

Development of Behavior

1. Innate behavior, instincts → genes
2. Learned behavior → environment

Development of Behavior

1. Innate behavior, instincts

- Behavior appears in fully functional form the first time it is performed
- Performed as Fixed Action Pattern = FAP

FAP

- motor pattern is uniform and stereotyped
- all members of a class (e.g. age, sex) perform it
- once started, always goes to completion
- Triggered by external signals = releaser & sign stimulus

Releaser = entire object that causes an FAP to be performed

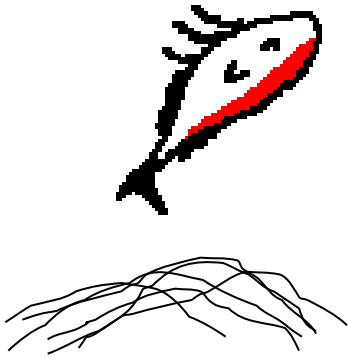
Sign stimulus = a part/feature of the releaser that determines performance of the FAP



♂

Threespine Stickleback ♀

3-Spined Sticklebacks

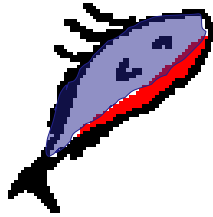


Male with red belly and nest



Female with enlarged belly

Male Aggressive Behavior



Resident male with nest



Intruder male

Male Courtship Behavior



Resident male with nest

Female with enlarged belly

Aggressive

Releaser = other fish

Sign stimulus = red belly

FAP = turn blue, attack

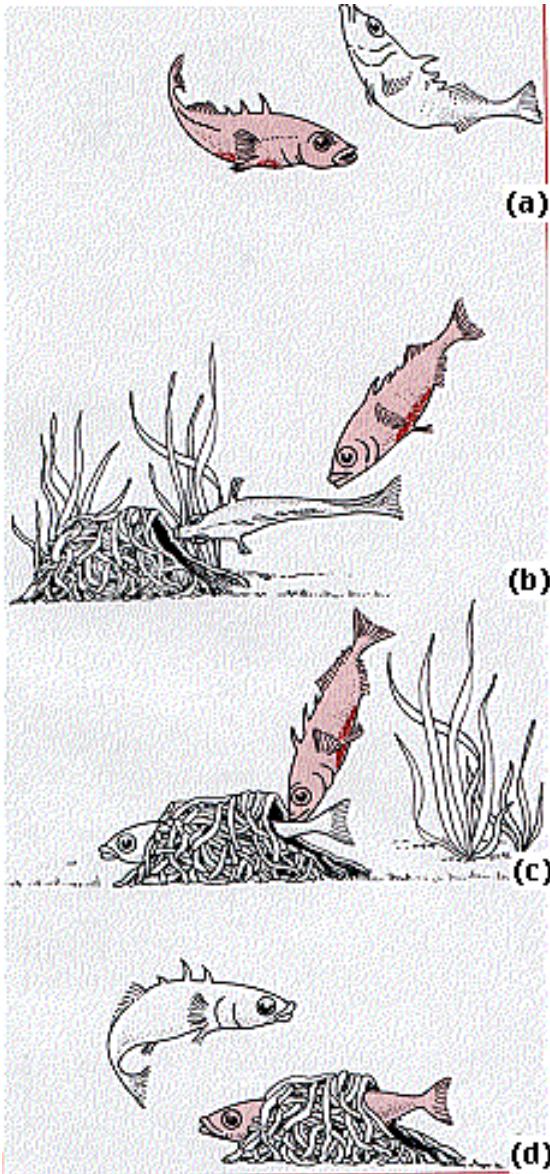
Courtship

Releaser = other fish

Sign stimulus = enlarged belly

FAP = zig zag dance, then go to nest

Female Behavior

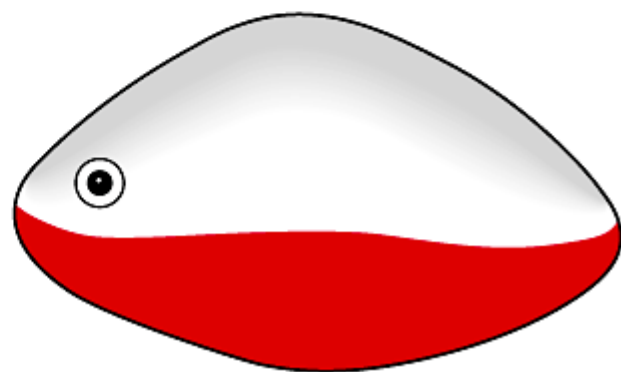
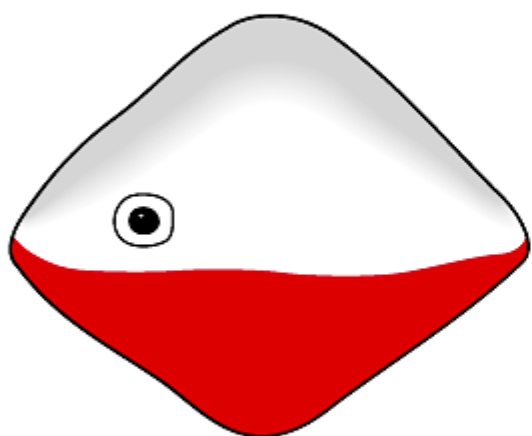
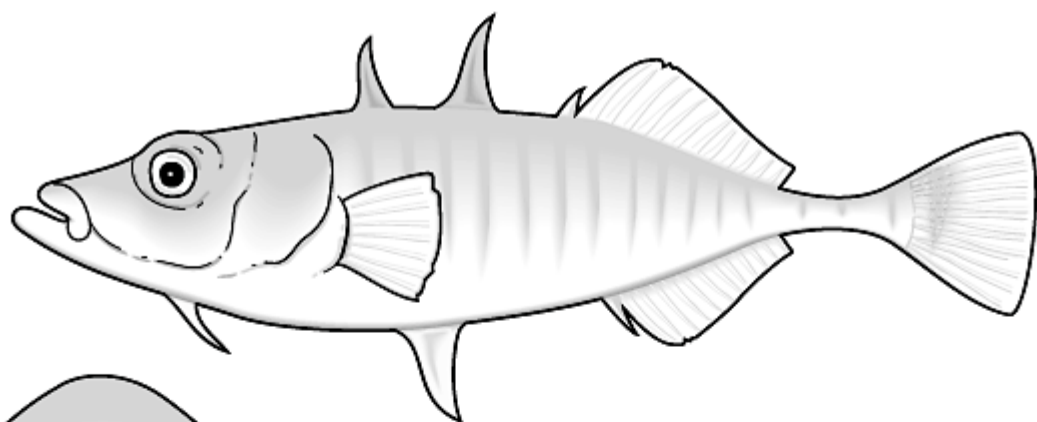


Female sees male with red belly
Releaser = male
Sign stimulus = red belly

FAP = Follow him to his nest and go in.

2nd sign stimulus = poked in tail
FAP = lay eggs in nest

Male enters nest to fertilize eggs.



Development of Behavior

2. Learned behavior

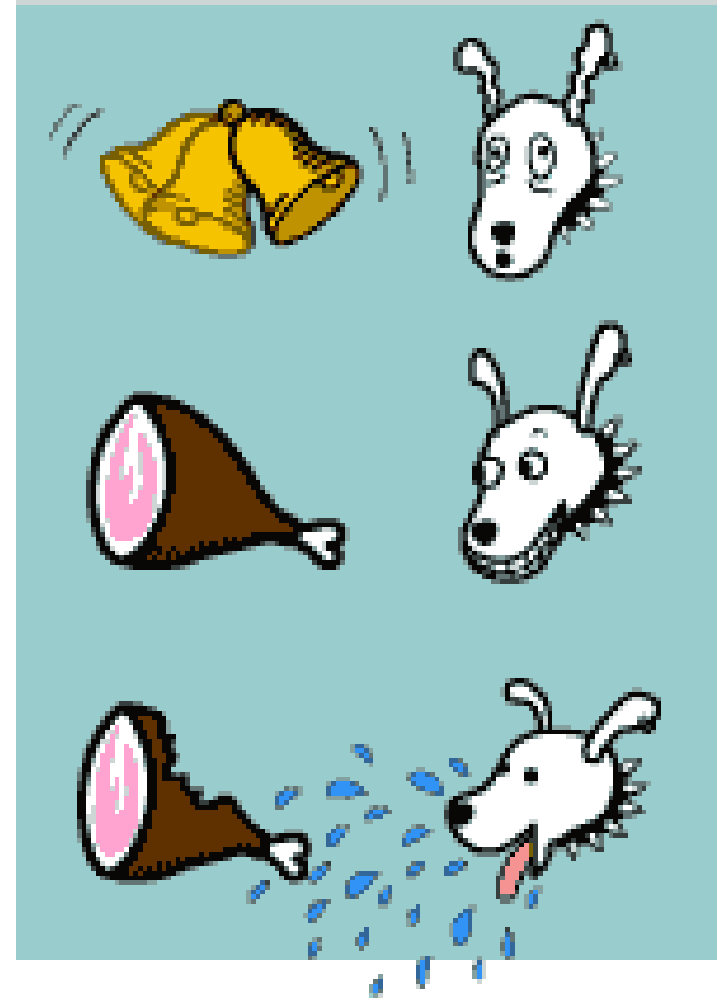
- Behavior requires some form of environmental input to be functional

Types of Learning:

1. **Associative learning** = process where animals associate one stimulus with another

a. **Classical conditioning** = a specific, conditioned, response is elicited by a specific stimulus

e.g. Pavlov's dogs



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b. **Operant conditioning/trial & error learning** = animal associates a behavior with a reward/punishment and then repeats/avoids that behavior.



e.g. chimpanzees



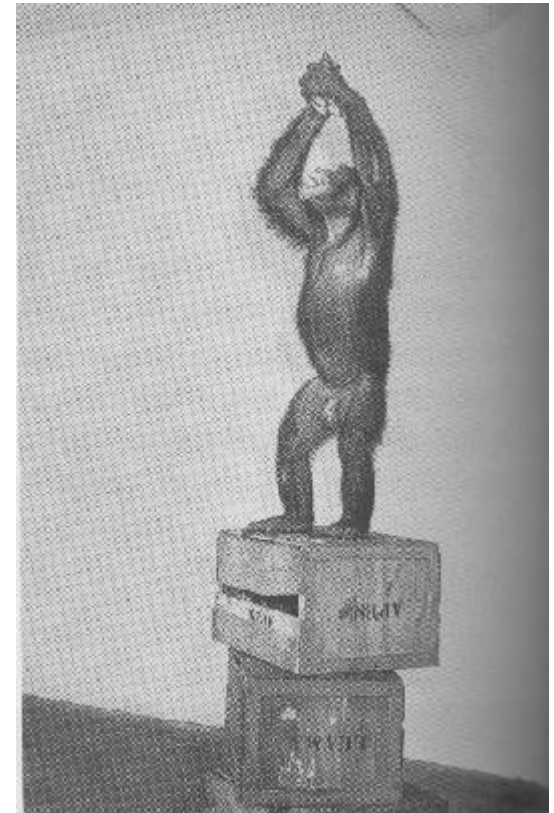
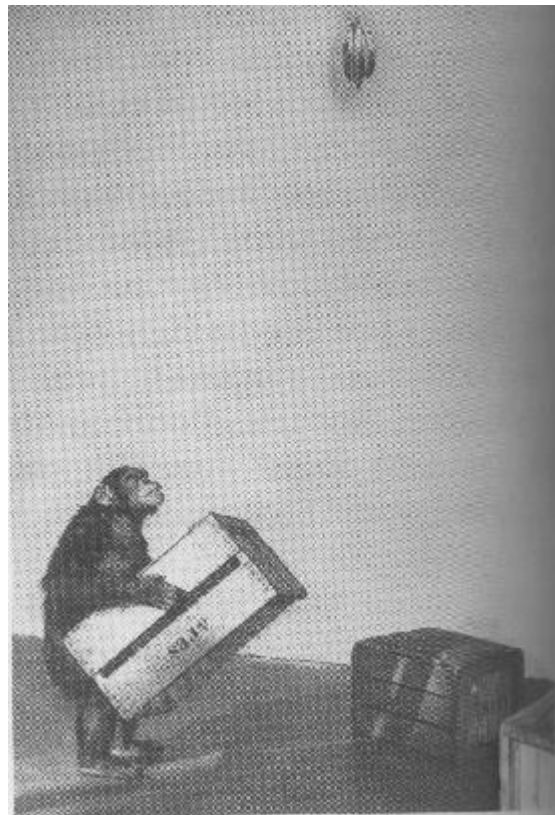
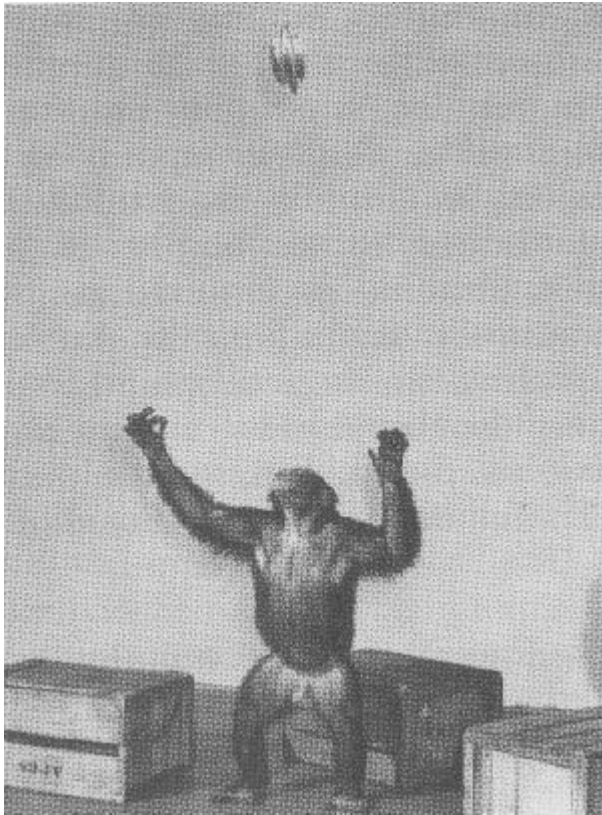
e.g. English tits

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 - b. **Operant conditioning/trial & error learning** = animal associates a behavior with a reward/punishment and then repeats/avoids that behavior.
2. **Observational learning** = process where animals learn by watching the actions of others
 - e.g. English tits & chimpanzees

3. Insight learning/reasoning = ability to perform appropriate behavior on first or second attempt in situations where they have no prior experience.

e.g. chimpanzees



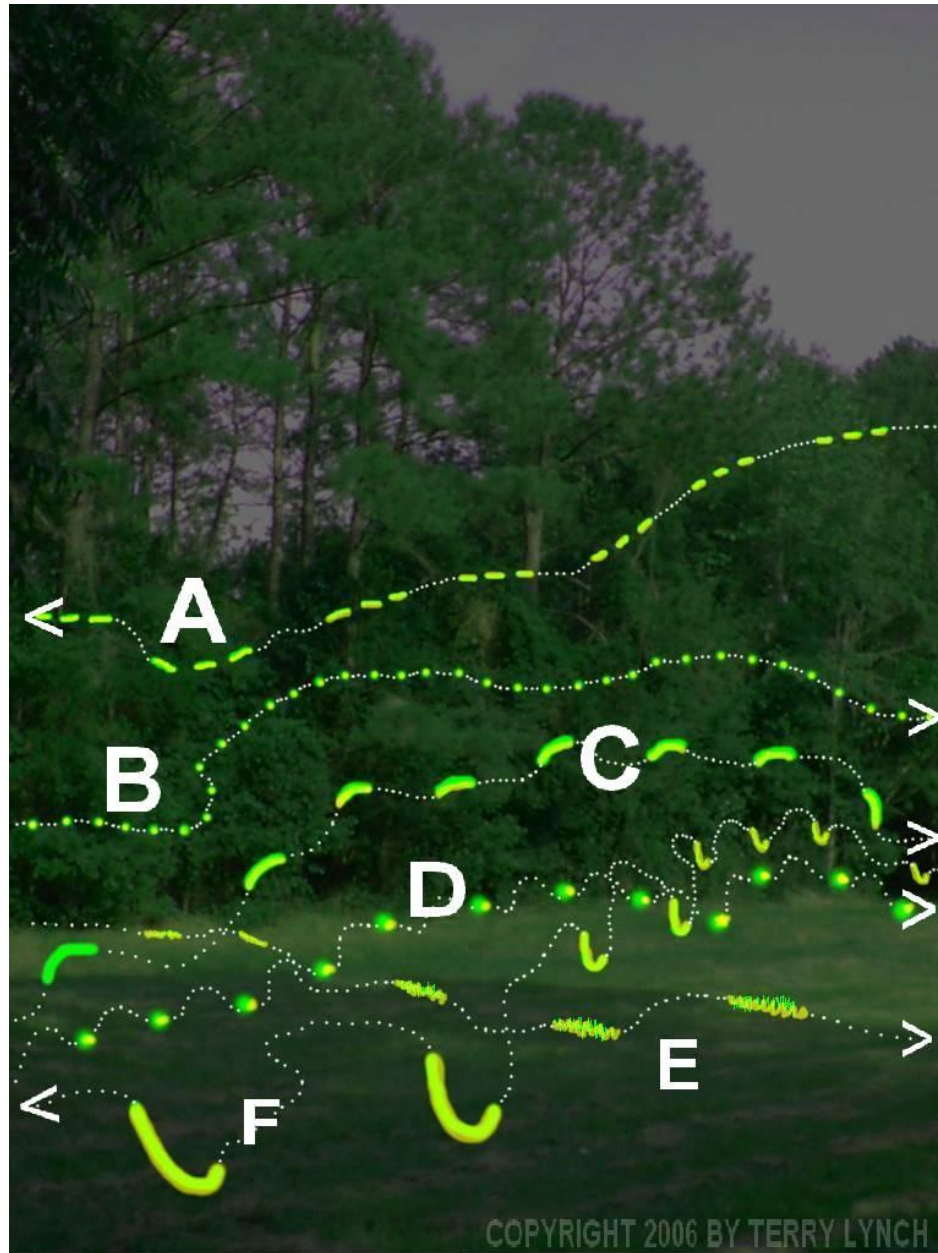
Advantages & Disadvantages of Innate & Learned Behaviors

	Innate	Learned
Advantages	<ul style="list-style-type: none">• Ensures presence of behaviors that are critical to survival or reproduction	
Disadvantages		
Most adaptive & prevalent		

Predator recognition & avoidance



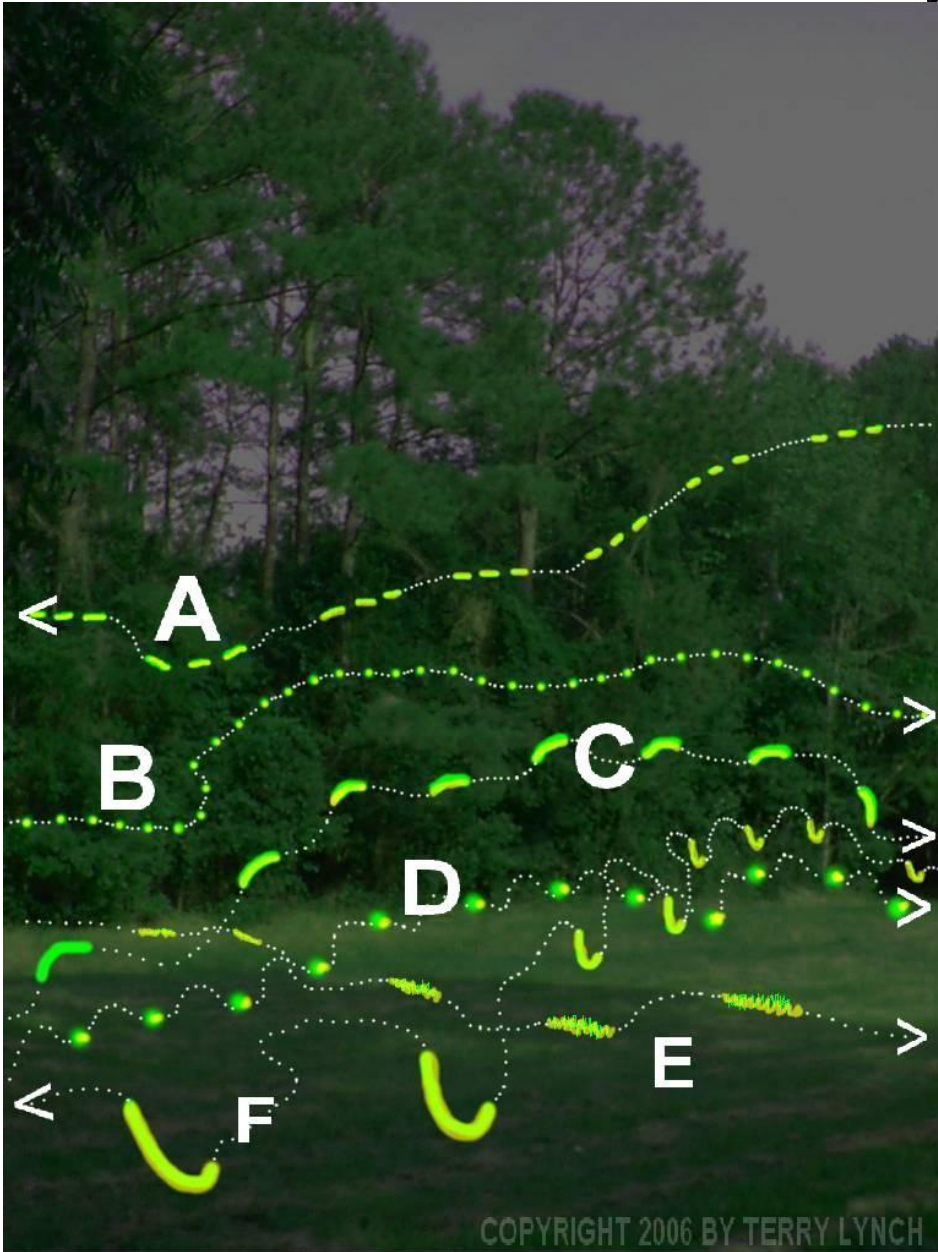
Courtship & species recognition



Advantages & Disadvantages of Innate & Learned Behaviors

	Innate	Learned
Advantages	<ul style="list-style-type: none">• Ensures presence of behaviors that are critical to survival or reproduction	
Disadvantages	<ul style="list-style-type: none">• Limited behavioral repertoire• Limited ability to adapt to changes• Right response given in the wrong situation	
Most adaptive & prevalent		

Mimicry



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Disadvantages	<ul style="list-style-type: none">• Limited behavioral repertoire• Limited ability to adapt to changes• Right response given in the wrong situation	
Most adaptive & prevalent	<ul style="list-style-type: none">• Animals with short lifespans• Animals with little or no parental care	

Egg recognition

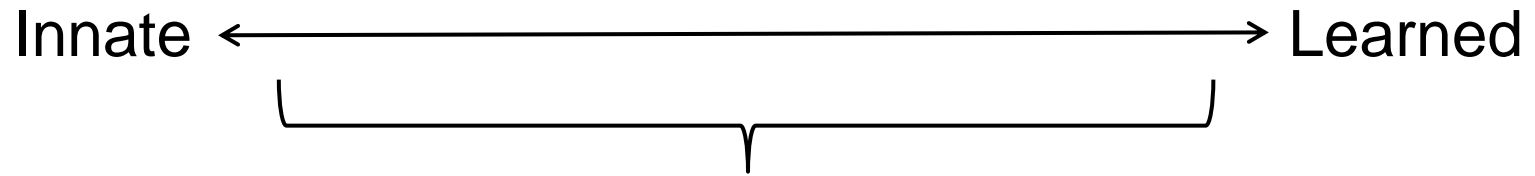


Hunting tactics



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Disadvantages	<ul style="list-style-type: none">• Limited behavioral repertoire• Limited ability to adapt to changes• Right response given in the wrong situation	<ul style="list-style-type: none">• Requires more brain space• Energetically costly• Higher probability of making mistakes while learning
Most adaptive & prevalent	<ul style="list-style-type: none">• Animals with short lifespans• Animals with little or no parental care	<ul style="list-style-type: none">• Animals with long lifespans• Animals with extended parental care



most behaviors have both innate and learned components

Innate behaviors modified through learning



Chicks peck at red spot on bill.



Cubs learn hunting tactics.

<http://www.youtube.com/watch?v=EXFInlrk2zg>

Genetically programmed learning



Bees programmed to learn location of hive.



Digger wasps programmed to learn size of larvae.

Imprinting

A special type of genetically programmed learning

Characterized by:

1. Occurs only during a genetically determined sensitive period
2. What is learned is irreversible
3. What is learned may be manifested at a later time

1. Parental Imprinting – offspring learn who their parents are.

- a) Parental bonding – offspring learn parents are first thing they see moving
- b) Mate recognition – offspring learn who they should mate with



2. Offspring Imprinting – parents learn who their offspring are.



3. Home area imprinting – learn where their home or natal area is.

