

Evolution Game Project 2015

Objective

Create a game that demonstrates how evolution happens.

Work individually, in pairs, or in groups of three.

Time allocated

- Creating days: most class periods November 10-November 30
- This is intended to be completed in class; however, if you wish to work on it outside of class, you are welcome to do so.
- Peer play and assess day: December 1 or 2 (flexday)

Kind of game

Your choice. Possibilities include:

	Examples that might help you think about your game
Digital	Darwin online game This one about birds on an island demonstrates a lot of processes Peppered moth explanation and simulation <i>Want to do a digital game but have not had coding/game design class?</i> <i>Buddy up with someone who has, or check with Ms Sanders; according to Mr. Gerl, there are quick-to-learn options for you, too.</i>
Board/card/dice game	Consider the board game we looked at in class, but imagine it is about evolution Here are instructions about a natural selection board game Here is a card game that looks cool
Physical simulation game	The pom pom simulation we did in class (you have the packet) Here is one about peppered moths Here is one using candy
Other?	Probably! Ask me or Mr. Gerl (mgerl@gallowayschool.org)!

Support:

Ms. Sanders is available to help you in class

Mr. Gerl (mgerl@gallowayschool.org) can help especially with digital game ideas and execution.

He is also available during our class time. Talk with Ms. Sanders about using his help during our class time.

Levels of assessment

Your classmates will be the testers of your game and assess it according to the following:

Function		Form	
★	Successfully demonstrates roles of mutation and natural selection .	★	I can tell that the creators worked hard on it. It's pretty fun.
★★	Successfully demonstrates roles of mutation and natural selection . Also successfully demonstrates one additional process from the table on the next page	★★	I can tell that the creators worked hard on it. It's really fun and creative. I like it!
★★★	Successfully demonstrates roles of mutation and natural selection . Also successfully demonstrates two or more additional processes from the table on the next page	★★★	Epic. Like, I can tell people worked hard on it, plus it is creative and addictively fun to play. I don't want to stop!

Natural Selection and Mutation Resources

Berkeley's website has the basics as well as a wealth of information to drill down into.

Here is the page we looked at about [natural selection](#).

And here is information about [mutation](#).

Additionally:

The *Modern Biology* textbook in the classroom is always a resource.

[All the resources we have used so far in class](#) are also resources for this.

The rest of the [Berkeley Evolution website](#).

Two terms that may be helpful for your understanding

We have said that evolution happens to populations and species (not individuals).

But what are populations and species?

Population: group of organisms (of the same species) living close to one another that interbreed with one another; a gene pool. For example, [see this image of Wolf populations](#). They are the same species, but occupy three distinct and separate areas, and do not interbreed between them.

Species: A group of individuals that actually or potentially interbreed in nature (forming viable, fertile offspring). In the example, if wolves from different populations were brought into contact (by being moved, or if their ranges expanded to meet), they could and would interbreed with one another and have wolf cubs that could survive and were not sterile.

Additional Processes

Include one or two (or more) of these for additional stars.

Process	Resources about it
<p>Coevolution: When two or more species affect each other's evolution.</p>	<ul style="list-style-type: none"> ● Berkeley's website is a good overall explanation and has real-life examples. ● Coevolution in the Great Barrier Reef: real life examples of different kinds of coevolution
<p>Sexual selection: A case of natural selection in which certain traits affect organism's ability to obtain and have sex with a mate</p>	<ul style="list-style-type: none"> ● Berkeley's website has overall good explanation and examples. ● The peacock is the poster child for this. Watch a video about them and dig into the info and games from PBS.
<p>Founder Effect: When a small number of individuals leave a population and form a new one, the new colony is likely to have different frequencies of traits and less variation of traits than the source population</p>	<ul style="list-style-type: none"> ● Berkeley's site introduces the idea ● Huntington's chorea genetic disease example ● Polydactyly example
<p>Bottleneck Effect: When a population's size is greatly reduced, many genes may be lost from the population, reducing the population's genetic variation.</p>	<ul style="list-style-type: none"> ● Berkeley's site introduces the idea ● Cheetah example
<p>Convergent evolution: The independent evolution of similar traits due to similar environmental challenges (not due to common ancestry)</p>	<ul style="list-style-type: none"> ● Berkeley website's explanation of analogies, results of convergent evolution. ● Many examples of convergent evolution
<p>Artificial selection: When conscious human action, not nature, selects for or against particular traits in another organism.</p>	<ul style="list-style-type: none"> ● Berkeley's site has basic description ● Corn is the plant poster child for artificial selection. ● Oh yeah, and dogs.
<p>Speciation: The process that forms new species. This involves the reproductive isolation of different parts of an ancestral species.</p>	<ul style="list-style-type: none"> ● Berkeley's site has a fine explanation ● In case you are curious about tigons and ligers ● Neat video about speciation among salamanders

If you use other sources, be certain they are reliable. If you are not sure, ask Ms. Sanders.