

Edexcel A Biology A-Level

Core Practical 18

Investigate habituation to a stimulus.



When snails are touched between the eye buds they retract into their shells very quickly and take some time to re-emerge. This is an **innate** response to what is perceived as a threat. **Habituation** is the decreasing of an innate response, such as this one over time, as the stimulus is repeated and is learned to be **benign**.

Equipment

- Snail
- Cotton wool bud
- Distilled water
- Chopping board
- Stopwatch

Method

1. **Dampen** the cotton wool bud in distilled water.
2. Touch the snail between the eye buds with the cotton wool bud
3. Time the **length of time it takes for the snail to emerge fully** from its shell again.
4. Repeat for a total of **ten touches**.

Risk Assessment

Hazard	Risk	Safety Precaution	In emergency	Risk Level
Biohazard	Contamination	Use disinfectant; wash hands with soap after handling	Seek assistance	Low
Bags/stools	Tripping	Keep under desks and away from workspace	Seek appropriate medical assistance; clean spillages	Low

Graph

- Plot a graph of **number of touches** against **time to re-emerge from shell**.



Conclusion

- Results can be tested using **Spearman's Rank Correlation Coefficient** to determine the **correlation** between the two variables and whether it is statistically significant.
- As number of touches increases, the time taken for the snail to re-emerge decreases because the snail becomes **habituated** to the stimuli. This is because calcium channels in the presynaptic membrane become **less responsive** to stimuli (the threshold increases) over time, so **less neurotransmitter** is released into the synaptic cleft.
- This is because it is evolutionarily advantageous not to use resources on responding to a benign stimulus.

Note: it is important to treat the snails **ethically** during the experiment and to re-release them afterwards.

