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LESSON NOTES
WEEK 19

Year/Level: 13A/B **Subject:** BIOLOGY

Strand	1 Structure And Life Processes
Sub Strand	1.2 Human Evolution
Content Learning Outcome	Define and differentiate between homing and migration with examples

Homing

Homing is the ability of animals to finds its way home over the unfamiliar territory. Homing is not clearly distinct from migration. From example, the journey of salmons could be regarded as migration and homing as well.

Examples of homing

- Frogs and toads make their way back every breeding season to the same pond in which they hatch.
- Snails and slugs return daily to the same place to spend the day-light hours.
- Limpet return to the same spot in which to spend the period of low tide, as do most of the small fish that inhibit tide pools.
- Bees find their way back to the hives over distance of more than one kilometres.

Significance of Migration

Migration costs energy however, it provides benefit to whales and marine life. For example:

- Compensating advantage: waste product of humpback whales stimulates the growth of phytoplanktons which is a food source to many marine life. Humpback whales benefit by moving away from its predators and is able to provide its offspring an opportunity to be born in a secured environment.
- Many tropical birds migrate to temperature regions to breed because longer day length of temperate summer allows greater time for the adults to feed the young.

Migration

Advantages	Disadvantages
New/more resources	Uses lots of energy (need to store energy prior to migration)
Greater genetic mixing Better breeding conditions	Could get lost on the way
They grow larger	Could get killed (eaten) on the way
Reduces predation and disease from parasites	Once arrive location may have changed – no habitat, no food, no nesting sites, climate change
Animals remain in a favourable temperature	Could run out of energy before reaching destination and die
May lead to the colonisation of a new area.	If young die lose a generation and species cannot continue
Constant food supply	

Additional Information

A. homing: inborn ability of an animal to navigate towards an original location (home territory or breeding spot) through unfamiliar areas.

B. blooming: healthy, energetic, and attractive appearance

C. photoperiod: developmental responses of plants to the relative lengths of light and dark periods

D. crepuscular activity: behaviour of animals that are active primarily during twilight, that is, the periods of dawn and dusk.

Homing is the inherent ability of an animal to navigate towards an original location through unfamiliar areas.

Migration is the relatively long-distance movement of individuals, usually on a seasonal basis. It is found in all major animal groups, including birds, mammals, fish, reptiles, amphibians, insects, and crustaceans.

Orientation an animal's change of position in response to an external stimulus, with respect to compass directions.

Biological Timing circadian rhythm. a daily cycle of activity observed in many living organisms. change of life, climacteric, menopause. the time in a woman's life in which the menstrual cycle ends

<u>Animal Navigation</u>

In order for animals to navigate, they need to have a sense of direction or location. Some of the methods used by animals to navigate are:

1.Visual cues*:* many animals learn their surrounding just as we learn the routes of streets, shops and our home. Birds that migrate learn the shape of coastlines and other topography of their route. Other animals learn signs such as streams, trees or any other object that would direct them towards their home. *For example, a digger wasp always memorises the landmarks around its burrow.*

2.Chemical navigation: dogs follow scent to find home and ants leave chemical trails for other ants to follow. The amazing migration of eels and salmon from the sea to certain rivers where they emigrated from originally are guided by the presence of the chemicals.

3.Solar navigation*:* many birds and other animals such as honey bees use the sun as a compass which suggests that they have an in-build clock. Similarly, bees use polarized lights to na vigate if the day gets cloudy.

Large migratory birds, ducks, hawks and geese fly mainly during the day and use the sun as a compass. They compensate for the changing direction of the sun. For example, a northern hemisphere bird flying south in autumn at 9:00am would fly at an angle of 45˚ left of the sun while at 3:00pm it would fly at 45˚ angle to the right of the sun.When such birds has its internal clock retarded six hours by being placed in artificial light–dark cycles and released outside,it sees the sun at 3:00pm as if it were 9:00 am and flies due west.

4.Magnetic fields: one of the many methods used by homing pigeons is an ability to follow the magnetic field lines of the earth; they have magnetic compass. If a magnet that deflects the normal magnetic field, is attached to the head of the homing pigeons, the birds can be made to fly by the same degree of deflection. However, if it is a clear day the birds use other navigational skills such as sun compasses and visual land mark to get home.

5.Star Navigation: night migration birds used a star compass. This was showed by placing the bird in to a planetarium, a dome like theatre that has star projected on its roof. The birds in their cage orientated to the artificial sky. Further experiments that birds only oriented to the bright northern move the least during the night.

6.Sound used as sonar: bats navigate by using high pitched squeaks which bounce off objects in their path. Similarly, humpback whales orientate by sonar since they have excellent hearing and a vast range of clicks and booms.

Many mechanisms for homing and migration are not yet understood. For example: limpet scratches a shallow hollow on a rocky surface which fits its shell closely.It feeds when the tide is in yet manages to return home when the tide goes out.

ACTIVITY:

1. The phenomenon of birds finding their way back to the point of origin when released in an unfamiliar territory is known as

   A. homing. B. migration. C. orientation. D. biological timing.