LaB-Lo

Depositional Landforms

↳ rockslide

↳ Alluvial Fan

Notes from Reading

Topic / Definition	Example	Diagram
Destructive Force - wearing down or destroying of something geological	Tsunami - water wears things down	
Constructive Force -		

LaB-Log

Depositional Landforms

↳ rockslide

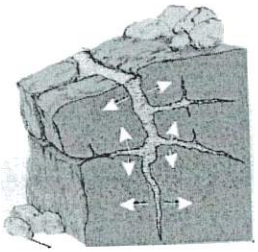
↳ Alluvial Fan

Destructive vs. Constructive Forces

- Destructive forces break down earth's surface in some way.
- Constructive forces build up earth materials, like deposition of sediments.
- Earth's surface is a constant shifting between destructive and constructive forces.

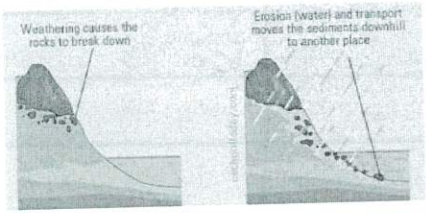
Weathering

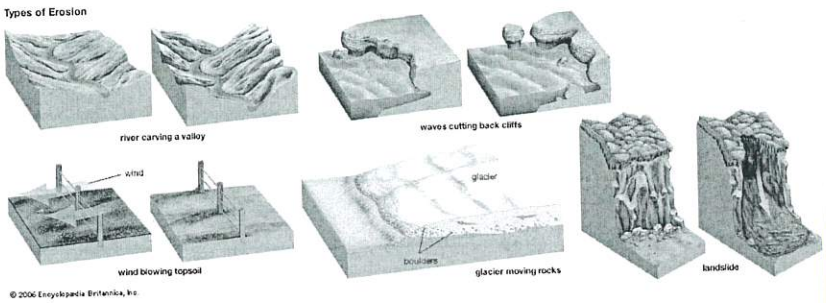
- This occurs when rocks are broken down into smaller pieces.
- Can be done by wind, water, ice, getting hit by other rocks, roots, or animals.
- Ice can get in cracks and break apart rocks.
- We call the smaller pieces sediments.



Erosion

- This is the movement of sediments from one place to another by wind, water or ice.
- This can be quick, or very slowly over time.
- Larger events like floods and tsunamis can produce dramatic erosion.

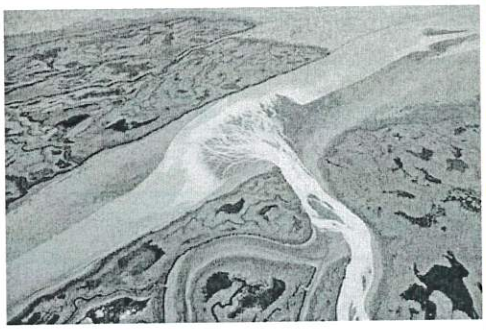




Effects of Erosion

- Erosion near buildings can cause lots of damage, like a landslide.
- Slow creeping of hillsides is also erosion.
- Can create caves ocean waves or underwater rivers, or rainwater.
- Acid rain can quicken weathering.

Deposition



- Sediments can be left, or deposited, in places.
- When the water, ice, or wind slows down enough, the sediments 'fall out' of the water.
- Rivers and glaciers can erode sediments far away from the original source.
- Deposition of sediments at river mouths can create deltas.

Floodplains

- Sediments can add nutrients to soils, especially in areas with lots of river deposition.
- These can make very fertile soil (fertile means lots of things can grow).
- Over long periods of time, sediments can eventually form sedimentary rocks and landforms in different places.
- Sometimes sediments can be harmful and can fill in lakes, rivers, and wetlands, and can cover habitat.

Consequences of Human Activities

- Humans accelerate natural changes.
- Construction and farming cause the most erosion due to breaking up the topsoil which can then be more easily moved by wind and/or water.
- Sometimes sediments can carry toxic materials and these can move around causing problems.

Analysis Questions (#1, 2)

ANALYSIS

1. Why is weathering important to the process of erosion?

2. Why does erosion always lead to deposition? Explain and provide an example.

3. Prepare a concept map for weathering, erosion and deposition. Be sure to use the following terms:

earth processes	weathering	erosion
deposition	sediments	wind
water	ice	floodplains
lakes	toxic materials	environment
delta	water	positive effects
negative effects	farming	construction

Activity 33: Earth's Processes and Boomtown's Coast – Reading Topics

Summarize each section of the reading, and be sure to include information AND DIAGRAMS about:

Beach Formation
What are factors that affect beach formation?
What are opposing forces involved?

A Naturally Changing Coastline
How does a coastline change shape over time?

Longshore Current
What is longshore current and how does it work? Draw diagram of it.
How do humans interrupt its natural process, and what happens?

Managing Earth Processes
What are ways to protect beach from deposition and erosion?
Define dredging, jetty, breakwater, seawalls, riprap. Draw diagrams.
What are problems associated with each of those methods?
What's the important message to remember about coastal forces?

- Jetty: built perpendicular to shore to stop longshore current. Protects harbors from sediment build-up. Can make sand build up on one side of jetty and erode from other.
- Breakwater: rock structure built parallel to shore to reduce wave energy hitting shore. Slows longshore current so sand builds up between beach and breakwater.
- Seawall: piles of rock built up along cliff or shoreline, reducing wave energy as it hits shore. Erosion around rocks increases because waves are redirected.
- Rip-rap: rocks used as jetties or seawalls.
- All these methods are temporary. Eventually the coastline will change due to waves and longshore currents.

Beach Formation

- Commonly found near mouths of rivers where sediments are deposited.
- Factors that affect beach formation are different shapes of the land, types of sand, wave action/energy, tides and seasons, and weather.
- Beaches form when amount of sediment supplied by river (constructive) is in balance with erosion energy (destructive) of ocean waves.

Naturally Changing Coastline

- With enough sediment deposition in deltas, beaches can form and extends shoreline towards the ocean.
- If wave energy is greater, it can erode and move the shoreline back towards the land.
- Cliffs can form with enough erosion.

Longshore Current

- Created when waves hit shoreline at an angle and carry sand with it in the direction of the current.
- Beaches can lengthen because of this.
- Human influences can interrupt longshore current and as the current moves around structures it slows down and deposited the sand, usually near the structure.

Managing Earth Processes

- Dredging: digging up and moving sand from one place to another. Can expose contamination and make land less stable.
- Jetty: built perpendicular to shore to slow longshore current and protect harbors from sediment build-up. Can make sand build up on one side of jetty and erode from other.
- Breakwater: rock structure built parallel to shore to reduce wave energy hitting shore. Slows longshore current so sand builds up between beach and breakwater.
- Seawall: piles of rock built up along cliff or shoreline, reducing wave energy as it hits shore. Erosion around rocks increases because waves are redirected.
- Rip-rap: rocks used as jetties or seawalls.
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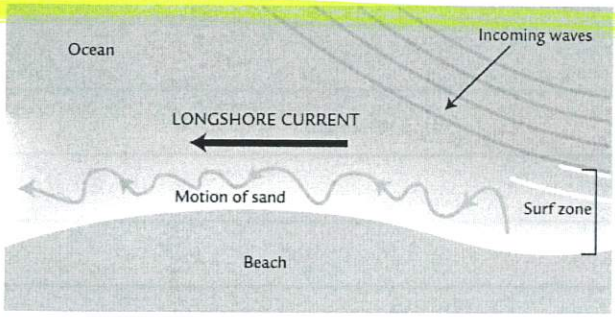


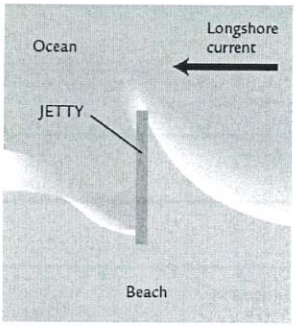


FIGURE 2: JETTY

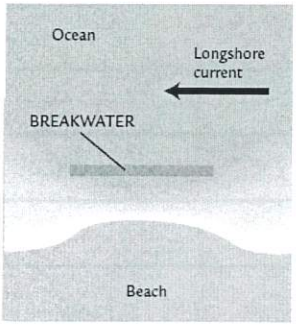
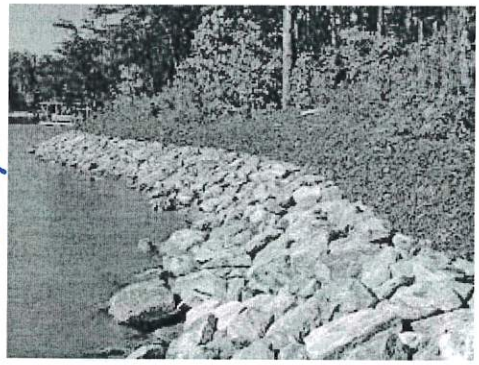
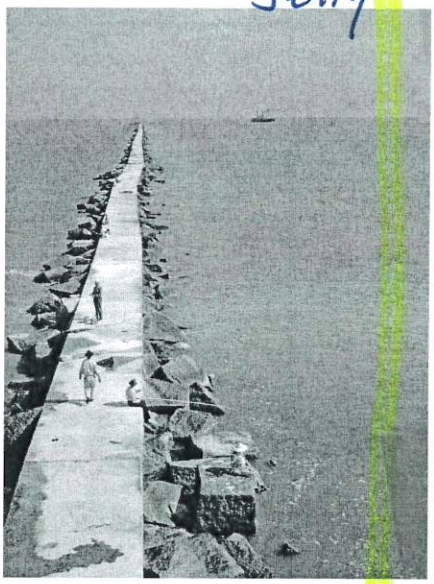


FIGURE 3: BREAKWATER

Jetty

Riprap





Seawall

Analysi

3. Prepare a
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erosion
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4. Choose a method that helps control either erosion or deposition on the coastline. For the method you choose, describe both an advantage and a disadvantage of its use.

Ana

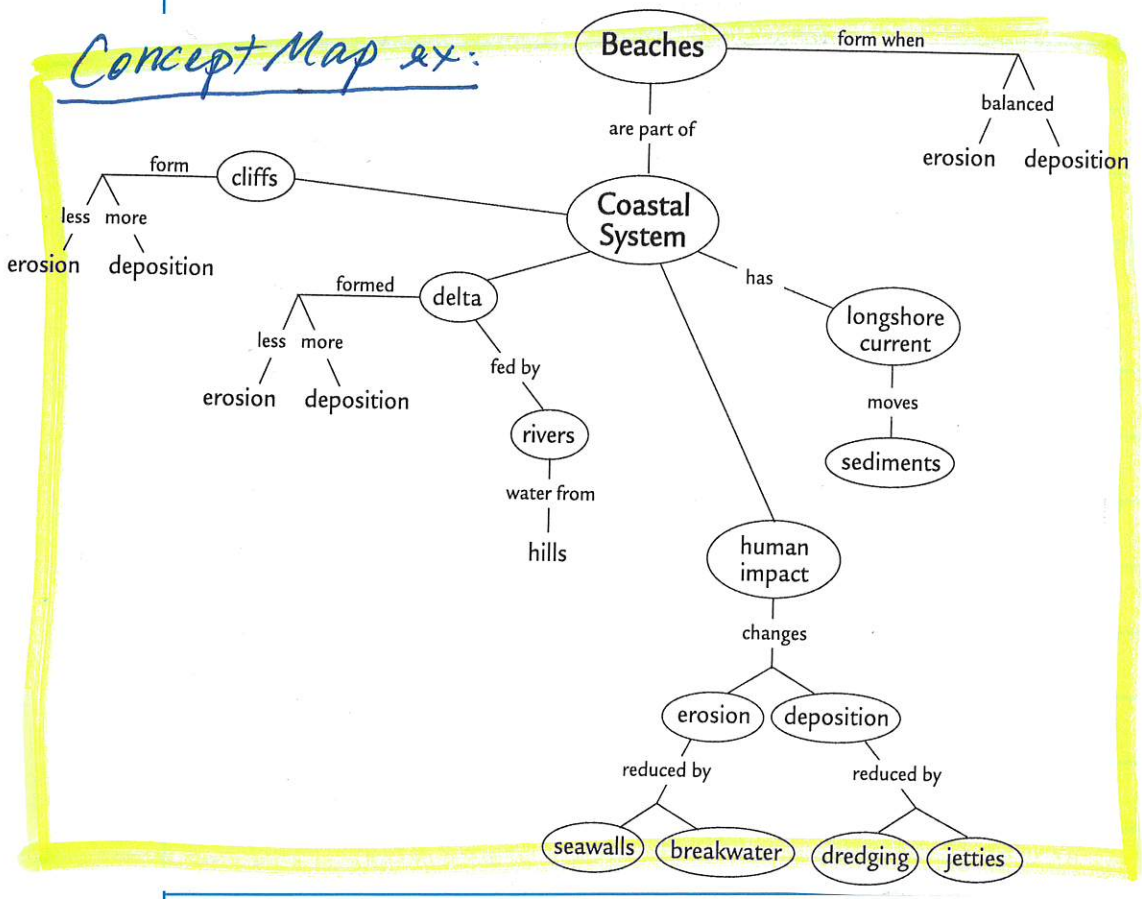
Analysis Questions (#3, 4)

3. Prepare a concept map for beaches and coastal systems. Be sure to use the following terms:

coastal system	beach	dredging
erosion	delta	jetty
deposition	cliff	breakwater
balanced	hill	seawall
longshore current	river	

4. Choose a method that helps control either erosion or deposition on the coastline. For the method you choose, describe both an advantage and a disadvantage of its use.

Concept Map ex:



* use bullets/ paragraph/ diagrams to capture what you observed on stream table.

Notes re: Beach action @ stream table

•

Name: _____ **FRIDAY NOTEBOOK REVIEW #** ____

Period: _____ Date: _____

Learning Summary of Last Week: Notebook Pages _____ to _____ *(Activities ____ to ____)*
(don't list just what you did)

Should be green!

Something that was interesting from this week, and **why** did you find it interesting:	Draw a diagram that will help you remember something from this week:

Question(s) that I have related to the topics learned: (you must come up with something!)

LOG

LAB-LOG

ACTIVITY	Date 2/4	Page 53
(leave blank)		

Ecology Unit
Big Ideas & Essential Questions

Big Ideas related to SEPUP Ecology Unit	Essential Questions
• Relationships exist between organisms (including humans) and the environment. • Energy flows throughout and between organisms (e.g. producers to consumers), and ultimately comes from the sun. • All organisms need biotic and abiotic factors the organisms get from their habitat. • The size of a population depends on many factors, including available resources and introduced species.	What are the relationships between an organisms, its environment, and other organisms? *(ENERGY & MATTER)* How does introducing a non-native organism affect the native ecosystem? *(CAUSE & EFFECT)*

LAB-LOG

ACTIVITY Title Page for ECOLOGY

Date 2/4

Page 55

Learning Targets for Ecology Unit

on their way!

Also, writing in each activity.

Contents

ACTIVITY 72 The Miracle Fish

Date 3/5

Page 58

Name:
Per:

Activity 72: The Miracle Fish?
INTRA-ACT STATEMENTS (Sheet 53.1)

	Names			
	James	James' Father	An owner of a fishing company	An environmentalist
1. Introducing the Nile perch has been a good thing because they supply a lot of food to the people around the lake.	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –
2. The huge fishing companies have really helped the area around Lake Victoria.	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –
3. In 1979 there were 16,000 people fishing along Lake Victoria's shores, and now there are 82,300, which is good for the local people.	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –
4. The declining diversity of fish in the lake is not a problem because the Nile perch provide more food and income to the people around the lake than the smaller fish did.	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –
5. The lake is so big, a few dead zones in the lake, caused by the increased algae growth, are not going to hurt anything.	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –	Agree/Disagree + or –

LaB-LOG

Name: ANSWER KEY

Activity 72: The Miracle Fish
READING OUTLINE

Read the "Fishing on Lake Victoria" introduction carefully.

1. **Describe the common fish found in Lake Victoria:** (you'll add to the chart a couple times, so write small)

Before 1980s	After 1980s
Cichlids – small freshwater fish, about 2-4 inches long *About 300 different species of cichlids, 99% of which can't be found anywhere else in the world.* *There were catfish, carp, and lungfish.*	*Large Nile perch that can grow up to 530 pounds, although average is 7-13 pounds.*

2. **What is an ecologist?**

A scientist who studies relationships between organisms and environments

3. **How did the people that lived around Lake Victoria used to catch fish?**

They used simple fishing nets and canoes. Fish were dried and sold locally.

4. **What happened by the late 1950s? Why is this a problem?**

The lake was being overfished (catching too many fish). Populations of fish didn't have enough to reproduce and grow. If there weren't enough fish, there might not be enough for people to eat.

5. **Complete the chart below:**

What did British Government want to do?	How did ecologists feel about that?
Wanted to introduce Nile perch into the lake and increase the amount of fish that was available to eat, and more high-protein food and to tell extra fish to other countries.	*They were opposed to this because they were worried that the Nile perch didn't have natural enemies and would negatively affect the lake's ecosystem.*

What finally happened?

The perch were secretly added to the lake, and then more were deliberately added by the government in the early 1960s.

6. **How did the amount of tons of fish change before and after a lot of Nile Perch were added to the lake?**

In 1960-70s, about 100,000 metric tons of fish were caught. By 1989, up to 500,000 metric tons total fish.

7. **Make at least 3 observations about the graph on page E-7.**

Total fish went up dramatically between 1980 and 1990.
Total fish then steadied out and declined between 1990 and 1995.
Nile perch went up sharply between 1980, then leveled out to 1990, and then rose again sharply to 1995.
The Nile perch make up more than half of total fish in 1995.

8. **What are consequences of adding the Nile Perch to the:**

Fish besides the Nile Perch	*Nile perch are big and eat smaller fish, so the small fish were wiped out, causing extinction of over 200 types of cichlids. Populations of other fish like catfish and lungfish also declined.*
Algae and therefore other plants and animals in the lake?	*Algae weren't eaten by smaller fish, and so algae increased 5-fold. Because they use up all the oxygen (they use more than they make), other plants and animals have problems surviving. Now, there are dead zones that don't have anything living.*
Number of people living around Lake Victoria	*Numbers of people went up a lot, from 16,000 in 1979 to 82,300 in 1993.*
Economy of areas around the lake	*The large fishing companies that have come in have added a lot of money to the local economy as people are put to work, and fish are sold.*

9. **Describe what appears to be happening now that the Nile Perch have caused the decline of so many of the fish (their food source).**

As populations of other fish decline, the Nile perch are losing their food source. Now the perch are eating smaller perch. Perhaps the Nile perch will decline because they have nothing to eat, and they also might be overfished because of the dwindling numbers of fish compared to the number of people that now live there.

Name: _____

Period:

Activity 72: The Miracle Fish?
Evidence and Trade-offs Scoring Rubrics

SEP #7: Engaging in Argument from Evidence			
1 – Developing Proficiency	*2 – Close to Proficient*	*3 – Proficient*	*4 – Highly Proficient*
Argument is significantly incomplete or inaccurate.	Argument is almost there, but lacks: • Introduction that describes the issues surrounding the introduction of the Nile perch into Lake Victoria. • At least three pieces of accurate and specific evidence, with supporting data, that support your decision. • At least two trade- offs discussed accurately and specifically, with data.	Argument is complete and correct, including: • Introduction that describes the issues surrounding the introduction of the Nile perch into Lake Victoria. • At least three pieces of accurate and specific evidence, with supporting data, that support your decision. • At least two trade- offs discussed accurately and specifically, with data. • A concluding paragraph that sums up the main arguments.	Argument goes above and beyond in some significant way, such as: • Including diagrams or other visual aids to clarify your ideas, and writing incorporates the diagrams and/or visual aids. • Including outside cited research on topics to back up evidence presented in textbook. Citations must include the name of the organization, the website address, and the date you got the information (can be done on OSLIS).

Self-Assessment:

SEP #8: Obtaining, Evaluating, and Communicating Information			
1 – Developing Proficiency	*2 – Close to Proficient*	*3 – Proficient*	*4 – Highly Proficient*

Communication is significantly incomplete or incorrect.	Communication is almost there, but lacks:
	• Clear, focused writing, with support for main points
	• Clear and coherent organization, which includes:
	  • introductory paragraph
	  • conclusion paragraph
	• Words that effectively convey the intended meaning
	• Writing that flows
	• Correct conventions that don't include errors that impede readability.
		Communication is complete and correct, and includes:
		• Clear, focused writing, with support for main points
		• Clear and coherent organization, which includes:
		  • introductory paragraph
		  • conclusion paragraph
		• Words that effectively convey the intended meaning
		• Writing that flows
		• Correct conventions that don't include errors that impede readability.
			Communication is complete and correct, and go above and beyond in some significant way, such as:
			• Citations, if outside sources of information used, are complete and MLA formatted
			• Writing is superior (conventions, sentence fluency, organization, support for arguments, word choice)

Self-Assessment:

LaB-Lo

Act 72 Nile Perch Evidence and Trade-offs — Grading Comments

ITB	Introduction Too Brief
Inc	Incomplete
EV	Evidence
TO	Trade-Off
DIW	Discuss images In Writing
EDZ	Explain Dead Zones more
Frag	Sentence fragment
OR	Outside Resources
IFR	Incorrect Format on Resources cited
SI?	Source of Information?

✓ = good, yep.

Other General Comments:

- Be professional – avoid spelling, grammar, and convention errors.
- Correct spelling is Nile perch and Lake Victoria.
- Introductions should include some discussion of why the British Gov't wanted to put the perch in the lake in the first place – feeding growing population!
- If you bring up 'dead zones', you need to explain how the algae started that to happen. It's not the algae that create the dead zones – it's the bacteria decomposing the dead algae that uses all the oxygen.
- Be sure to include #s as evidence in discussing your points.
- If you're going to say something about the Nile perch bringing lots of food, prove it with specific evidence from the activity.
- In future, alphabetize resources cited by the first letter of the citation.
- Citations must follow MLA format from OSLIS.

Name: _____

Act 72: The Miracle Fish?

Date: _____ Period: _____

DISCUSSION WEB about: *Nile perch introduction into Lake Victoria*

Question: *Should the Nile perch have been introduced into Lake Victoria?*

Yes / Advantages to introducing	No / Disadvantages to introducing

ACTIVITY 72: The Miracle Fish?

AQ #6: Evidence and Trade-Offs

Name: _____

Date: _____ Period: _____

(If present, attach "References Cited" as separate page)

To those people that disagree, I would remind them that

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ACTIVITY 12, cont. | Date 2/7 | Page 61

Nile perch

Analysis Questions #2, 3, 7

ANALYSIS

1. Based on the reading, how did the amount of fish caught in Lake Victoria change from the 1960s to 1989?
2. Based on the graph showing amounts of fish caught in Lake Victoria, describe how the amount of Nile perch caught by Kenya changed from 1980 to 1995.
3. Look again at the graph. How do you think the number of metric tons of fish caught relates to the size of the total fish population from year to year? Explain your reasoning.
4. How did the introduction of Nile perch affect the food supply of the people who lived near Lake Victoria?
5. What effect did the introduction of Nile perch have on the organisms that lived in the lake?
6. Should Nile perch have been introduced into Lake Victoria? Support your answer with evidence and discuss the trade-offs of your decision.

   Hint: To write a complete answer, first state your opinion. Provide two or more pieces of evidence that support your opinion. Then consider all sides of the issue and identify the trade-offs of your decision.
7. What do you predict will happen to Lake Victoria over the next 20–30 years? Why?

Name: _____
Period:

Activity 73: ~~Introduced Species~~ Organism Data Entry

Name of Organism:

Plant / Animal / Other (circle one)

Description of organism:

Problem(s) it causes:

Possible solution?

Name of Organism:

Plant / Animal / Other (circle one)

Description of organism:

Problem(s) it causes:

Possible solution?

Name of Organism:

Plant / Animal / Other (circle one)

Description of organism:

Problem(s) it causes:

Possible solution?

Name of Organism:

Plant / Animal / Other (circle one)

Description of organism:

Problem(s) it causes:

Possible solution?

Name: _____
Period:

Activity 73: Introduced Species
Background Information

Introduced Species

The concept of ***introduced species*** as an ecological issue is a relatively recent one. Previously, species were introduced into new regions without concern for their long-term impact; for example, wheat and cattle were introduced into new regions to provide food for people. The introduction of species by humans has caused major changes in ***ecosystems*** throughout the world. Such ideas can be explored together with other subjects, such as early civilizations or the migration of Europeans to the Americas. Discussing species introduced for agricultural purposes also provides a broader understanding of this complex issue.

It is sometimes very difficult to determine which species are not ***native*** to an area. The case of San Francisco Bay is an example. Species first arrived in the bay between 5,000 and 8,000 years ago, when the bay filled up with water as ice sheets melted at the end of the last ice age. About 100 years ago, many new additional species arrived as shipping between the East and West coasts of the United States increased. Recently, new species introduced from Asia and New Zealand have begun to affect populations of these organisms. Thus the definition of introduced species depends on how far back in time one goes.

Species migrations to new geographical areas are also a natural process that has been going on over evolutionary time, as species colonize new habitats (e.g., islands, the North American continent via the Bering land bridge, and Mount St. Helen's after its recent eruption). What is different about species introductions in modern times is that:

(1) species are being transported by humans to geographical areas so far from their original ranges that it is unlikely that they could have traveled those distances on their own, and
(2) many more species are being moved around the globe as a result of international trade and travel than has been the case in the past.

Species are continually being introduced into new environments around the globe. Only a few of them survive and even fewer expand their populations to the point that they ***out-compete*** native species. Species that can out-compete native species are considered ***invasive***. And it's not just in the United States – it's a world-wide problem. For example, Leidy's comb jelly traveled in a ship's ballast water from its native habitat on the Atlantic coast of the Americas to the Black Sea, where it has caused major damage to the Black Sea ecosystem. Ecologists are now concerned that the species might spread into the Mediterranean Sea.

Islands that are fairly distant from the mainland tend to be more vulnerable to the introduction of new species. Understanding why islands are so vulnerable requires knowing about both ecology and evolution. The ease of invasion of island ecology stems from a number of factors. Geographically distinct islands tend to have native species that have evolved together over long periods of time. When a new species successfully competes with a native species, the population of the native species goes down fast as available resources decline and the initial populations of island species are small. When a native species' population decreases to endangerment or extinction, this can devastate the species that rely on it within the ecosystem, each of whose populations are also small to begin with. Island species are generally not found anywhere else on Earth, so if they die out locally, no other population is available to replenish the island. Therefore, the introduction of new species on a geographically distinct island often causes significant changes in the entire ecosystem of the island, involving many species becoming extinct in very short periods of time.

Coastal regions, such as California, Florida, and Hawaii that have a lot of international traffic (via water, air, or land) seem to have a greater number of introduced species. This tends to be associated with human travel through the area because many organisms can travel in the holds of ships or on cargo.

Factors that make a species more likely to survive and succeed in a new environment include:
- for animal species, hardiness and flexibility in terms of requirements for food or shelter;
- for plant species, flexibility in soil requirements and method of pollination;
- a high reproductive rate (common but not universal among successful invaders).

Flexible species with high reproductive rates often do well in disrupted ecosystems, such as when humans settle an area. In the U.S., successful examples of these species include the European rat and the Oriental cockroach.

In general, when the new environment's climate is similar to the species' native climate, the ecosystem is more vulnerable to a successful introduction.

Damage Caused by Introduced Species

Introduced species are thought to be the second most important factor in species extinction, after habitat loss. In addition, introduced species cause billions of dollars of damage each year. For example, introduced forest pests, such as the Asian longhorn beetle, cause $4 billion in annual damages (such as timber loss) in the U.S. Other impacts include loss of livestock and crops, medical costs (when species infect humans), and damage to structures such as water pipes and power lines.

Strategies to limit future impact from introduced species are usually grouped into ***biological control***, ***chemical control***, ***physical control***, and ***prevention strategies***.
- **Biological control** measures include the secondary introduction of parasites and/or predators.
- **Chemical control** can include the use of pesticides and herbicides.
- **Physical/ mechanical control** includes the physical removal of the species with traps and baits or by cutting and clearing vegetation.

These control strategies themselves may also impact ecosystems in unintended ways.

- **Prevention strategies** to prevent further spread of an introduced species include inspecting cargo and luggage at borders and at airports, and using specially trained dogs to detect incoming species. International rules govern where and how a ship's ballast water (water stored in big tanks to help make the ship float properly) is emptied. Educating the public to avoid the accidental release of exotic species, such as unwanted aquarium fish, can also reduce the spread of species.

REFERENCES

- Bright, Chris. Life Out of Bounds: Bioinvasion in a Borderless World. New York: Norton and Company, 1998.
- Diamond, Jared. Guns, Germs, and Steel. New York: Norton and Company, 1999.

Name: _____

Period:

Activity 73 Extension
OPB Silent Invasion Video Questions
http://watch.opb.org/video/1274375861/

What are the names of the species that are invading Oregon discussed in the video?	Where did the invasive species originate (come from)?

What challenges are wildlife or fisheries biologists facing with controlling invasive species?

Species	Challenges

Describe what can we do, as Oregonians, to help with these issues.

Name: Ms. Leishman
Period:

Activity 75: Classifying Animals
READING NOTES

Classification: System scientists use to organize living (organisms) things, so that they can be better understood.

5-Kingdom classification system based mainly on physical structures + characteristics.

6-Kingdom classification system split up the bacteria into two kingdoms.

3-Domain classification system is more recent and classifies according to similar genetic similarities

Eukaryotes - made up of all living things that have cells **with** a nucleus, including animals, plants, fungi, protists

Prokaryotes - Archaea and bacteria, which **do not** have a nucleus

All systems allow scientists to classify & organize with similar characteristics.

Comparison of Classification Systems

3-Domain	Eukarya				Bacteria	Archaea
6-Kingdom	Animals	Plants	Fungi	Protists	Bacteria	Archaea
5-Kingdom	Animals	Plants	Fungi	Protists	Bacteria	
Eukarote or Prokaryote?	Eukaryote				Prokaryote	

More Vocabulary!

Genus — The second smallest group of organisms that an organism can belong in. Will have one or more species in it.

Species — Exact type of organism – similar enough to breed together and have fertile offspring.

Fertile — Able to have offspring that can eventually have their own offspring

Scientific name — Made up of the Genus and Species, written in ***italics***

Levels of Classification for Living Things:

Size of Group	Levels	Mnemonic #1	Mnemonic #2
LARGEST	Kingdom	Kings	Kids
	Phylum	Play	Playing
	Class	Chess	Chase
	Order	on	on
	Family	Fine	Freeways
	Genus	grained	get
SMALLEST	Species	sand	Smashed

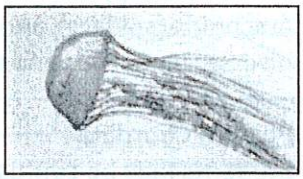
Name: _____ Activity 75: Classifying Animals

Period: BACKGROUND INFORMATION

History of Taxonomy (Taxonomy is the scientific study of classification)

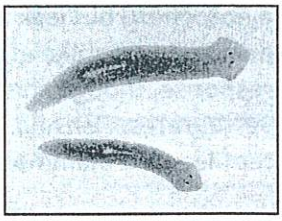
Carolus Linnaeus (1707–1778) was the first biologist to make a thorough system of classification. Until Linnaeus, organisms were known entirely by local names. Linnaeus used Latin terms for naming species and making his groups, since Latin was the universal language of science at the time. Linnaeus' taxonomy was based only on *morphological* similarities. ***Morphology refers to the form and structure of an organism***. Other classification systems are based on *phylogeny*. ***Phylogeny*** uses morphological (shape and form), physiological (how the body works), and genetic information to determine how species are related. The phylogenetic classification system continues to be changed/updated as scientists discover more about how species are related. However, Linnaean classification is still useful for grouping and describing organisms.

Phylum Cnidaria (formerly "coelenterates")



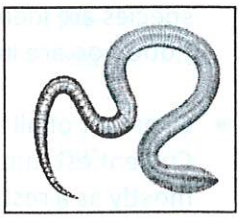
The organisms in this phylum have been called "jellyfish" but are now called "jellies" because they are not fish. They are radially symmetrical animals with stinging tentacles and no skeleton or shell. They do not have specialized breathing organs; gas exchange occurs by diffusion through the skin. Cnidarians have a pocket-type gut in which their mouth serves also as the anus. There are about 5,000 known species of cnidarians. Some jellies have tentacles over 40 feet long and can be deadly to humans. This phylum also includes Portuguese man-of-wars and corals.

Phylum Platyhelminthes (flatworms)



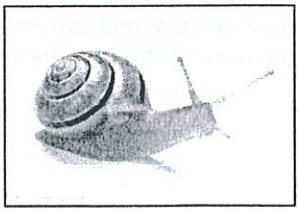
Since these flat animals have enough surface area for their volume, they (like cnidarians) require neither specialized breathing organs nor a conventional circulatory system. They are bilaterally symmetrical and also use the same opening for both mouth and anus. This phylum includes liver flukes and tapeworms (which are parasitic) as well as the harmless freshwater planaria that are often used as research organisms.

Phylum Annelida (segmented worms)



The annelids are segmented worms with a round body shape and bristles (known as setae) on each segment. Some annelids, like the bristle worms, have gills, but others, like earthworms and leeches, meet their gas exchange requirements by diffusion across their moist skin surface. Unlike flatworms, segmented worms have a one-way digestive tract, with separate openings for mouth and anus. There are about 9,000 known species of annelids, which include leeches, fan worms, tube worms, earthworms, and bristle worms. The largest earthworms in the world are 6 feet long and live in Australia.

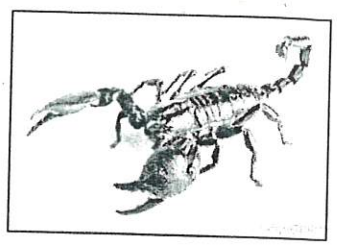
Phylum Mollusca



Soft bodies with a muscular foot and shell characterize mollusks, whose major groups include bivalves, gastropods, and cephalopods. All have some type of shell: even octopi, slugs, and squid have the remnants of a shell within their body. Mollusks have specialized respiratory organs: land-

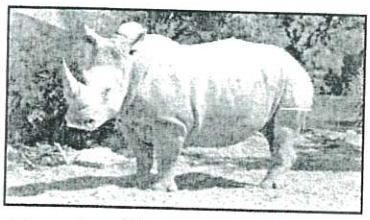
living mollusks (such as some slugs and snails) have lungs while aquatic mollusks have gills. There are over 100,000 named species of mollusks and they range in size from nearly microscopic to the 18-meter giant squid. They also have tubular guts with separate openings for the mouth and anus. Many mollusks have a ribbon-like tongue with teeth. They show a high degree of variability in their nervous systems. Cephalopods such as octopi and cuttlefish are the most intelligent of these invertebrates and exhibit learning and social communication. Clams, on the other hand, do not even have a concentration of nerves.

Phylum Arthropoda



Arthropods have external, jointed skeletons and highly segmented body plans. Aquatic arthropods have gills while land-dwelling arthropods, such as insects, have tiny tubes that reach directly into the body and network throughout it. There are nearly 1,000,000 known species of insects, the most common of which are beetles. There are over 80,000 species of other arthropods, including crustaceans (which include shrimp, lobster, crab, and many of the plankton animals), arachnids (spiders), and myriapods (centipedes and millipedes). Arthropods are by far the most diverse, numerous and successful group of animals.

Phylum Chordata



Students may be confused about the difference between vertebrates and the phylum Chordata; Vertebrata is a subphylum of the Chordata. All chordates have a *notochord* during embryonic development. The **notochord** is a flexible rod that provides support to the organism. While most chordates are vertebrates, chordates include sea creatures such as tunicates and amphioxus, which have a notochord but lack a backbone. The subphylum Vertebrata is defined by a backbone, a brain case, and an internal skeleton. A central nervous system (brain and spinal cord) coordinates movement and response, though this feature is not exclusive to vertebrates. There are about 50,000 known species of vertebrates. Fish and the larval stages of amphibians have gills. Other vertebrate classes—birds, reptiles, and mammals (as well as most adult amphibians)—have lungs.

Classification Facts

- There are approximately 2.5 million known species in all, and scientists estimate that millions more species have not yet been identified, especially among the microbes. Each year, thousands of new species are identified. Of the known species, approximately 50,000 are vertebrates, while nearly 1,000,000 are insects. Bacteria are the most abundant and diverse group of organisms, though.

- Over 90% of all species that have ever lived have disappeared as a result of natural processes. Current estimates suggest that one species per day is becoming extinct due to human activity, mostly as a result of habitat destruction. Many species are becoming extinct before they are even discovered.

REFERENCES

Buchsbaum, R. Animals Without Backbones. Chicago: University of Chicago Press, 1976.
I.U.C.N The World Conservation Union. http://www.biodiversity.org/ (1999)
Romer and Parsons. The Vertebrate Body. Philadelphia: W.B. Saunders Co., 1977.

ACTIVITY Act 75 Classifying Animals | Date 3/18 | Page 65

Learning Target: I can explain different [illegible] classification [illegible] organisms.

Activity 75: Classifying Animals
PHYLUM CARD INFO **Name:**

Phylum: PLATYHELMINTHES
- Flat body
- Oxygen absorbed across body surface
- No circulation system

- planaria (4)
- tapeworms
- marine flatworms

Phylum: CNIDARIA
- Soft body
- Water moving in and out of body provides oxygen and removes waste
- Stinging cells

jelly coral sea anemone

Phylum: ARTHROPODA
- Outer skeleton
- Jointed legs
- Circulation system
- Simple respiration (air tubes, gills)

- rock shrimp (15)
- longhorn beetle
- tiger mosquito

Phylum: ANNELIDA
- Segmented body
- Circulation system with simple heart and blood vessels

- bristleworm (13)
- leech earthworm

Phylum: MOLLUSCA
- Gills for respiration
- Simple circulation with heart
- Often has shell

- cuttlefish
- zebra mussel
- cowrie

Phylum: CHORDATA
- Backbone
- Complex nervous system
- Circulation system
- Respiratory system (gills or lungs)

- nutria
- starling
- Nile perch

best way to group animals? Explain.

LAB-LOG

ACTIVITY Act 75 Classifying Animals | Date 2/18 | Page 65

Learning Target: I can explain different systems of classifying living organisms.

WRU Thinking?

What do you collect? How do you sort your collections? Why?

Procedure

- card sorting categories listed below

- Actual phylum ÷ card sorting listed below

Analysis Questions (#1, 3, 4)

ANALYSIS

1. How did your categories change when you followed the biologists' system of phyla? Did your number of categories increase, decrease, or stay the same?

2. Look carefully at how biologists group these animals into phyla. What types of characteristics are used to group animals into phyla?

3. Animals without backbones are called invertebrates. How many invertebrate phyla do the animals on your Animal Cards represent? List these phyla.

4. **Reflection:** What characteristics were most important to you when you grouped the Animal Cards? How are these characteristics different from the ones that biologists use to classify? What do you now think is the best way to group animals? Explain.

ACTIVITY 75, cont | Date 2/25 | Page 67

Analysis Questions (cont) 2, 4

Lab

- Macro - invertebrates
- Water Chemi

ACTIVITY

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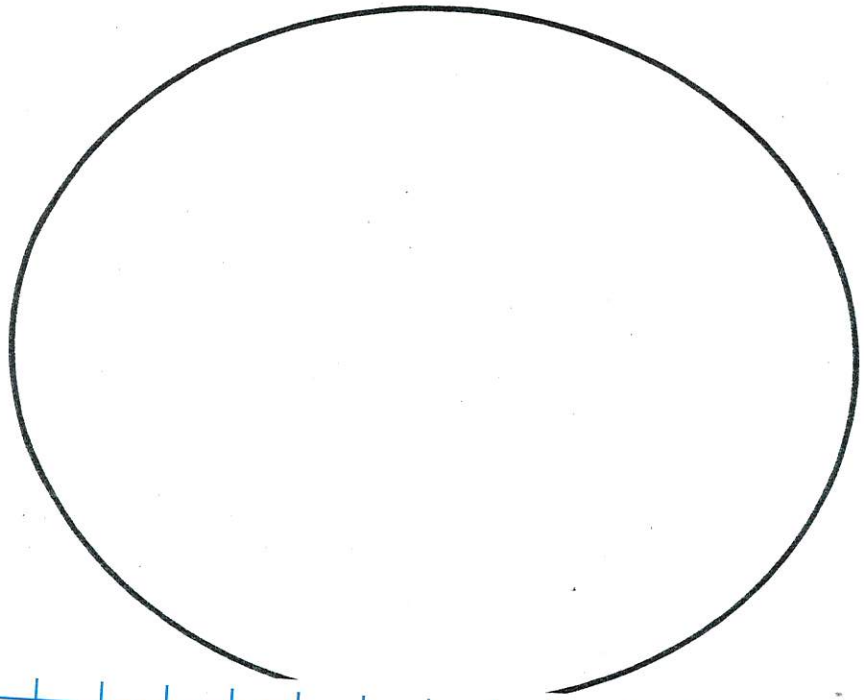
Date 2/25

Clean Rivers Education Project

Macroinvertebrates



Clean Rivers Education

A City of Portland Environmental Services Program

Draw the macroinvertebrate that you see in your jar.

What is the name of your animal?

_____

Which pollution group is your macro in?

- ☐ Sensitive (Group 1)
- ☐ Somewhat Sensitive (Group 2)
- ☐ Tolerant (Group 3)

Clean Rivers Education

A City of Portland Environmental Services Program

Water Chemistry Report

You're the watershed manager. You're in charge of making decisions about how to improve the water quality of our rivers and streams. What actions do you recommend to decrease the water temperature of local streams?

and I know that ____________________

ACTIVITY Clean Rivers Education Project | Date 2/25 | Page 68

LAB-L

*Macro-

WORK FOR CLEAN RIVERS - HELP RESTORE STREAMBANKS AND FISH HABITAT

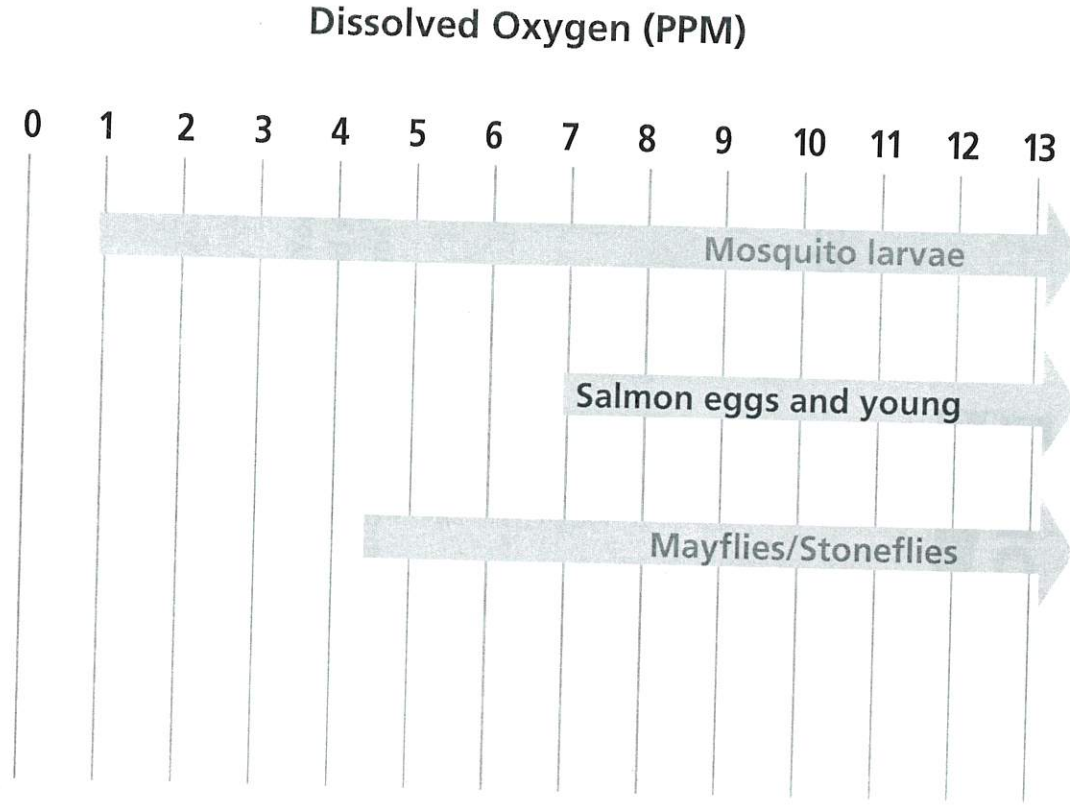
Dissolved Oxygen (D.O.)

Definition: The amount of oxygen in the water.

Importance: Required by aquatic life to breathe.

How is it measured? In Parts Per Million (PPM).

(some scientists use mg/l or percent saturation)



OD 0501

CITY OF PORTLAND ENVIRONMENTAL SERVICES WORKS FOR CLEAN AND HEALTHY WATERSHEDS

WE ALL LIVE IN A WATERSHED - REDUCE - REUSE - RECYCLE - FOR A HEALTHY ENVIRONMENT

HELP PREVENT POLLUTION - HELP KEEP OUR RIVERS AND STREAMS HEALTHY

ACTIVITY Clean Rivers Education Project | Date 2/25 | Page 68

LaB-L

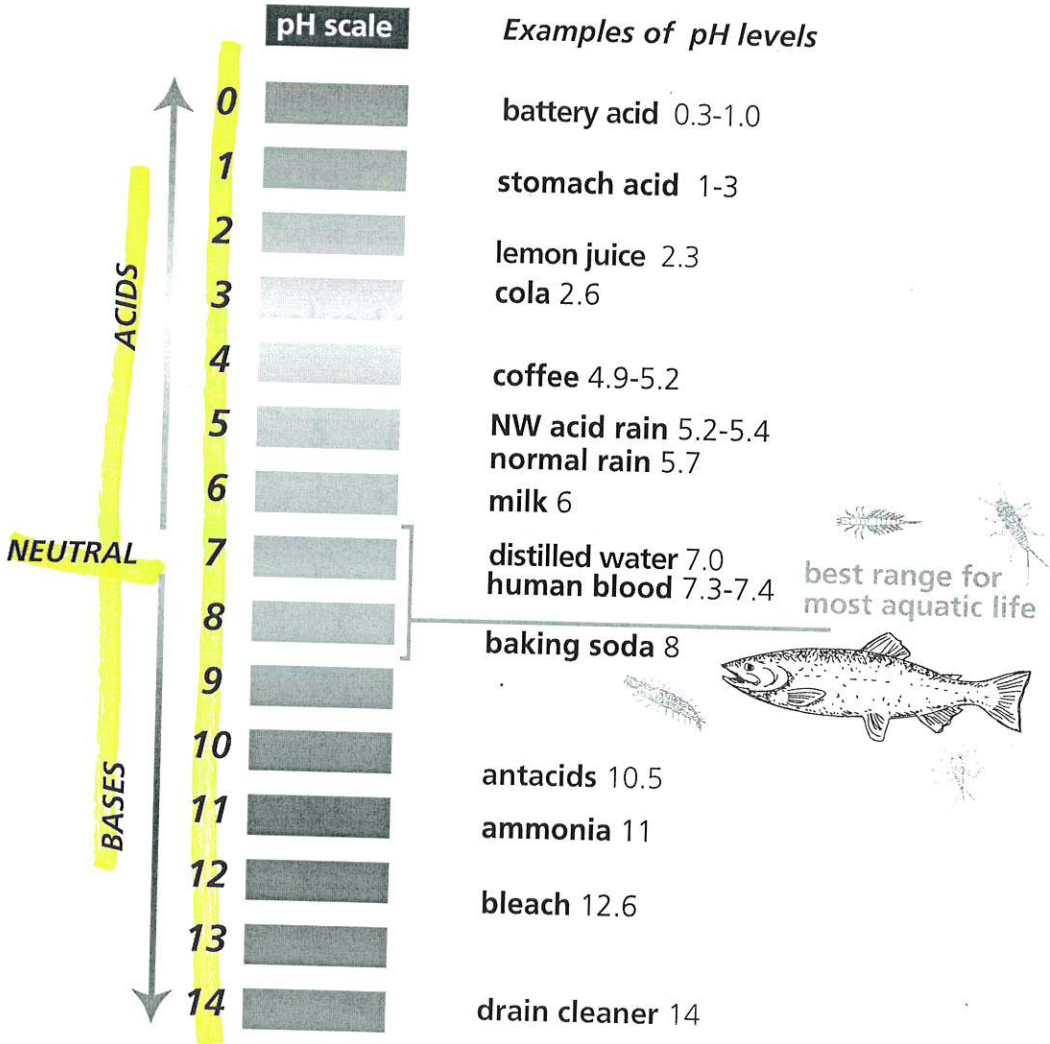
*Macro-

WORK FOR CLEAN RIVERS - HELP RESTORE STREAMBANKS AND FISH HABITAT

pH

Definition: Measure of how acidic or basic (alkaline) the water is.

Importance: Pollution can change the pH of water.
If water is too acidic or too basic aquatic life can die.



OD 0501

CITY OF PORTLAND ENVIRONMENTAL SERVICES WORKS FOR CLEAN AND HEALTHY WATERSHEDS

CITY OF PORTLAND ENVIRONMENTAL SERVICES WORKS FOR CLEAN AND HEALTHY WATERSHEDS

HELP PREVENT POLLUTION - HELP KEEP OUR RIVERS AND STREAMS HEALTHY

WE ALL LIVE IN A WATERSHED - REDUCE - REUSE - RECYCLE - FOR A HEALTHY ENVIRONMENT

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WORK FOR CLEAN RIVERS - HELP RESTORE STREAMBANKS AND FISH HABITAT

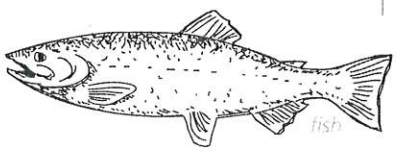
Temperature

Aquatic organisms breathe oxygen that is dissolved in the water.

- Warmer water may mean less dissolved oxygen is available for aquatic animals to breathe.
- Colder water can hold more dissolved oxygen.

Rapid changes in water temperature can kill aquatic organisms.

°C	°F	Preferred Temperature
50	122	**Warm** Above 68° F (20° C) dragonflies, bass, carp, catfish
40	98.6	
30	86	
20	68	**Cool** 55-68° F (13-20° C) Chinook, coho, sturgeon, cutthroat trout, mayflies
10	50	
0	32	**Cold** Below 55° F (13° C) Steelhead, caddisflies, stoneflies, salmon eggs and alevins
-10	14	
-20	0	



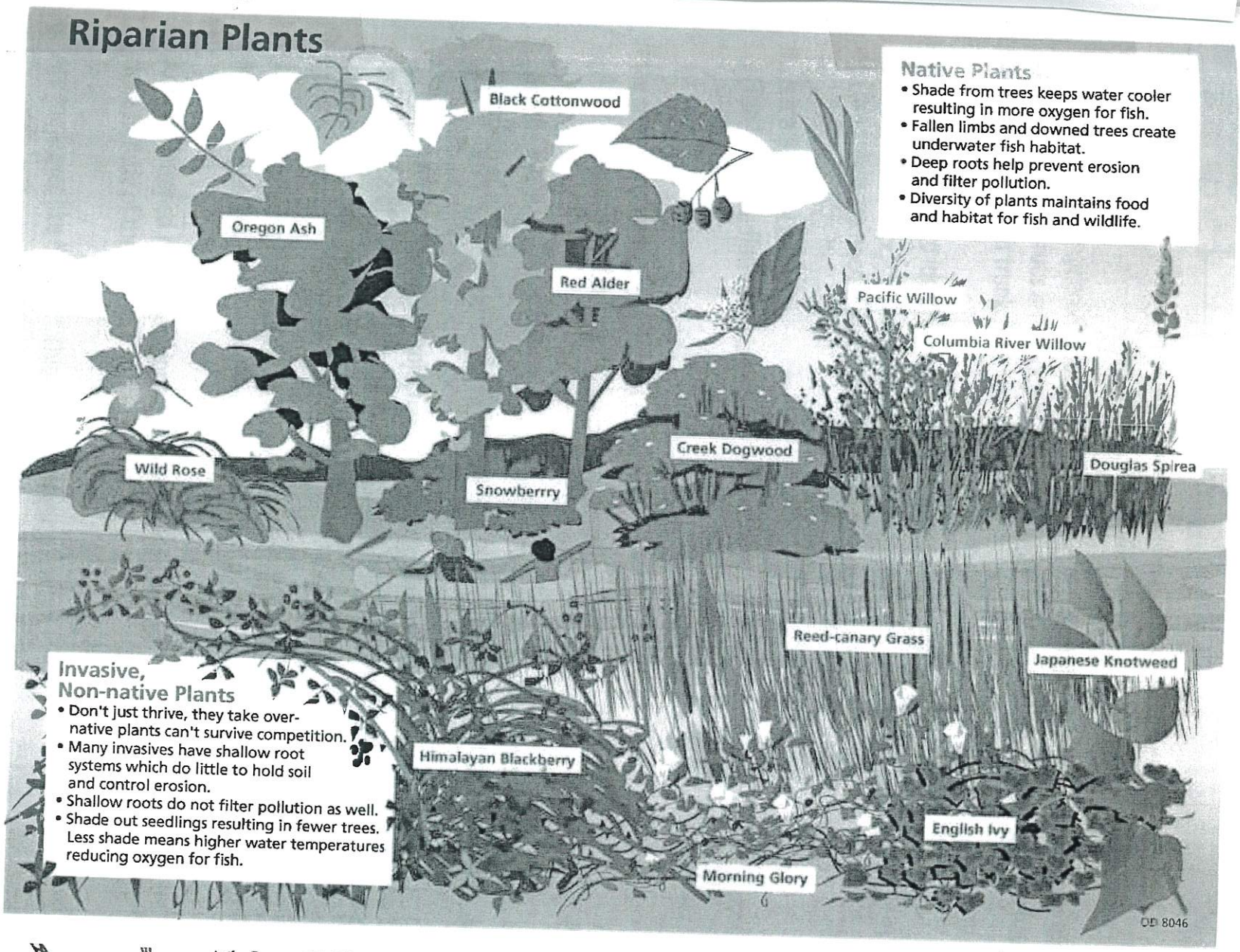
OD 0501

CITY OF PORTLAND ENVIRONMENTAL SERVICES WORKS FOR CLEAN AND HEALTHY WATERSHEDS

HELP PREVENT POLLUTION - HELP KEEP OUR RIVERS AND STREAMS HEALTHY

WE ALL LIVE IN A WATERSHED - REDUCE - REUSE - RECYCLE - FOR A HEALTHY ENVIRONMENT

Riparian Zone Plants Drawings


Riparian Plants
Native Plants
• Shade from trees keeps water cooler resulting in more oxygen for fish.
• Fallen limbs and downed trees create underwater fish habitat.
• Deep roots help prevent erosion and filter pollution.
• Diversity of plants maintains food and habitat for fish and wildlife.
Black Cottonwood
Oregon Ash
Red Alder
Pacific Willow
Columbia River Willow
Wild Rose
Snowberrry
Creek Dogwood
Douglas Spirea
Reed-canary Grass
Japanese Knotweed
Invasive, Non-native Plants
• Don't just thrive, they take over- native plants can't survive competition.
• Many invasives have shallow root systems which do little to hold soil and control erosion.
• Shallow roots do not filter pollution as well.
• Shade out seedlings resulting in fewer trees. Less shade means higher water temperatures reducing oxygen for fish.
Himalayan Blackberry
English Ivy
Morning Glory
OD 8046

· Riparian

Trees are usually considered woody plants which grow higher than twelve feet and have just one main trunk. Shrubs are woody plants which grow usually less than twelve feet and have more than one main trunk.

When attempting to identify a woody plant, look for the following:

A. Is it a CONIFER?
(The leaves are needlelike or scale like, and it has woody cones.)

B. Is it a BROAD-LEAVED?
(The leaves are flattened blades)

If the tree is a CONIFER, look for the following:

1. Are the needles in "bundles?" This is characteristic of pines.

2. Are the needles coming from the tree singly? Are the tree and its cones erect (standing at attention!) with a strong, pleasant odor. This characteristic of firs.

3. Are the needles on woody projections on the twig, the branches and cones hanging, and the tops of the trees bowed? Is woody stubble left on the twigs when the needles fall. This characteristic of hemlocks.

4. Are the needles coming out singly all around the twig? Do the hanging cones have three parted projection. This is characteristic of Douglas fir.

5. Are the flattened needles equipped with points on the tips? This is characteristic of the yews.

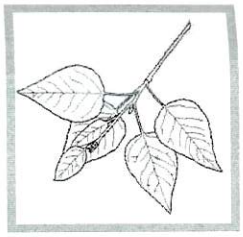
6. Are the leaves like "scales?" This is characteristic of cedars.

Plant Identification

- TREES
- SHRUBS
- FERNS and HORSETAILS
- HERBS
- ● AN INVASIVE PLANT

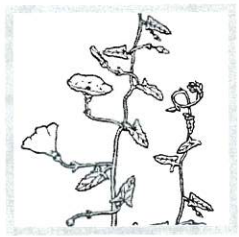

BITTERSWEET NIGHTSHADE ●

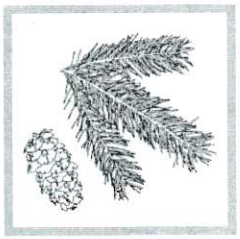

BIGLEAF MAPLE


BLACK COTTONWOOD


FRINGECUP


GOATSBEARD


MORNING GLORY ●


DOUGLAS FIR


ENGLISH HOLLY ●


PACIFIC WATERLEAF


POISON-HEMLOCK ●


RED COLUMBINE

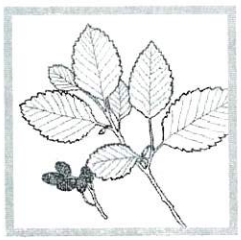

OREGON ASH


PACIFIC WILLOW


REED CANARY GRASS ●


WILD STRAWBERRY


YARROW


RED ALDER


WESTERN REDCEDAR

SPIRAEA

TALL OREGON GRAPE

THIMBLEBERRY

VINE MAPLE

WESTERN HAZELNUT

LaB-LOG

Riparian

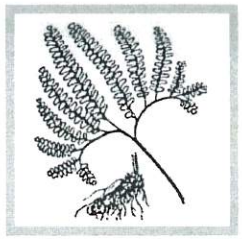
ACTIVITY Clean Rivers Education Project

Date 2/25

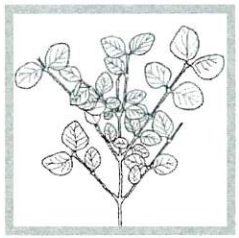
Plant Identification

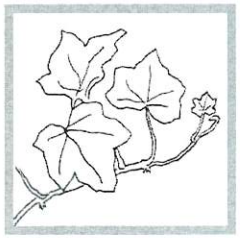
- TREES
- SHRUBS
- FERNS and HORSETAILS
- HERBS
- ● AN INVASIVE PLANT

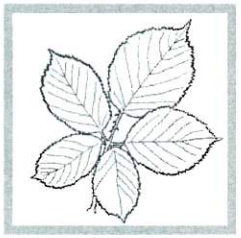

COMMON HORSETAIL


MAIDENHAIR FERN


SWORD FERN


COMMON SNOWBERRY


ENGLISH IVY ●


HIMALAYAN BLACKBERRY ●

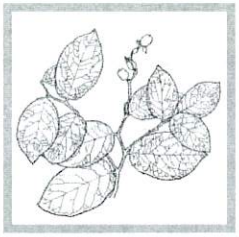

NOOTKA ROSE


PACIFIC NINEBARK


RED-OSIER DOGWOOD


RED ELDERBERRY

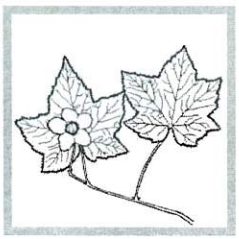

RED-FLOWERING CURRANT


SALAL


SALMONBERRY


SPIRAEA


TALL OREGON GRAPE


THIMBLEBERRY


VINE MAPLE


WESTERN HAZELNUT

LaB-LOG

Riparian Plants

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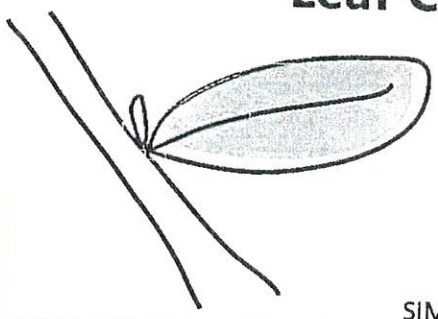
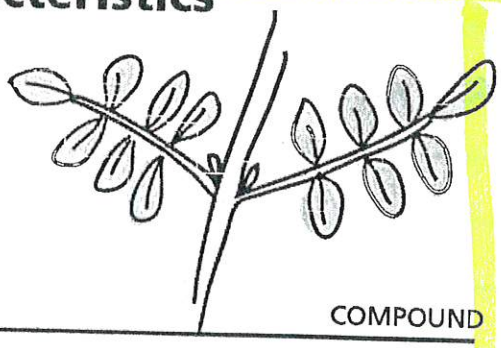
· Riparian Plants

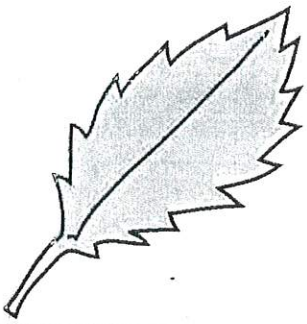
WORK FOR CLEAN RIVERS - HELP RESTORE STREAMBANKS AND FISH HABIT

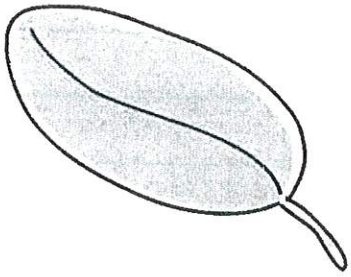
CITY OF PORTLAND ENVIRONMENTAL SERVICES WORKS FOR CLEAN AND HEALTHY WATERSHEDS

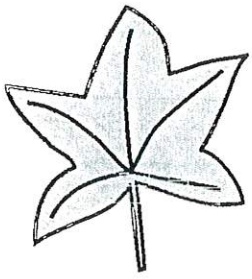
Leaf Characteristics

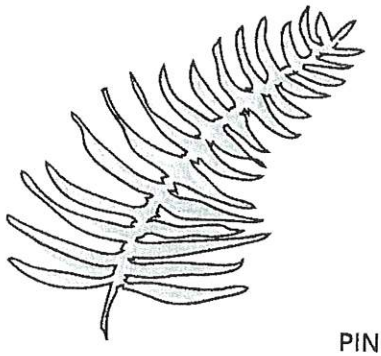

SIMPLE

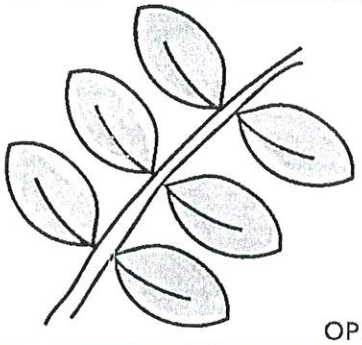

COMPOUND

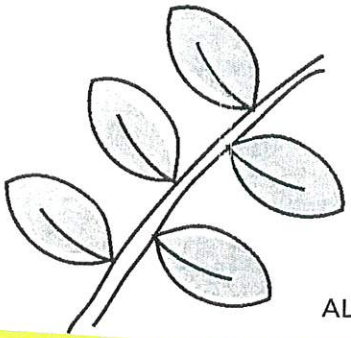

TOOTHED


ENTIRE / SMOOTH


LOBED


PINNATE


OPPOSITE


ALTERNATE

HELP PREVENT POLLUTION - HELP KEEP OUR RIVERS AND STREAMS HEALTH

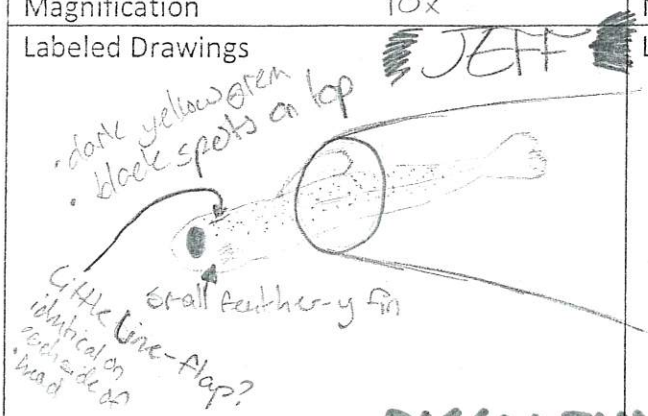
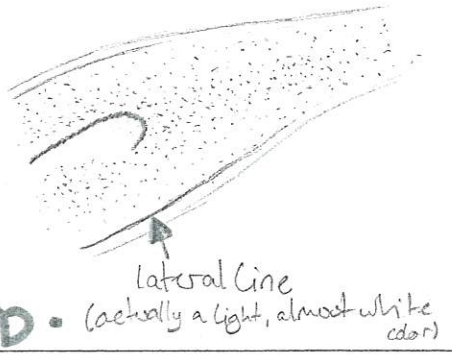
Salmon / Trout Observations

DO NOT TAPE

Date of observation: 2-26-20	Name of stage: swim-up-fry

HINTS FOR MAKING HIGH-QUALITY OBSERVATIONS

- *Use details*
- *Make comparisons with things you know*
- *Measure it*
- *"Reminds me of..."*
- *Color?*
- *Shape?*
- *Smell?*
- *Features / appendages?*
- *Texture?*

Magnification 10x	Magnification 30x
Labeled Drawings JEFF  	Labeled Drawings 
OBSERVATIONS • black spots on the back - thicker near the top & fade out • dark/dull yellow-green color • orang-y tail, fade to yellow w/ black tail-tip & end of fin	OBSERVATIONS
Inferences: prediction based on observations • black spots to blend in w/ yellow-green color rocks & shading? / shadows	Inferences • little flap to sense current? & small fins

• DISCONTINUED •

Name: _____
Period:

Activity 74: Observing Organisms
TIPS FOR SCIENTIFIC DRAWINGS

Draw what you see...
(not the picture in your head)

Scientific sketching is....

A ACCURATE

B BIG

C Colorful

D *Detailed*

E Explained

STEP 1: Draw the outline of the object. Think about the shapes (ovals, squares, triangles, etc.) that make up the object. Consider drawing just ONE PART in detail for more complicated objects.

STEP 2: Add details to shape. Consider adding appendages, a midline, etc.

STEP 3: Choose an area where there is something unusual or interesting. Blow it up in a zoom bubble to show more detail.

STEP 4: Add labels to give more detail about color, texture, movement, etc.

STEP 5: Add color.

Name: _____

Per: Date:

Activity 74: Observing Organisms
Encyclopedia Article Prompt and Rubric

Analysis Question #3:
As an ecologist, you are asked to write an entry in an encyclopedia about one of the organisms you observed in the lab. Use your laboratory notes to write at least three paragraphs describing the organism.

In the Encyclopedia article, include the following:

- The common name and the scientific name
- A physical description
  - A suggestion is to include both inside and outside, if possible
- A description of how it moves
  - Both in water and on 'land' (if it can survive on 'land')
- A description of how it responds to stimuli *(a stimulus is something that causes a response)*
- An explanation of how its structures contribute to their function.
- Diagrams with labels and color (labels neat, horizontal, outside field of view)
- A 'blown-up' diagram showing details that can be seen better at higher magnification (with magnification factor noted)

Other criteria:

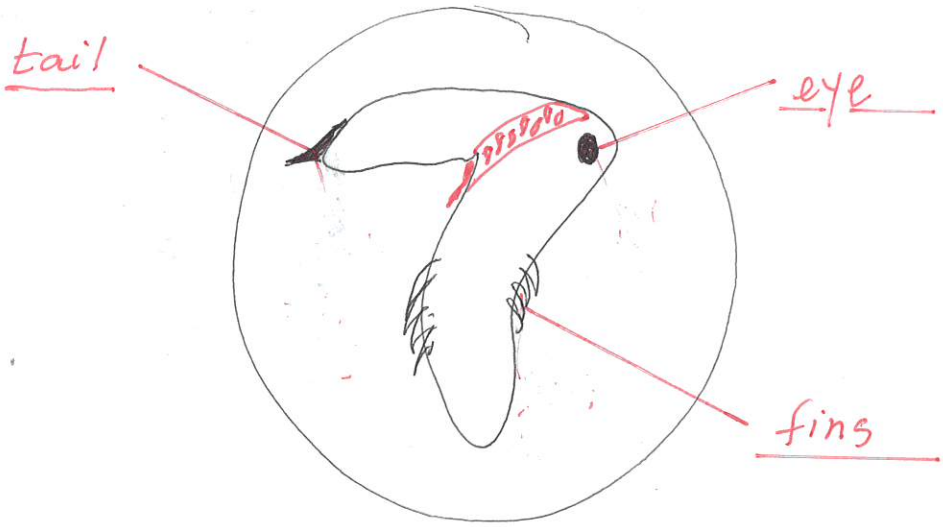
- Details are important. If using specific terms, define/describe them.
- Spelling counts – be professional.
- Include inferences, and say "I think that . . ." so that the reader knows it's an inference and not something quoted from a book.
- NO OUTSIDE RESEARCH. This should be based on the observations that YOU made.
- Do the Final Copy on a separate sheet of paper (include proper heading and Activity title) or a provided template.

REFER TO SCORING RUBRIC ON NEXT PAGE for scoring and **Self Assessment:**

Cross-Cutting Concept and Science & Engineering Practice
CC #6: Structure and Function: I can visualize and model complex and microscopic structures and systems to describe how their function depends on the shapes, composition, and relationships among its parts. (what it's made of)
SEP #8: Obtaining, Evaluating, and Communicating Information: I can integrate qualitative and quantitative information in written texts and visual displays to clarify claims and findings.

rganisms
lia Article

Orcinficus pointytailius



Name: ____
Period: ____

ACTIVITY 74: Observing organisms | Date 4/25 | Page 71

Act 74 Observing Organisms
Encyclopedia Article

Name: _____

Period: _____

LAB-LOG

ACTIVITY 77: Ups & Downs | Page 72 | Date 3/4

77 Ups and Downs

INVESTIGATION

You can gather ecological information by studying an individual organism, as you did in Activity 74, "Observing Organisms." But most organisms do not affect an environment as individuals, but as groups. Groups of individuals of a single species that live in the same place are known as populations. The photos on this page and the next show different populations of sea lions.

One introduced species that is causing a lot of problems in the United States is the zebra mussel. Its success in freshwater environments has caused the loss of native wildlife as well as damage to equipment. How fast is this population spreading? Some investigators predict that populations of zebra mussels will be found across the entire United States within 20 years. Studying what has happened to populations of zebra mussels in lakes around the world can help scientists figure out what changes are occurring in the U.S. and what to expect for the future.

AB

2. a. What factors do you think affect the size of a population?

   b. Explain how each factor might affect population size: Would it cause the population to increase, decrease, or stay the same? Why?

Procedure for Act 77 and 78:

1. Make a new page for Act 77: Ups and Downs. Read the Introduction (pg. E-32) and define **Population** in your Notebook. ✓

2. Answer Analysis Question #2 (a and b) for Activity 77.

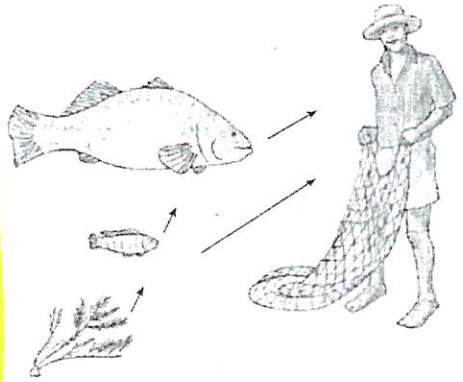
3. Start a new page for Act 78: Coughing Up Clues in your Notebook. Read the Introduction (pg. E-37) and define **Food Web** in your Notebook. Sketch the image, too.

4. Answer Analysis Question #2 (a, b, and c) for Activity 78.

78 Coughing Up Clues

LABORATORY

How do introduced species affect other organisms within a habitat? What happens to the populations of native species when a new organism is introduced? Scientists often draw diagrams, called **food webs**, to model the feeding relationships within an ecosystem. By showing what each organism eats, food webs model the energy relationships among species.



A simplified food web of Lake Victoria

How can you find out what an organism eats? One way is to examine its stomach contents. But in the case of owls, you can also examine an owl pellet. An owl pellet is a combination of bones and fur that an owl coughs up, just as a cat coughs up a hairball. Owl pellets are formed when owls swallow their prey whole and their digestive system cannot break down fur and bones. Within 12–24 hours after eating, an owl throws up a pellet. Piles of pellets are often found at the base of the tree on which an owl is perched. These pellets help ecologists learn what and how much owls eat.

ANALYSIS

1. What did you learn about the diet of owls from investigating an owl pellet? Include information about the type and number of organisms in an owl's diet. (Remember that an owl ejects a pellet within 12 to 24 hours after eating.)

2. a. The organisms that you uncovered in your owl pellet are likely to be voles, small rodents similar to mice. Owls also eat other small mammals, such as shrews, and insects. Use this information on owl diet to develop a food web.

   b. Voles eat mostly plant material such as grass, seeds, roots, and bark. Shrews eat insects. Add these relationships to your food web.

   c. The great horned owl sometimes eats other owls. It also eats small mammals like voles. Add the great horned owl to your food web.

Name:

Activity 77: Ups and Downs
Anticipation Guide

Anticipation Guide: Introduced Species—the Zebra Mussel

Before starting the activity, mark whether you agree (+) or disagree (–) with each statement below. After completing the activity, mark whether you agree (+) or disagree (–) with each statement below. Under each statement, explain how the activity gave evidence to support or change your ideas.

Before	After		
____	____	**1.**	Studying what has happened in the past with an introduced species can help us predict its future
____	____	**2.**	A healthy population of animals in a habitat will stay the same year after year with very little change.
____	____	**3.**	To cause problems in a habitat, introduced species, such as the Nile perch, have to be larger than the other animals in the habitat.
____	____	**4.**	An introduced species has to be near the top of the food web—a predator—if it is to cause problems in a habitat.
____	____	**5.**	It is possible for an introduced species to be both helpful and harmful to a habitat.
____	____	**6.**	Populations of living things can be affected by nonliving factors, such as rainfall.
____	____	**7.**	Populations of living things can be affected by living factors, such as another species.

Before	After		
____	____	**8.**	Species that are introduced into a habitat are always successful.
____	____	**9.**	An introduced species that is invasive will increase in a habitat indefinitely.
____	____	**10.**	A decrease in the population of an introduced species must be due to a new predator in that environment.
____	____	**11.**	It is easy to get rid of an introduced species once it has begun to reproduce in a habitat.
____	____	**12.**	It can cost a lot of money to get rid of an introduced species once it has begun to reproduce in a habitat.
____	____	**13.**	Adding a predator to a habitat to get rid of an introduced species is always a good solution.
____	____	**14.**	When people are trying to control an introduced species, it helps them to know as much as possible about that species, including its habitat, life cycle, and feeding habits.

LaB-L

Vocabulary

Population: the number of individuals of the same species that live in the same area at a given time.

Analysis Question (#2a, b)

Factor that affects population size	How does it affect it?
Temperature	depends on the organism's preference/ tolerance
Pollution - air	
invasive species	depends
natural disasters (dramatic weather events	decrease in pop.

Analysis Questions, cont

Factors	How does it affect it?
overeating	
loss of habitat	
loss of food	
amount of predators	
climate change	
dead zones - lack of O_2	
water supply	
acidity level	

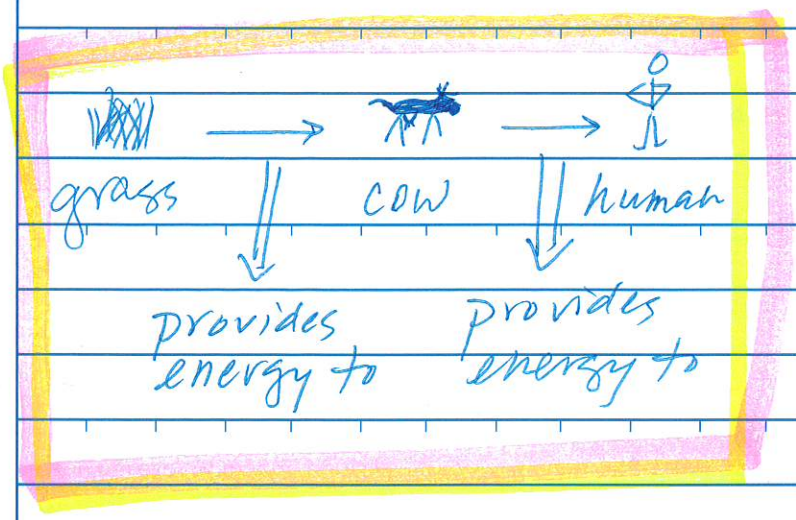
AQ, continued

~~Ea~~ Factor	How does it effect the pop size
Reproductive Rate	
Human influence	
Diseases	Lower pop.
Light & sound pollution	

Learning Target

I can explain what a food web is, draw one, and describe the energy flow through it.

Food Chain / Web



Name:

ECOLOGY QUIZ: ACTIVITIES 72-83 STUDY GUIDE

1. Use the textbook (online or otherwise). Look at the analysis questions for each of the activities. Can you answer them? If not, go through your materials again, and get help if you need it!

2. Go through your notebook. Carefully review highlighted vocabulary words and other notes. Do you understand them? If you don't remember something, then make sure you go back, review, and/or get help. Help can come from the book, your science notebook, peers, online research, or Mr. Groom.

3. Take notes/copy diagrams as you study. Use that during the quiz!

Activity	Associated Vocabulary/Concepts/Handouts
72: The Miracle Fish?	• Ecology/Ecologist definition • How people have different perspectives on the introduction of the Nile perch • What are pros and cons of Nile perch introduction • Read pages E-6 to E-8. • Review AQ #2-7 • Understand the graph on page E-7 • Handout: Reading Outline • Handout: Intra-Act sheet – understand the statements and different perspectives
73: Invasive Species	• Introduced Species definition • Review data sheets (complete those that you haven't done yet!) • Native vs. non-native species • Review notes from OPB Movie: The Silent Invasion • How a non-native species out-competes native species to become invasive • Ways to control invasive species – understand the main ways • Handout: Background Information – read it again! Lots in there! (*)
74: Observing Organisms	• Definition of Ecology • Observation vs. inference definitions • Treat organisms humanely and with care • Definitions of ~~anthropomorphism~~ and anthropocentrism, and examples of each • Review AQ #1-4
75: Classifying Animals	• Review Introduction on page E-19 – 20. • Handout: Reading Notes • Know similarities and differences between 3-Domain, 5-Kingdom, and 6-Kingdom classification systems • Prokaryote vs. Eukaryote • Definitions for: Genus, Species, Fertile, Scientific Name • Know the different levels of the Classification System (KPCOFGS) • Handout: Background Information (*) • Handout: Phylum Card Info • Linneaus is the Father of Classification/Taxonomy • Review AQ #1-4
76: People, Birds, and Bats	• Endotherm vs. ectotherm • Using evidence, rather than assumptions, to classify organisms • Understand how some organisms don't fit neatly into a particular class • Know how to use classification chart on pages E-30-31

Endotherm: provides it's own thermal energy.

Ectotherm: relies on outside sources of energy for heating.

Activity	Associated Vocabulary/Concepts/Handouts
77: Ups and Downs	• Definition of population • Handout: Anticipation Guide • Know how to graph when data has gaps • Know how to analyze and then make conclusions based on graphs • Know what things can affect the population of a species over time ✱
78: Coughing Up Clues	• Reading, Page E-37 • What is a food web? • Owl pellet video and what owl pellets can tell you.
79: Eating for Energy	• Reading, page E-41-45 • Food chain – notes in Notebook • Reading Outline – very important • Producers vs. consumers • Plankton and their importance (we watched a video on them, too) • Photosynthesis • Food webs and how everything is arrowed and labeled, and what drives most food webs • How invasive species affect food webs • AQ # 1, 3, 4, 5
80: Nature's Recyclers	• Reading, page E-46 • Definition of decomposer, examples, and their importance to food webs • Where to put on food webs • Videos of different types of decomposers • Review AQ #2-4
81: A Producer's Source of Energy	• Review page E-50 • Photosynthesis 'lab', results, conclusions • Handout: Background Information (and notes from that) • Autotroph vs. heterotroph • Photosynthetic autotroph vs. chemosynthetic autotroph • Equations for photosynthesis and respiration and how they're linked • Function of respiration and photosynthesis, and where they happen in organisms
83: A Suitable Habitat	• Reading, pages E-58-64 • Definitions of habitat, population, communities, ecosystem, biodiversity, biome • Biotic vs. abiotic factors • Competition vs. predator/prey • Understand how species are adapted to survive in their ecosystems • Know some examples of biomes, and some threats to them
83 Extension: Symbiosis	• Reading handout • 3 types of symbiotic relationships: mutualism, commensalism, parasitism • Videos about different types