



comments / questions?

Vitamin C is essential in mammals (and other vertebrates)?

Can you generate a scenario (using evolutionary mechanisms) to explain how it came to be that humans and other (haplorhini or dry nose) primates are vitamin C dependent, while most other mammals (as well as other primates) are not.

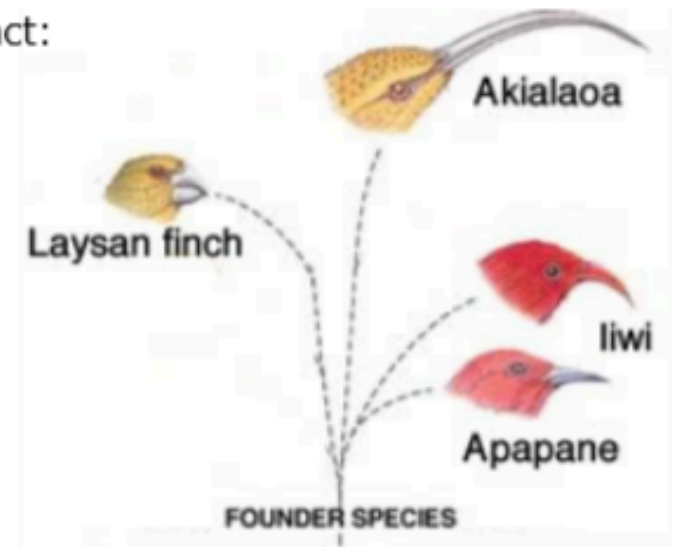
[blog post](#)

What does it mean to say that speciation is a continuous process? How is it related to the continuity of life and the presence of a last common ancestor.

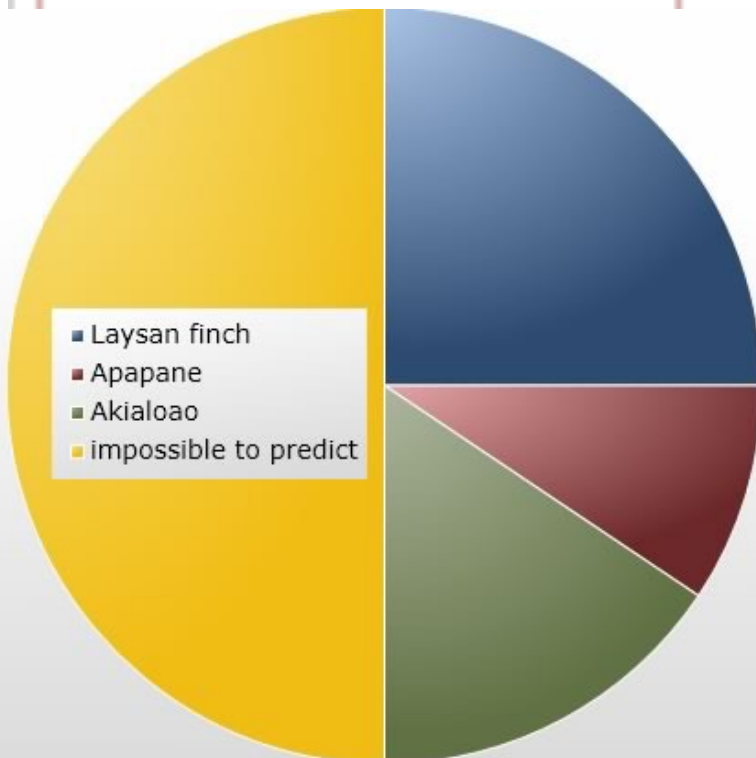
Is speciation a selectable trait? What is its evolutionary value ?

Which of these species of finch is the most likely to go extinct:

- ☐ Laysan finch
- ☐ Iiwi
- ☐ Apapane
- ☐ Akialoao
- ☐ impossible to predict



explain why a reproductive barrier between populations



what is the logic of your answer?

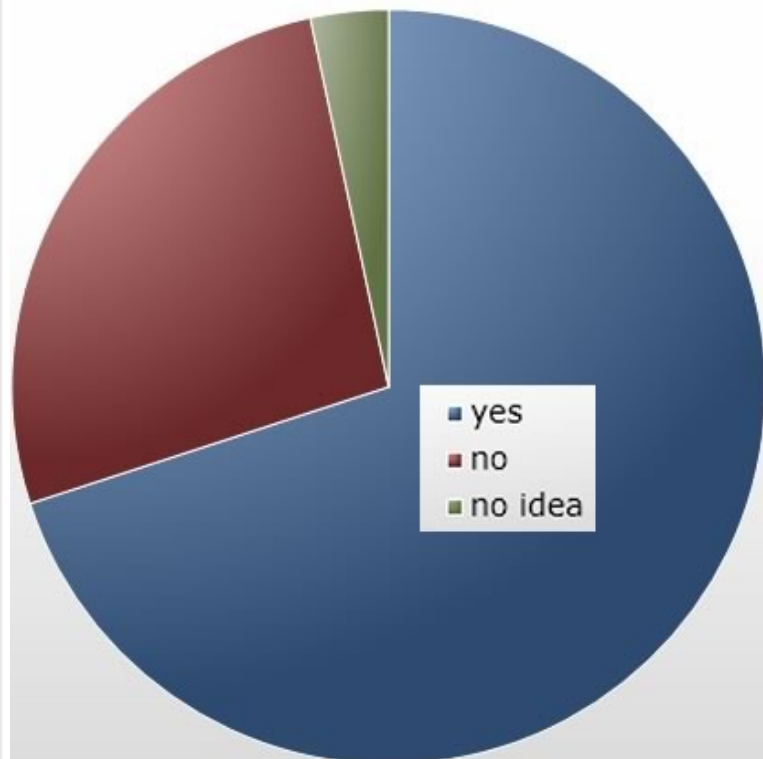
42. What is involved in establishing reproductive isolation between populations (species formation); what factors favor speciation?

43. How are sympatric and allopatric speciation the same and how do they differ?

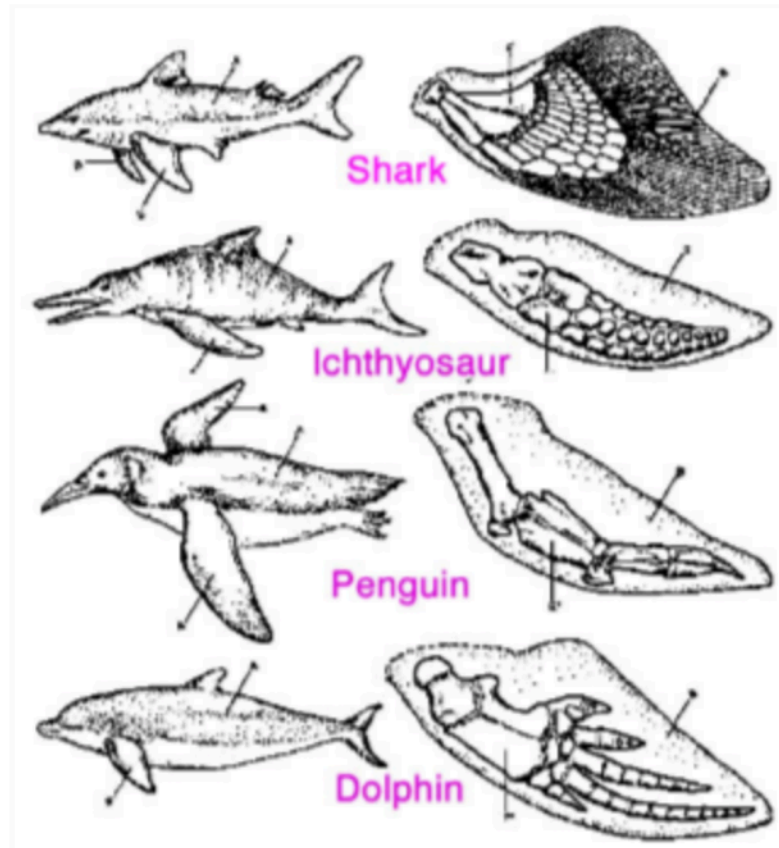
44. Describe the (Darwinian) cycle of selection associated with the development of a trait, such as the extended neck of giraffes. Consider the feedback between behavior and anatomy.

Here are four examples of convergent evolution.
Did their common ancestor have fins?

- ☐ yes
- ☐ no
- ☐ impossible to tell, their ancestors are extinct
- ☐ no idea



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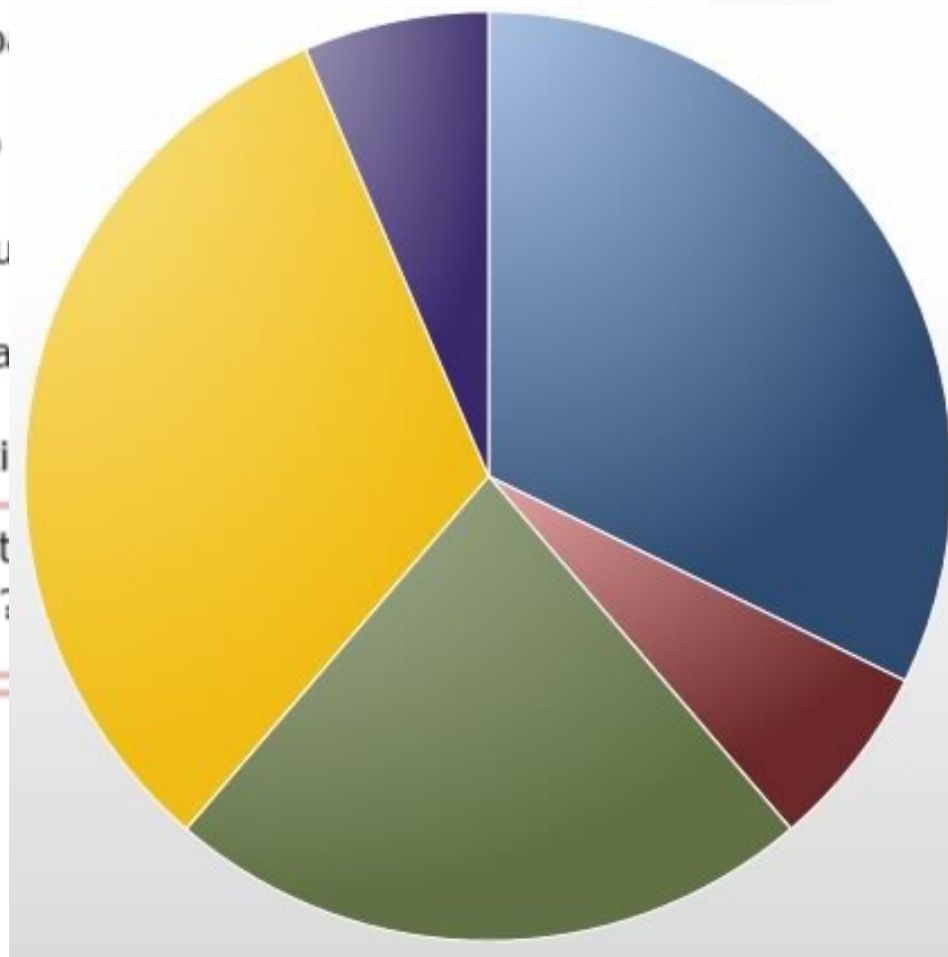


What are the core ideas in chapter 3 +
what do they explain?

Which of these traits do you find the **MOST** difficult to accept as a product of evolutionary mechanisms?

- ☐ loyalty to a mate / life partner
- ☐ loyalty to a social group
- ☐ the social aspects of adult lactose tolerance
- ☐ the randomness of mutation
- ☐ the frequency of extinction

Explain your reasoning and perhaps identify an evolution argument you have ever heard?



- loyalty to a mate / life partner
- loyalty to a social group
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- the randomness of mutation
- the frequency of extinction

What is the core idea driving social evolution?

How is reproductive success enhanced by
(often costly) social cooperation?

10-Chapter 4.1 read pages 87-94 first

Draw a schematic of the difference between a colony of individual cells and a (simple) multicellular organism. In the text input box describe the most important differences....

10-Chapter 4.1 read pages 87-94 first

Draw a schematic model of the difference between a colony of individual cells and a (simple) multicellular organism. In the text input box describe the most important differences....



Individual cells undergo simpler processes of division. Multicellular organisms have interactions regarding signal transduction and other nearby organisms.

Draw Erase XReset

30586

10-Chapter 4.1 read pages 87-94 first

Draw a schematic model of the difference between a colony of individual cells and a (simple) multicellular organism. In the text input box describe the most important differences....



The individual cell colony, each cell only has a nucleus, while the multicellular organism has multiple cells in it and each smaller cell has its own nucleus.

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10-Chapter 4.1 read pages 87-94 first

Draw a schematic model of the difference between a colony of individual cells and a (simple) multicellular organism. In the text input box describe the most important differences....



The most important difference between a colony of individual cells and a multicellular organism is the differentiation of jobs or duties for each cell. In an organism with multiple cells, each cell has developed to perform a different function.

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10-Chapter 4.1 read pages 87-94 first

Draw a schematic model of the difference between a colony of individual cells and a (simple) multicellular organism. In the text input box describe the most important differences....



Individual cells can survive on their own and generally don't exist within the same, semi-permeable barrier, while a multicellular organism usually has all its cells under the same membrane and can't survive if one dies.

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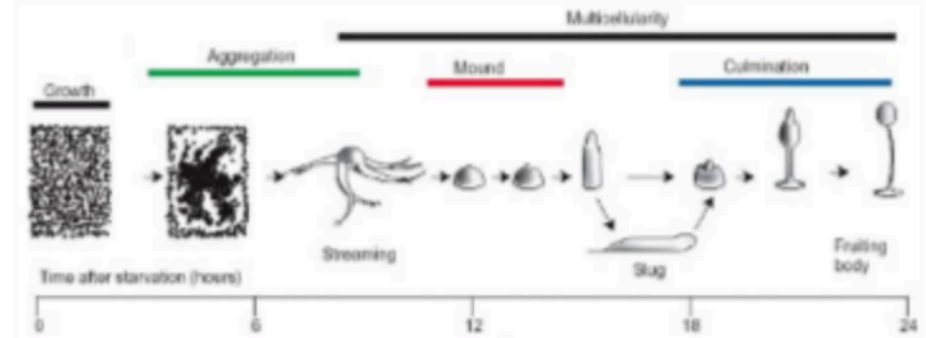
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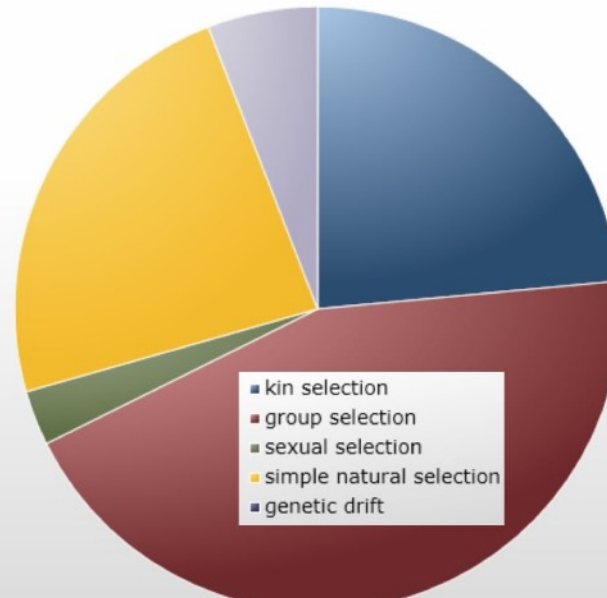
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Consider the behavior of the cellular slime mold *Dictylostelium*. How is the multicellular slug like a true multicellular organism and how is it different?



Which is more likely to be involved in the evolution of social behavior in slime models, then explain you thinking

- ☐ kin selection
- ☐ group selection
- ☐ sexual selection
- ☐ simple natural selection
- ☐ genetic drift

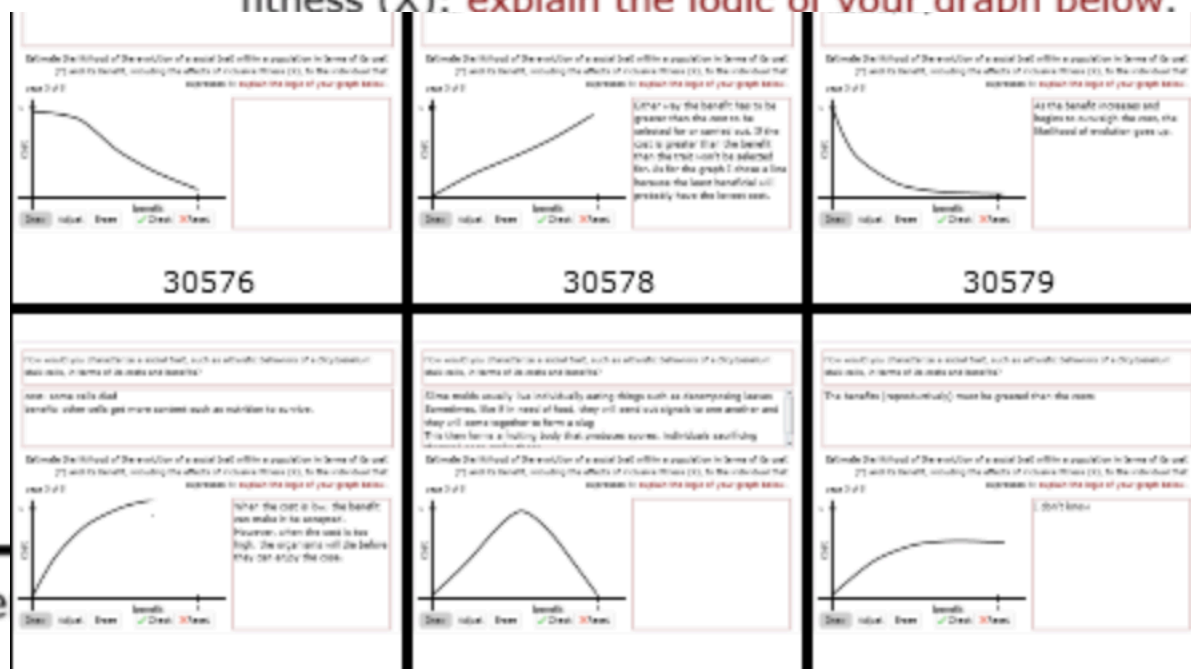
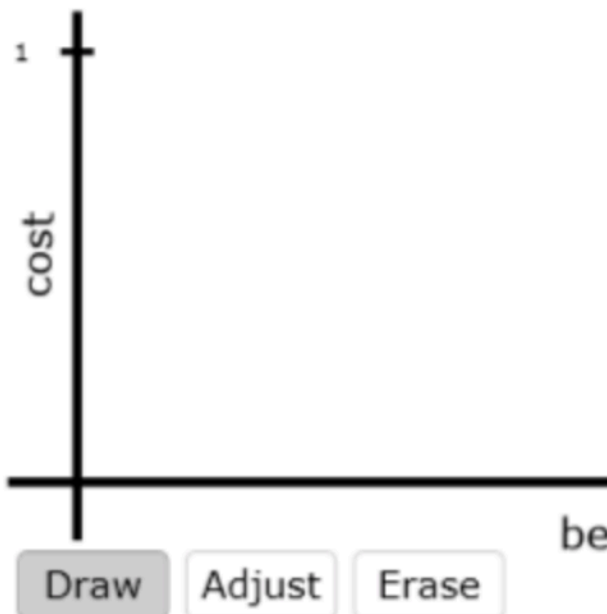


Are kin and group selection really different?

How would you identify a social trait, such as altruistic behavior of a *Dicytostelium* stalk cell, in terms of its costs and benefits?

Estimate the likelihood of the evolution of a social trait within a population in terms of the cost of the trait to the individual that expresses it (Y) and its benefit in terms of inclusive fitness (X): **explain the logic of your graph below.**

page 3 of 5



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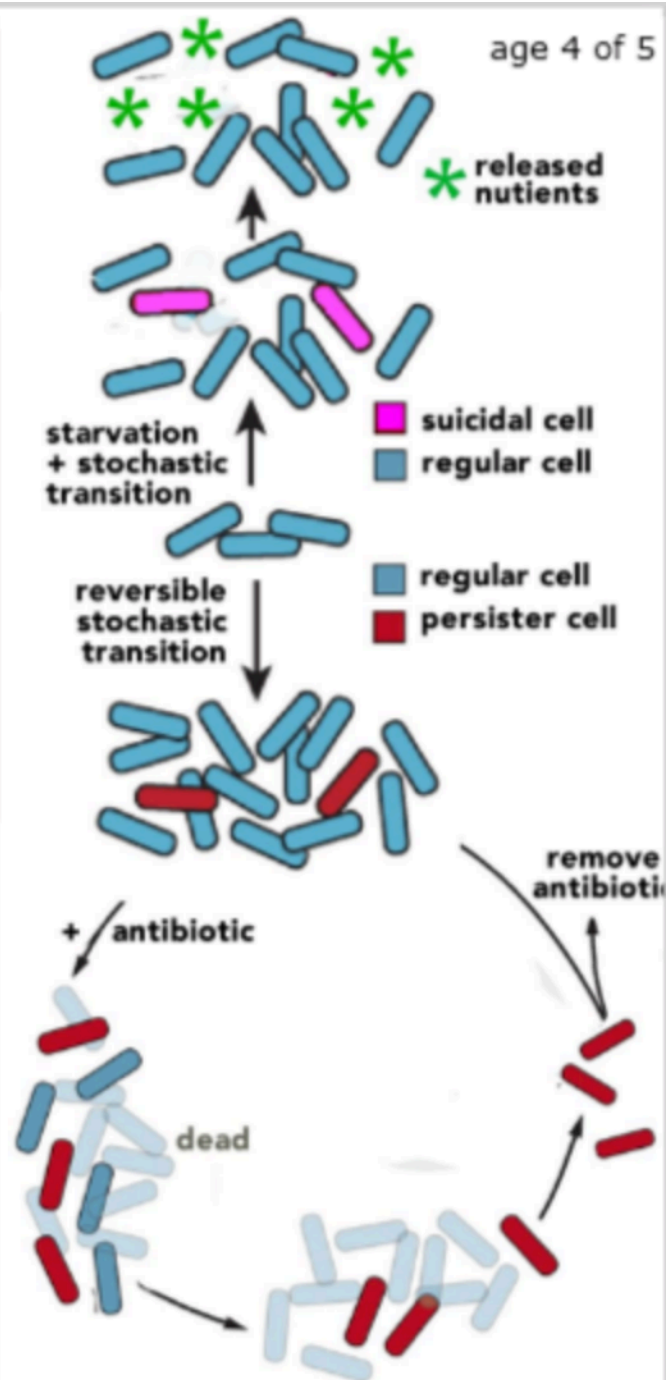
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page 3 of 5



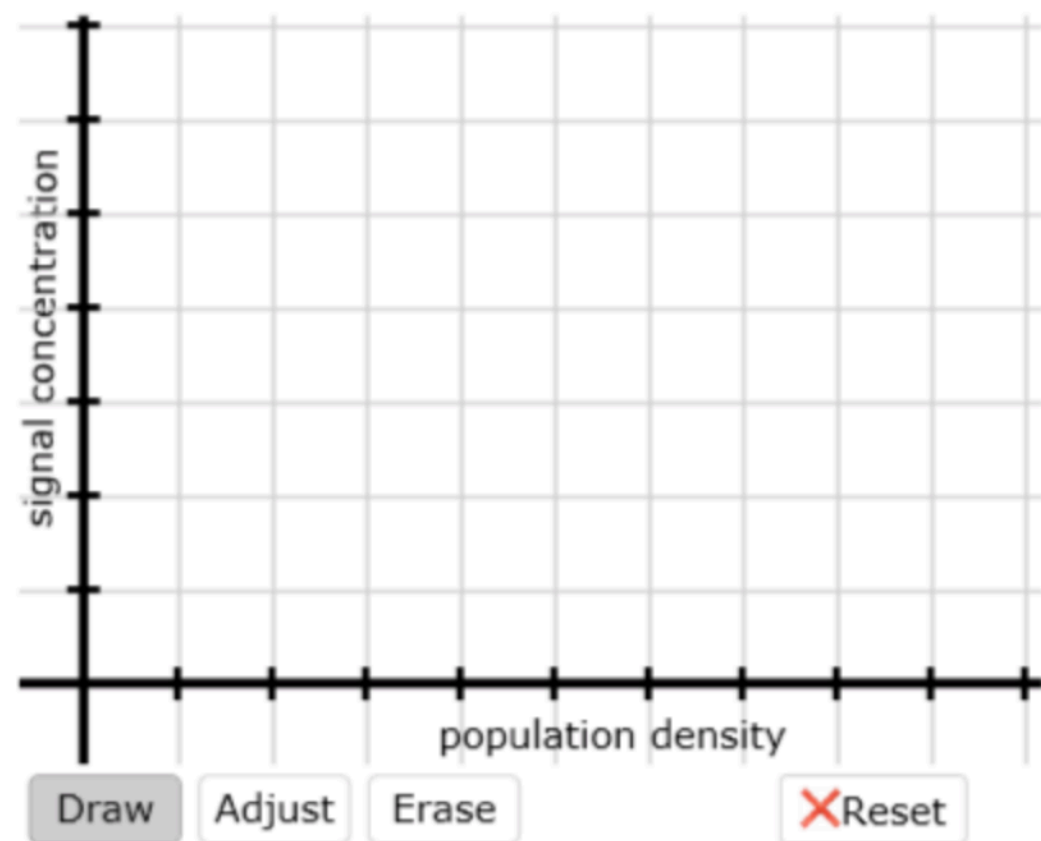
Explain the logic for using quorum sensing to control the expression of "expensive" traits, such as programmed cell death, the expression of genes encoding light emitting protein systems, digestive enzymes, etc.

How might a population protect itself against an individual (a social cheater) that minimized its costs and maximized its benefits from the social behavior?



In social systems, cells respond to signal molecule that they themselves secrete. Response to the signal begins when the signal concentration reaches a minimal "threshold" level. A single cell cannot produce enough signal to reach the threshold concentration.

In the graph, draw out your prediction of signal concentration as a function of population density



As a function of frequency, how might the presence of social cheaters in the population influence its social behavior?

Monday 25 Sept	Chapter 4.2 Social and Sexual Selection	85-106	Complete beSocratic #11
Wed. 27 Sept	Chapter 4.3 Social and Sexual Selection	85-106	Complete beSocratic #12
Friday. 29 Sept	REVIEW for midterm #1		previous midterm

**Monday
2 Oct.**

first midterm exam

exam answers