Young Naturalists

SPECIAL DELIVERY

SLUG EGGS ▲

DOUG WECHSLER, VIREO

CENTIPEDE EGGS ▲

BILL BEATTY

HUMMINGBIRD EGGS ▼

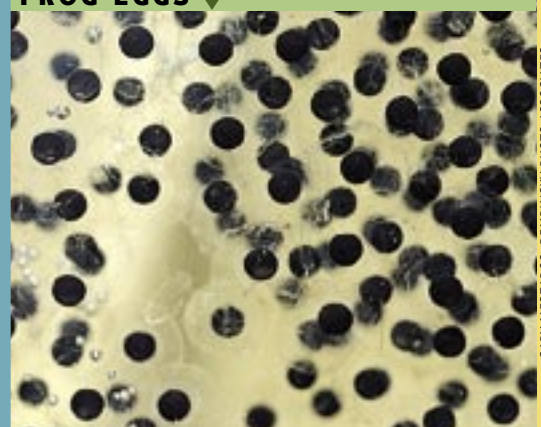
OSTRICH EGG ▲

CARROL HENDERSON

SKINK EGGS ▲

A.B. SHELDON, DEMBINSKY PHOTO ASSOCIATES

FROG EGGS ▼



GARY MESZAROS, DEMBINSKY PHOTO ASSOCIATES

What are portable, durable, dependable, convertible, and altogether incredible? Eggs!

BY MARY HOFF Illustrations by Taina Litwak

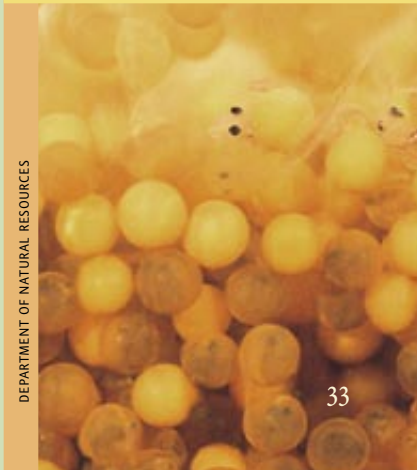
Some are smaller than grains of salt. Others are big as grapefruit. They come in beautiful colors and intriguing shapes. Each holds a wonder of the most wonderful sort: a new life, bundled up in this tiny container that provides everything the creature needs to grow.

Most animals develop outside their mothers in special shelters we know as eggs. Some eggs are soft, protected from the world by thin membranes. Others are hard, surrounded by a tough shell or case. Turtles, toads, spiders, snails, fish, birds, insects, and crayfish all hatch from eggs.

Eggs develop inside female animals. An egg starts with a single cell, called an *ovum,* in the mother's ovary. The mother's body makes food, called *yolk,* for the ovum—much as someone might pack you a lunch if you were going away. Then the ovum sets off on a journey. It travels down a tube called an *oviduct.* Along the way, it gathers other parts, such as membranes and a shell. At the end, the mother squeezes the finished egg out of her body.

To make a new animal, most eggs must be fertilized—the ovum must combine with a sperm cell from a male. In some animals, such as birds and insects, the egg is fertilized inside the mother. In other animals, such as frogs and fish, the ovum and sperm join outside the mother's body.

WALLEYE EGGS ▼

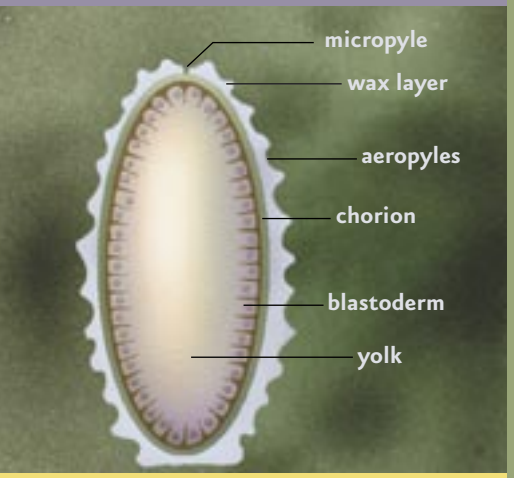


DEPARTMENT OF NATURAL RESOURCES

INSECTS

GARY C. BAKER, DEMBINSKY PHOTO ASSOCIATES

BUTTERFLY EGG



PARTS OF AN INSECT EGG

fun fact

In some species of bees, ants, aphids, and wasps, eggs can develop into new individuals without being fertilized by a male.

On the bottom of a milkweed leaf hangs a tiny white speck. It is an egg, deposited by a female monarch butterfly.

Inside it, things are as busy as McDonald's at lunchtime. Cells are dividing and changing to make up different body parts. Four days after the egg was laid, a fully formed caterpillar will nibble its way out.

Most insects lay eggs. Some eggs are long and skinny, like miniature hot dogs. Some are shaped like footballs. They may be brown, green, yellow, or white.

Insects lay their eggs where the young will be able to find food when they hatch. Some, such as the monarch, glue their eggs to leaves of specific "host" plants they need to survive. Some wasps lay eggs inside juicy caterpillars. Acorn weevils lay theirs inside acorns. Stable flies lay eggs in manure because their young eat manure when they hatch.

Grasshoppers and cockroaches enclose their eggs in a container called an *egg case* or *ootheca.* This helps protect the eggs from predators and from drying out.

When it comes time to hatch, baby insects swallow liquid and air from inside the egg to make their head swell. Then they push against the eggshell and pop out.

See glossary on page 41 for egg part definitions.

DOUG WECHSLER, VIREO

BEETLE EGGS

JIM SOGAARD

STINK BUG EGGS

Some insect eggs serve as time capsules to help the population survive harsh conditions. If the weather becomes very hot or very cold, the embryo (developing insect) may enter a state called *diapause,* in which development stops. It will stay this way until living conditions improve.

OTHER INVERTEBRATES

Invertebrates (animals without backbones) lay eggs in many places. Pond snails lay their eggs on plants under the surface of the water. Spiders spin silken cases around their eggs and hide or carry them. Crayfish carry their eggs in a special holding spot under their abdomen. Freshwater clams shelter eggs in their gills.

Have you ever seen a nightcrawler with a fat ring around its body? The ring, called a *clitellum,* helps a nightcrawler care for its eggs. The clitellum produces a ring of slime that slips off the nightcrawler's body, gathering eggs. Then the slime closes and hardens into a protective case for the eggs. You might find these lemon-shaped egg cases, which are a little bit smaller than a pea, in the soil in your garden.

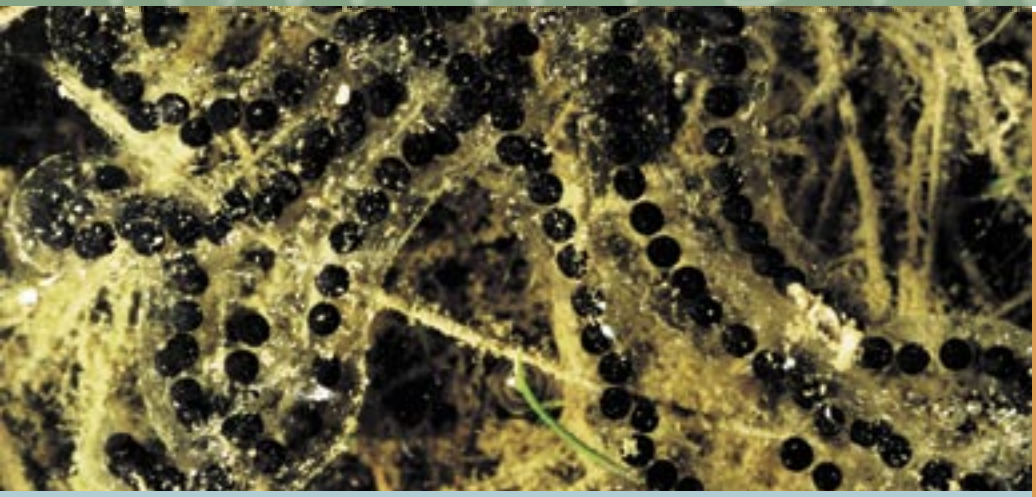
GARY MESZAROS, DEMBINSKY PHOTO ASSOCIATES

CRAYFISH EGGS

fun fact

The eggs of *daphnia*, a tiny pond invertebrate, can stay alive for 20 years, waiting for good hatching conditions.

AMPHIBIANS



TOAD EGGS

DOUG WECHSLER, VIREO

MUDPUPPY EGGS

MIKE DAVIS

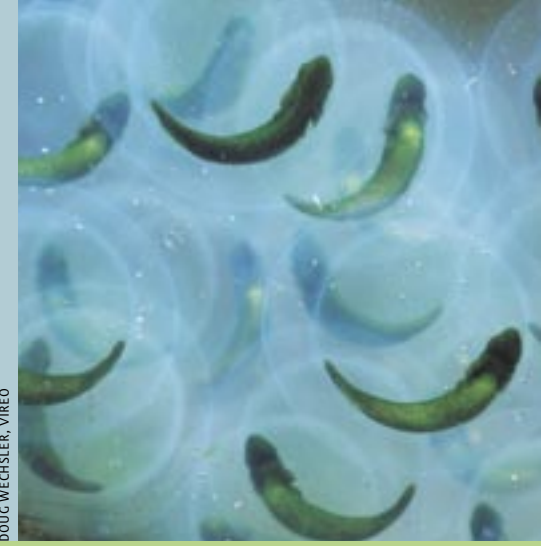
Imagine starting your life in a bowl full of jelly! That's just what would happen if you were a frog.

A gellike material encases frog and toad eggs. When the mother first lays the eggs, you can't see this layer. But when the material soaks up water, it swells to form a thick, clear coating. The coating keeps the embryos from drying and helps protect them from germs, predators, and bumps. It also serves as a greenhouse. The dark embryos soak up the sun's light rays, and the warmth helps them grow.

Minnesota frogs and toads lay their eggs in water. Spring peepers lay 800 to 1,000 eggs, each with its own jelly coat. Pickerel frogs encase their eggs in one big jelly blob. American toads lay their eggs in strings that can stretch more than 60 feet long.

Salamanders are closely related to frogs and toads. Some salamanders lay eggs in water, and some lay them on land.

Most amphibians abandon their eggs after they lay them. But some watch over their eggs. Mudpuppies guard their eggs until they hatch. Redback salamanders lay eggs among rocks or under a log, then they curl around the eggs to protect them.



DOUG WECHSLER, VIREO

SALAMANDER EGGS

fun fact

Frogs, toads, salamanders, and fish belong to a group of egg-layers called *anamniotes*. Unlike bird and reptile eggs, anamniote eggs have no liquid-filled sac. They don't need the liquid because they develop and hatch in ponds and other wet places.

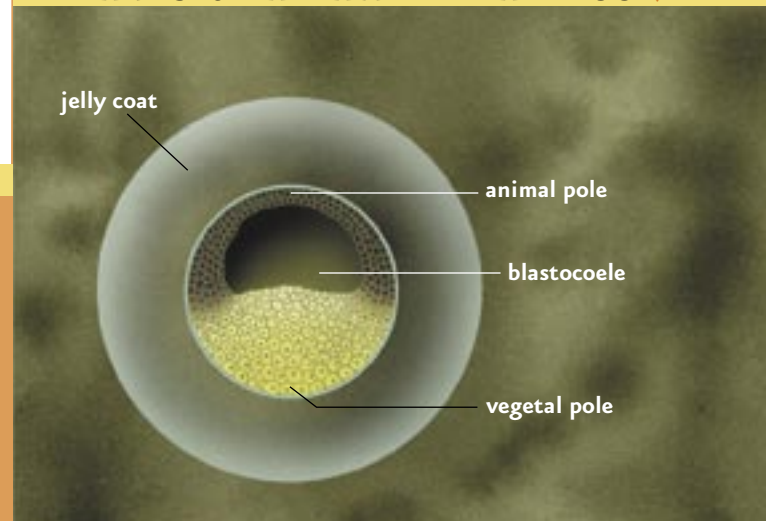
fun fact

Bullfrogs can lay 25,000 eggs in a single batch.

fun fact

The jelly of some frog eggs contains algae, which might camouflage the eggs so predators don't find and eat them.

PARTS OF AN AMPHIBIAN EGG



FISH

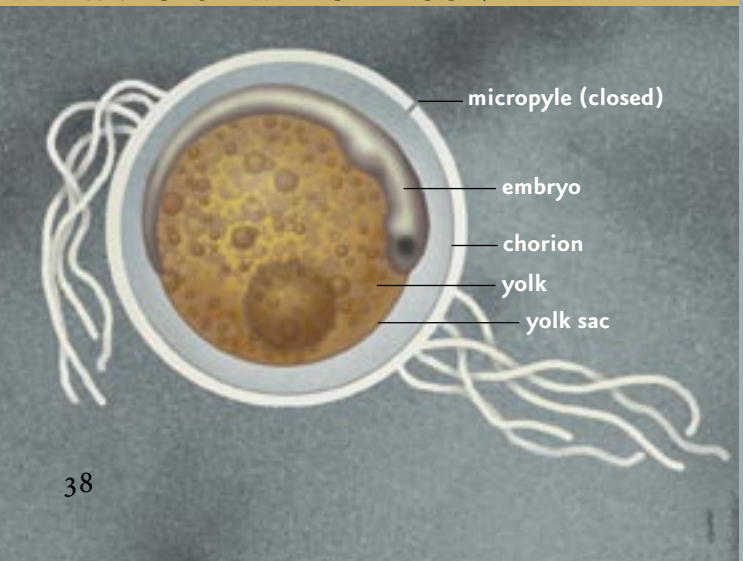
fun fact

Caviar, a food served as snacks at fancy parties, is the salted eggs of sturgeon or other fish.

SALMON EGGS

NATALIE FOBES

PARTS OF A FISH EGG



In early spring walleyes move to shallow, clear water to spawn—lay their eggs. A female walleye can produce 200,000 eggs or more. Males fertilize them after they leave her body. The pinhead-size eggs fall to the bottom of the lake among stones, where they are protected from predators.

After a week or two, baby fish emerge. The baby fish, called *fry,* still have a ball of yolk inside them, so they don't need to eat food for several days.

Other species of fish have different egg-laying habits. Some, such as trout, build nests for their eggs. Bullhead and crappie males care for the eggs until they hatch.

REPTILES

A painted turtle crawls out of a pond. She goes uphill to dry land and digs a hole. Then she lowers her back end into the hole and slowly squeezes out a round, white egg about the size of a ping-pong ball. Plop! When she has laid four to 20 eggs in the hole, she paddles soil on top of them with her hind legs.

Over the next couple of months, the embryos inside the eggs grow. When the baby turtles hatch, they dig their way up to the surface and crawl down to the pond.

Some snakes lay eggs in holes too. Other snakes and lizards produce eggs that develop and hatch inside their bodies. Then they give birth to live young. This is called *ovoviviparity.*

A.B. SHELDON, DEMBINSKY PHOTO ASSOCIATES

TURTLE HATCHING

fun fact

Reptiles and birds belong to a category of animals known as *amniotes*. Their eggs have a special membrane, called an *amnion*, that encloses the embryo in a bag of liquid. This gives the embryo the moisture it needs to develop properly, making it possible for reptiles and birds to lay their eggs in dry places.

PARTS OF A REPTILE EGG

BIRDS

LIZ HARPER

▲ THRUSH EGGS

CARROL HENDERSON

GULL EGGS ▲

Bird eggs come in many shapes, colors, textures, and sizes. The shapes vary greatly, from the round eggs of owls, to songbirds' oval eggs (slightly larger at one end), to shorebird eggs with one pointed end. Some eggs are cone-shaped or elliptical.

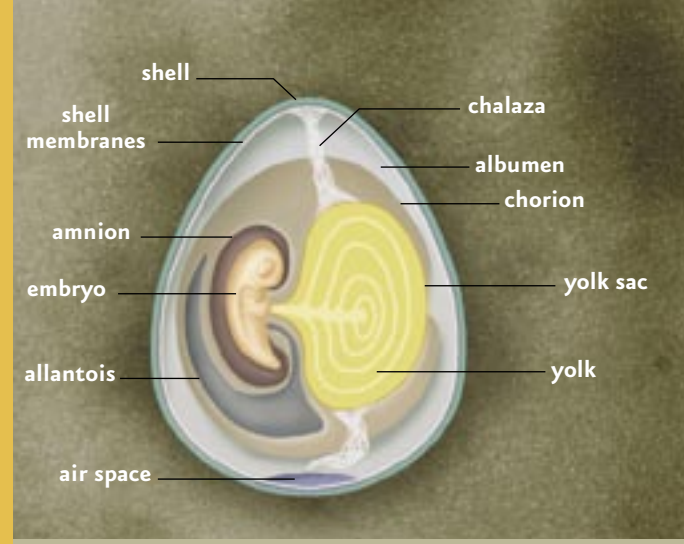
Bird eggs may be blue, brown, or white. Eggs of birds that nest in grasslands and other open places have drab colors, splotches, and scrawls that help hide them from predators. Cavity-nesting birds, such as flickers, usually have plain white eggs because their eggs are tucked away, out of sight of predators.

Textures vary from the chalky white of heron eggs to the waxy green of mallard eggs. Egg sizes vary too. Trumpeter swans lay Minnesota's biggest bird eggs—the size of mangoes. Ruby-throated hummingbirds lay the smallest—the size of Tic-Tacs.

Bird eggs develop inside the mother. First the yolk forms. As the yolk travels down the oviduct, it gathers albumen (white), membranes, and shell. In many birds, cells surrounding the egg add color to the shell. All-over colors are produced early in the egg's development. Farther down the oviduct, the egg may pick up bits of color that make spots and streaks.

The number of eggs laid depends on the species. Hummingbirds and eagles usually lay two eggs. Ducks might lay 10 eggs or more. One of the parents (usually the mother) sits on the eggs to keep them warm.

When it comes time to hatch, the baby bird pecks its way though the shell with its *egg tooth.* This pointed tip on its bill falls off soon after hatching.



BIRD EGG ▲

ATTENTION TEACHERS

To find an online teachers guide for this article, visit www.dnr.state.mn.us/young_naturalists/eggs. To learn more about using *Minnesota Conservation Volunteer* as a teaching tool, contact Meredith McNab, meredith.mcnab@dnr.state.mn.us or 651-215-0615.

Mary Hoff, *Stillwater, is a freelance science writer and production coordinator for the* Volunteer. *She wishes to thank Leon Browder, University of Calgary, who provided valuable assistance in reviewing this article.*

EGG PART NAMES

Note: Not all eggs have all of these parts.

aeropyles tiny holes that allow air to move in and out of the egg

albumen nutrient-rich substance (the "white" of chicken eggs)

allantois bag-shaped membrane that carries food and air to the embryo and serves as a wastebasket

amnion membrane that holds the liquid surrounding the embryo

animal pole dark half of amphibian egg

blastocoele liquid-filled space inside the ball of cells that will form the embryo

blastoderm cells that will form the embryo

chalaza rubbery string that suspends the embryo in the middle of the egg

chorion shell or membrane

embryo the developing animal

jelly coat Jellolike material surrounding some eggs

micropyle tiny hole that lets sperm into the egg to fertilize it, then closes

shell outer, protective layer of an egg

shell membranes thin layers that line the inside of the shell

vegetal pole light-colored half of amphibian egg

wax layer layer that resists water

yolk material that provides food for the developing embryo

yolk sac membrane surrounding the yolk