

Biology Level 3

Plants & Animals

Orientation responses

Stimulus	
Gravity	<i>Geo</i>
Light	<i>Photo</i>
Chemical	<i>Chemo</i>
Touch	<i>Thigmo</i>
Plants	
Directional (+/-)	<i>Tropism</i>
Non-directional	<i>Nasty</i>
Animals	
Directional (+/-)	<i>Taxis</i>
Non-directional	<i>Kinesis</i>

What you need to know:



Gravity



light



Chemical



Touch

+

Towards

-

Away

Tropisms – Directional plant response to a stimulus.

Nastic responses – Non-directional plant response to a stimulus.

Taxis – Directional animal response to a stimulus.

Kinesis – Non-directional animal response to a stimulus.

Video Summaries

Migration, homing & navigation

Migration

A regular movement of a population of animals between habitats.

7 factors of migration:

1. Involves a return journey
2. Purpose
3. Active
4. Long distances
5. Involves populations
6. Genetically controlled
7. Initiated by environmental factors

Navigation

Use of environmental queues to orientate and navigate.

5 environmental queues:

1. Sun compass
2. Star compass
3. Magnetic compass
4. Visual signs/landmarks
5. Scent trails

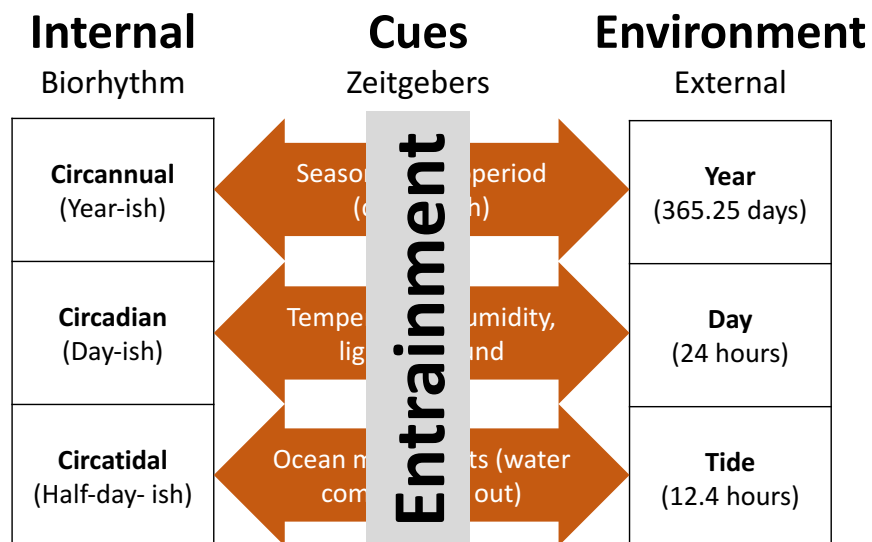
Homing

The ability of an animal to find its way home over unfamiliar territory.

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Biological timing responses



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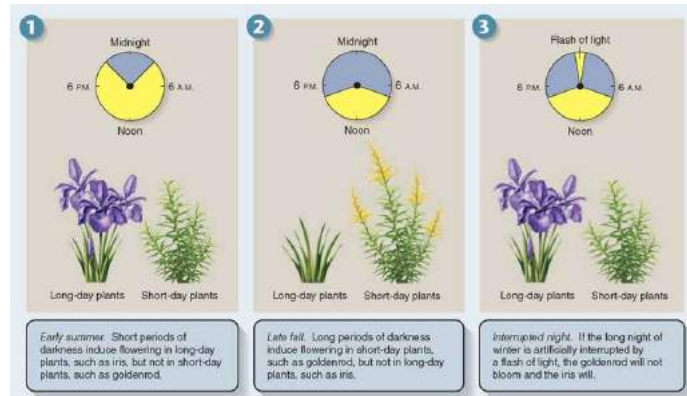
Video Summaries

Biological timing responses

Benefits of biorhythms

1. Allow prediction of events that need a build up of food or reserves.
2. Synchronisation of internal physiological processes
3. Synchronisation of social activities
4. Allows animals that use sun and star positions to adjust their compasses.

Photoperiodism

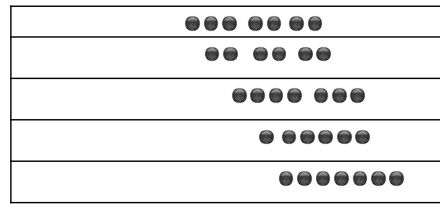
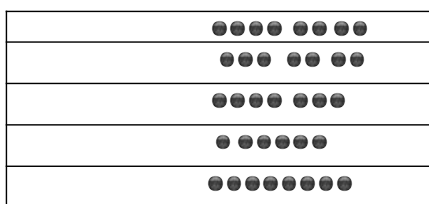


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Animal Actograms

An **actogram** is a graph used to plot activity against time. They most commonly show a circadian rhythm (approx 24h) or a circatidal rhythm (approx 12 h)



Normal environment

The activity occurs at the same time each day for the same period. This means that the **endogenous rhythm** is being **entrained** by a **zeitgeber** so the observable rhythm equals external cues.

Free running period

When no zeitgebers (external synchronisers) are present. Take away **zeitgeber** then see the **endogenous rhythm**. Calculate **free running period**, take the ten days difference and divide it by ten (or just look at the graph and see if you can work it out).

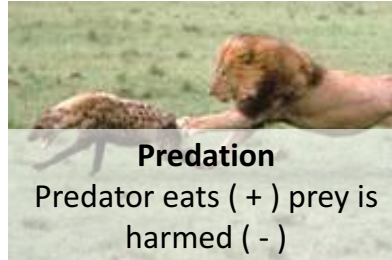
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Video Summaries

Interspecific relationships

What you need to know:



- Camouflage
- Behavioural responses
- Chemical defenses
- Structural defenses
- Mimicry – batesian and mullerian

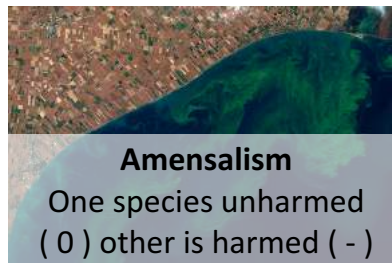


- Ectoparasites
 - Endoparasites
- Social parasites**
- Reproductive parasites
 - Slave parasites

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Interspecific relationships



- Algal (marine)
- Antibiotics (microorganisms)
- Allelopathy (plants)

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Video Summaries

Intraspecific relationships

What you need to know

Communication (Intraspecific competition): Members of the same species, sharing the same ecological niche. **(1)** Agnostic behaviours and displays, **(2)** Territoriality, **(3)** Dominance interactions, and **(4)** Sexual dimorphism

Territoriality - behaviour involved in defending an area intraspecifically (from members of the same species).

Home range - area over which animals range but do not defend.

Hierarchies – **(1)** highly ranked individuals, **(2)** lower ranked individuals **(3)** Resources are not shared equally.

Animal groups – **(1)** open, **(2)** closed, **(3)** anonymous, **(4)** individualised.

Group Advantages	Group Disadvantages
Safety in numbers and group defense	Increased spread of disease and parasites
Knowledge and learning passed down	More competition for resources
Specialisation of roles	Increased conflict
Cooperative food gathering	
Efficiency in locomotion	
Groups can modify their environment	

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Reproductive Behaviour

Courting

Important part of reproductive behaviour to ensure successful mating. Involves displays, calls, pheromones etc. There are a number of benefits including; species recognition, attracting mates from a distance, natural selection and establishing pair bonds.

Mating systems

Monogamy – one male, one female, both usually rear bond.

Pair bond forms which is an enduring relationship that lasts longer than mating. May be seasonal or life-long.

Polygyny – one male competes for many females. Males are biggest strongest and showiest, and not usually involved in child rearing.

Polyandry – one female competes for many males. Females are not involved in child rearing.

Cooperative breeders – where related, non-breeding adults assist in raising young. Can be referred to as a **kin group**.

Synchronised spawning - in response to external environmental cues, males and females release gametes simultaneously and fertilisation is external.

R-strategy	K-strategy
Large numbers of eggs	Few offspring
Little investment of energy in offspring	Large investment of energy in offspring
Little risk to parents	Parents ensure survival of fewer offspring
Low survivorship	High survivorship

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