

# COMPARISON OF EVOLUTION MECHANISMS: SUMMARY

## Lamarck's Hypothesis: The Inheritance of Acquired Characteristics

1. A changing environment creates a need for certain features to be developed in order to survive.\*
2. "Acquired Characteristics": Through use and/or non-use, those features needed for survival are developed in each individual.
3. Inheritance: Those characteristics developed ("acquired") by individuals are somehow passed on to their offspring, who can continue that development...
4. New Species: Eventually, over many generations, enough differences have developed that we can say we have a new species.

## Darwin's Hypothesis: Natural Selection

1. Overproduction: More offspring produced than will ultimately survive and reproduce
2. Variation: Inheritable features vary from individual to individual.
3. Change in environment: Changes in climate, topography, food supply, predators, etc.
4. "Struggle for existence": Mainly competition within the species, for food, habitat, survival from being eaten
5. "Survival of the fit" (not necessarily the strongest): Those with more adaptive traits tend to survive longer and/or produce the most offspring; these are the "naturally selected".
6. Inheritance of "selected" features: Traits involved are already inheritable, but may involve new combinations.
7. New Species, better adapted to the new environment: When the collective traits of the population differ significantly from the earlier population, and can no longer reproduce with the earlier population.

### QUICK COMPARISON

LAMARCK	DARWIN
1. <u>Environment</u> changes, thus creating a "need" to change	1. Variations of inheritable features which already normally exist
2. Development of new features, "in order to survive."* or "so that one can survive."*	2. Environment "screens out" (or SELECTS) features contributing to survival, and tends to eliminate the others.
3. Newly acquired traits somehow get passed down to offspring	3. Those with traits which help survival tend to survive and have more offspring, who inherit those traits.
4. New Species, eventually	4. New Species, eventually

\* Note the Anthropomorphic wording here ("something non-human having human motivations or attributes"). This could also be referred to as the "Mickey Mouse" syndrome. Be sure to avoid this kind of wording or implication in any explanations of Natural Selection.

### COMMON MISCONCEPTIONS TO AVOID

1. Only groups of organisms can evolve (populations or species); individuals never evolve.

Adaptations, in the evolutionary sense, as properly used in class and text, can only "develop" as characteristics of a species, generally over a long period of time, involving many generations; these must not be confused with the "adjustments" an individual might make, consciously or otherwise, enabling it to survive better (such as "developing resistance to a disease" or "adapting to higher altitudes", etc.).