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SEPTEMBER 2012

# Volant

## Adaptation

2012  
AUGUST  
TUESDAY

07

220-146 • Wk 32

### Adaptation of

9 am animals in exploring the air  
10 am or extraterrestrial environ-  
11 am ment is called volant adap-  
12 noon tation.

1 pm The volant adaptation are  
2 pm concerned with the flight. The  
3 pm flight is a form of locomotion  
4 pm in the air under which the body  
5 pm has to be firstly prevented from  
6 pm falling down and secondly  
more forwards, the speeder  
the better. Thus it modifica-  
tion in the animal body for

2012  
AUGUST  
WEDNESDAY

30	31				1	
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JULY 2012

08

reducing the weight of the body and also for the formation of organs capable of executing the flight. \*

The flight may be of two types —

- ① Passive or gliding type
- ② Active or true flight

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SEPTEMBER 2012

2012  
AUGUST  
THURSDAY

09

Development of specialized organ for flying is the primary requirement. Body of a volant animal must be light and rigid. During flight continuous supply of energy and power to the muscle is necessary. Animals are also required to acquire speed adaptation. Moreover, balancing and navigation of the body during flight should be well integrated.

2012  
AUGUST  
FRIDAY

WK 32 • 273-143

# 10 Passive flight

30	31					
2	3	4	5	6	7	8
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JULY 2012

9 am  
10 am  
11 am  
12 noon  
1 pm  
2 pm  
3 pm  
4 pm  
5 pm  
6 pm

This type of movement involves no propulsion other than the initial force of jumping. Gliding is characterized by leaping or jumping from a high point and held up by some sustaining organ, then to glide to lower level.

Here the 'wings' are made up of pterosauria. In this type of flight the animal never exerts any locomotory force instead they move passively.



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SEPTEMBER 2012

2012

AUGUST

SATURDAY

224-142 • Wk 32

There are two

types of passive flight among the animal.

① Parachuting and Gliding.

Parachuting → During passive

flight when come down on

the earth at an angle of

$45^\circ$  or more then it is called

parachuting. Ex: Tree frog.

Gliding? When the passive flier

comes down on the earth at

an angle less than the  $45^\circ$  it

is called gliding.

Example — Draco.

SUNDAY 12

IM

2012

AUGUST

MONDAY

Wk 33 • 226-140

# Modification for flight

30	31	1	2	3	4	5	6	7
8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	1	2	3
M	T	W	T	F	S	S		

JULY 2012

## 13 In fish we

### prime modification of pectoral fins

As the passive fliers are evolved from diff<sup>t</sup> groups

so they have modified their respective organs

differently. The details of modification are discussed below.

In fish the prime modification in the development of larger pectoral fin - both in structure and muscular support.



M

DATE

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SEPTEMBER 2012

2012

AUGUST.

TUESDAY

227-139 • Wk 33

Hypocercal tail fin 14

9 am in large. At that movement  
10 am pectoral fin become fully  
11 am stretched and the fish leaps  
12 noon out of water & gliders.

1 pm In Amphibians Tree  
2 pm frog possess webbed feet.  
3 pm On the lateral side of the body  
4 pm they have fold of skin  
5 pm known as patagia.

6 pm In Reptiles (Draco) has  
patagia extended from thorax  
of the hind limbs. & are supported  
by six pair of ribs.



2012  
AUGUST  
WEDNESDAY  
WA 33 • 228-138

30	31				
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23	24	25	26	27	28
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JULY 2012

# 15 In flying gecko

9 am  
10 am  
The skin is laterally expanded from neck, body, tail, limbs and bet<sup>n</sup> toes, which support

11 am  
their body during gliding.

12 noon  
1 pm  
The flying snake the ventral side of the body is concave

2 pm  
3 pm  
~~Permanent~~ modification of for  
4 pm flight needed for flying in  
5 pm mammals —

6 pm  
All the flying mammals except bats, possess similar type of modification as in Reptiles.

					1	2
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SEPTEMBER 2012

2012  
AUGUST  
THURSDAY

for gliding 16

229.137 • W<sub>113</sub>

Patagia from

They have extended lateral side of the body. During flight the patagia extends and helps the mammal to glide a few distance.

9 am  
10 am  
11 am  
12 noon  
1 pm  
2 pm  
3 pm  
4 pm  
5 pm  
6 pm

2. ACTIVE FLIGHT:-

In insect wings are made up of

It is the aerial flight caused by the action of wings. True flight is found in insect,



2012  
AUGUST  
FRIDAY

30	31	A	B	C	D
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19	20	21	22	23	24
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JULY 2012

17 pterodactyls,

birds, and bats. In all

of them the nature of  
development & structure  
of wings are quite diff<sup>t</sup>.

and their analogy suggest  
that the flight has evolved  
independently in diff<sup>t</sup>

groups. In true flight  
the power is implied

and the movement in air

sustained. The whole body

is covered diff<sup>t</sup> type of

feathers which are helpful

during flight. Fore limb

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2012  
AUGUST  
SATURDAY

SEPTEMBER 2012

modified wings. 18

231-135 • Wk 33

9 am  
10 am  
11 am  
12 noon  
1 pm  
2 pm  
3 pm  
4 pm  
5 pm  
6 pm

The feathers of remiges are renewable. Wings are modified according to the need of flight. The type of flight. The feathers form <sup>diff<sup>t</sup></sup> types of wings are described below.

The exoskeleton of bird - These ~~pt~~ nature's 'master pieces' are light, elastic, waterproof and most imp<sup>t</sup> in flight. Birds feather are classified into quill feathers, contour f., fte filoplumes. Quills are

SUNDAY 19

9 am

Flight feathers of wings are called remiges and those

10 am

of tail are called rectrices

11 am

Flight feather consist +

12 noon

barbs, barbules and

1 pm

barbicles which are formed

2 pm

a sort of net which

3 pm

help in flight.

4 pm

5 pm

Presence of wing - In birds

6 pm

The fore limbs are modified

into wing helping in

flying. The hind limbs and

legs are large and



3	4	5	6	7	1	2
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17	18	19	20	21	15	16
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M	T	W	T	F	S	S

SEPTEMBER 2012

2012

AUGUST

TUESDAY

234-132 • Wk 34

variously adapted **21**

9 am

far walking, running, scra-  
taking, perching, food capturing

10 am

swimmings. There are so many

11 am

types of wings:

12 noon

1. Elliptical wing:- It is for flying

1 pm

at a relatively moderate speed

2 pm

but useful for quick ascent -  
e.g. crow, Robin.

3 pm

2. High speed wing - Comparati-

4 pm

vely this wings are small with

5 pm

pointed tips. It can generate

6 pm

much speed. duck, teal

3. Loam soaring wing - It is

very long, narrow & pointed

tip.

2012

AUGUST

WEDNESDAY

Wk 34 • 235-131

22

30	31				
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23	24	25	26	27	28
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JULY 2012

④ Broad soaring wing - <sup>thin</sup>

9 am

10 am

11 am

12 noon

1 pm

These type of wings are board with moderate wing load in comparison to their larger body -

2 pm Pneumatization of bone:- the

13/12  
27/10/12  
21/3/12

3 pm

4 pm

5 pm

6 pm

bone of birds are hollow, and air filled. They also contain many air cavities. These are buoyancy during flight.

				1	2
3	4	5	6	7	8
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SEPTEMBER 2012

2012

AUGUST

THURSDAY

236-130 • Wk 34

Occurrence of **23**  
flight muscles and

9 am. keeled sternum:— In birds,  
10 am. specific flight muscles are  
11 am. developed which connect the  
12 noon. wings with limb bones. Each  
1 pm. wing is depressed or lowered  
2 pm. by an enormous muscle  
3 pm. called pectoralis major. The  
4 pm. sternum is well developed  
5 pm. and bears a median keel  
6 pm. or carina for the attachment  
of pectoralis muscles.

Development of air sac:— They act  
as air reservoirs during



24 Respiration and

serve as balloons to provide

9 am

lightness and buoyancy

10 am

to the body. Air sac also

11 am

help in internal perspiration

12 noon

Thus, helping in the regu-

1 pm

lation of the body's temperature

2 pm

Brain and sense organ's

3 pm

Specificity:- Cerebrum is

4 pm

well developed and optic

5 pm

lobe become enlarged.

6 pm

Birds eyes are large and

bears sclerotic plates to

resists variable air

pressure. Eyes also

3	4	5	6	7	1	2
10	11	12	13	14	8	9
17	18	19	20	21	15	16
24	25	26	27	28	22	23
M	T	W	T	F	29	30
				S	S	

SEPTEMBER 2012

2012

AUGUST

SATURDAY

Contain ~~pecten~~ **25**

238-128 • Wk 34

9 am

pectens to regulate ~~the~~ fluid pressure within in the eye.

10 am

Beak → The conversion of fore limbs into wings is the

11 am

12 noon

compensated by the presence of bill or beak. The beak

1 pm

2 pm

is ~~hard~~ horny and lacks

3 pm

teeth.

4 pm

Mobile neck → The neck are very long and flexible.

5 pm

6 pm

Single ovary → A single functioning

SUNDAY 26

ovary is present in female which

is help for left side of the female

also lead to reduction of weight



MONDAY

WA 88 + 240 108

27 week is very

essential for flight.

Absence of urinary bladder

since it help in reducing the weight of the body.

Modification of Tail - Tail

and its enveloping membrane

help in changing

direction during flight.

In some cases it serves

a capacious pouch for

holding prey and also

as a cradle for the

new born young.



3	4	5	6	7	8	9
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SEPTEMBER 2012

2012

AUGUST

TUESDAY

Other metabalee **28**

741 125 • 76 25

9 am

10 am

11 am

12 noon

1 pm

2 pm

3 pm

4 pm

5 pm

6 pm

rate is very ~~high~~ high during

because they require much

energy during flight.

Volant adaptation animal

are have powerful ear in

combination with nose and

mouth develop a special

sensing system, called

echolocation. They emit

ultra sonic sounds reflects

back from the body of prey

at night, which are per-

ceived by the ear,

परिचय

2012  
AUGUST  
WEDNESDAY  
Wk 35 • 242-124

30	31				
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M	T	W	T	F	S

JULY 2012

# 29 Conduction

All animals are

9 am

modified in various parts

10 am

of the body for volun-

11 am

tary adaptation. Specially

12 noon

in birds are more

1 pm

peculiar & special.

2 pm

Characteristic of their

3 pm

body structure for

4 pm

successful volent life.

5 pm

6 pm

