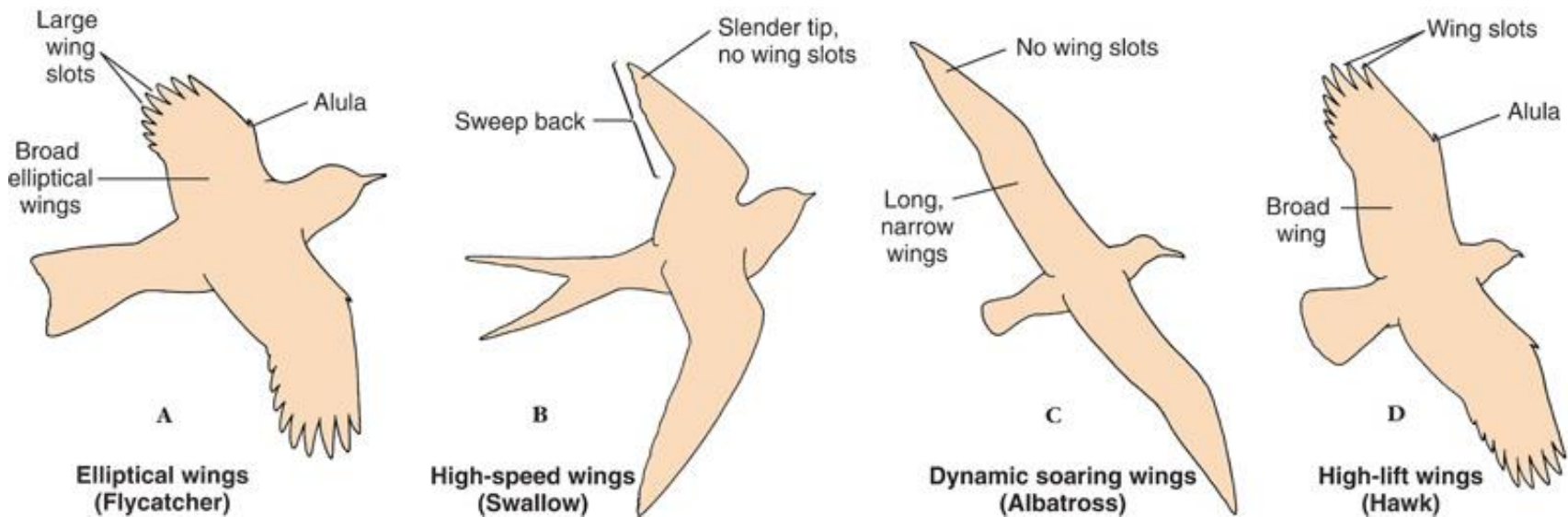


Flight - Wings are Specialized for Particular Kinds of Flight

- **Elliptical wings** are good for maneuvering in forests.
- **High speed wings** are used by birds that feed during flight or that make long migrations.
- **Dynamic soaring wings** are used by oceanic birds that exploit the reliable sea winds.
- **High lift wings** are found in predators that carry heavy loads. Soaring over land with variable air currents.



Food & Feeding

- Early birds were **carnivorous**, feeding mostly on insects.
 - Many birds are still **insectivores**.
 - Other foods include nectar, seeds, berries, worms, crustaceans, molluscs, fish, frogs, small birds & mammals.

Food & Feeding

- Some birds are **generalists**, feeding on a wide range of food items.
 - Perhaps more competition for food, but less danger of something happening to the food source.
- Others are **specialists**, only feeding on one type of food.
 - Less competition, more danger of losing the food source.

Food & Feeding

- The beaks of birds are strongly adapted to specialized food habits.

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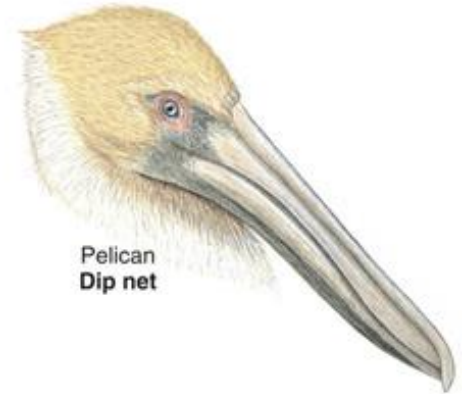
Raven
Generalized bill



Cardinal
Seed
cracker



American avocet
Worm burrow probe



Pelican
Dip net



Parrot
Nut cracker



Flamingo
Mud sifter



Anhinga
Fish spear



Eagle
Meat tearer



"ALL-PURPOSES"
BEAK OF THE
ROOK. LONG AND
STOUT, IT IS USED
FOR DEVOURING
A VARIETY OF
FOODS - INSECTS,
CARRION, FIELD MICE
AS WELL AS FRUIT
AND GRAIN

SHARP-EDGED
HOOKED
BEAK OF
FLESH-
DEVOURING
FALCON



THICK-STOUT
SEED-CRACKING
BEAK OF
THE BULLFINCH



منقار Bill/Beak



• شکل منقار = رژیم غذایی و نوع تغذیه

ساختار منقار

- نیم نوک بالایی: فرا نوک Upper mandible
- نیم نوک پایینی: فرو نوک Lower mandible

اکثر پرندگان: فرا نوک < فرو نوک

راسته سلیم شکلان: فرا نوک = فرو نوک

شبهگرد شکلان و فلامینگو و آب شکاف یا اسکیمر: فرا نوک > فرو نوک

شکل منقار



چرخ‌ریسک پس‌سر سفید:
منقاری مثلی شکل و بسیار
کوچک دارد که حتی از سسک‌ها
و سهره‌ها هم کوتاه‌تر است.



توکای باغی:
منقاری قوی و محکم که برای
پرنندگان همه‌چیزخوار بسیار
مناسب و کارآمد است.



سسک چیف‌چاف:
منقار این پرنده یک نمونه خوب از
منقار پرنندگان حشره‌خوار می‌باشد
و کاملاً تیز و باریک است.



زرده‌پره مزرعه:
دارای منقاری قطور و محکم
است که برای پرنندگان دانه‌خوار
کاملاً مناسب است.



اردک سرسبز:
منقار این پرنده از غازها تخت‌تر
بوده و از بسیاری از اردک‌ها نیز
پهن‌تر است.



حواصیل سفید بزرگ:
منقار این پرنده شکلی خنجرمانند
دارد که برای برداشتن غذایش از
آن استفاده می‌کند، نه برای زخمی
کردن و سوراخ کردن ماهی‌ها.



عقاب طلایی:
یکی از سنگین‌ترین و بزرگ‌ترین
منقارها را در بین پرنندگان شکاری
دارد که برای شکافتن و دریدن
پوست و گوشت مناسب است.



گیلان‌شاه:
منقاری باریک و بلند دارد که
برای کاوش در میان گل‌ولای
بسیار مناسب است و کمی به
سمت پایین انحنای دارد.



سلیم خرچنگ‌خوار:
دارای منقاری بزرگ و
محکم است تا بتواند غذای
محبوب خود یعنی خرچنگ
را شکار نماید.



سنگ‌چشم سرحنایی:
منقاری متوسط با نوک
تیز و خمیده دارد که برای
شکار جانوران کوچکی مانند
مارمولک‌ها مناسب است.



غاز پیشانی سفید:
دارای منقاری سنگین‌تر از
اردک‌ها بوده که برای کندن
علف‌ها از زمین بسیار
مناسب است.



آووست:
منقاری بسیار باریک و دراز دارد
که رو به بالا انحنای پیدا کرده
است و به علت فرم خاص منقار
شناسایی آن آسان است.

Flamingos are filter feeders

- Flamingos feed with their heads down, and their bills are adapted accordingly.
- In most birds a smaller lower beak works against a larger upper one. In flamingos this is reversed; the lower bill is much larger and stronger
- The tongue also can be used as a pump to pass water through the bill's strainer more efficiently.



A Diet for Flying

Most birds eat assorted foods that are rich in energy and proteins. Their high level of activity requires that they eat almost constantly. Their sources of food are varied and include seeds, fruits, nectar, leaves, insects and other invertebrates, and meat of all kinds (including carrion). Many species eat more than one type of food; some even alternate according to the seasons and to the migration cycle. This guarantees their survival. However, there are others birds—a minority—that consume only one type of food, for which they have no competition. Because their dependence on this single source of food is greater, though, the risk is higher. Feeding behavior also varies among different species. For example, some eat alone, and others eat in groups.

A Complex System

Feeding microorganisms that live in salty water demands a complex filtration system. The flamingo's bill is specially adapted to take in the water and throat pump the water inside the bill as they wade and dip and bring water through the tonillar lamellae, which resemble water balloons, to retain the food passing through them. Their tongue also has a depressed area, where the stones and sediments that come in with the water collect. The whole operation requires that the flamingo submerge its bill upside down because of the number of microorganisms they need to consume and the time it takes to filter them, flamingos usually spend many hours in the water. The rite involved in this activity is mitigated by the fact that flamingos do not eat alone, but rather in groups. Occasionally there are intense episodes of aggression, possibly because of territorial conflicts.

Filtering of Food



From Parents to Children

Flamingos and pelicans feed the young a special "milk" that is produced in the crop and has a nutritional value similar to the milk of mammals. Both make a defendable produce it as soon as food is ingested without the chicks not having any breastfoot.

It is given to the young during the first days of a flight and is a nutrient food.

1. That's why a problem is with it to bring it up when it is not eating, a problem not for predators participation in the preparation, just as with mammals.

3. This milk has a high concentration of the phytoplankton that have the bacteria that is why the bill is able to digest and the other nutrients that are in the water.

Types of Diet

Birds depend on a great deal of energy, and their diet must be suited to their high metabolic rates. They eat practically anything, although the diet of some birds is very specific. The same foods are not always available, with the same birds able to adjust their diets throughout the year.

NECTAR

It is a substance of sugar and water that flowers produce to attract insects. In order to get it, a bird must have a long, sharp bill. In temperate regions, nectar is plentiful in the spring and summer, whereas in the tropical regions, it is available year-round. Its main jobs and temperatures are very fond of this food.

SEEDS AND FRUITS

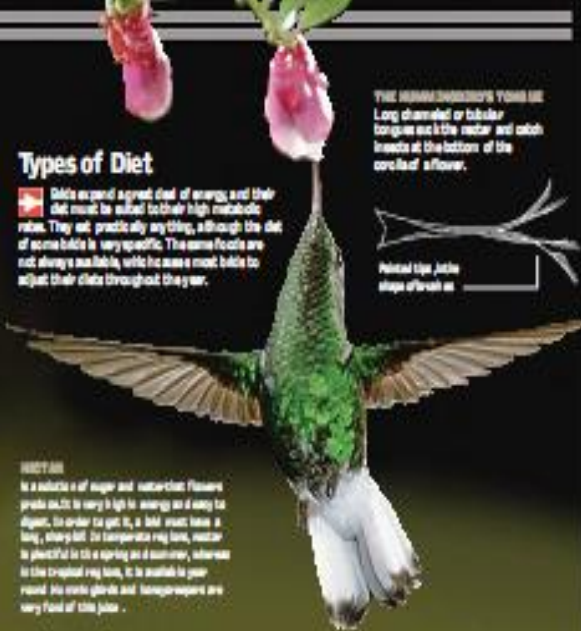
The high energy and protein content of seeds and fruits are ideal food for birds. The problem is that they are seasonal.

MEAT

Hunting and scavenging is a food source. They rarely specialize in one type of prey, but the prey's size depends on the species.

THE HUMMINGBIRD'S TONGUE IS LONG AND TUBULAR. IT IS USED TO REACH INTO THE TUBES OF FLOWERS TO GET THE NECTAR.

Pointed tip. Juste shape of bill as



Characteristics of Birds

- All birds also have hindlimbs adapted for walking, swimming, or perching.
 - Foot structure in bird feet shows considerable variation.
- All have keratinized beaks.
- All lay shelled amniotic eggs.



Perching bird
(such as a
cardinal)



Grasping bird
(such as a
woodpecker)



Raptor
(such as a
bald eagle)



Swimming bird
(such as a
duck)

شکل پاها

نسبت به زیستگاه و محل زندگی، عادات و رفتار پرنده متفاوت است.



WALKING

The long hind claw is typical of small birds, such as pipits, that run or walk in grassy places.



CLIMBING

Two backward-facing toes and strong claws allow climbing birds to grip onto a branch.



HUNTING

Sharp, hooked claws grasp live prey; a strong grip makes the hind claw a lethal weapon.



SWIMMING

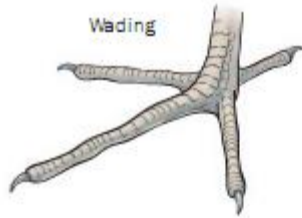
Webbed feet provide extra thrust under the water's surface, which is ideal for swimming.



Perching



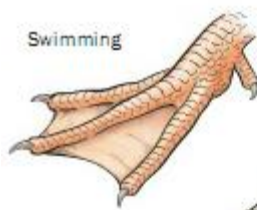
Running



Wading



Climbing



Swimming



Running on floating vegetation



Hunting

JM©2002



پی پت چمنزار



کبک



سهره سبزی



دار کوب



بادخورک



عقاب



آبچلیک پاسرخ



عقاب ماهیخوار



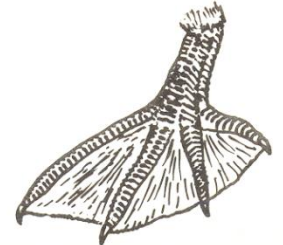
کشیم بزرگ



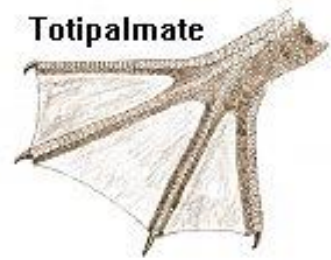
فالاروپ



سر سبز



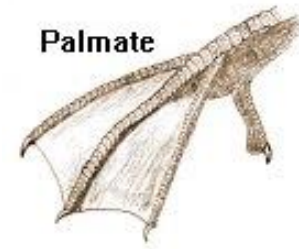
باکلان سیاه



Totipalmate



Lobate



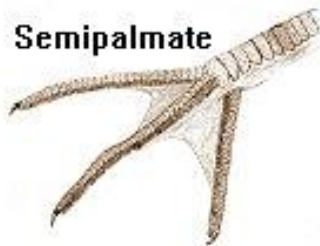
Palmate

شکل پاها

(۱) پرده کامل:

- سه انگشت در یک پرده: **Palmate**: اردکها، غواصیان، کاکایی، پرستوی دریایی، فلامینگو
- چهار انگشت در یک پرده: **Totipalmate**: باکلان پلکان بوبی و کبوتر دریایی
- پرده لپی ها: **Lobate**: هر انگشت پرده جداگانه دارد: چنگرها و کشیم ها
- (۲) نیم پرده داران: **Semipalmate**: انگشت ۳، ۲ و ۴ نیم پرده دارند: لک لک سانان، ماکیان، آبچلیک و پرستوی دریایی

(۳) بدون پرده ها: **Raptorial**: خشکیزی ها، چکاوک یا پیت ها



Semipalmate



Raptorial

شماره گذاری و ترتیب انگشتان پا

- **Anisodactyl**: گنجشکسانان و کبوترسانان
- **Zygodactyl**: جفت انگشتی یا چهار انگشتی: مرغ عشق و فاخته
- **Semi-Zygodactyl**: انگشت ۴ حد واسط عقب و جلوی پا: جغدها، عقاب ماهیگیر
- **Pamprodactyl**: انگشت ۱ توانایی حرکت به جلو را دارد. پرستو، بادخورک

Anisodactyl



- **Hetrodactyl**: ناجور انگشتی

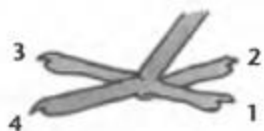
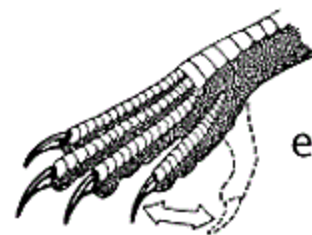
- **Syndactyl**: بین انگشت ۲ و ۳ پرده ناقصی وجود دارد: هدهد



Zygodactyl

دارکوب، طوطی، کوکو

Pamprodactyl



Hetrodactyl

شکل پاها

- فقط دارای انگشت ۳ و ۴: شترمرغ (هرچه تعداد انگشت کمتر سرعت دویدن بیشتر)
- انگشت شماره ۱ تحلیل رفته است: میش مرغ، هوبره، بلدرچین و زنگوله بال
- در پرندگان شاخه نشین انگشت ۱ بلندتر است.
- ماکیان دارای مهمیز (spurs) هستند و روی انگشت اول قرار دارد.



Bird	Type of Feet	Type of Beak	Probable Diet	Probable Habitat
Bluebird	three toes in front, one behind	short & rounded	seeds, insect	forest, meadow
Chicken	short, blunt	short & rounded	seeds, insects	meadow
Duck	webbed	flat	algae	lake
Eagle	talons	hooked	small animals	meadow, forest
Sparrow	three toes in front, one behind	short & rounded	seeds, insects	forest, meadow
Flamingo	long, skinny	hooked	*shrimp*	near water
Heron	long, skinny	hooked	fish	near water
Kingfisher	three toes in front, one behind	spear-shaped	fish	near water
Owl	talons	curved	small animals	forest
Pelican	webbed	scooped	fish	water
Hummingbird	tiny	long, tubular	nectar	meadow
Woodpecker	2 front, 2 back	chisel	insects	forest

SHAPE

It depends on the pressure exerted by the oviduct walls. The large end emerges first.



Oval: The most frequent



Conical: Prevents falling



Spherical: Reduces the surface area

COLOR AND TEXTURE

Both texture and color help parents locate the egg.



Light Egg



Dark Egg



Speckled Egg

جوجه ها

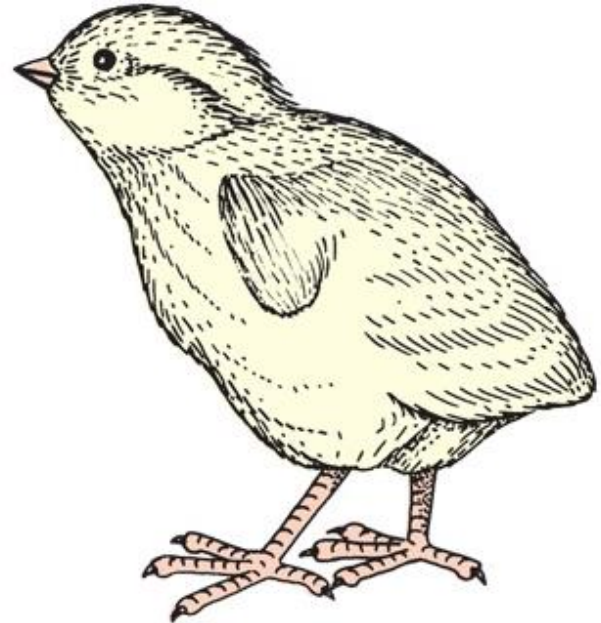
- Precocial
- Semi-Precocial
- Semi-Altricial
- Altricial



Precocial and altricial chicks. The newborn chicks of many waterbirds, such as the Sora (*Porzana carolina*, left), are precocial in that they have open eyes, downy feathers, and are capable of independent movement within a few hours of hatching. Altricial chicks, which include most songbirds, such as the Gray Catbird (right), hatch blind, naked, and virtually helpless.

Nesting

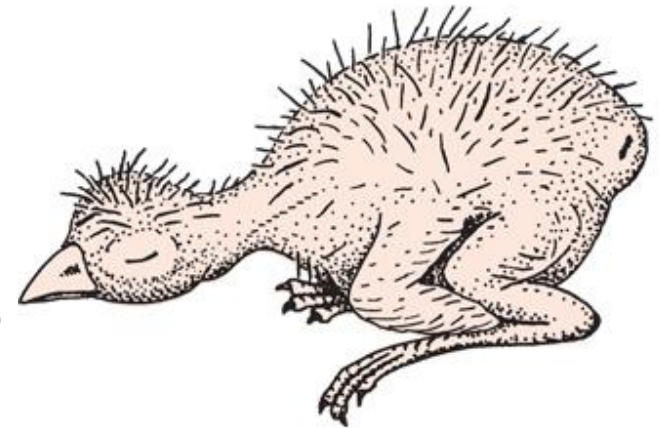
- **Precocial** young, such as ducks, water birds, fowl and quail are covered with down when they hatch and can run or swim as soon as their down dries.
 - Most precocial young must still be cared for by the parents for a time.



Precocial
One-day-old ruffed grouse

Nesting

- **Altricial** young are naked and unable to see or walk at hatching.
 - They must remain in the nest for a week or more.
 - Parents must spend lots of time & energy bringing food to hatchlings.
- There is a continuum with the young of many species falling in between the two extremes.



Altricial
One-day-old meadowlark

جوجه ها

وابستگی و یا عدم وابستگی جوجه ها به والدین

- Nidifagus: جوجه مستقل ، لانه گریز
- Nidiculus: جوجه نیازمند

Nidifugous جوجه مستقل

Postnatal Development

Chicks develop at highly variable rates after hatching. Some birds are born with their eyes open and with a thick layer of down feathers. These birds can also feed themselves. That is why they are called precocious, or nidifugous. Ducks, rheas, ostriches, and certain beach birds can walk and swim as soon as they are born. Other species are born naked and develop their feathers later. They need to stay in the nest until they have sufficiently developed, so adult birds must care for them. These birds are called nidicolous. The most helpless chicks are the young of songbirds and hummingbirds because they need warmth from their parents to grow strong. ●



Nidifugous Young

DEFINITION Nidifugous young are fully developed at the moment of birth. They can move and even leave the nest, hence their name (which means "leaving the nest"). This adaptation demands more investment on time because the chick is almost fully developed at birth. This is the case with incubator birds (Magellanic penguin) which lay their first independent toes in the world as well (as soon as they leave the shell). Ducks follow their parents but nidifugous birds do not, whereas ostriches follow their parents, and the parents know their where to find food.

GROWTH STAGES

30 hours

The chick hatches naked with the skin that covers the body. It can walk and lay itself on feet by its parents.

24 hours

It still has a significant amount of time the black-headed chick needs to be ready to fly.

7 to 8 days

Quack is obvious, and the first down feathers appear at the tip of the wing. The bird leaves the nest. It can swim!

DEFINITION The chick is almost fully developed. It can walk on its own.



Red-legged Partridge
Alectoris lagopus

INCUBATION PERIOD
10 to 12 days

DEFINITION To be born with a pair of eyes.

DEFINITION To be born with a pair of eyes.

15 days

It can walk and swim. It can eat, walk, and fly. It can swim. The neck is almost fully developed.

21 days

It is almost completely an adult. Its flight is as good as that of an adult. It can eat, walk, and fly. It can swim.

SIZE COMPARISON

NIDIFUGOUS

The egg is larger, the chick is born more developed, and the incubation period is longer than that of nidicolous birds.



NIDICOLOUS

The egg is small, the chick is born less developed, and the incubation period is shorter than that of nidifugous birds.



جوجه نیازمند Nidiculus

Nidicolous Broods

PRO Most of these birds are born naked, with **Red** downy skin and only a few feathers located out of their heads. They stay in the nest. For the first few days, the parents must regulate their own body temperature they need their parents in order to stay warm. In 10 to 14 weeks, they have a few feathers, but they require constant care and food. They form a numerically important group that includes Passeriformes (songbirds).

POB They need much food to do this. The parents must feed them 24 hours a day.

AN ADULT BIRD CAN FEED ITS YOUNG UP TO 400 TIMES A DAY.

HOLE SPARROW
Melospiza cinerea

STAGES OF GROWTH

25 hours
It performs a few instinctive movements. It can barely raise its head to look for food.

4 days
The eyes open. The tips of the first feathers appear. It performs a few movements.

6 days
The first feathers begin to unfold. The red skin around the eyes is gone, and the skin gets sufficient to give the body its own color.

8 days
Parents search a chick around the nest, except around its eyes. The legs are well developed, and the parents no longer around in the nest.

10 days
Feathers cover almost all the body, but they are not yet fully out. The chick can now walk on its own, and it is voracious. Growth is very fast.

12-15 days
Development is complete. In 12-15 days, the young birds are able to fly. It is still necessary for the bird to reach a full size.

12-15 days
BY THE ESTIMATED TIME THAT IT TAKES THIS HOODED LARK CHICK TO LEAVE THE NEST.

BEHIND OF THE BILL
The color is bright red. It indicates the parents to regulate the heat.

BEHIND THE BILL
Some species have a red fleshy protuberance that can be seen even in 10 days.

EYES
Hooded larks are born blind. They open their eyes a few days after birth.

FEATHERS
The feathers are born without color. It will take 10-14 days for the feathers to reach their adult color.

SIZE COMPARISON

NIDIFUGOUS

The egg is larger, the chick is born more developed, and the incubation period is longer than that of nidicolous birds.



NIDICOLOUS

They lay small eggs, with a brief incubation period, and the young are helpless at birth.

