Evolution: Natural Selection and Phenotypes

Big Idea 1: Process of evolution drives the diversity of life
• 1A1: Natural selection is a major mechanism of evolution.
• 1A2: Natural selection acts on phenotypic variations.
• 1A3: Evolutionary change is also driven by random processes
- Change in allele frequency of a gene pool in a population over time.
5 processes that can cause evolution to occur

- Population can shrink → chance can take over → genetic drift (pinky)
- Non Random Mating (ring finger)
- Mutation (middle finger)
- Gene Flow from movement (pointer)
- Natural Selection → adaptations (thumb)
Microevolution

Small changes in a population
Macroevolution

Big changes → speciation (formation of a new species)
What do you know about this guy?
Natural Selection

- Individ w/ favorable **phenotypes** (physical features) are more likely to survive and produce more offspring, passing down traits to generations!
How Does Evolution Really Work?

Video Clip!!
CONDITIONS NECESSARY FOR NATURAL SELECTION

1. Reproduction
2. Inheritable Traits
3. Variation of Individuals
4. Variation of fitness of organisms
EVOLUTIONARY FITNESS

• To be fit, you must be able to reproduce!
• Measured by reproductive success.
Why is the Zorse Not Evolutionary Fit?
Adaptation

• A genetic variation that is favored by selection and provides an advantage to an org. in a environment.

• Occurs naturally through environmental pressures.
Natural Selection Acts on Phenotype

- Environments may change and act as a selective mechanism on populations.
Peppered Moth Video Clip
1) Stabilizing Selection: Selective pressures select against the 2 extremes of a trait.

• Ex: Better to be average!
Types of Natural Selection

2) Directional selection: 1 extreme of the trait experiences selection against it.

- Ex: giraffes w/ short necks
3) **Disruptive selection**: Selection pressures act against individuals in middle of 2 extremes of the trait.

- Ex: Don’t be average
Genetic Variation is Good For You!

- A diverse gene pool is important for survival of a species in a changing environment.

Cuban tree snails (Polymita picta)