Name _____

Date _____ Period _____

Comparing Bird and Reptile Eggs

Objectives

As a result of doing this activity, you should be able to:

- Identify the parts of a bird's egg.
- Compare the structure of bird and reptile eggs.
- Compare a hard eggshell with a rubbery eggshell.
- Explain how oxygen gets into a hard-shelled egg.

Introduction

Birds and reptiles have several similarities. Although birds have feathers, they also have scales and some have reptile-like claws. Birds and reptiles are also similar in that they lay eggs with shells. The internal structure of both bird and reptile eggs is also quite similar.

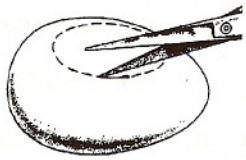
In this activity you will examine the basic structure of a hard-shelled egg by dissecting a chicken egg. You will also examine the structure of various reptiles' eggs to determine how some reptiles' eggs and birds' eggs are alike.

Materials

Chicken Eggs "Prepared" Eggs Pointed Scissors Magnifying Glass Small Dish

Procedure

1. Get a chicken egg and begin to open it by carefully tapping the eggshell with the point of your scissors. Tap at the spot indicated in the illustration at the right until you break a tiny hole in the eggshell. Insert the point of the scissors in this hole, and carefully cut the eggshell as indicated. Remove the loose pieces of shell. Use your scissors to enlarge the opening in the shell if the opening is smaller than the yolk of the egg. When the opening is large enough, carefully pour the contents of the egg into a dish. Be careful not to break the yolk.

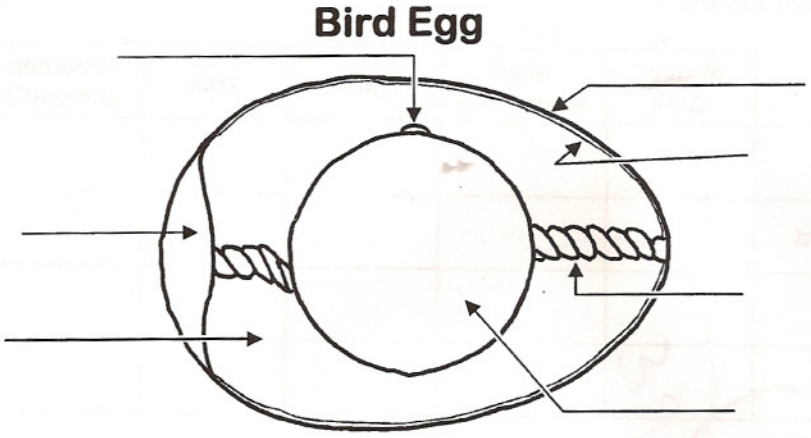


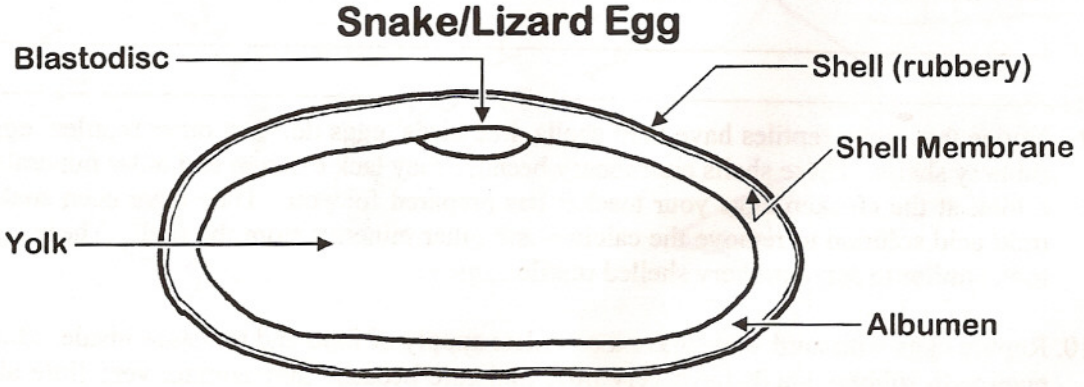
2. Examine the eggshell with a magnifying glass. The ***shell*** has pores that allow air to reach the embryo. Locate the ***shell membrane***. It rests against the inside of the shell. Many blood vessels form in the shell membrane as the embryo develops. It is through this membrane that the blood absorbs oxygen to carry to the developing embryo. Try to find the ***air space***. Be sure to notice if the air space is located at the broad end or at the narrow end of the egg.

3. Continue your examination of the egg by looking at the yolk. The yolk serves as a source of food for the developing embryo. Try to locate a small whitish spot on the surface of the yolk. This spot is the ***blastodisc***. It would develop into an embryo if the egg was fertile. Now look at the clear, liquid part of the egg. It is primarily made up of a protein called ***albumen***. The clear liquid part of the egg supplies the embryo with moisture and some nutrients.

   The albumen also acts as a shock absorber. You should be able to locate two thick whitish structures within the albumen called ***twisters*** (or chalazae). As a hen incubates her eggs, she turns them often. The twisters turn the yolk so the embryo always remains on top, close to the warmth of its mother's body. After 21 days of incubation, the embryo has developed into a chick and is ready to hatch.

4. On the bird's egg diagram below, label the following parts: ***Shell, Shell Membrane***, ***Blastodisc***, ***Yolk***, ***Twister***, ***Albumen***, and ***Air Space***.





5. Look at the drawing of the snake/lizard egg above. Instead of incubating their eggs, most reptiles cover their eggs with sand and abandon them. Thus, most reptiles' eggs must rely on the sun to provide the warmth necessary for their development. What structure is present in a bird's egg but not in a reptile's egg? Why doesn't the reptile's egg need this structure?

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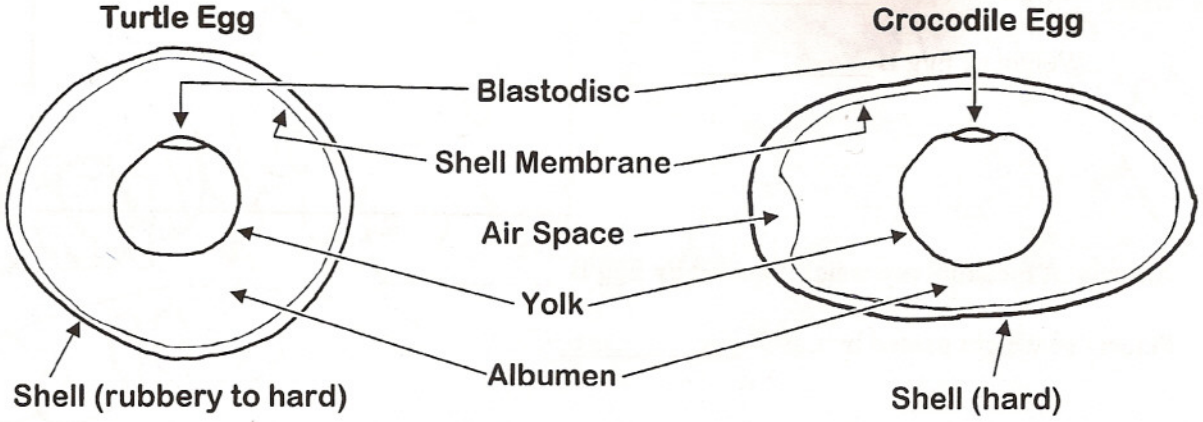
6. Now look below at the illustrations of the turtle and crocodile eggs. Compare them with the drawing of the snake/lizard egg above..



7. Finally, compare all the reptiles' eggs with the structure of a bird's egg. Complete the table below as to the kind of shell (rubbery, hard, or varies) and note the presence (**X**) or absence (—) of the listed structures.

	Kind of Shell	Shell Membrane	Air Space	Yolk	Albumen (amount)	Twisters
Bird						
Snake or Lizard						
Turtle						
Crocodile						

8. How are snakes' and lizards' eggs different from turtles' and crocodiles' eggs?

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9. Notice that some reptiles have hard shells, like birds' eggs do. But other reptiles' eggs have rubbery shells. These shells are rubbery because they lack calcium and other minerals. Take a look at the chicken eggs your teacher has prepared for you. They have been soaked in a mild acid solution to remove the calcium and other minerals from the shell. These eggs now look similar to some rubbery shelled reptile eggs.

10. Reptile eggs with hard shells have a complete supply of food and moisture inside. But reptile eggs with rubbery shells have very little moisture because they contain very little albumen. These eggs must be able to absorb a certain amount of water from their environment in order to develop. For example, during the incubation of the king cobra's eggs, enough moisture is absorbed to increase the weight of the eggs by 66 percent. Take a look at the rubbery egg demonstration. Both Eggs A and B have had the minerals removed from their shells. Additionally, Egg B has been soaked overnight in a beaker of pure water. The weights of the eggs are also given. Assuming the eggs started out weighing the same, calculate the amount of moisture Egg B has absorbed.

Show Your Calculations Here

Weight of Egg A _____

Weight of Egg B _____

Amount of moisture (by weight) gained by Egg B _____

Percent of weight gained by Egg B _____

11. A desert tortoise lays eggs with hard shells, while a sea turtle lays eggs with rubbery shells. Which kind of egg would you expect to have less albumen? Why?

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12. Eggs with hard shells have a complete supply of food and moisture inside. How do these eggs get oxygen from the outside?

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13. Compare how most birds' eggs get warmth with how many reptiles' eggs are warmed.

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14. Which kind of reptile's egg is most like a bird's egg? Which is least like a bird's egg? Be sure to **explain each of your answers**.

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Final Analysis

1. List the common names of the four major groups of reptiles.

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2. What is the difference (if any) between a tortoise and a turtle?

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3. Many people buy turtles, put them in an aquarium set-up of some kind, and feed them plant material such as lettuce. After several months, the turtles usually die. What do you think is the most common cause of pet turtle deaths?

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Extra Credit

Check out the Internet for these.

1. What is the major factor that determines the sex of a developing sea turtle?

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2. Which is usually larger and more aggressive as an adult? Alligator Crocodile