

1. What word describes tiny, free-floating, "animal like" things?
2. What word describes a lake with very little amounts of nutrients and plants?
3. What word is used to describe the bottom of a lake or stream?
4. Define riparian
5. Warm water is more dense than cold water.
6. Punctae and raphe are both shell characteristics of
7. What is a bad reading for the amount of nitrates in a lake?
8. What is a Q- value?
9. A secchi disk is used to measure _____
10. Why is the temperature of the Pigeon River in the summer and winter fairly close?? But Otsego Lake is VERY different?
11. Why is the water in Grand Traverse Bay (lake Michigan) so clear?
12. What is the most insidious, terrible, worst exotic species ever to get into the great lakes?
13. Name 5 exotic fish to Michigan?
14. This exotic was NOT transported here in ballast.
15. What is the an acidic pH in lakes and streams when acid rain falls or pine needles accumulate in a lake.
16. What is the normal (Q value of 100) amount of phosphates in lakes and streams.
17. What is a normal reading for dissolved oxygen levels in good cold water?
18. Hard water is water that has lots of
19. What is BOD?
20. What is the phylum of the hellgrammite?
21. What is the class of the stonefly?
22. What 3 benthic macroinvertebrates are the most pollution sensitive?
23. Describe the life cycle of the dragonfly, caddisfly, stonefly.
24. Diatoms are _____
25. Diatoms are in the phylum _____
26. Two reasons that diatoms and algae are important.
27. Desmids are _____
28. Euglena move using _____ Phylum of Euglena _____
29. Ulothrix and Zygnema are examples of _____
30. What word is used to describe this process? 5000 years ago we had a lake, it gradually gets shallower and fills in with weeds and plants through natural processes, eventually turning into a swampy wetland, then finally its dry ground.
31. In question 30 I said it can be a natural process. How can humans speed up the process?
32. Paramecium and Stentor are both
33. A watershed is
34. Our native species are other countries exotic species. explain
35. The sea lamprey got here in a unique way. How
36. Which exotic species was brought in on purpose?
37. The sea lamprey almost wiped out the
38. Zebra mussel are
39. Last year in class we ate some tasty asian carp. Where did it come from?
40. This Michigan fish is one of the most common in lakes, called a panfish, have a yellowish tint and taste yummy.
41. This Michigan fish IS native, has beautiful coloring, doesn't get real big, and fly fishermen love catching it in rivers
42. This native Michigan minnow lives in rivers and lakes and doesn't get very large.
43. Mesotrophic water has
44. A thermocline is a region where
45. Why do many fish go upstream to spawn?
46. What is TFM
47. What is Bayluscide?
48. what is sterile male release?
49. what are electrical weirs used for in relation to lamprey.
50. What is the DO level in Otsego Lake right now. Approximately.
51. Give 5 facts about Isle Royale.
52. what is the average mortality % of wolves on Isle Royale each year?
53. Why are the wolves inbreeding on Isle Royale?
54. Should they bring more wolves onto the island to help the genetic diversity and let wolves increase population? Explain.
55. Which benthic macroinvertebrate has large biting jaws and can draw blood on Taylor Swanson.
56. Draw the great lakes region including all 5 great lakes, 6 states around them, 4 major rivers and the St. Lawrence seaway.
57. Why are people so freaked out about Asian Carp? Do you think they will "take over the great lakes?" explain
58. What is a vernal pond? Who lives in a vernal pond? Why are vernal ponds important?
59. Know everything about everything related to water.

Limnology final exam
review

Class of fish

Osteichthyes

Phylum of spirogyra

Chlorophyta

Phylum of amoeba

Sarcodina

Phylum of stentor

Ciliophora

Phylum of paramecium

ciliophora

Kingdom of diatoms

Protista

Kingdom of zygnema

Protista

Phylum of zygnuma

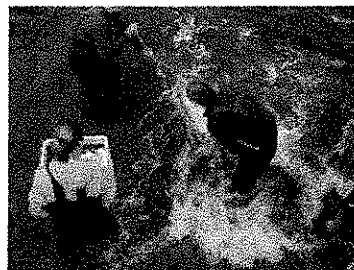
Chlorophyta

What protozoan is colonial,
flagellated, and green.

- VOLVOX

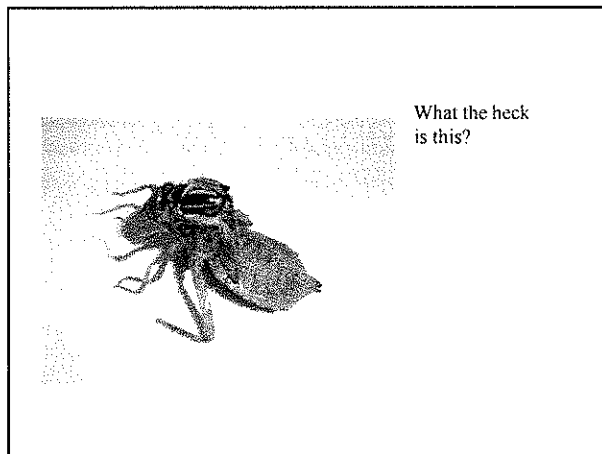
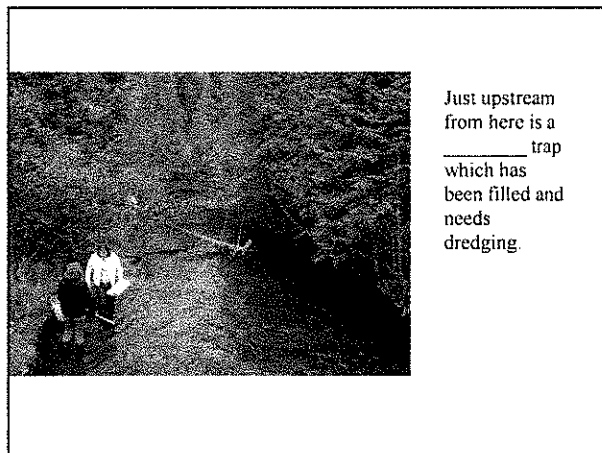
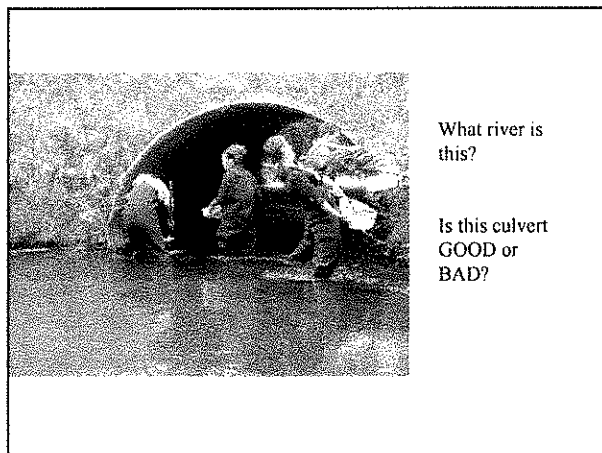
Phylum of diatoms

Bacciliariophyta



Can bugs really
live in a very
swift current
like this?

YES OR NO



Class of diatoms
Bacciliariophyceae

Name three common diatoms

Tabellaria, fragillaria, synedra,
cocconies, stauroneis, ...

Green one celled primitive plant-
like things

DESMIDS

Name a specific zooplankton

Paramecium, bythotrephes,
daphnia...

One celled glass house
phytoplankton

DIATOMS

A secchi disk measures

Water clarity or turbidity

As water gets cloudier, the temp
goes _____ and the D.O. goes _____

UP and DOWN

Did we find any nitrates in the
Sturgeon or Otsego Lake?

NO

The water temp of the
Sturgeon....

IS COLD and stays constant from
headwaters to Burt Lake.

Name THREE wetland trees.

Cedar, Tamarack, Tag Alder, Spruce

True or False – A small amount of
Fecal coliform bacteria is bad for
you.

FALSE

This exotic is a zooplankton

Cerc.pengoi or bythotrephes (spiny
water flea)

This exotic's beauty is why it is
here.

Purple loosestrife

This exotic is good bait, that's
how it got here.

Crusty rayfish

This exotic swam here on its
own.

Lamprey

This exotic arrived first.

Lamprey

This exotic is a favorite salmon
food.

alewife

This exotic filters A LOT of
water.

Zebra mussel

This exotic has done the most
damage to the great lakes.

Sea Lamprey
(people too though)

Once a top predator of the great
lakes, but now its numbers are much
lower.

Lake trout and burbot and sturgeon

What does diatom mean?

Made of two parts.

Two views of a diatom are
called...

Valve and girdle

This fish is a panfish, very abundant,
good eating, and easy to catch.

Perch, sunfish, ...

Phylum of fish

Chordata

Otsego Lake has a population of
these huge "prehistoric" fish.

Sturgeon

This fish is also called a
"lawyer."

burbot

Class of stonefly

insecta

Class of mayfly

Insecta

Class of hellgrammite

Insecta

Order of stonefly

Plecoptera

Order of mayfly

Ephemeroptera

Class of lamprey

Cephalospidomorphii

Order of hellgrammite

Megaloptera

Order of caddisfly

Trichoptera

Which **THREE** bugs are the most sensitive to water quality?

EPT, mayfly, stonefly, caddisfly

WE found this macroinvertebrate while sailing.

Caddisfly

Do macroinvertebrates like dragonfly, stonefly, caddisfly, etc, live longer in aquatic or terrestrial stages of life?

Aquatic ! (2-5 years)

What is DDT?

Kills mosquito larvae, cancer causing agent, found in Michigan waters.

What are PCB's?

Fire retardant actually mixed with cow chow. Now found in Michigan waters.

Bedrock of lower peninsula

Calcium carbonate (limestone)

Bedrock of western UP.

Granite 'eh.

Limestone acts as a BUFFER to prevent large pH changes.

Most likely to tip a canoe

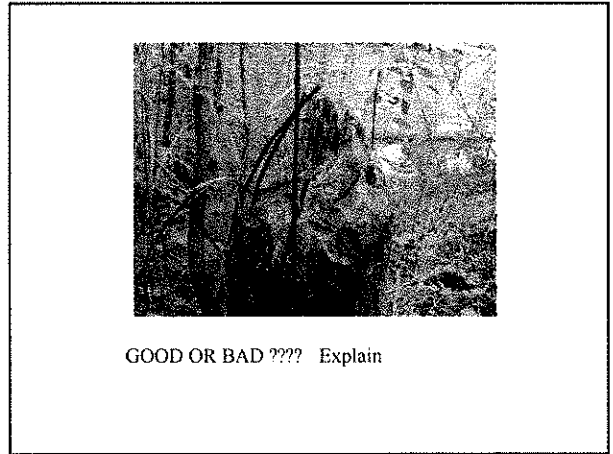
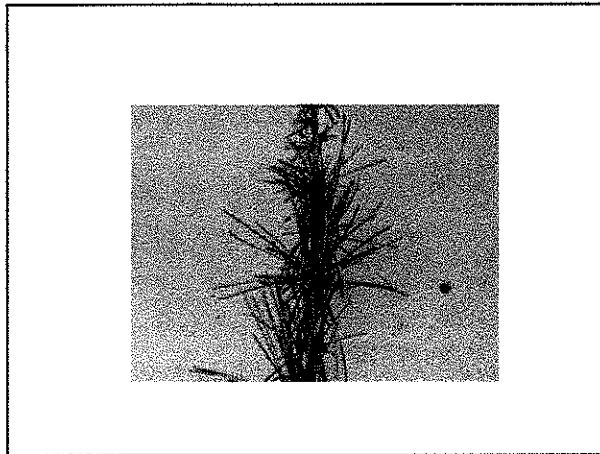
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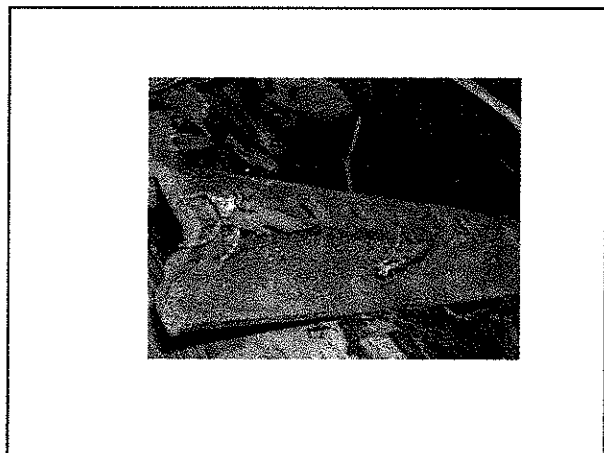
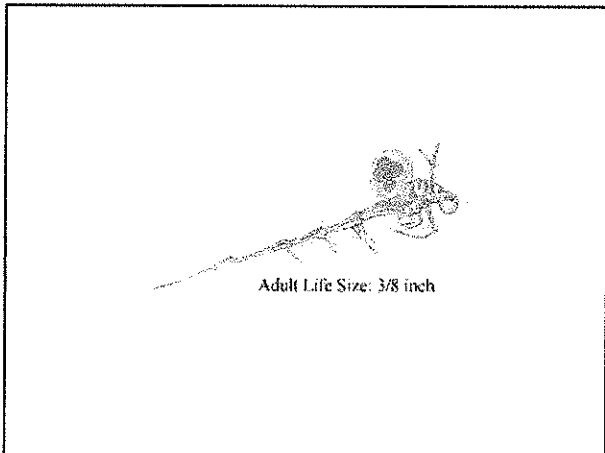
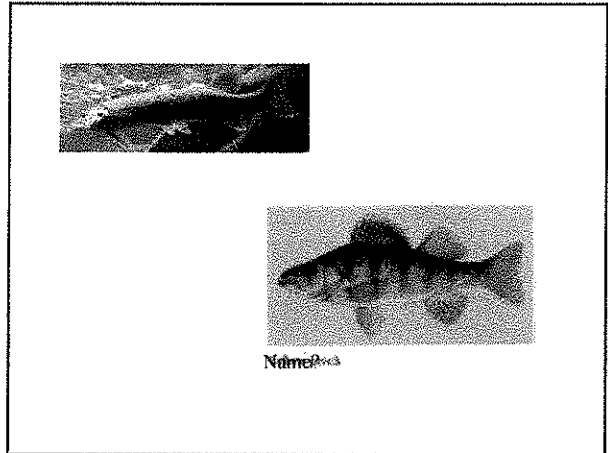
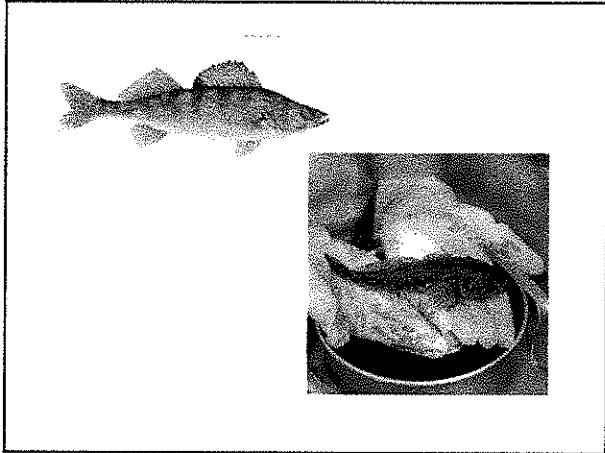
Fish found in trawl net on sailing trip.

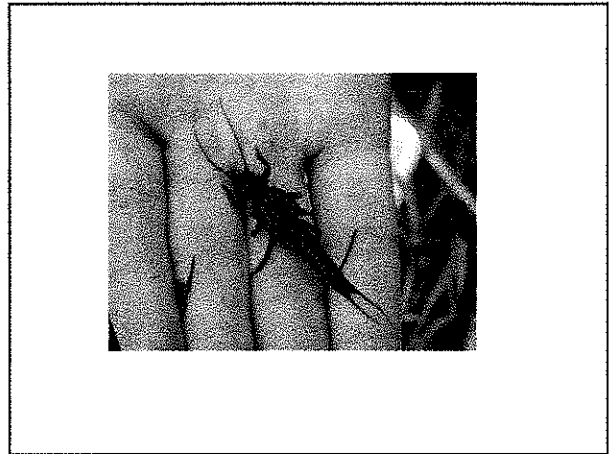
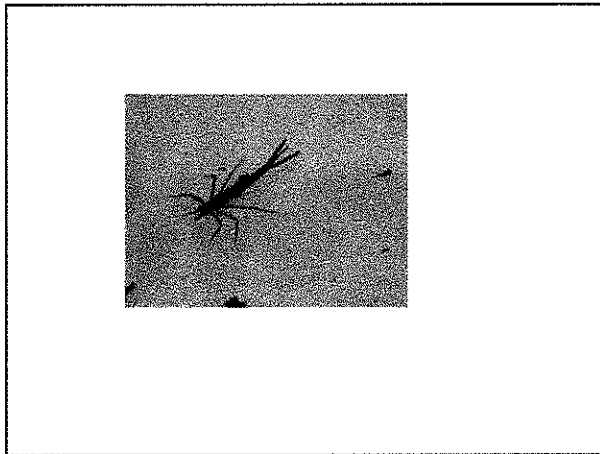
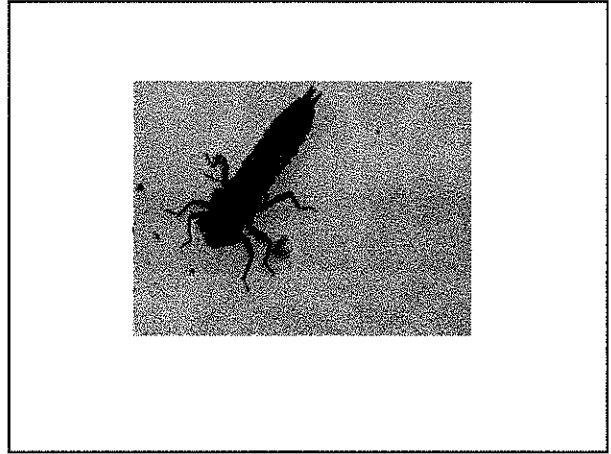
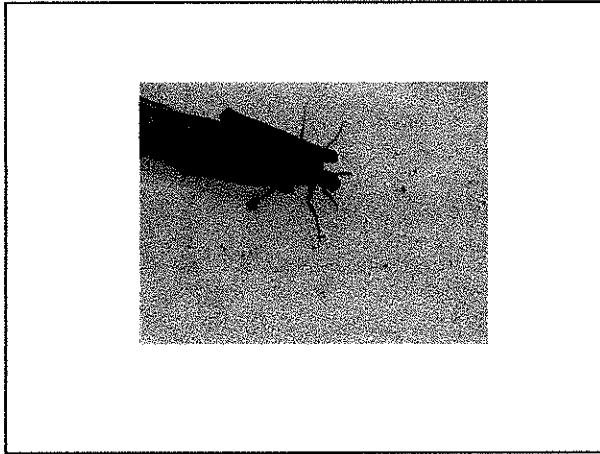
Johnny darter, sculpin, rock bass.

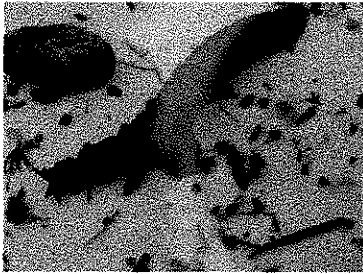
Did we find any zooplankton on sailing trip?

YUP, a whole bunch.









A definite lack of _____.



Where is this?

