



NON-RANDOM MATING AND GENE FLOW

February 3rd 2016

SHAPE OF THE DAY

- Go through our anti-biotics worksheet
- Sexual selection/non-random mating
- Gene flow
- Studying tips and strategies
- Making test questions
- Give Ms. Hui Feedback!



WORKSHEET



SAMPLE ANSWER

Antibiotics do not kill all bacteria in the population, some bacteria are resistant to antibiotics. The bacteria that survive the antibiotics become more resistant. Over time, the population of bacteria become completely immune to antibiotics.



SAMPLE ANSWER

Antibiotics do not kill all bacteria in the population, some bacteria are resistant to antibiotics (1 point, variation). The bacteria that survive the antibiotics **become more resistant**. Over time, the population of bacteria become **completely immune to** antibiotics. (1 point, population change)

2 of 4 points



- The antibiotics do not kill all bacteria in the population, some bacteria have variants of genes that allow them to be more resistant to antibiotics (1 point, variation of gene in population).
- The bacteria that do survive the antibiotics, would be more successful (more likely to reproduce). (1 point successful traits increase chances of survival and reproduction)



- In the next generation of bacteria, there will be a higher percentage of bacteria with the gene variant/trait that allows them to be resistant to antibiotics. Over many generations, the population of bacteria develop almost complete resistance to antibiotics. (1 point, change at population level).
- (1 point for correct use of all terms)

4 of 4 points

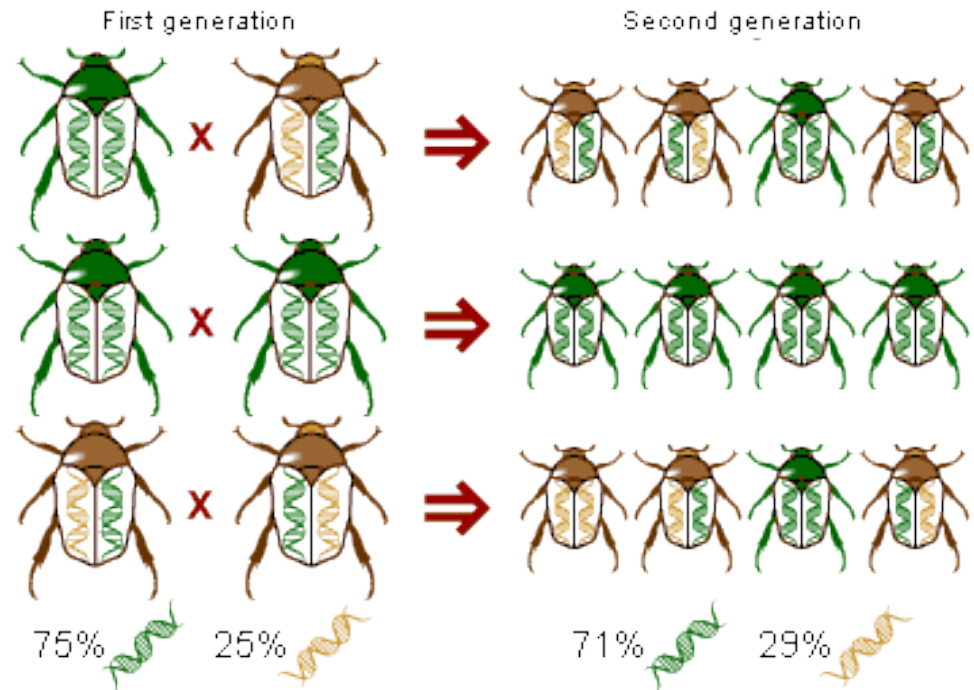
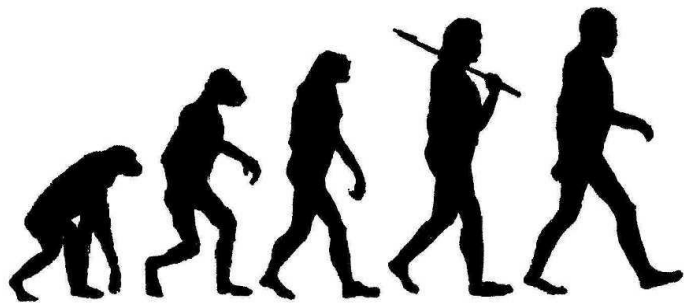


LEARNING OBJECTIVES

- Explain how non-random mating can also “select” for genetic changes in a population
 - *Explain what stops non-random traits from going “too far”
 - Explain how gene flow introduces or excludes genes from a population and changes the gene frequency
- *Explain how gene flow **INCREASES** the genetic diversity of a gene pool



Evolution is change in allele frequency over time



Natural selection is the **differential survival and reproduction** of individuals due to differences in **phenotype**.



Traits that increase the likelihood of survival and reproduction are selected for.







Sexual selection is a mode of natural selection where typically members of

one biological **sex** choose mates of the other **sex** with whom to mate (intersexual **selection**)

competition between members of the same **sex** to **sexually** reproduce with members of the opposite **sex** (intra-sexual **selection**).



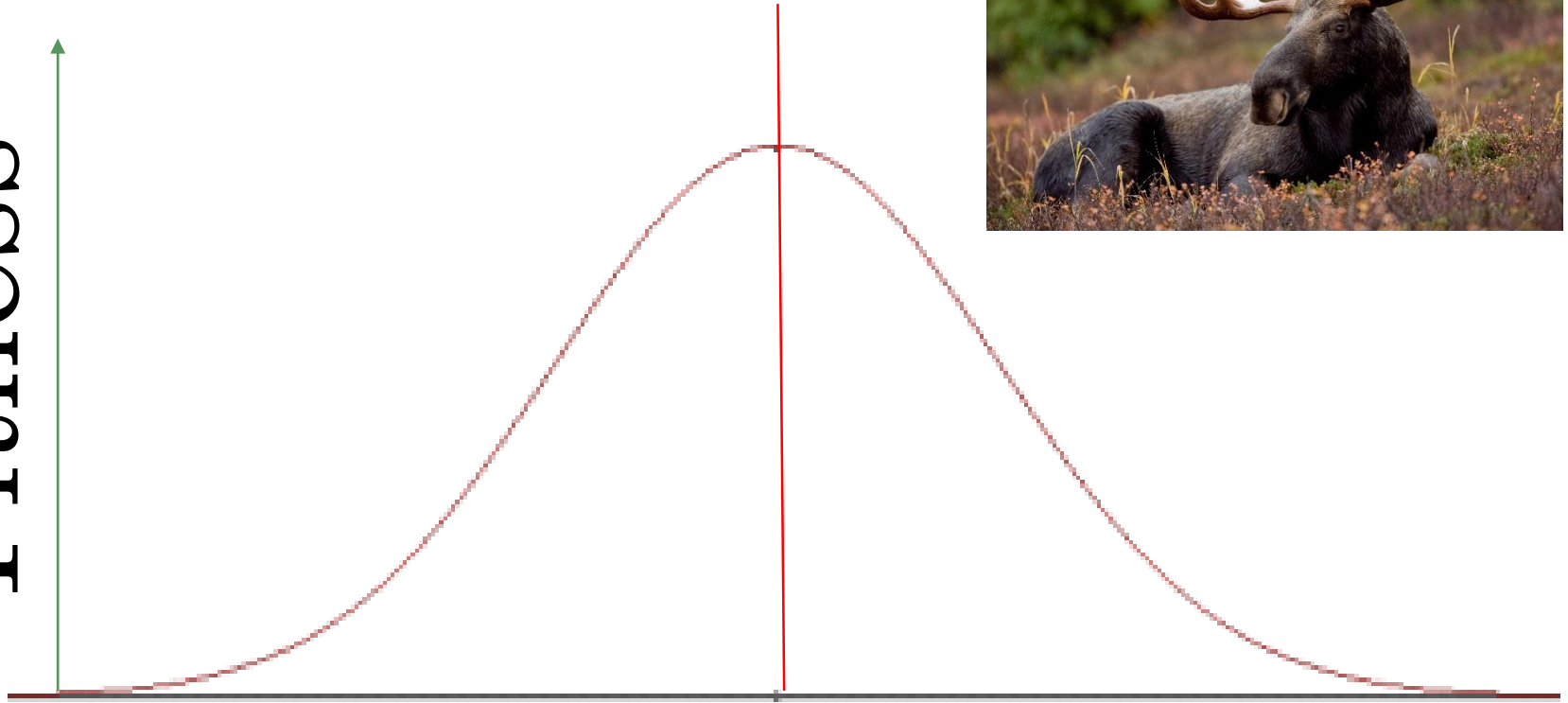
BBC



**But why wouldn't these
“sexual” traits just get more
extreme?**



Fitness



Horn Size



FIVE FACTORS THAT PRODUCE EVOLUTIONARY CHANGE

- 1. **Natural/Artificial Selection**
- 2. **Sexual Selection or Non-random Mating**
- 3. Gene Flow
- 4. Genetic Drift
- 5. Mutations



Why wouldn't all the organisms in a population (**in an area**) be the same after many generations if there are certain characteristics that are favored?

(in other words, decrease in genetic diversity)

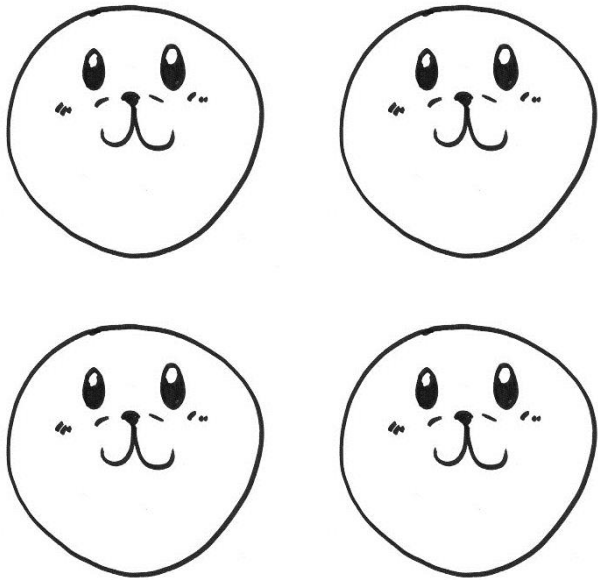


Because there are ways that a population's genetic diversity **increases** rather than **decreases!**



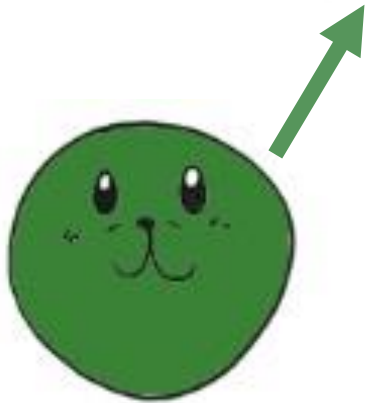
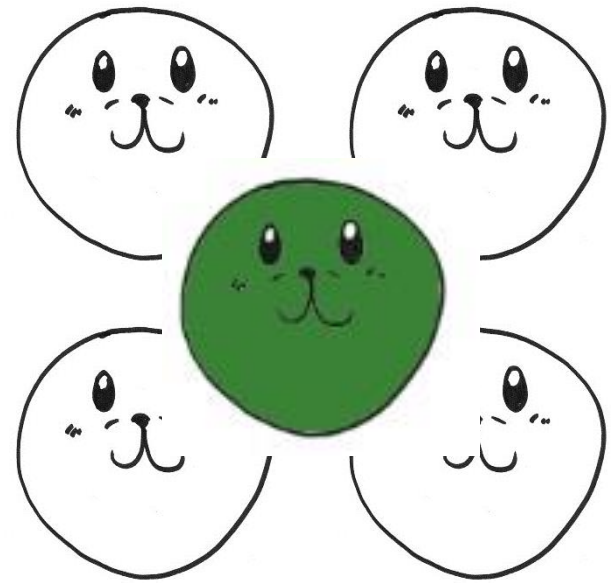
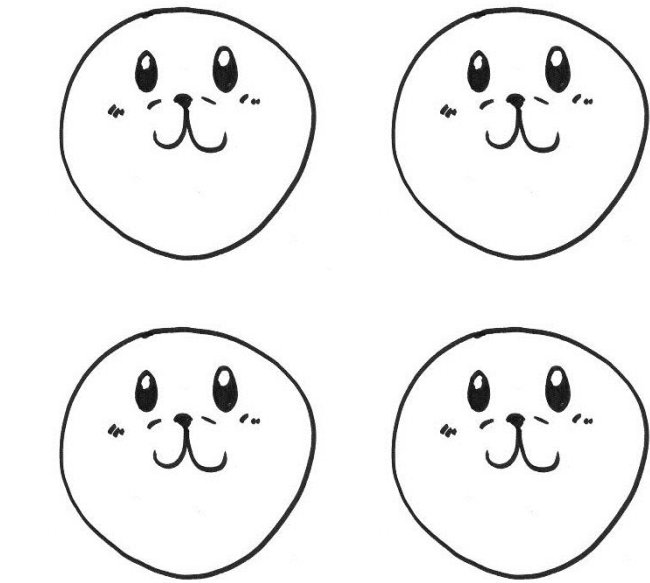
GENE FLOW

- Change of allele frequency in a population **DUE TO** immigration and emigration



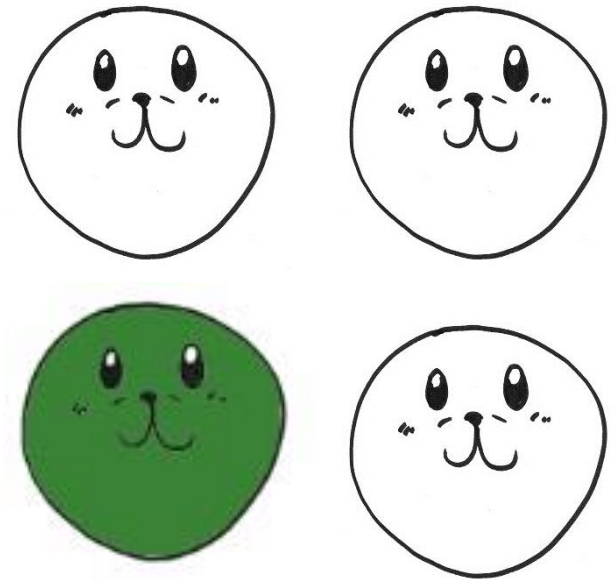
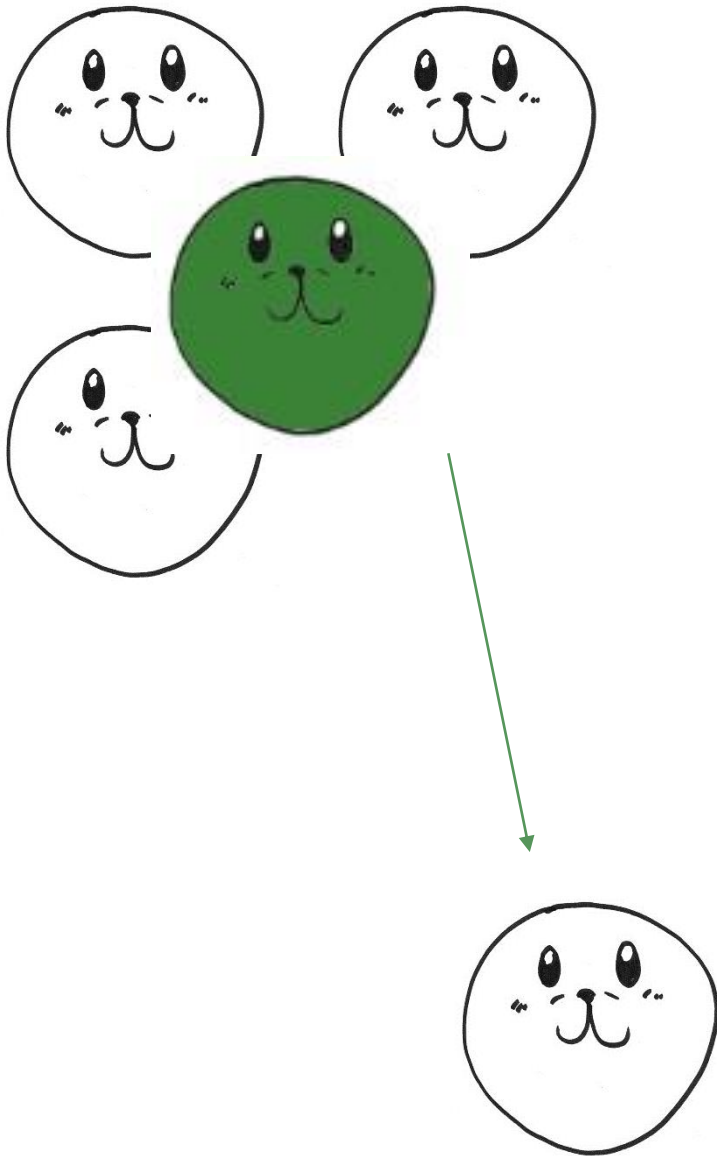
**100% White
Alleles**





20% Green
80% White





25% Green
75% White







The seeds from this dandelion will be carried by the wind and travel a long distance.

The seeds carry the alleles to another population.



The caribou migrate hundreds of thousands of miles every year. Populations mix together.

When mating between individuals happens, so does exchange of alleles

Gene Flow is the movement of alleles (versions of a gene) from one population to another.

Adios, amigos!



Studying

How do you study for quizzes and tests?

What strategies work for you?

What strategies have you found don't work for you?



WE REMEMBER

10% of what we read

20% of what we hear

30% of what we see

50% of what we see and hear

70% of what we discuss with others

80% of what we personally experience

95% of what we teach others

- Edgar Dale



Studying

A few of the most common problems students encounter when studying are:

- Thinking you know something when you don't (*misinformation effect*)
- Using ineffective studying methods such as cramming, looking at the answers, or focusing only on factual recall.



Classroom practice – Effortless learning is a dangerous illusion



news | Published in TES magazine on 18 April, 2014 | By: Peter Brown, Henry Roediger and Mark McDaniel

Last Updated: 17 April, 2014

Section: news

Teachers understandably want to smooth the path to knowledge for their students. But for true mastery you must make them struggle

Mary Pat Wenderoth stops herself mid-lesson and asks her class a question about the day's work. The students turn to their notes but she stops them. "Don't look it up. Imagine your brain is a forest and your memory is in there somewhere. The more times you make a path to that memory, the stronger that path becomes. Try to figure it out."

Wenderoth is a principal lecturer in biology at the University of Washington in Seattle, US. She keeps close tabs on research into how humans learn and knits the findings into her teaching methods. One of the most fundamental conclusions may appear contradictory: the best way to make learning stick is to focus less on getting knowledge into the brain and more on getting it out.

<http://makeitstick.net/pdfs/ClassroomPracticeEffortlessLearningIsADangerousIllusionNewsTES.pdf>



Some tips ...

- Test yourself often, w/o looking at the answers.
 - (control for *misinformation effect*)
- Test yourself beyond the FACTS, test for conceptual understanding
- Do something with the material
 - Draw a comic
 - Write a poem
 - Make mind map or concept map
- Teach it to someone else
- Allow for forgetting, then study.



For this class...

DO...

- Focus on the learning objectives
- Make concept maps
- Test yourself ...

DO NOT...

- Only read over notes, power-points or textbook, do something with it
- Study the night before
- Don't kill yourself studying



Ms. Hui's crazy ideas

- Reflect on a daily basis what you've learned.
- Teach it to someone else... or film yourself on your webcam
- Act it out in a roleplay... make sure no one is watching
- Study half an hour before you sleep
- Keep trying! Don't give up! If you fail, it means you've learned how not to do it.

