul style="list-style-type: none">• Make observations about the environment and how things change• Classify plants and/or animals, living things and non-living things and describe similarities and differences
Living Environment	<ul style="list-style-type: none">• Diagram the life cycle of living organisms• Explain the process of how plants produce their own food• Explain how plants and animals obtain energy from food

The CNMI

We live on an island. Our island is part of a group of islands called the Commonwealth of the Northern Mariana Islands or CNMI. The island chain is made up of 14 islands that were formed from volcanoes thousands of years ago.



- Farallon de Pajaros (Uracas)
- Maug
- Asuncion

● Agrihan

● Pagan

● Alamagan

● Guguan

Philippine
Sea

● Sarigan

● Anatahan

Pacific
Ocean

● Farallon
de Medinilla

● Saipan
● Tinian
● Aguiguan

● Rota

Activity – Which Direction?

A **compass** is used to help people find direction.



N = North

E = East

S = South

W = West

Use the map of the CNMI on page 5 to answer these questions about directions.
Circle the correct direction.

The Pacific Ocean is _____ of the CNMI.

North

South

East

West

Tinian is _____ of Saipan.

North

South

East

West

Saipan is _____ of Rota.

North

South

East

West

The Philippine Sea is _____ of the CNMI.

North

South

East

West

Aguiguan is _____ of Pagan.

North

South

East

West

CNMI Islands - Where People Live

Look at the shape of the three main islands that make up the CNMI. You should be able to recognize each island by its shape.



Saipan



Tinian



Rota

These are the three main islands where people live in the CNMI. These are not the only islands that people live on. Other inhabited islands are Agrihan, Alamagan, and Anatahan. On the map below, circle all of the islands where people live in the CNMI.

● Farallon de Pajaros
(Uracas)



● Maug

● Asuncion



● Agrihan



● Pagan



● Alamagan



● Guguan



● Sarigan



● Anatahan



● Farallon
de Medinilla



Saipan

Tinian

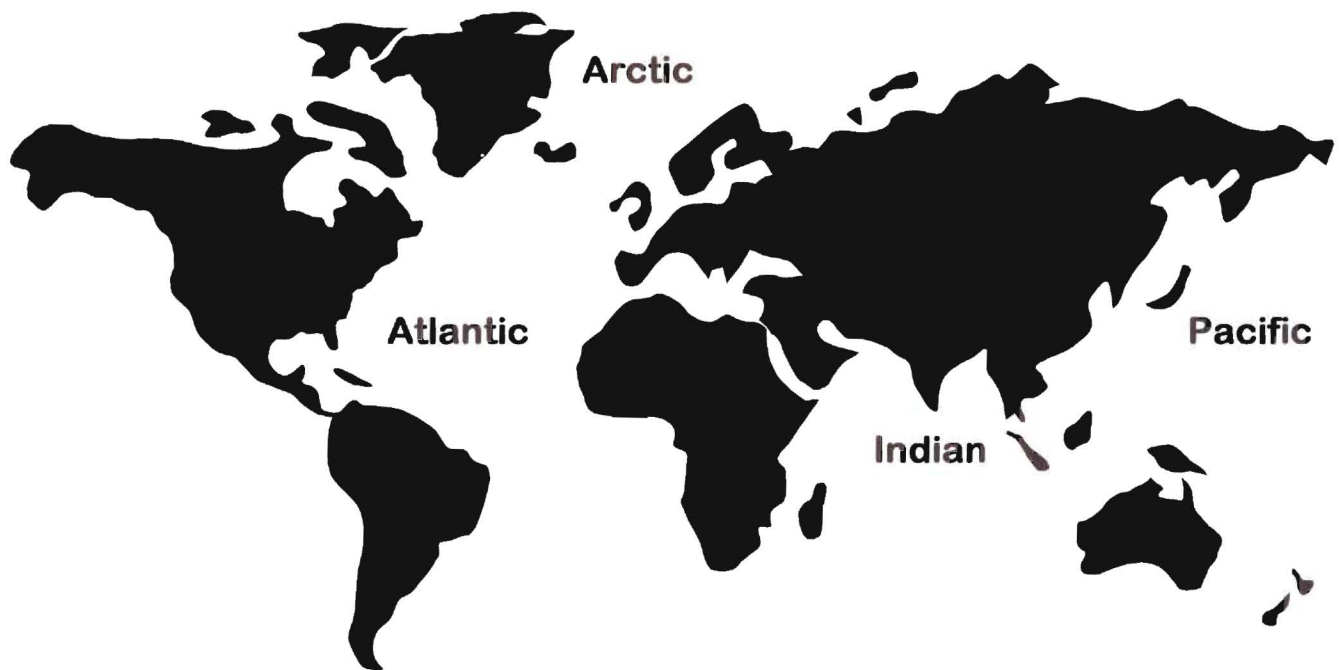
Aguiguan



Rota

The Oceans

The four oceans on the Earth are: Atlantic, Pacific, Indian and Arctic Ocean. The Mariana Islands are located in the Pacific Ocean. The Pacific Ocean is the largest ocean. The Arctic Ocean is the smallest ocean. Sometimes the ocean is called the sea.



The oceans are very salty. There is enough salt in the oceans to cover the land on the Earth with a layer that is 502 feet (153 meters) thick!

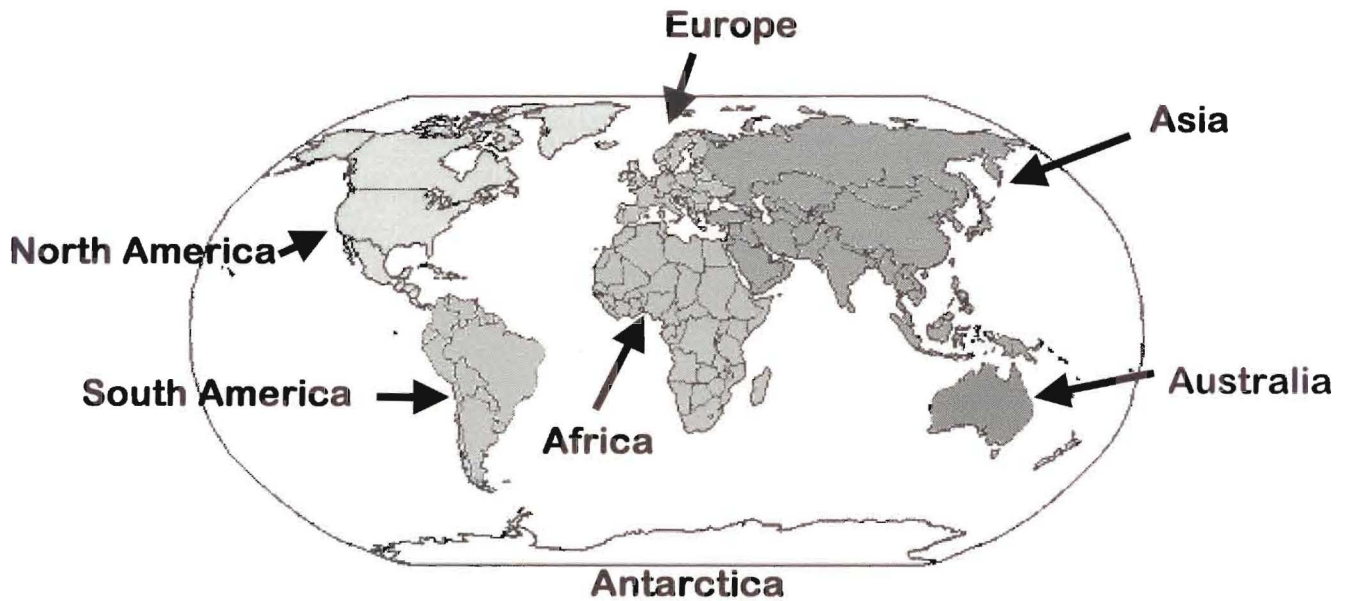
The oceans cover two thirds of the Earth's surface. 97% of all of the water on the Earth is in the oceans. That means that 97% of all of the water on the Earth is salty. We cannot drink water that is salty. The remaining 3% is in many places on the Earth such as in frozen glaciers, underground, and in the air. There is even a lot of water inside of plants and animals. Only 1% of the water on the Earth is fresh water that we can drink. That is why it is important to conserve water.

The oceans are very deep. The deepest part of the ocean is the Marianas Trench. It is located very close to the CNMI. The following table provides information on the average depth and deepest part of the oceans.

Oceans	Feet	Miles	Meters	Kilometers
Average Depth	13,124	2.49	4000	4
Deepest Part	35,838	6.79	10,923	10.92

The Continents

A continent is a large area of land. There are seven continents on the Earth. The largest continent is Asia. Mount Everest is the highest mountain on the Earth. It is found on the continent of Asia.



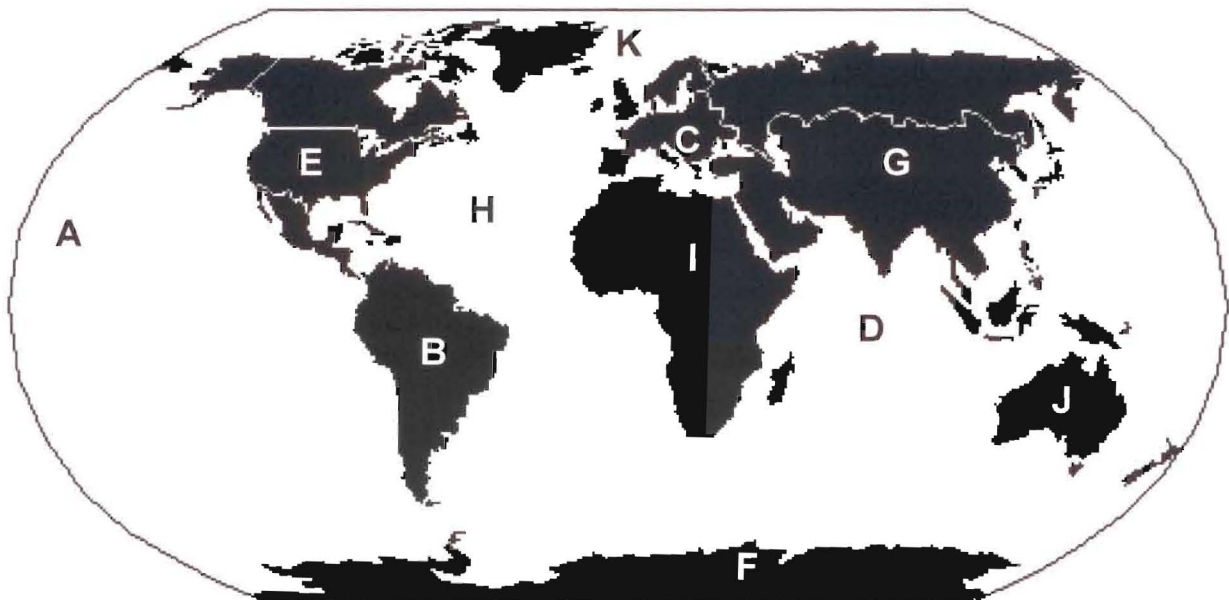
Review Questions – The Oceans and Continents

1. Only _____ of all of the water on the Earth is water that we can drink.
1 % 2% 3% 4%
2. The largest ocean is the _____ Ocean.
Arctic Pacific Atlantic
3. The largest continent is _____.
North America Africa Asia
4. Mount Everest is 29,208 feet (8848 meters). If Mount Everest was turned upside down and dropped into the Ocean, could it fit inside of the Marianas Trench?
Yes No

Oceans and Continents Review

On the map below, locate the following places. Place the letter of the correct label on the line next to each location.

- _____ Pacific Ocean
- _____ Atlantic Ocean
- _____ Indian Ocean
- _____ Arctic Ocean
- _____ North America
- _____ South America
- _____ Australia
- _____ Antarctica
- _____ Africa
- _____ Europe
- _____ Asia



Find the CNMI, the place where you live. Put a star on the map where the CNMI is located. Hint: the Commonwealth of the Northern Mariana Islands (CNMI) is in the Pacific Ocean. It is to the East of Asia.

The Three Forms of Water

Water has three forms:

1. Solid (ice)
2. Liquid
3. Gas (steam, vapor)

Review

Place an **S** on the water that is in the **Solid** form.

Place an **L** on the water that is in the **Liquid** form.

Place a **G** on the water that is in the **Gas** form.

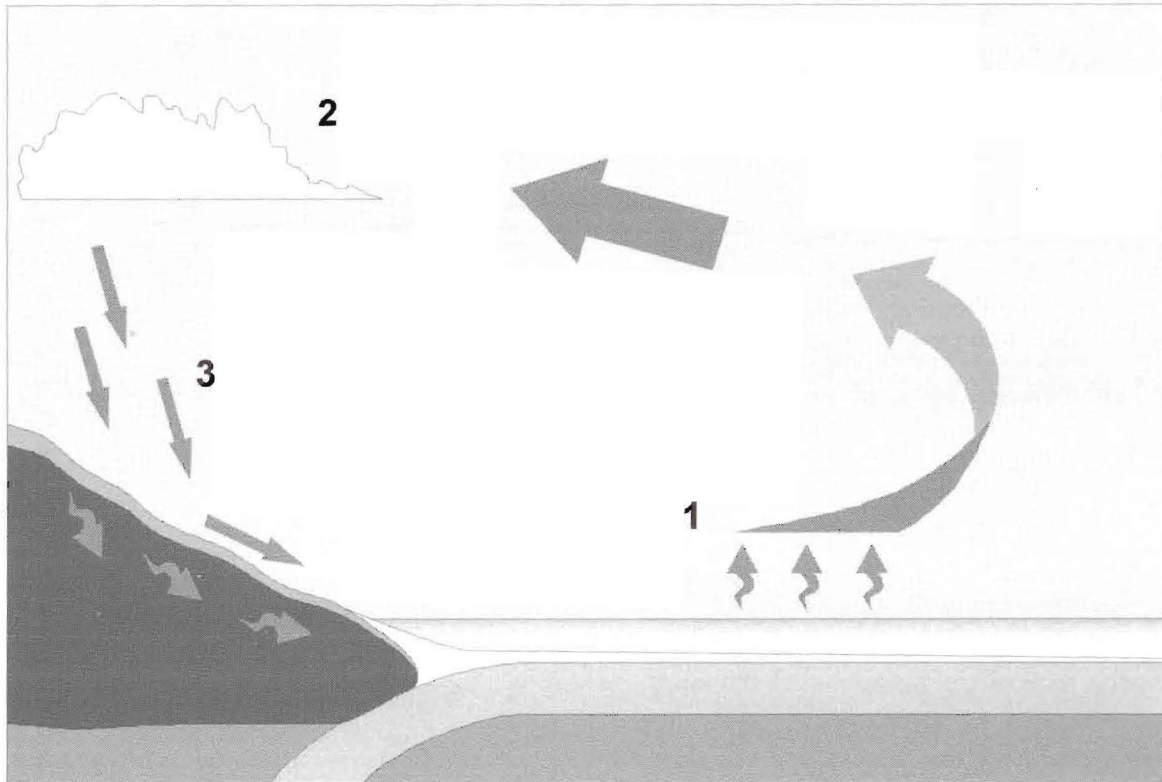


Observations: 1. Put ice cubes into a glass. Watch how they change from solid to liquid form. 2. Boil water. Watch how it changes from liquid to gas form.

The Water Cycle

There are three processes that occur during the water cycle.

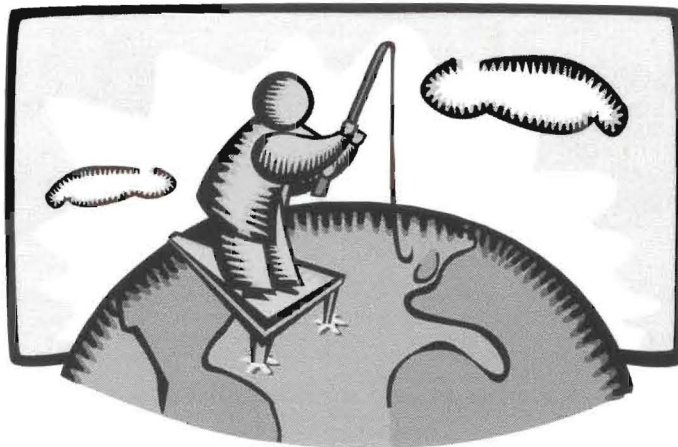
1. Evaporation
2. Condensation
3. Precipitation



1. **Evaporation** – The heat from the sun causes water to evaporate from oceans, lakes, rivers, and land. When water evaporates, it changes from the liquid form to the gas (vapor) form.
2. **Condensation** – Condensation happens as the water begins to cool. As the water vapor rises into the cooler, higher, air, it cools and condenses into tiny droplets to form clouds.
3. **Precipitation** – This happens when the water cools and condenses so much that droplets are too heavy to remain in the sky. When the droplets grow larger and heavier, they fall as precipitation, or rain. Precipitation can also be sleet, hail or even snow (but not here in the tropics!).

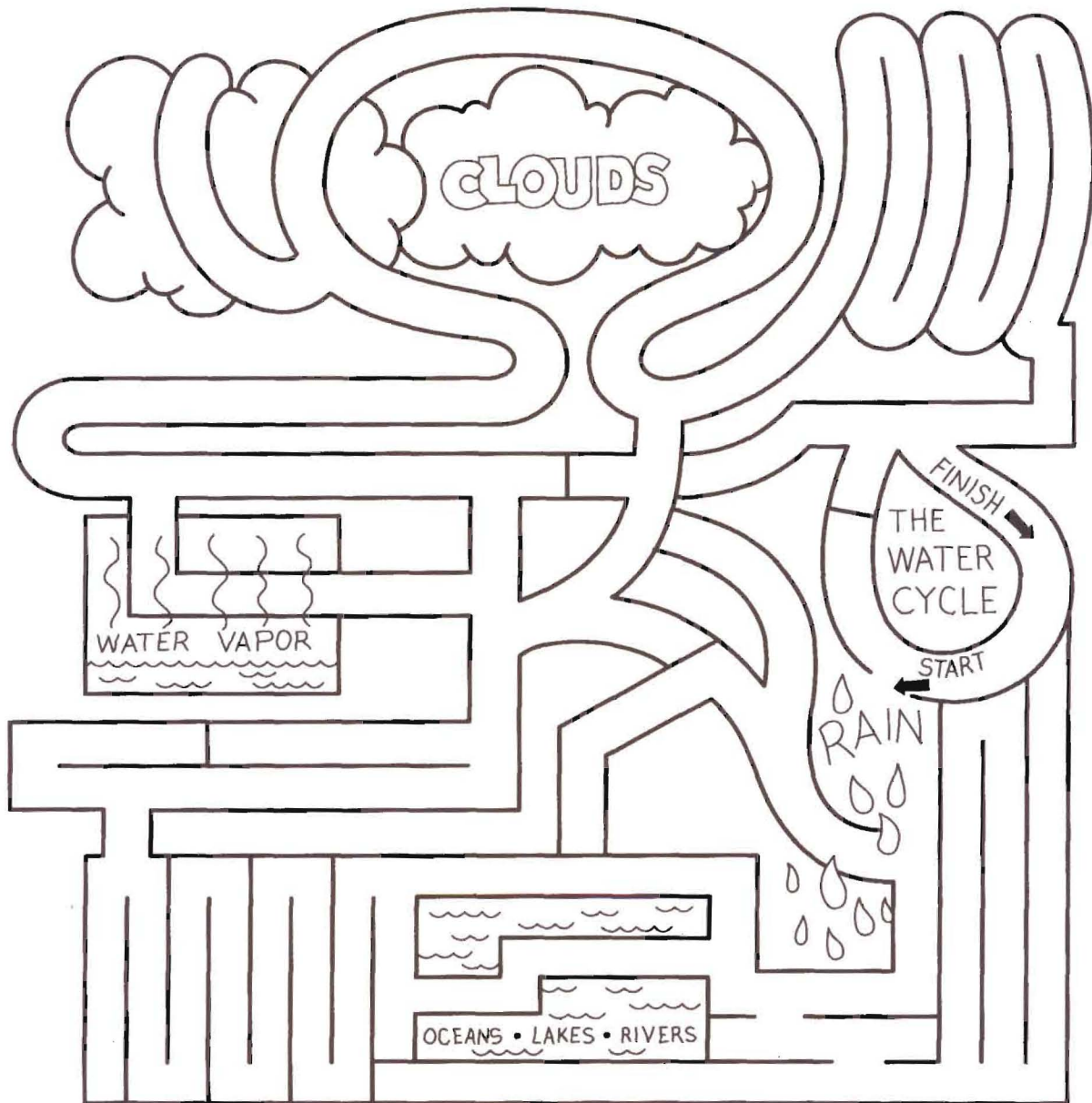
Water - Review Questions

1. The three forms of water are solid, _____ and gas.
2. Gas is also called _____ or steam.
3. Evaporation is when water in the _____ form turns into water in the gas form.
4. Precipitation is the same as _____. Sleet, _____ and snow are all forms of precipitation.
5. When water vapor (gas) rises, it cools to form _____ high up in the sky.
6. Two places on the Earth where water can be found are _____ and _____.
7. List at least two important uses of water:
 - 1.
 - 2.
8. We should never waste water. That is because not all of the water on the Earth can be used and because all living things need water. Only _____ % of all of the water on the Earth is in a form that we can use.
9. List three things that you can do to conserve water in your home.
 - 1.
 - 2.
 - 3.



Water Cycle Maze

A cloud is a mass of many water droplets or small pieces of ice that float together in the air. Clouds are part of the water cycle. Help the raindrop go through the water cycle.



How many different animals can you find hiding in this picture?



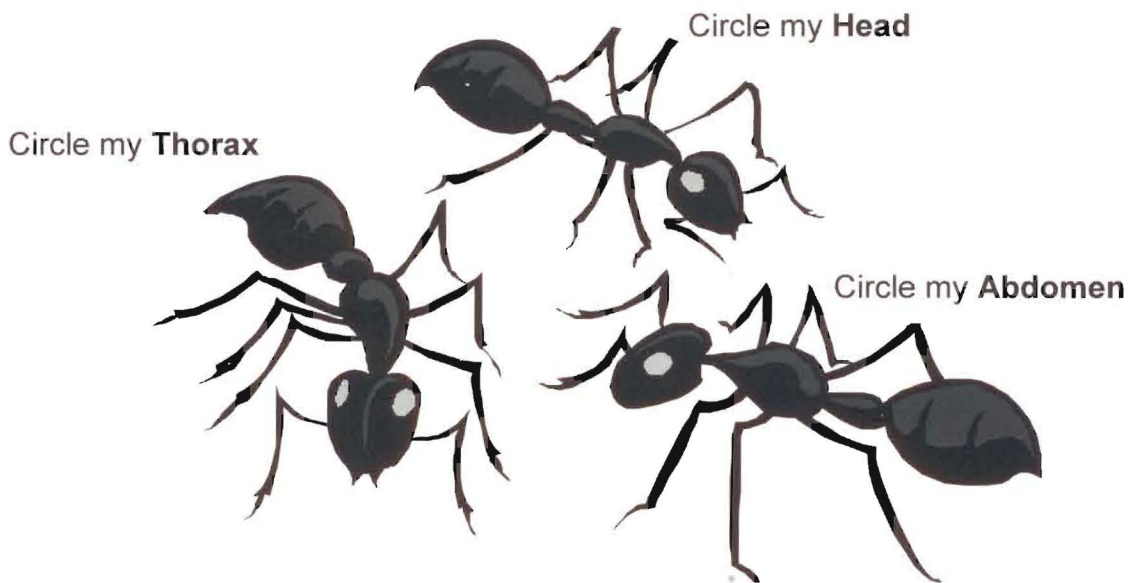
Amazing Insects

On our islands (CNMI), there are only about 2000 different species of insects. This may seem like a lot of different kinds of insects. However, that number is **really** low compared to how many insects there are in the world. It is estimated that there are about 30 million different species of insects in the world.

There are two reasons that there may not be a lot of insects here in the CNMI. The first reason is that there are not a lot of different habitats for insects. That is because there is not a lot of land in the CNMI. The second reason is that the islands are very isolated. For millions of years, it was difficult for insects to migrate to these islands. Many species of insects arrived in our islands about 3,500 years ago. That is when the ancient Chamorros arrived, and with their food and belongings, there were insects. Other insects arrived with ships and cargo from all over the world.

The body of an insect contains a head, a thorax, and an abdomen. The **head** is where the antennae, eyes, and mouthparts are. The **thorax** has three pairs of segmented legs and one or two pairs of wings attached to it. The **abdomen** contains the digestive and reproductive organs.

Find the body part of each ant.



Insects belong to a larger group of animals called **Arthropods**. There are many groups of Arthropods. They include insects, arachnids (spiders and their relatives), centipedes, millipedes, and crustaceans. The crustacean group includes crabs, lobsters, and shrimp. Arthropods have a hard outer covering called the **exoskeleton**. As they grow, they must shed their exoskeleton. This process is called **molting**.

Insects change form as they grow from egg to adult. The process of change is called **metamorphosis**. A butterfly is an example of an insect that has complete metamorphosis. The caterpillar is the larvae stage of the life cycle.

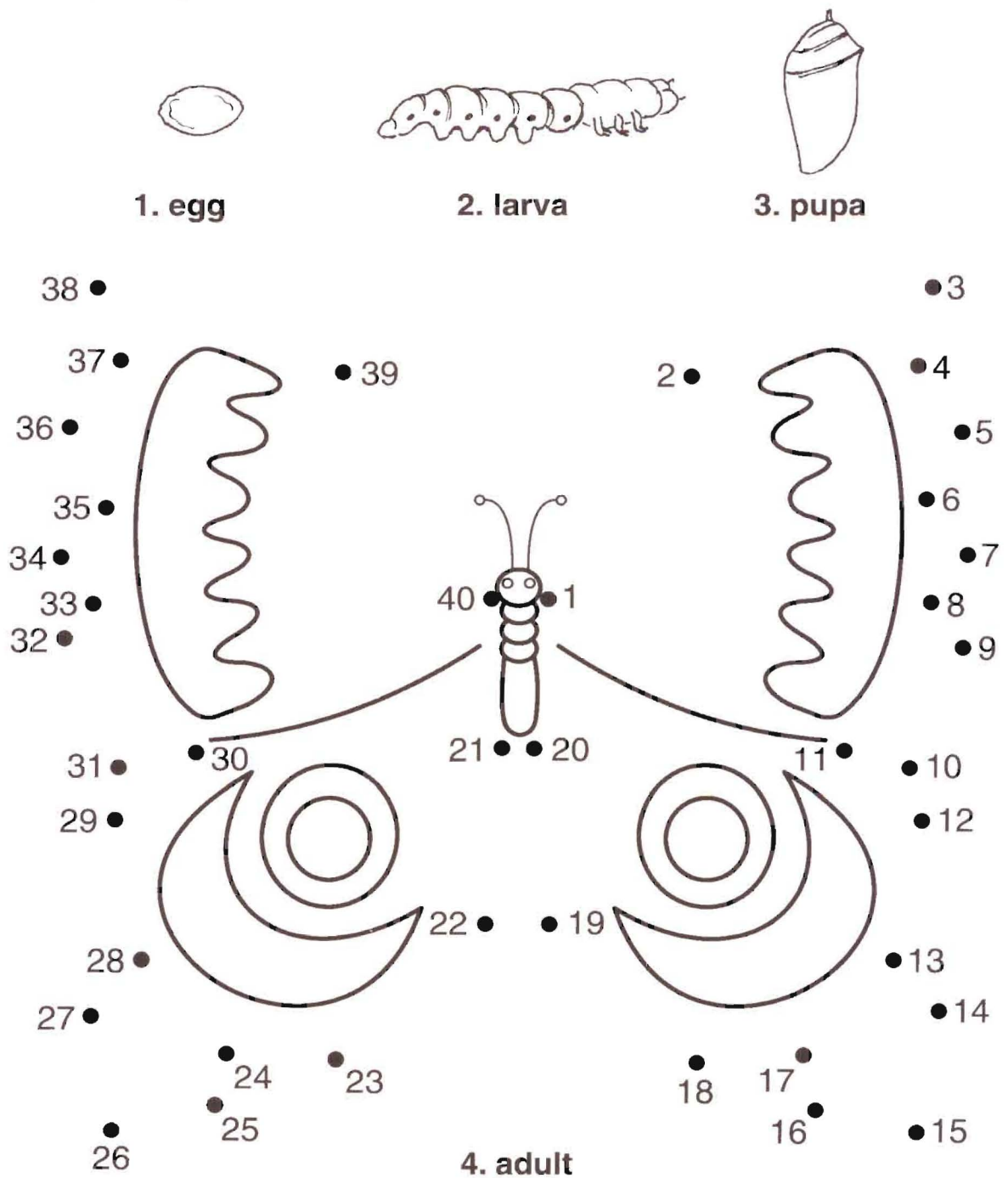
Find the Insects

These 10 animals are all Arthropods. Only 5 of the 10 Arthropods below are insects. **Circle each of the 5 insects.**



Insect's Life Cycle – Connect the Dots

An insect is an animal with six legs, wings, a body that is divided into three sections, and an exoskeleton instead of a backbone. Connect the dots to see the fourth stage of this insect's life cycle.



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Amazing Insects – Review Questions

1. How many different kinds of insects are in the CNMI (estimate)?
2. How many different kinds of insects are in the world (estimate)?
3. Describe two ways that insects came to the CNMI.
4. What are the three body parts of an insect? Describe each part of the insect.
5. Name three different animals that belong in the Arthropod group.
6. What is the outer covering of an Arthropod called?
7. What is molting?
8. What is metamorphosis?
9. What are the four stages in the butterfly's life cycle?



Ayuyu Game – Teacher's Directions

Objectives

To introduce students to the basic concepts of conservation and resource management through a fun, role-playing activity.

To introduce students to the rationale behind resource management regulations.

To familiarize students with concepts such as legal seasons, legal sizes, bag limits, season limits, and legal methods for harvesting.

Introduction

1. Introduce topic of coconut crabs.

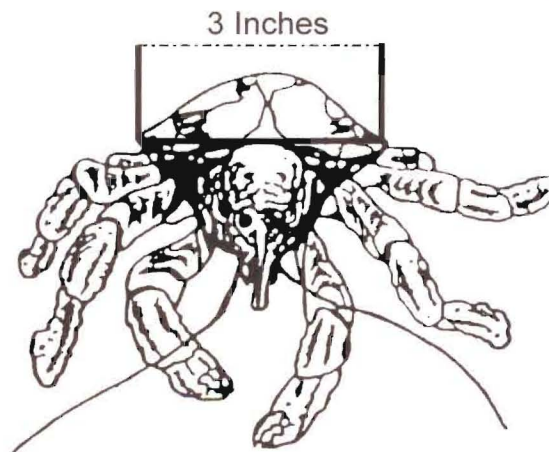
Show picture and ask:

What is the local name? (ayuyu: pronounced azuzu) Has anyone ever seen a live coconut crab? Has anyone eaten a coconut crab? Are they good to eat? Has anyone ever gone hunting for coconut crabs? Does anyone want to go hunting for coconut crabs today?

2. Let's play a game. Let's pretend that today we're going hunting for coconut crabs.
3. Hand out one ayuyu coloring sheet to each student. Ask them to color the ayuyu and then cut them out. These will be the ayuyu that we will be hunting.
4. While students are coloring the crabs, point out the body parts such as the back, head, powerful claws used to break open coconuts, legs, eyes mouth, antennae, etc.
5. Briefly go over the life history (life cycle) of the coconut crabs mentioning that:
 - a. They begin their lives in the ocean; mother crabs lay their eggs in the ocean;
 - b. The tiny crabs float around for a few months then climb inside a seashell and crawl up on the beach; at this time they look a lot like hermit crabs;
 - c. Soon the crabs leave their seashell and depend on their own hard shell for protection;
 - d. They hide during the day in holes that they dig or holes in the limestone rocks;
 - e. They come out at night to look for food and they eat almost anything, including fruits, plants, rotten wood and their favorite food, of course, is the coconut. Using their strong claws, they tear away the tough coconut husk and then, somehow, crack the nut inside;

- f. Full grown crabs have no natural enemies or predators other than man; young crabs may be eaten by rats, pigs or monitor lizards;
 - g. In some places people have eaten many of the coconut crabs. Here in the CNMI, big crabs are very hard to find and even small crabs are getting harder and harder to find.
6. Ask – What is the first thing that we need to do before we go hunting for ayuyu? We need to find out the rules for hunting them.
- a. Go to the Fish and Wildlife office to get a license and find out the rules;
 - b. Legal hunting season is from September 15 to November 15; explain that this is the only time we're supposed to hunt them;
 - c. Legal size is 3 inches or more measured across the back; - we cannot catch any crab that is smaller than three inches across the back.

Demonstrate how to measure the crabs.



- d. Ayuyu may be taken by hand only, no guns, spears, knives/ or machetes; (must be careful)
 - e. No females with eggs may be taken; eggs are located under the body;
 - f. Bag limit (max. number of crabs that may be taken per day) is 5
 - g. Season limit (max. number that may be taken per season) is 10
7. Now that we have our license and we know the rules, we are ready to go hunting.

What do we need to bring? (flashlight, strong bag, shoes, ruler or other measuring tool, gloves, mosquito repellent, etc,)

Where do we go to hunt them? (forest, undisturbed place with many coconut trees)

When do we go? (at night, full moon is better; remember the legal hunting season)

Do we go alone? (no)

How must we act? (must walk quietly, not make any noise, look around and listen carefully)

Any safety precautions? (watch where we are walking, be careful of the ayuyu's claws, no fires, etc.)

Note: suggest bringing props to class

8. Collect all the ayuyu that the students have colored and cut out. Announce that the classroom is our pretend forest or coconut grove where many coconut crabs live.
9. Next divide the class into two groups. One group will be the hunters, send them outside with their bags, flashlights, rulers, license, etc. The other group can be coconut trees; they can help hide the cut out ayuyu around the classroom. Turn off the lights to simulate darkness.

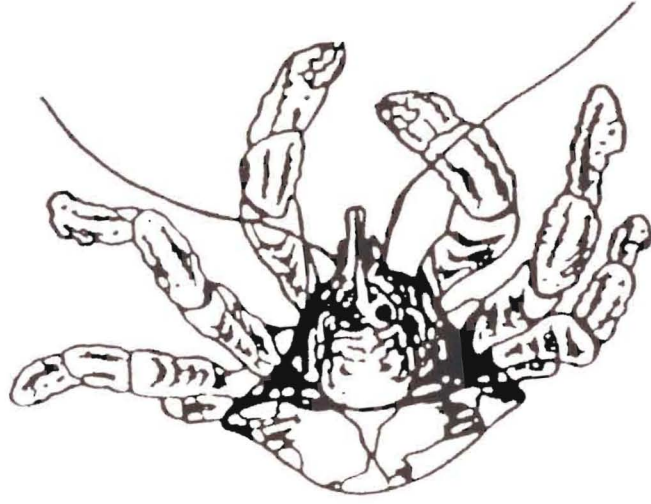
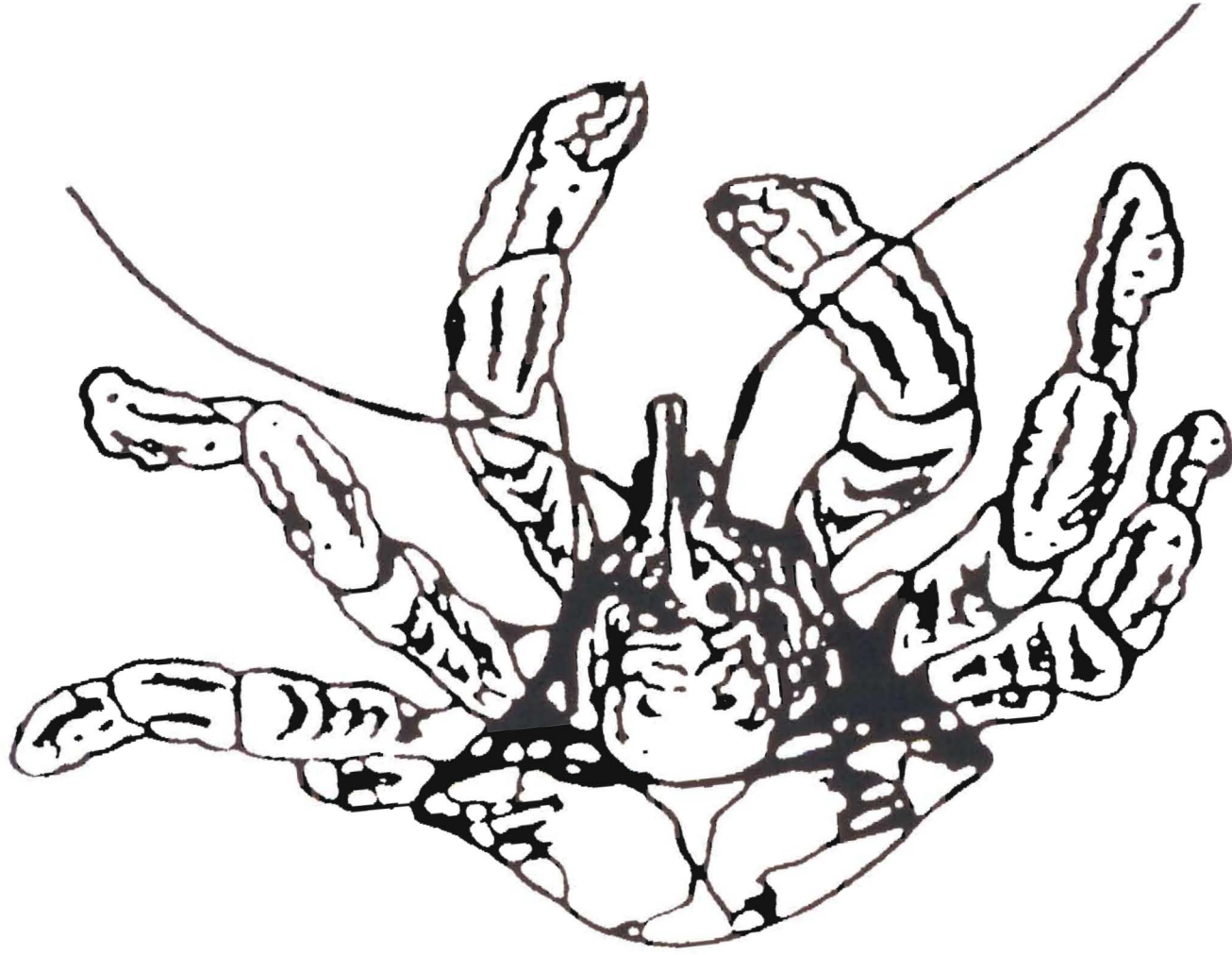
Bring the hunters in and have them start hunting for the ayuyu that have been placed around the classroom. Stress that they have to move quietly and not make noise. Also stress that they may only keep ayuyu that are more than three inches across the back. (you may want to have them practice measuring beforehand)

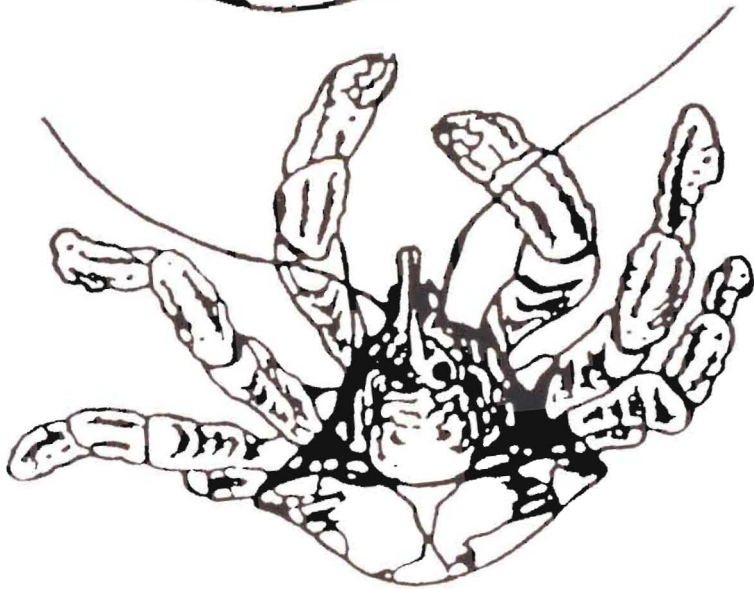
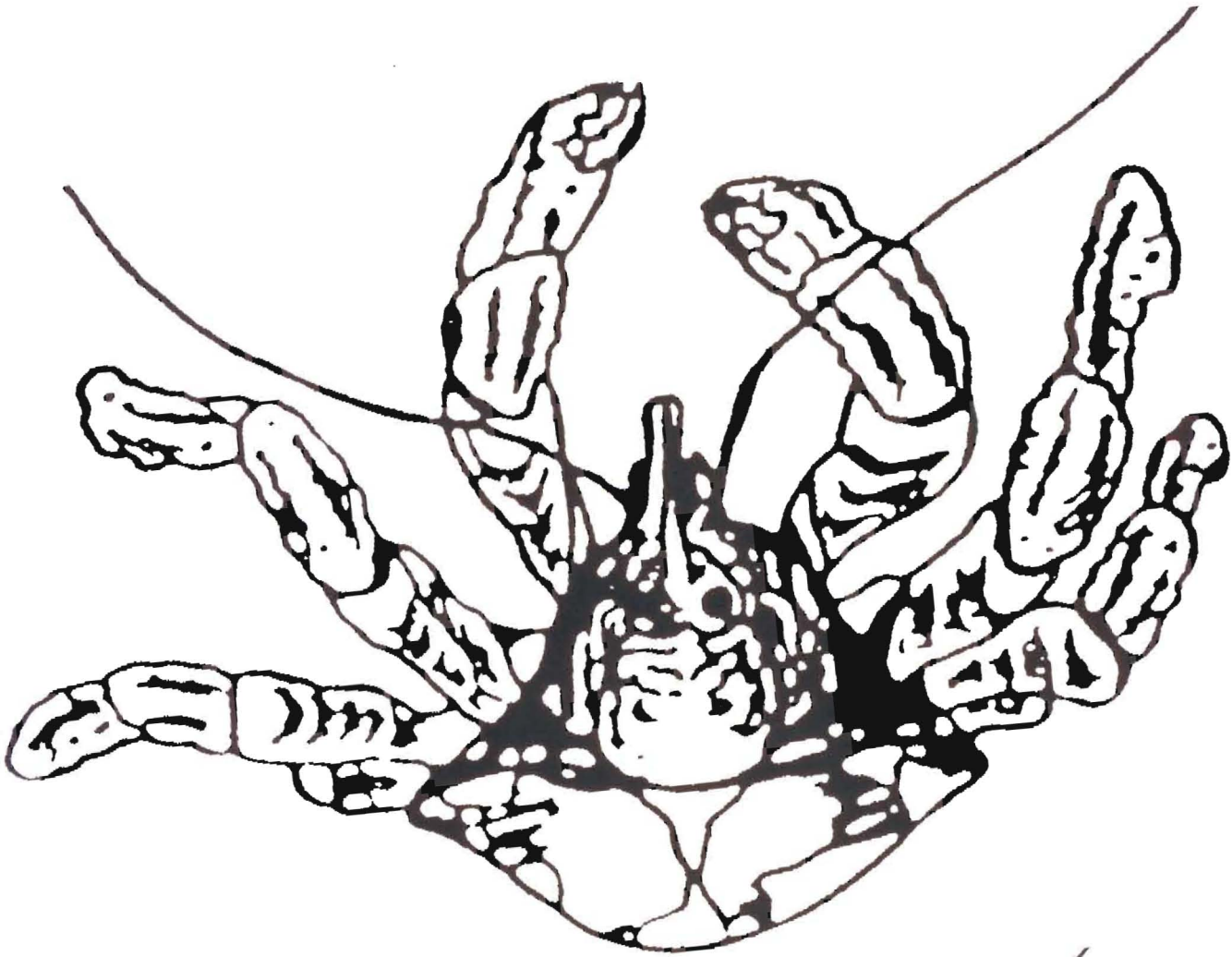
10. After most of them have found, measured, and caught a few crabs, or after a reasonable length of time, call them back. How many crabs did each hunter catch? How many did the whole group catch?

Did anyone catch any crabs under size? (shame, shame, take away their license)
Did anyone catch more than the legal bag limit? (shame, shame, take away their license) Did anyone get pinched? (Ha! Ha!)

11. Have groups switch roles and repeat.
12. Have students answer the discussion questions
13. Go over the answers to the questions as a class.

Ayuyu – for Coloring and Cut Outs





Ayuyu Game – Discussion Questions

1. What will happen if people caught more ayuyu than they're supposed to (i.e. more than the limit)?
2. What will happen if all of the small crabs are caught?
3. Why do we have a three-inch size limit?
4. What happens when we reduce the amount of area that crabs live in (i.e. we make the forest smaller)?
5. Why are we supposed to hunt ayuyu only during the season from September to November?
6. Do we want to have more crabs in the future? Why?
7. What can WE do to help make sure we have coconut crabs in the future?

Answers to Discussion Questions

1. What will happen if people caught more ayuyu than they're supposed to (i.e. more than the limit)?

Answer - soon, no more crabs.

2. What will happen if all of the small crabs are caught?

Answer - soon, no more crabs.

3. Why do we have a three-inch size limit?

Answer - to let the crabs get big enough to reproduce so that they can replenish the population.

4. What happens when we reduce the amount of area that crabs live in (i.e. we make the forest smaller)?

Answer - Use the analogy of cutting the classroom in half, then there wouldn't be enough places for all the crabs to hide, therefore, less crabs. (If we want to continue to have coconut crabs, we need to preserve the areas where they live.)

5. Why are we supposed to hunt ayuyu only during the season from September to November?

Answer - So we don't disturb the crabs during their spawning (reproductive) season.

6. Do we want to have more crabs in the future? Why?

Answer – YES. For their beauty, for a balanced ecosystem (balance in nature), and for food for us.

7. What can WE do to help make sure we have coconut crabs in the future?

Answer - obey the regulations; teach others about the regulations and why we should obey them; scold anyone who doesn't follow the regulations and report them to CNMI Division of Fish and Wildlife or to the Police; protect and preserve the forests.

The Story of Alicia Ayuyu

By Olympia Terrel

Alicia Ayuyu was on her way back to the seashore. She had been living up in the jungle eating fruits, plants, and rotten wood every night. In the daytime she would sleep in a cave in the limestone rocks.

Life was good for Alicia, but it was about to get better. Her *dagan* was getting bigger and bigger which made her very happy. She was making eggs, which she would need to release in the ocean. She loved going down to the beach because that meant she would have a chance to see her best turtle friend Tyrone.

Being a coconut crab, Alicia had to be careful once she left the forest to return to the sea where she was born. Everyone on Saipan, Tinian and Rota loved to catch coconut crabs and eat them. Everyone said coconut crabs were *manggé*: everyone except Gabriela and her mother.

Ever since Gabriela learned that there were fewer and fewer coconut crabs on Saipan she wanted to help them. Her last name was Ayuyu, so she felt that since her last name meant coconut crab she should be their protector. Every year when the moon is right and the coconut crabs start heading to the ocean to lay their eggs, Gabriela and her mother stay out late at night helping the crabs get to the sea. If they come across any crab hunters they ask them to look and see whether or not the crabs have eggs. If the crab's *dagan* is full of eggs they ask the hunter to release her so that there may be more coconut crabs born. Usually the hunters do what Gabriela and her mother ask. Gabriela didn't know that one of the crabs they took to the sea one night was named Alicia.

As Gabriela put Alicia down on the rocky coast she looked out in the ocean and saw a turtle. She smiled because she thought seeing a turtle was good luck. Gabriela didn't know that the turtle was named Tyrone and that he was waiting for Alicia.

Alicia waved a claw at Tyrone and slipped down to the edge of the waves. They had a lot to talk about since last year. Tyrone told Alicia all about how he swam to Pagan for a big family reunion. No people live on Pagan, so it is a safe place for turtles to meet. He told her all about floating with the currents and swimming through the corals. She loved to hear stories about

the ocean. They reminded her of when she was a little girl-crab floating on the sea.

She was happy to see Tyrone and to hear about his adventures, but also because he would make sure that her eggs got safely out into the deep water so that they could hatch into baby coconut crabs. Tyrone would swim along side the eggs and watch out for hungry fish. If a fish came to eat some of the eggs he would chase it away and give the crabs a chance to be born.

Alicia and Tyrone talked and talked until they realized it was almost sunrise. She released all her eggs into the water and the friends said goodbye until next year. Using his flippers Tyrone gently pushed the eggs farther and farther from shore keeping an eye out for hungry fish.

Gabriela and her mother went back home happy that they were able to help some coconut crabs get to the sea. Alicia climbed back to the limestone forest, happy to know that her eggs were safe with her turtle friend. Tyrone swam out to sea, happy that he could help make sure Alicia's eggs hatched into baby crabs. Have you helped anyone today?

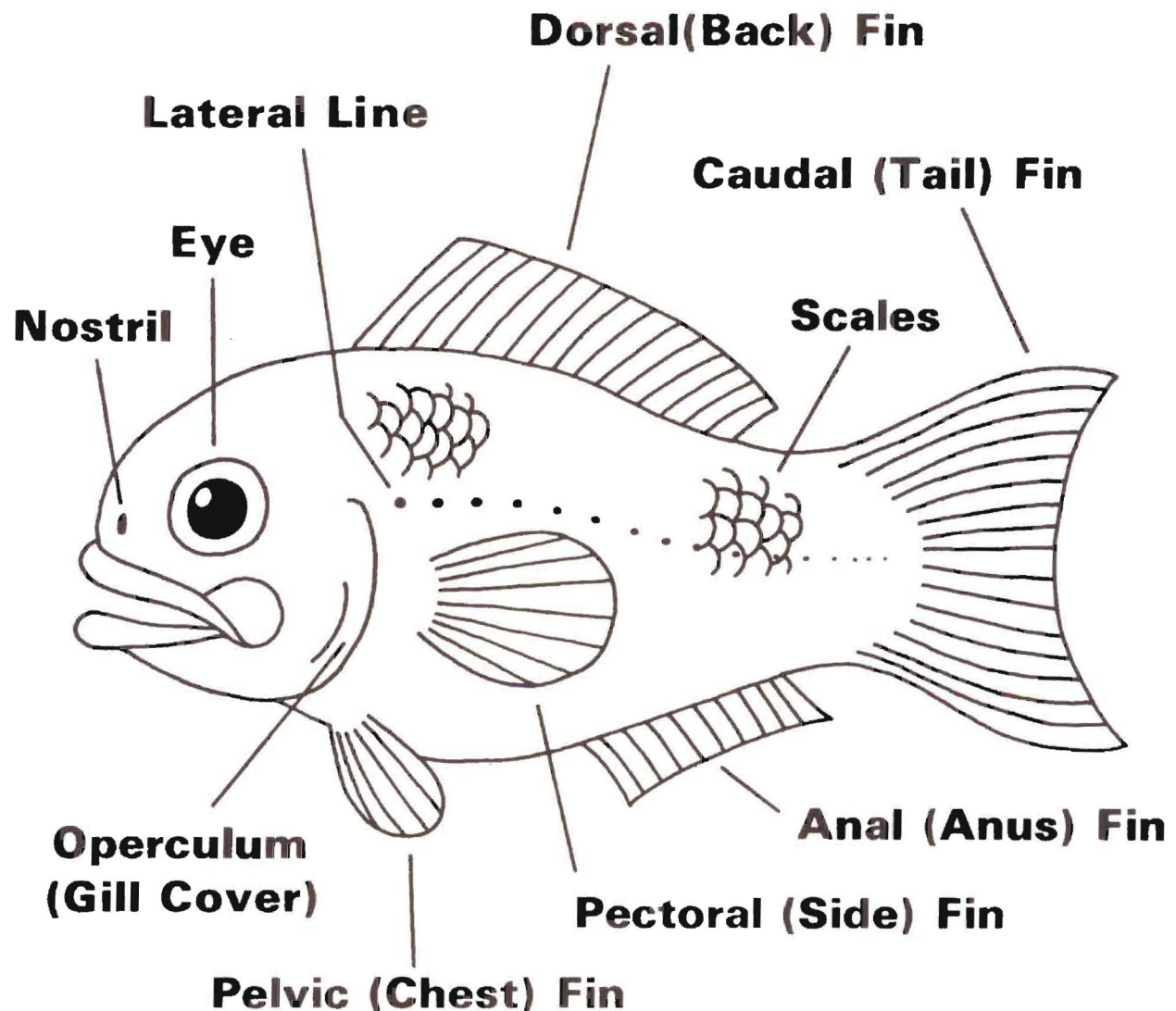
Review Questions - Alicia Ayuyu

1. What is the habitat of the adult coconut crab?
2. What do coconut crabs eat?
3. When do the coconut crabs eat?
4. Where does the female coconut crab lay her eggs?
5. How do Gabriela and her mother help coconut crabs?
6. What happens to the eggs after the female lays them?
7. How did Tyrone help Alicia?

Fish – External Anatomy

Fish do not breathe through their nostrils. Their **nostrils** are used to smell. Fish breathe through their gills. They have a hard, outer covering to protect their gills. That covering is called an **operculum**. Fish have a lateral line which is made up of holes or pores along the side of the body. The **lateral line** is used to detect other moving fishes, animals, and objects from the disturbances that they make. It is the lateral line that helps schools of fish change direction at the same time.

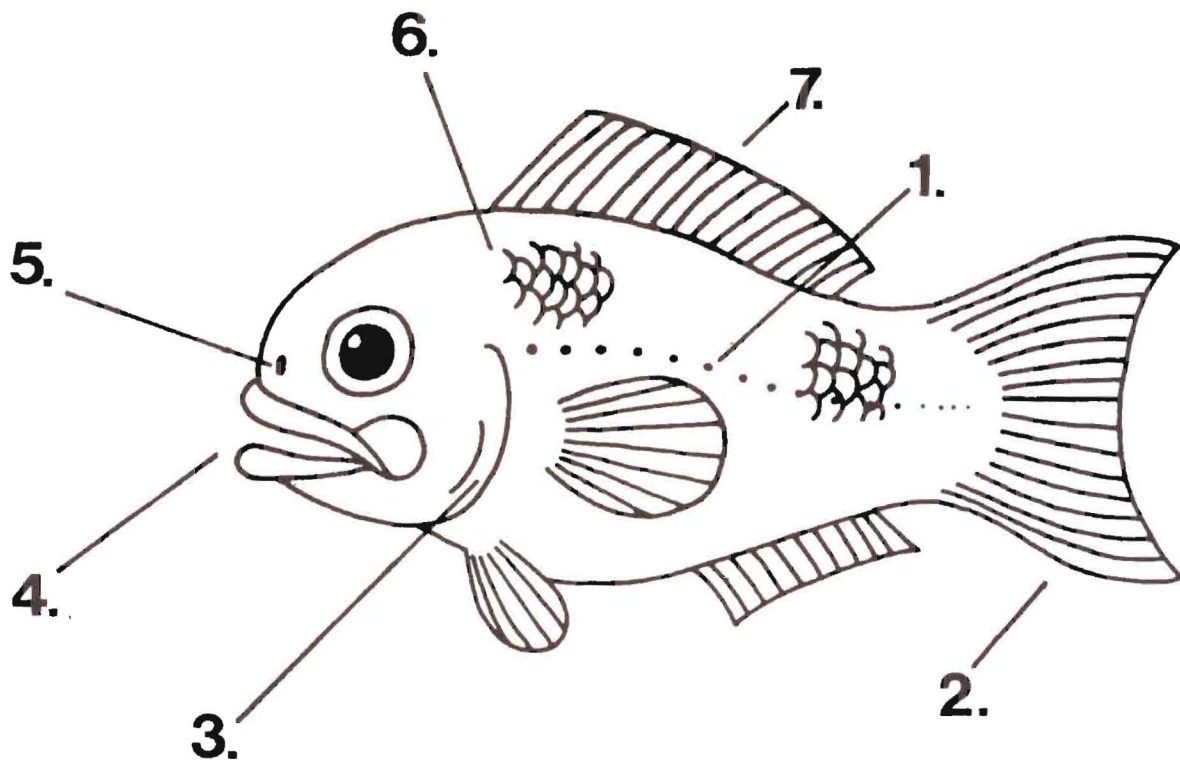
The **caudal fin**, or tail fin of a fish provides the fish forward motion. The **pectoral fins** are used to help fish change direction.



From Fishy Activities for Your Small Fry, used with permission.

Fish – External Anatomy Labels

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

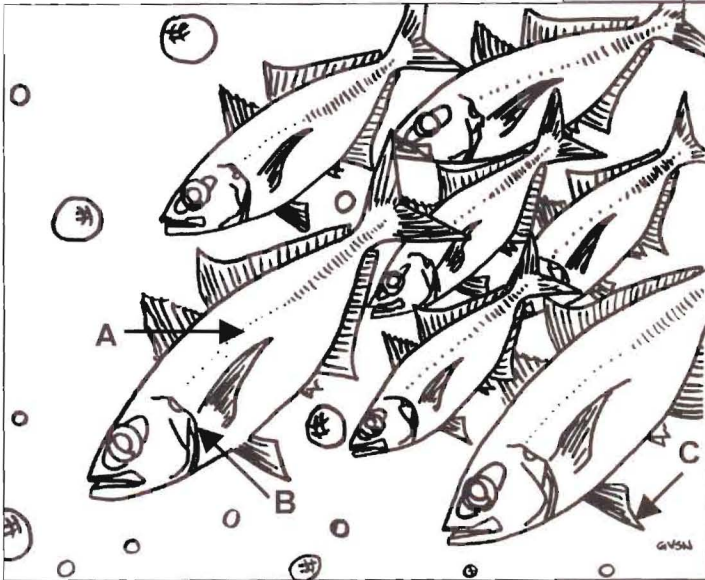
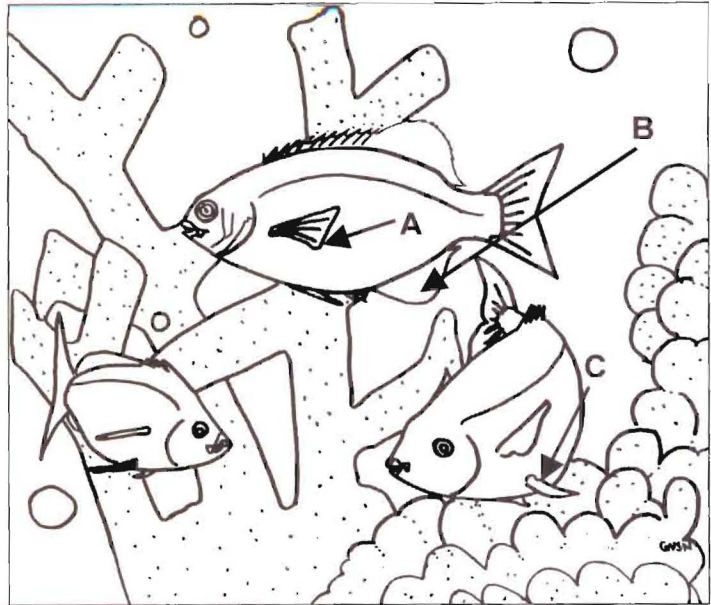


From Fishy Activities for Your Small Fry, used with permission.

Fish Anatomy Quiz

Label the parts of the **Rudder Fish**.

- A. _____
 B. _____
 C. _____

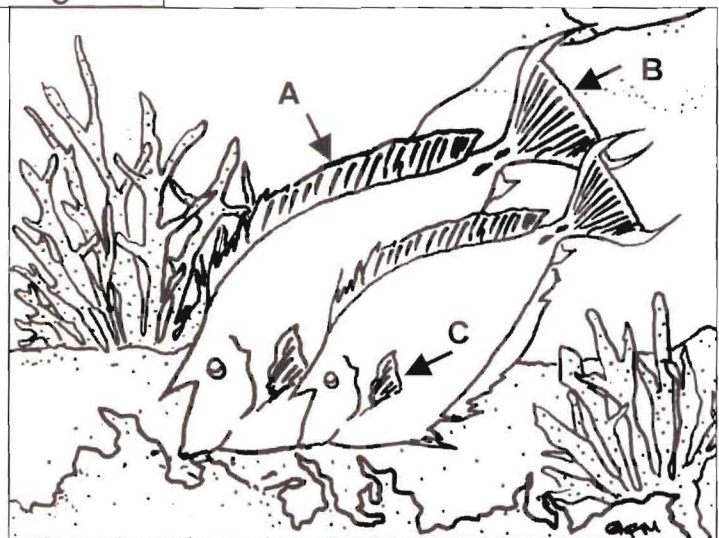


Label the parts of the **Big Eye Scad**.

- A. _____
 B. _____
 C. _____

Label the parts of the **Unicorn Fish**.

- A. _____
 B. _____
 C. _____

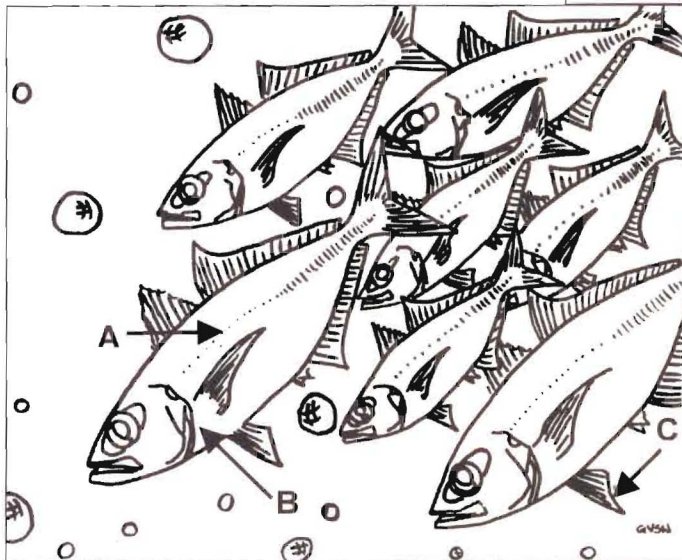
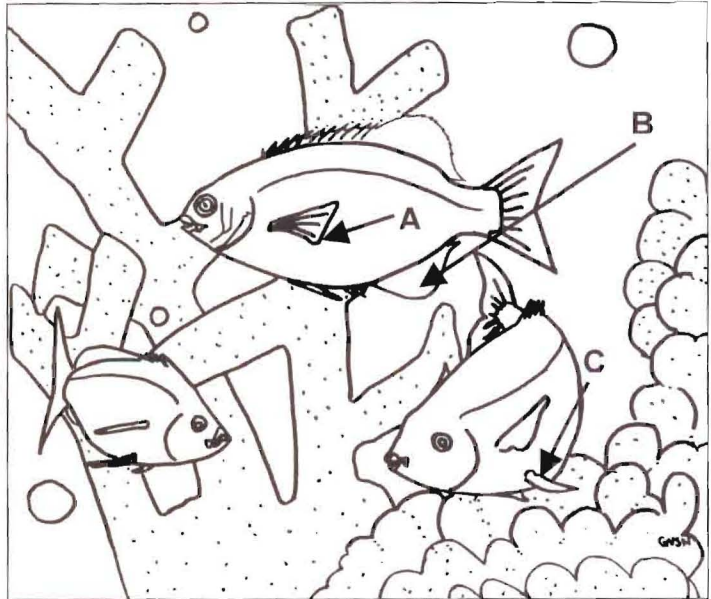


Fish drawings from Let's Talk Fish and Wildlife, used with permission.

Answers to Fish Anatomy Quiz

Rudder Fish

- A. Pectoral Fin
- B. Anal Fin
- C. Pelvic Fin

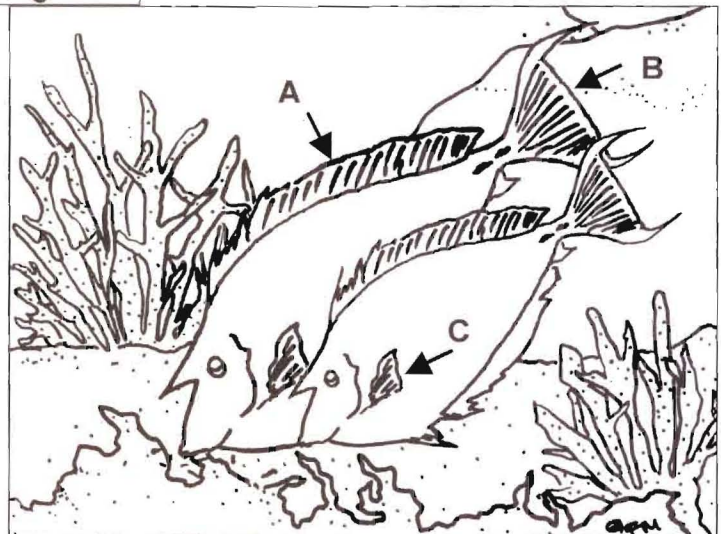


Big Eye Scad

- A. Lateral Line
- B. Operculum
- C. Pelvic Fin

Unicorn Fish

- A. Dorsal Fin
- B. Caudal or Tail Fin
- C. Pectoral Fin



Fishy Names


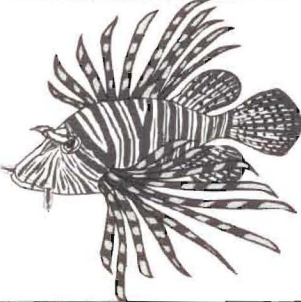
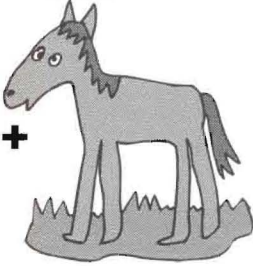

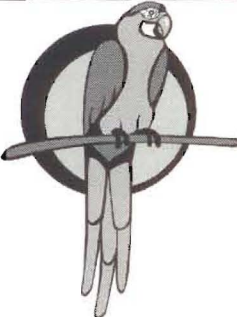
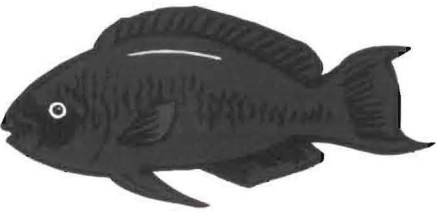


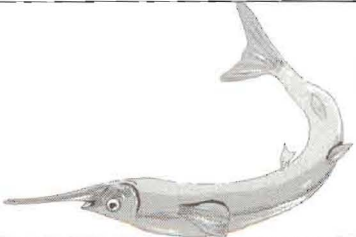
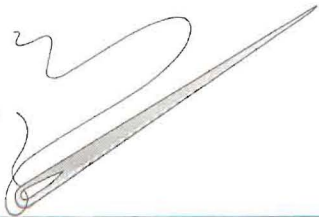
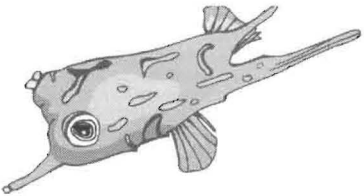

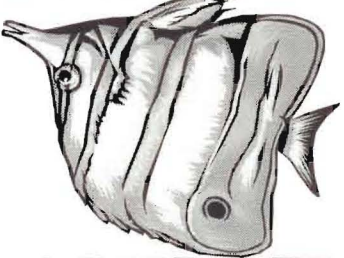
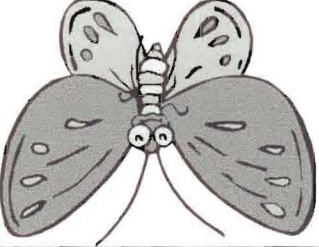

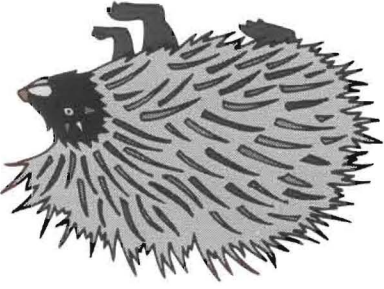
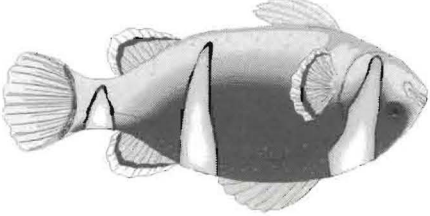

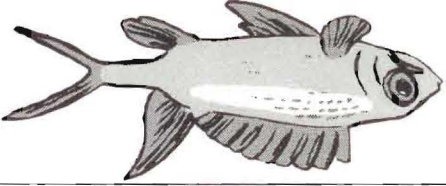

Use the clues to find out the names of each fish. Write your answers on the lines below.

Answers:

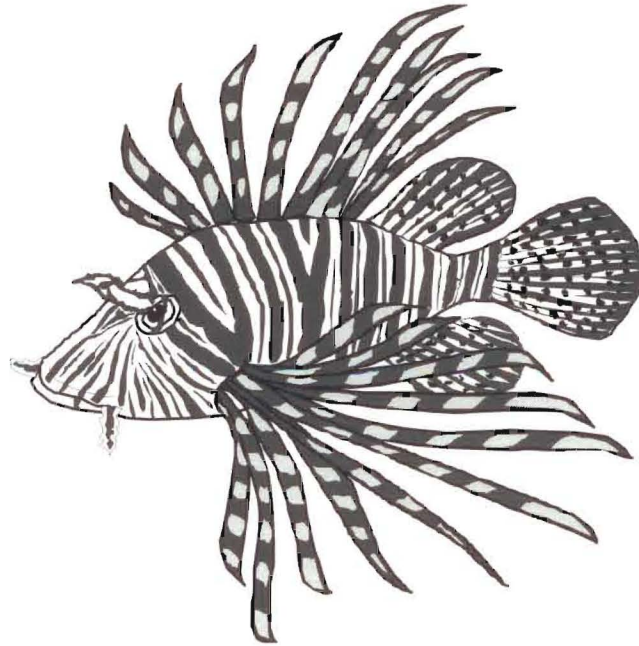
1. _____
2. _____
3. _____
4. _____
5. _____

6. _____
7. _____
8. _____
9. _____

 + fish	 1
sea + 	 2
 + fish	 3

<p>4</p> 	<p>+ fish</p> 
<p>5</p> 	<p>+ fish</p> 
<p>6</p> 	<p>+ fish</p> 
<p>7</p> 	<p>+ fish</p> 
<p>8</p> 	<p>+ fish</p> 
<p>9</p> 	<p>+ fish</p> 

Creature Feature - The Lionfish

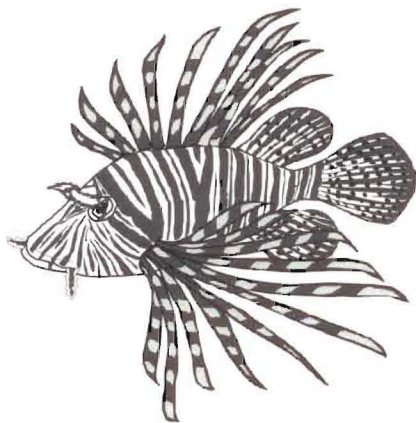


The lionfish lives on the coral reef. It can be found in shallow water that is only 3 feet deep to over 200 feet deep. Lionfish have large mouths and like to feed on small fish, crabs, and shrimp. Another name for the lionfish is the turkeyfish or the firefish.

Lionfishes belong to the scorpionfish family. Fishes in the scorpionfish family are called NUFO' in Chamorro. Relatives of lionfishes are the scorpionfishes and stonefishes. They also belong to the scorpionfish family. All fishes in the scorpionfish family have venomous spines. That means that they can sting. The poison is used to defend themselves from attackers.

Many people collect lionfish to keep in their aquarium. They live well in captivity and they are attractive fish. They have beautiful red/orange and white stripes. Their fins look like feathers. Be careful never to touch a lionfish. Their fins may be beautiful but inside of each one is a sharp spine full of poison.

The Lionfish - Questions



1. How are lionfish similar to scorpions?
2. Name at least two fish that belong to the scorpionfish family.
3. What is the Chamorro name for all scorpionfishes?
4. What is the habitat of a lionfish?
5. What do lionfish eat?
6. Why do people collect lionfish?
7. What could happen to you if you touch a lionfish?

Reptiles of the CNMI

A reptile is a cold-blooded animal. That means that they cannot maintain their body temperature. They get warmth from the sun, heated rocks, logs, or soil. Reptiles have scales and lay eggs. Examples of reptiles that live in the CNMI are lizards, skinks, geckos, and turtles. There are about 6000 different species of reptiles in the world. Examples of reptiles that are not found in the CNMI are crocodiles and alligators. The Brown treesnake is a reptile that has been spotted in the CNMI. It is important that Brown treesnakes are kept out of the CNMI because they do not belong here.



Monitor Lizard
Hilitai, Chamorro
Ghooluuf, Carolinian

The Monitor lizard is a spotted lizard that lives in the forests of the CNMI. Sometimes, they are called iguanas. However, there are no true iguanas in our part of the world. Its average size is about three feet but it can grow to over five feet long!

Monitor lizards eat insects, snails, smaller reptiles, rats, crabs, fish, birds, and their eggs. Monitor lizards even eat dead animals.

Monitor lizards are very well adapted for living on our islands. They can climb trees, dig holes, and swim. When you see them, they will probably be sitting still. But, they can run very fast to escape if they think you are a threat to them.

Monitor lizard drawing from Let's Talk Fish and Wildlife, used with permission.

Brown Treesnakes – Keep Them Out!



Brown treesnakes do not belong in the CNMI. A few snakes have been found here already. They came to the CNMI by hiding inside of ships and airplanes. Special dogs are trained to catch the brown treesnake.

Brown treesnakes like to eat forest birds and their eggs. If brown treesnakes come to the CNMI, they may eat too many birds. It would be very sad to have the birds disappear. That is one reason why it is important to keep the brown treesnake out of the CNMI. If you see a brown treesnake, tell your parents or your teacher. They should call 28-SNAKE, the brown treesnake hotline.

Questions – Write the answer to each question.

1. Have you ever seen a brown treesnake? _____
If yes, where? _____
2. What does the brown treesnake eat?

3. How do the brown treesnakes travel from one island to another?

4. What should you do if you see a brown treesnake?

Brown treesnake drawing used with permission from the USGS.

Reptile Coloring

A reptile is a cold-blooded animal that has scales, a backbone, and short legs or no legs at all. Choose a word from the word box to complete each sentence about reptiles.

crocodile
eggs

lizard
scaly

snake
turtle

A _____ has a hard shell.

A chameleon is a kind of _____.

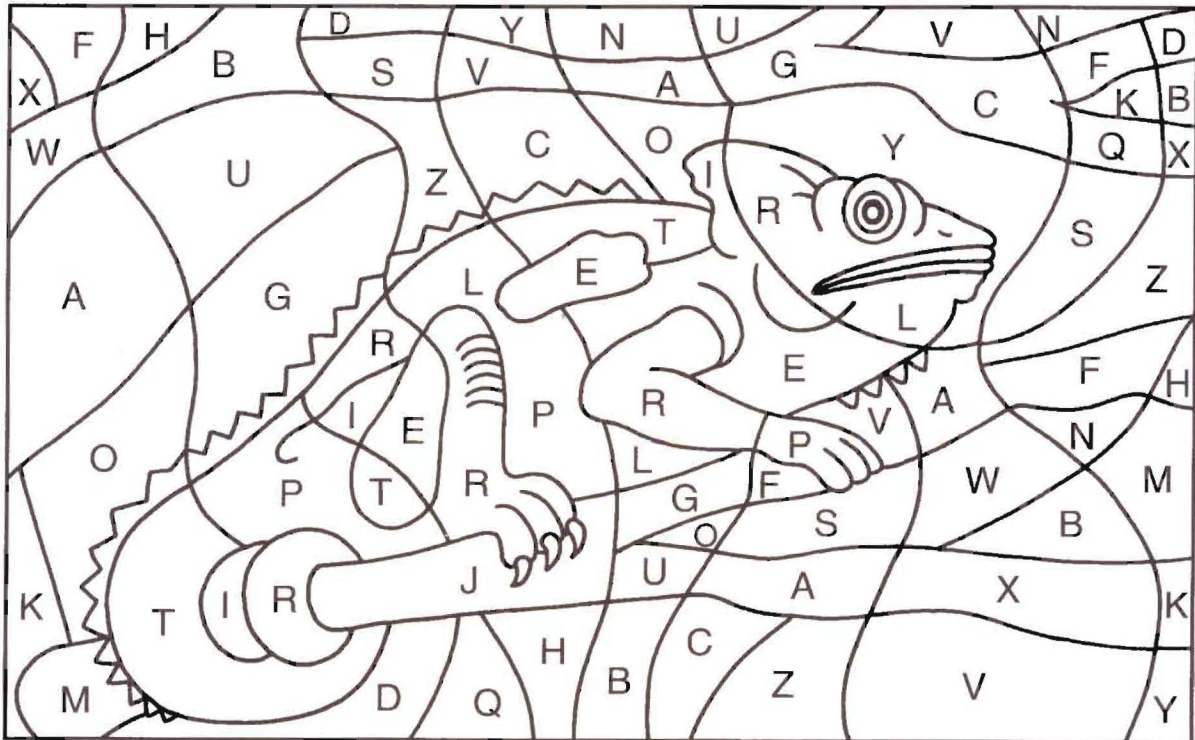
A reptile that has no legs and can be poisonous is a _____.

Reptiles hatch babies from _____.

A _____ has a pair of large teeth in its lower jaw that can be seen even when its mouth is closed.

Most reptiles have _____ skin.

Color all of the spaces in the picture below that contain a letter in the word **REPTILE**.



Used with permission from Carson-Dellosa Publishing Company's CD-4544, Science Puzzles & Games

Mammals of the CNMI

A mammal is a warm-blooded animal. Mammals have fur. Mammals do not lay eggs. They give birth to live young and feed their babies with milk. The Mariana fruit bat is a mammal that was here in the CNMI long before humans. It is **native** to our islands. Native animals were here before humans. Most of the land mammals in the CNMI came here because of humans. Animals that came here because of humans are called **introduced** species. Examples of introduced mammals are deer, pigs, cows, and goats.



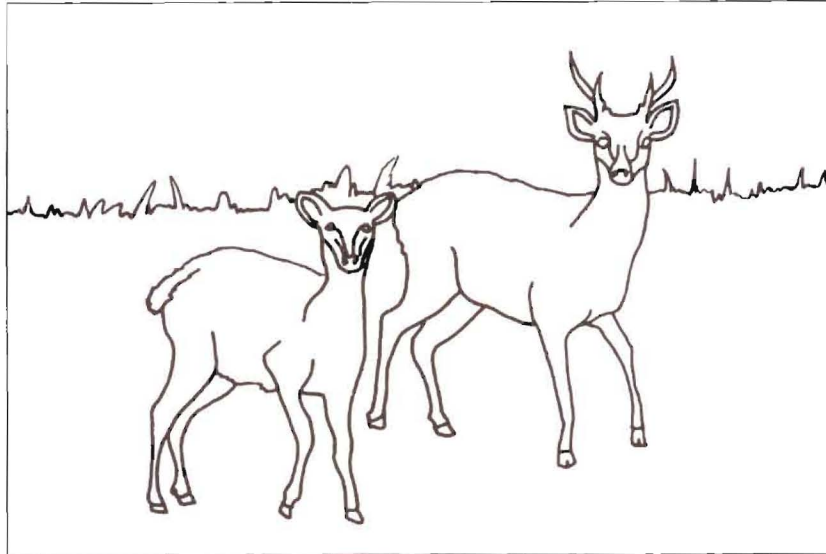
Mariana Fruit Bat
Fanihi, Chamorro
Pai'Scheei, Carolinian

Adult Mariana fruit bats are brownish black and weigh about one pound. They live in the forest and are very social animals. They stay in groups, or colonies during the day, resting and grooming each other. During the night, the fruit bats leave their colonies and feed. They like to eat fruits and flowers of native forest trees.

The Mariana fruit bat is a locally endangered species. That means that its population is threatened and the animal needs special protection. Threats to the Fanihi are illegal hunting, human disturbance to the forest and habitat destruction. It is illegal to hunt the Mariana fruit bat anywhere in the CNMI.

We should all do our part to protect the Mariana fruit bat. The Mariana fruit bat is endemic to our islands. That means that it is found nowhere else in the world, except for on a few islands. Not only is it a rare and beautiful mammal, but it also serves an important role in our environment. The fruit bat is an important pollinator and seed disperser in the native forests.

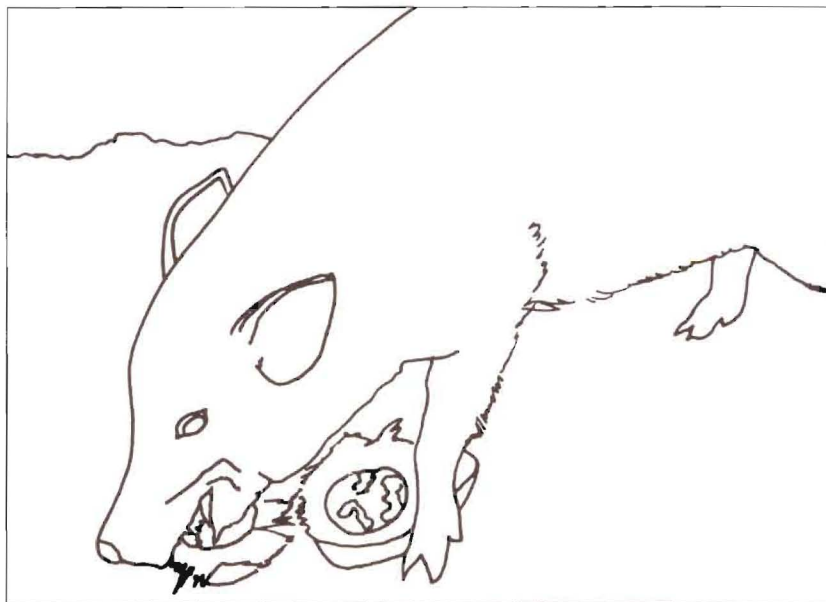
Introduced Mammals



Sambar Deer

Benado, Chamorro; Maloosch, Carolinian

Deer first came to the CNMI about 200 years ago. They are mostly found in the forests and other habitats where there is grass and bushes for them to eat. Deer may only be hunted during the legal hunting season.



Wild Pig

Pigs were brought to the islands as food for humans. Wild pigs live in the forest and feed on fruits and small animals. Humans hunt them year round. Pigs and other mammals (such as cows and goats) destroy the natural vegetation on many of our islands.

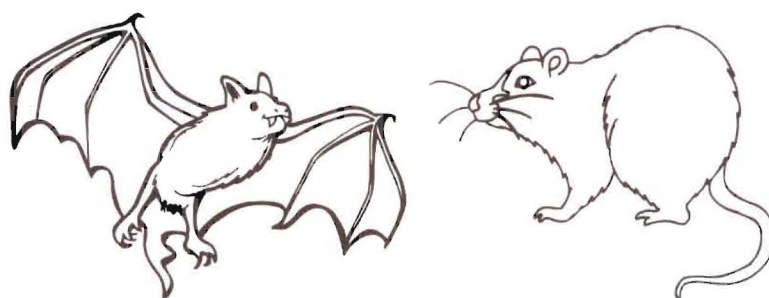
Mammal drawings from Let's Talk Fish and Wildlife, used with permission.

Mammal Questions

1. What do all mammals have in common?
2. Give an example of a mammal that is native to the CNMI.
3. Give an example of a mammal that was introduced to the CNMI.
4. The Mariana fruit bats feed during the night. What do they do all day?
5. What are three threats to the Mariana fruit bat?
6. When were deer first brought to the CNMI?
7. Why were pigs brought to the CNMI?
8. Pigs and other introduced mammals are harmful to our environment. Why?



Why Bats and Rats are Alike



Here on our islands, there are many rats. There were once also many bats. At one time the rats and the bats always stayed together, but today they are never seen with each other.

One particular rat and bat were very close friends a long time ago, and always played together. But in gathering food, the bat had an advantage because he could fly off and get mango fruit for himself and his rat friend. This was their favorite food.

One day the rat decided to trick his bat friend and take the wings for himself. So the next day the rat asked his friend what it was like to fly around and be able to eat mango at any time. The bat bragged to him that it was wonderful and glorious to have wings. So the rat asked if he could just try the wings once and see for himself.

The bat felt that they were very good friends and so he let the rat borrow the wings. The rat immediately flew high into the sky. As he flew away and looked down, he felt so good, and everything was so beautiful, that he forgot his bat friend and flew away, never to return.

The bat was sad and cried because he was wingless. He took on the habits and characteristics of the rat and had to scurry around to find food on the ground. And this story explains why today the bats and rats look alike. It is because of an unfaithful friend rat that fooled the bat into parting with his wings.

*Reprinted from Never and Always – Micronesian Legends, Fables, and Folklore;
courtesy of Gene Ashby and the students of the College of Micronesia.*

Activity – Competing for Food

Objectives

Students will learn that different types of birds eat different types of foods due to the shape of their beak.

Students will learn how to gather and collect data.

Materials

Hard food items - peanuts and M&Ms

Soft food items – raisins or dried fruits, marshmallows or Styrofoam

Metal pieces – paper clips

Paper plates

Construction paper (for designing beaks)

Plastic spoons

Bamboo skewers

Straws

Magnets

Procedure

Each group of 4 will receive construction paper, one plastic spoon, one bamboo skewer, one straw, and one magnet.

You will each make a different type of bird beak out of construction paper.

At the end of your beak, attach one of the four materials: plastic spoon, bamboo skewer, straw, and magnet.

Name your bird and draw a picture of its beak.

Practice feeding with your beak. You can only pick up one food item at a time.

Place the following food items onto a paper plate.

10 peanuts

10 M & Ms

10 raisins

10 marshmallows

10 paper clips

Each member of the team:

Pick up one food item at a time with your beak.

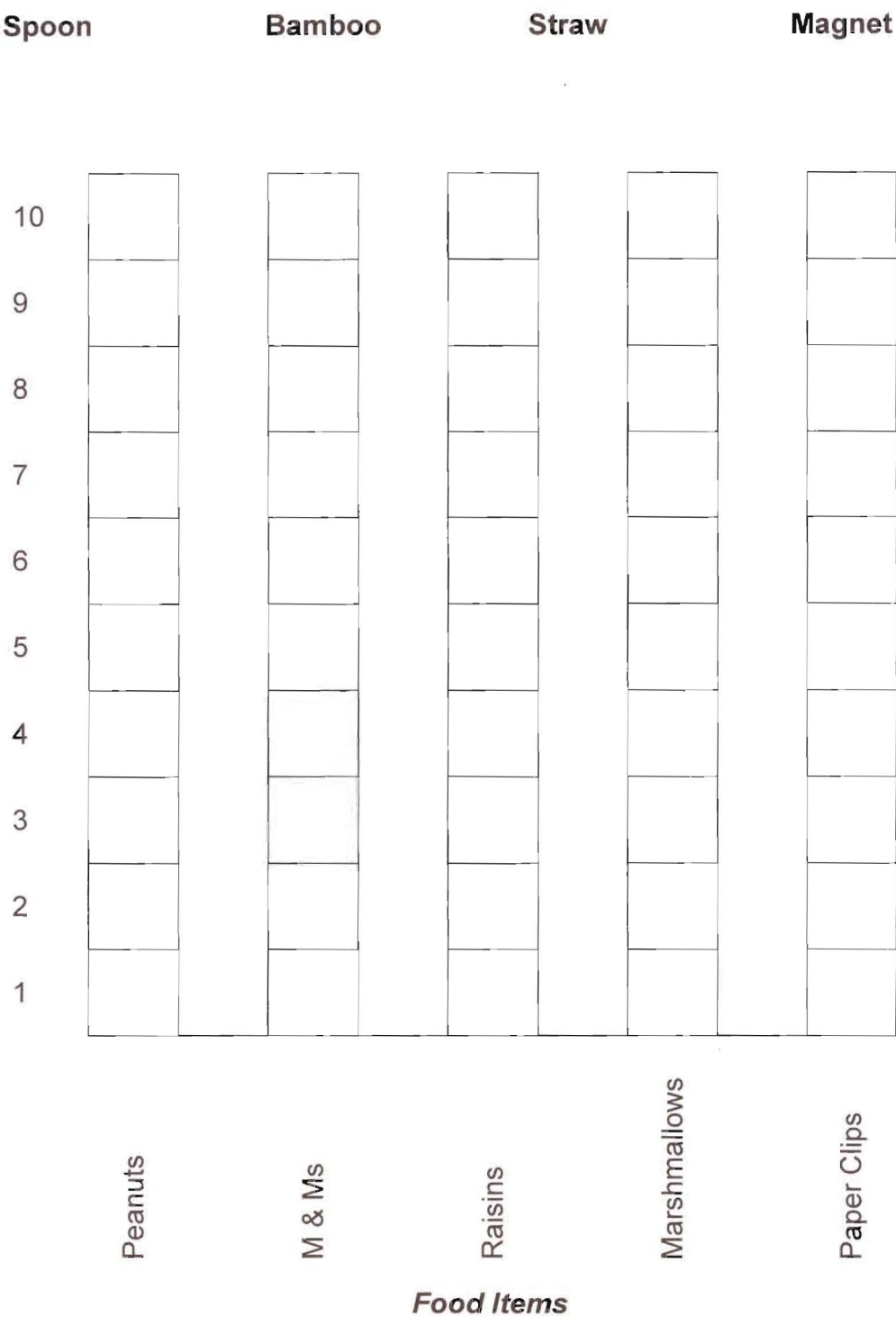


Continue feeding by catching one item at a time until all of the food is gone. DO NOT EAT THE FOOD. It must be counted and recorded first.

Results - Record the amount of food that your bird caught. Fill in the correct number of blocks for each food item that your bird caught.

What is the name of your bird? _____

Circle the Type of Beak that Your Bird Had



Follow-up Questions

1. What kind of food was the easiest to catch?
2. What kind of food did your bird catch the most of?
3. What kind of food was the most difficult to catch?
4. What kind of food did your bird catch the least of?
5. What would happen if only one type of food was available for all of the different types of birds to eat?

Extension Activities

Compare the results of the other teams to the results of your team. For example, did the other birds that used spoons on their beaks (spoonbills) capture the same kinds of food as the one from your team?

Each team can make a separate graph for each food item. Use a different color for each bird and compare which type of beak was the most successful at catching each type of food.

Build a better beak. Use materials from the classroom to build a beak that will be more successful at catching food.

Topics for Further Discussion

Adaptations – some birds are specialized and can only eat certain kinds of food. Adaptations are special traits that help species survive in their environment. A long, curved beak that can reach far inside of a flower is an example of an adaptation for eating nectar.

Competition - birds that can eat many different types of food may be very successful at competing for food.

Endangered species – species that are limited to a certain food item may become endangered if their food supply decreases.

Extinction – if a bird is adapted to eating only a certain kind of food and that food supply is no longer available, it may go extinct.

Reduce, Reuse, Recycle

Introduction: What is different about the way people live now and the way that they lived in the past? Discuss how our ancestors lived off of the land and did not produce trash that could not be used again. Now, humans produce so much trash. Where does it go? Most goes into landfills. A landfill is a large hole where the trash collectors bring the trash from your house. When the landfills become too full, more landfills need to be built. How can we help?

Reduce – do not use as much packaging, items that cannot be recycled, etc.

Reuse – use trash items over again for other purposes

Recycle – make other things out of the trash that we create.

Teacher: Questions for Discussion and Possible Answers

How can humans reduce the amount of trash that they make?

Buy larger containers.

Reduce buying foods that have a lot of packaging.

How can humans reuse their trash?

Use grocery bags over again for other things.

Use trash items to create art projects.

Make a piggy bank out of an old jar.

What kinds of items can be recycled?

Paper – newspaper and cardboard

Plastic – food containers, shampoo bottles, etc.

Metal – soda cans, cars, etc.

Glass – jars, bottles, etc.

Chemicals – oil, paint, etc.



Activity – Recycling Paper

Objectives

Students will learn how to make recycled paper
Students will discuss ways to use the recycled paper



Materials

Newspaper and used writing paper
Bowl
Water
Wire Screen (students should bring from home)
Blender
Food coloring
Rolling pin
Large spoon
Liquid Starch (optional)
Wax paper



Procedure

Tear paper into small scraps. Soak overnight in a bowl of water.

The next day, pour the soaked paper mixture into a blender with one ounce of liquid starch (optional) and 10 drops of food coloring (any color).

Blend until it is smooth and creamy.

Scoop a large spoonful of the mixture onto a screen. Roll the mixture flat with a rolling pin. Excess liquid may be soaked up with towels. Cover the paper with wax paper. Let dry for at least one day.

The next day, peel the paper off of the screen. The students can put their name on their paper. They may also cut it into shapes and/or use it for other arts and crafts projects.

Discuss several ways to use the recycled paper.



Brainstorming Ideas – Recycling Paper

Each year, the average American uses 500 pounds of paper. Paper is made from trees and other plants. Some of the paper that we use has been recycled.

Brainstorm: Uses of Paper

Examples

Food packages
Gift-wrap
Newspaper
Construction paper
Writing letters
Cards
Books and magazines
Bags for carrying things



Brainstorm: Uses of Recycled Paper

Examples

Newspapers are made from recycled paper.

Old newspapers are then used for:

- arts and crafts
- to wrap fish
- pet cages
- clean up spills
- packaging material

Used paper can be used for scratch paper.

Extra pieces of wrapping paper can be used to wrap smaller gifts.

Brainstorm: Reasons to Recycle Paper

Examples

Save trees
Save money
Save room in landfills
Less trash
Keep the islands beautiful



Brainstorm: Ways to Reduce amount of Paper Used

Examples

Buy larger quantities (less packaging materials).
Use scratch paper instead of new paper whenever possible.
Use shoeboxes to store things inside.
Buy paper that is made from recycled paper.
Use a lunch box instead of paper bags.
Electronic books instead of paper.

Breathe In, Breathe Out

Oxygen from our healthy forest

Directions: Read the story.

Number the pictures below in the correct order according to the story.

You can't see it but healthy trees are producing oxygen for us to breathe. Here is how.

Green leaves are like little food factories. First, the leaves breathe in carbon dioxide. Second, carbon dioxide is mixed with water from the soil and a chemical called chlorophyll is made. Third, the leaves use the sun's light as the energy that mixes everything together. This makes food for the tree. Fourth, while the tree is making food, oxygen is released into the air. That is what we breathe.



From: The Forest Fun Book, used with permission

Growing a Flower

Read the story. Number the pictures 1 - 6 to show the correct order.

Katie wanted to grow a flower. First, she put some dirt in a pot. Next, she planted seeds in the dirt. Then, Katie watered the seeds to help them grow. She looked at the flowerpot every day. One day, a plant started growing from one of the seeds. It grew bigger and bigger. Finally, Katie had a beautiful plant with lots of flowers!



Used with permission from Carson-Dellosa Publishing Company's CD-4539, Reading Comprehension

The Scientific Method

Steps of the Scientific Method

1. Observe (your environment)
2. Make a Hypothesis (Guess what is going on)
3. Test your Hypothesis
4. Record Your Results
5. Share Your Results

Teacher: Read this Story Aloud

Joe brought home two fern plants. He placed one on the table next to his bed and the other near the window. He watered them the same amount each day. Joe observed that the fern near the window grew faster and larger than the one near his bed.

Ask Question 1.

Joe thought that the fern near the window had more sunlight and that is why it grew faster and larger than the other fern. Joe decided to test his hypothesis. First, he wrote it down as if he were a scientist. *If a plant has more sunlight, then it will grow faster.*

Ask Question 2.

Joe knew that in order to test his hypothesis, he needed to have two plants that were the same size. Joe decided to buy some bean seeds from the grocery store and raise the plants himself.

Ask Question 3.

He took several seeds out of the bag. They were very dry and hard. He wet a paper towel and squeezed out the extra water. He rolled up the seeds in the paper towel and placed them in a bag. He once did this in school in his science class. Joe remembered that is how to get the bean seeds to sprout.

Ask Question 4.

After a couple of days, the seeds sprouted. He then put one seed in a cup that was filled half way with soil. He covered up the seed with soil. He repeated this task three more times, putting one seed in each cup. After he planted four bean plants, he gave them each one-teaspoon of water each day. After the plants grew to about one inch, he decided that it was time to conduct his experiment.

Ask Question 5.

He placed two plants in a large box. He closed the box so no light could get in. Then, he placed the other two plants near the window. Each day, he watered each of his four plants one teaspoon of water. Every three or four days, Joe recorded how tall his plants were.

Ask Question 6.

Questions for Discussion

1. What was Joe's observation about the two ferns plants?
2. What was Joe's hypothesis?
3. Why didn't Joe use his two fern plants to test his hypothesis?
4. Why did Joe wrap the bean seeds in a damp paper towel?
5. How many seeds did Joe plant?
6. How did Joe make sure that two of his plants did not get any sunlight?

Conducting an Experiment

Because the story was never finished, you do not know what Joe's results were. You will need to repeat Joe's experiment to find out what happened.

To find out if plants grow faster in the sunlight, you will conduct an experiment that is the same as what Joe did in the story.

Here was Joe's hypothesis.

If a plant has more sunlight, then it will grow faster.

Write your hypothesis below. It can be the same as Joe's.

Procedure

Before you begin the experiment, fill in the blanks below with the correct procedure.

1. To make the bean seeds sprout, they should be soaked for a couple of days in a damp _____.
2. After the seeds sprout, place them into a _____ that is filled half way with _____. Then, cover them up with soil.
3. All bean plants should be watered about one-_____ per day.
4. Place half of the plants in a _____ to keep them from getting any sunlight. Place the other half near a _____ so that they get sunlight.
5. Measure the height of your plants every three or four _____.
6. Record your results in your notebook.

Conduct the experiment.

Record your results in the tables below.

Results

	Day _____	Day _____	Day _____	Day _____	Day _____
Plant 1 (dark)					
Plant 2 (dark)					
Plant 3 (light)					
Plant 4 (light)					

	Day _____	Day _____	Day _____	Day _____	Day _____
Plant 1 (dark)					
Plant 2 (dark)					
Plant 3 (light)					
Plant 4 (light)					

Conclusion Questions

Circle the answer that best describes your results.

At the end of the experiment, which plant was the tallest?

Plant 1 Plant 2 Plant 3 Plant 4

At the end of the experiment, which plant was the second tallest?

Plant 1 Plant 2 Plant 3 Plant 4

The two tallest plants were the ones that were kept in the:

Box Sunlight One in the box, One in the sunlight

Look back at your hypothesis. Are your results what you expected? Explain.

Share your results with other students in the class. Did the other teams have similar results? Explain.

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