

Basic Biology Series

FISH

NAME _____ SCHOOL _____

DATE STARTED _____ DATE COMPLETED _____

PREREQUISITE: Animal Kingdom.

HOW TO DO THIS COURSE: Do the steps one at a time, in order. When you finish a step, put your initials and the date on the sign-off line on the right. A split line means to get a pass (and an initial) from another student (or your supervisor if it says that). Essays are turned in to the supervisor.

PURPOSE: Learn something about the nature and importance of fish in the world, and become familiar with a variety of the more common fish.

ESTIMATED TIME: 12 hours.

MATERIALS NEEDED FOR THIS COURSE

A guide book on fish (*Golden Guides* series published by Golden Books or *Peterson's First Guides* published by Houghton Mifflin are suggested). Fish eggs. (Fish eggs are processed for use as bait. Make sure you don't get imitation eggs made from cheese.) Coloring crayons and drawing paper, several fishing or outdoor magazines with pictures of fish; an aquarium with several fish in it (recommended).

Heron text-pack with these Data Sheets:

2858	2859	2861	2860	2862
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Exams: 3592, 4731 (review)

NOTE TO THE SUPERVISOR

At the end of Part A of this course there is a practical application referring to a list of practical application projects (DS #2861 Fish, Practical Application Projects). The student is to do at least three of them. Many of these projects work well with a group. Try to plan group activities for students who are doing or will soon do this course.

The "special project" option (project #11) allows you and the students to be innovative. Make this a group project if there is a special or unusual opportunity to study fish in your area that you want to take advantage of. Do not let students use this option to shortcut the requirement by doing something too minor.

It is expected that the student will complete three of these, but if there is one of them that the student cannot reasonably finish in time to meet the course completion target (for instance if it depends on a planned group excursion which takes place too late) you can sign off the step at your discretion if the project is well planned and you are confident it will be done (and the other two are fully done).

A. ABOUT FISH

1. READ: Data Sheet #2858 How All Fish Are Alike. _____

2. DEMONSTRATE USING CLAY: Four ways that all fish are alike. _____

3. DEMONSTRATE: Draw a picture of a fish. Show the fins, gills and the scales. Color it if you like, then turn it in to your supervisor. _____
4. DEFINE: aquarium _____
5. DEMONSTRATE: Look at the fish in the aquarium in your classroom or school (if there is one). Look at the fins, gills and scales on each fish. Notice how the fish pumps water through its gills, and how the fins help the fish move. Point these things out in your demonstration.

If there is no aquarium at the school, arrange to see some live fish close up someplace else. (Continue below in the meantime.) _____

6. READ: Data Sheet #2859 The Life of a Fish. _____
7. DEMONSTRATE: Get some fish eggs from your supervisor. Look at them closely. Feel them and smell them. _____
8. DEMONSTRATE USING CLAY: The life of a fish. Show the things that happen as they go from eggs to small fish to big fish that make it important for fish to lay *lots* of eggs. _____
9. PRACTICAL APPLICATION: Choose three things to do from the list in Data Sheet #2861 Fish, Practical Application Projects, or choose two of these and one more practical application activity having to do with fish that you think of yourself. (If you think of your own, your supervisor must approve.) Write down what projects you want to do and when you plan to do them, and turn that in to your supervisor. Do what it says to do for each project that you choose. Do these projects as soon as you can, but not during course time. The sign-off line here is for planning your projects. There is another sign-off line at the end of the course steps for completing them. **Supervisor pass.** _____

B. DIFFERENT KINDS OF FISH

1. READ: Data Sheet #2860 Different Kinds of Fish, to the heading "Herrings, Sardines and Anchovies." _____
2. DEMONSTRATE: Look up tuna in a guide book and look at the pictures. See how many different tuna it shows, and notice how they are alike and how they are different. Get a pass from your supervisor

17. READ: Data Sheet #2860, the section “Skates and Rays.” _____
18. DEMONSTRATE: Look up skates and rays in a guide book and look at the pictures. See how many different skates and rays it shows, and notice how they are alike and how they are different. _____
19. READ: Data Sheet #2860, the section “Sea Horses.” _____
20. DEMONSTRATE: Look up sea horses in a guide book and look at the pictures. Notice how they are like other fish and how they are different. _____
21. DEMONSTRATE: Look up at least ten other different kinds of fish in your guide book that were not included in the data sheet. Some that you might find are tarpon, carp, cod, mullet, bass, perch, jacks, scad, croakers, porgies, mackerels, marlins, swordfish, flounder, toadfish, sturgeons, shads, whitefish, smelt, pikes, suckers, minnows, shiners and sunfish. Particularly look for fish that might be found near where you live. If you live near the ocean, you might look mostly for salt water fish. If you live inland, you might be more interested in freshwater fish. Make a list of the fish you pick and write something about each one that tells how it is different from other fish. Count each one as a separate demonstration. Turn what you wrote in to your supervisor. **Supervisor pass.** _____
22. DEMONSTRATE: Pick at least five of your favorite kinds of fish from all the fish you have studied. Draw pictures of these fish. Try to make your pictures show what makes each of these fish special. Count each picture as a separate demonstration. Save your pictures for the next step. _____
23. ESSAY: Write a short essay about each of the pictures you drew. Tell the name of each fish, why you picked it and some things you were interested in about it. Also tell where it lives and what it eats, and what it is doing in your picture. Count each one as a separate demo. Turn in your pictures with your essay. _____
24. PRACTICAL APPLICATION: Look through several fishing or outdoor magazines. Look for the pictures of fish. See if you can name each kind of fish that you see. _____
25. DRILL: Have your supervisor or someone who has done this course show you pictures of ten or more different fish in your guide book, _____

and you tell what fish it is without looking at the name. They should choose the common sorts of fish you have studied. The drill is passed when you can name ten different ones of the kinds of fish you studied in Data Sheet #2860 Different Kinds of Fish, quickly and easily.

C. FISH IN THE WORLD

1. READ: Data Sheet #2862 Living with Fish. _____
2. DEMONSTRATE USING CLAY: A food chain. _____
3. DEMONSTRATE (with objects): Show the many steps a tuna or sardine goes through to get from the ocean where it lives to your home where you can eat it. _____
4. ESSAY: Imagine what the world would be like if the fish all disappeared. Write an essay telling what you think it would be like and what would happen. Decide whether it is good to have fish in the world, and tell what you decided and why you decided that in your essay. _____
5. PRACTICAL APPLICATION: Completion of projects from Part A, step 9. Write a report on each project telling what you did and what you learned about fish from doing it. If one of your projects isn't done when you get to this point, write a report saying what you have done so far and when you expect to finish the project. Turn your reports in to your supervisor. Your supervisor will decide if it is okay to sign off this step before the last project is finished. (You must complete at least two of the projects to complete the course.) **Supervisor pass.** _____

I have done all the steps of this course. I understand what I studied. I can use what I studied.

Student _____ Date _____

The student has completed the steps of this course and knows and can use what was studied.

Supervisor _____ Date _____

This student has passed the exam for this course.

Examiner _____ Date _____

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