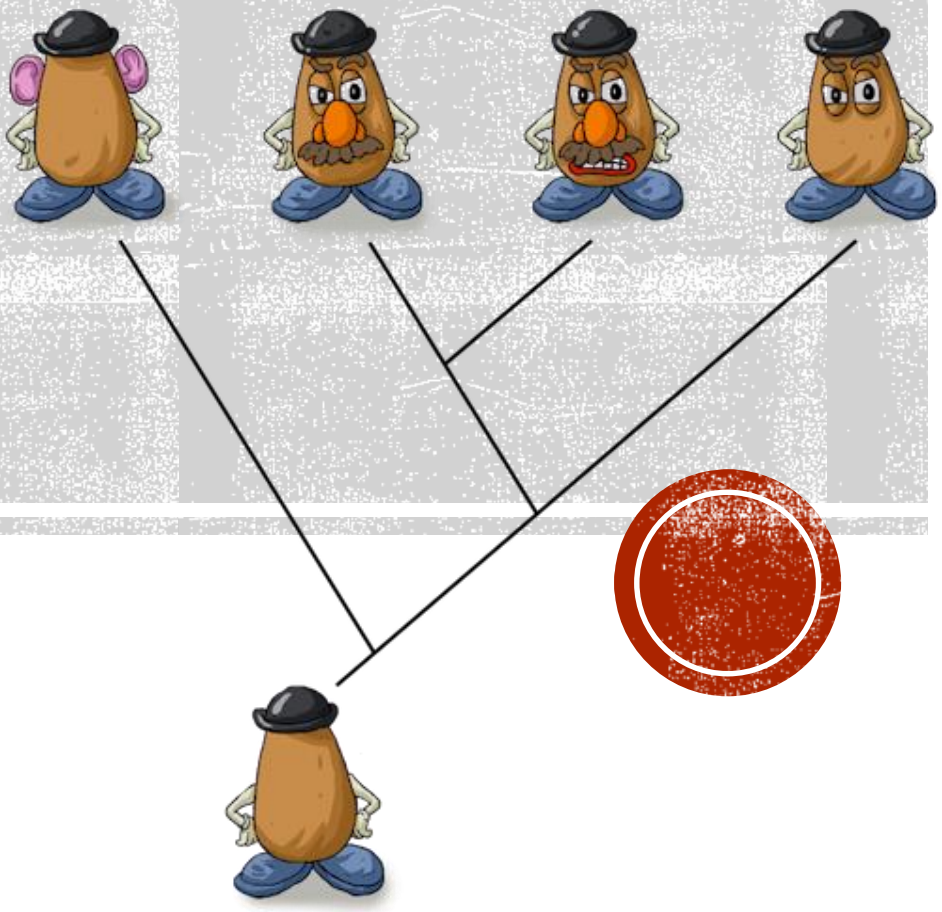
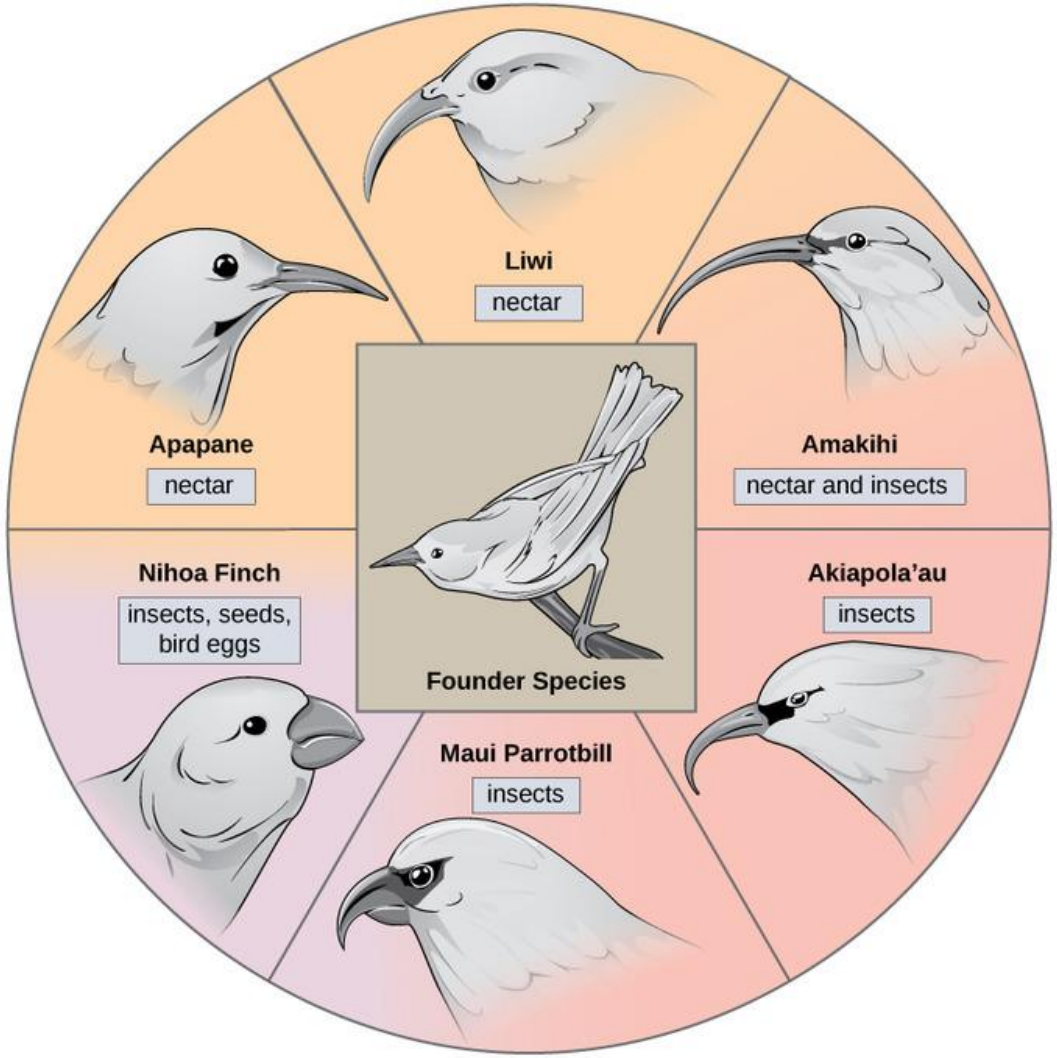
# SPECIATION

Creating a new species



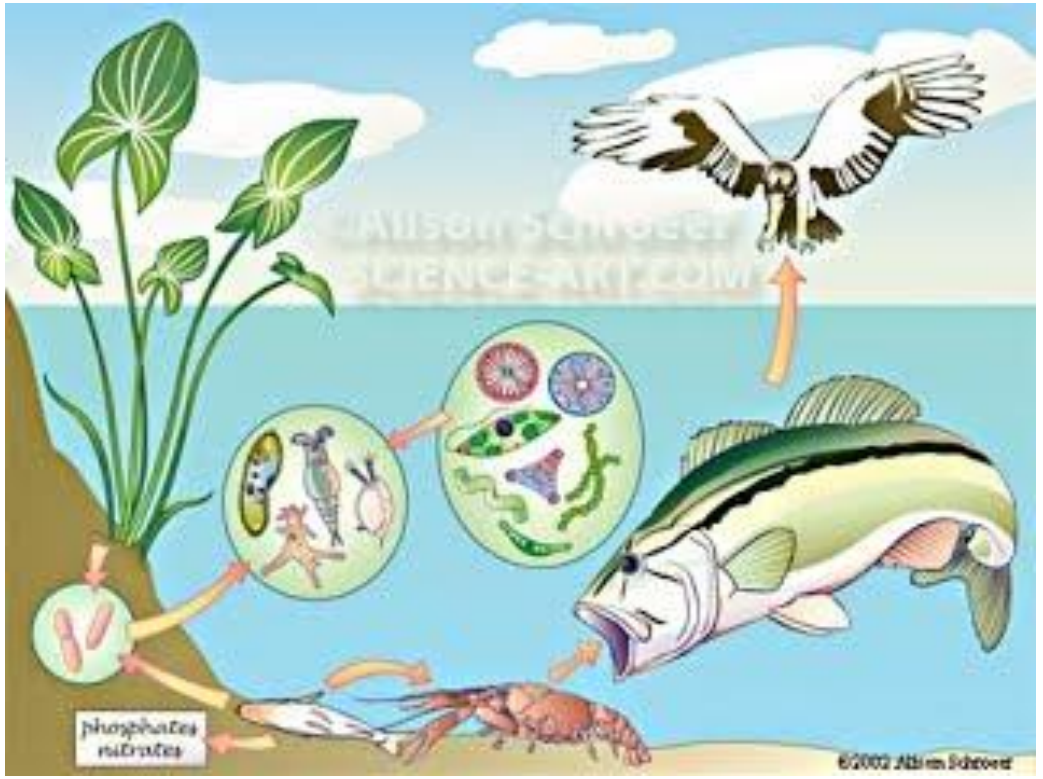
# SPECIATION

- The development of a NEW species



# NICHE: HOW TO MAKE A LIVING

- All organisms need to obtain the necessities of life from their surroundings
- Niche: Combination of an organisms habitat and its interaction within that habitat
  - How the organism obtains food
  - Are they a predator/prey
  - Where they live
  - What they do within their habitat (where they live)



# ORGANISMS OCCUPYING THE SAME NICHE?

- If two species occupy the same NICHE in the same location at the same time, they will COMPETE with each other for
  - Food
  - Space

# CONSEQUENCES OF HAVING THE SAME NICHE?

- One of the species will not survive
  - Why?


- No two species can occupy the same niche in the same location for a long period of time.
- One species will be more efficient than the other.
- It will survive, reproduce and drive the less efficient species to EXTINCTION

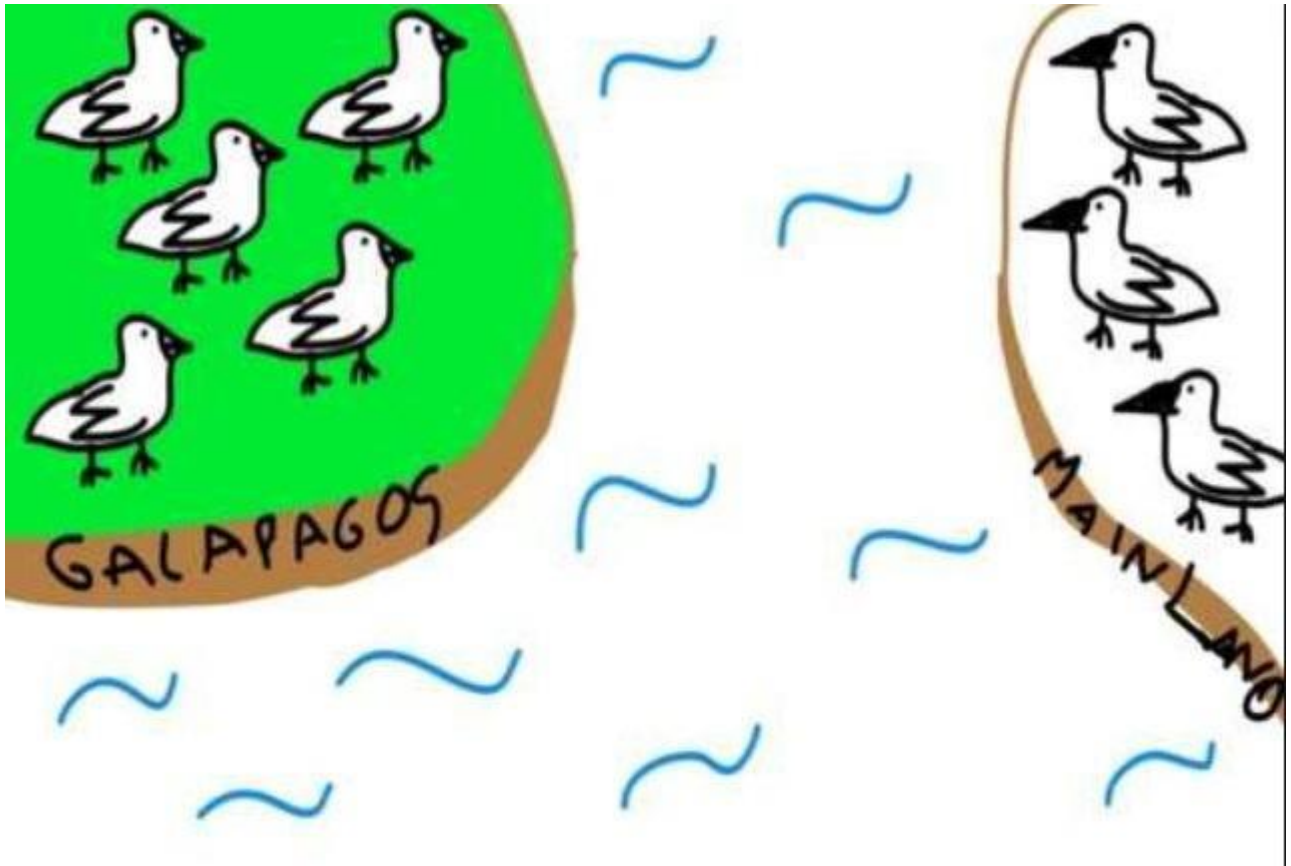
# OCCUPYING A DIFFERENT NICHE?

- The two species will NOT compete with one another
- Less competition=less chance of extinction
- Any species that occupies an unoccupied niche will have less competition and a better chance of survival.



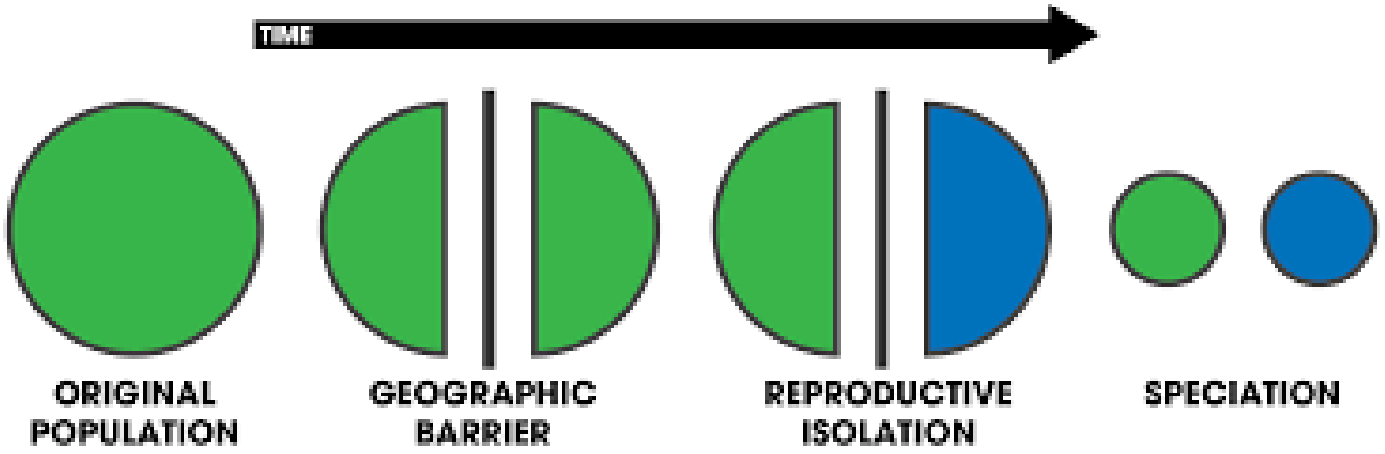
# THE PROCESS OF SPECIATION

- Review: Species: a group of organisms that can breed with one another and produce fertile offspring in a natural environment
- Same species? If yes, then same gene pool.
- Scientists that have learned that new species usually form only when populations are isolated or separated due to environmental change/influence



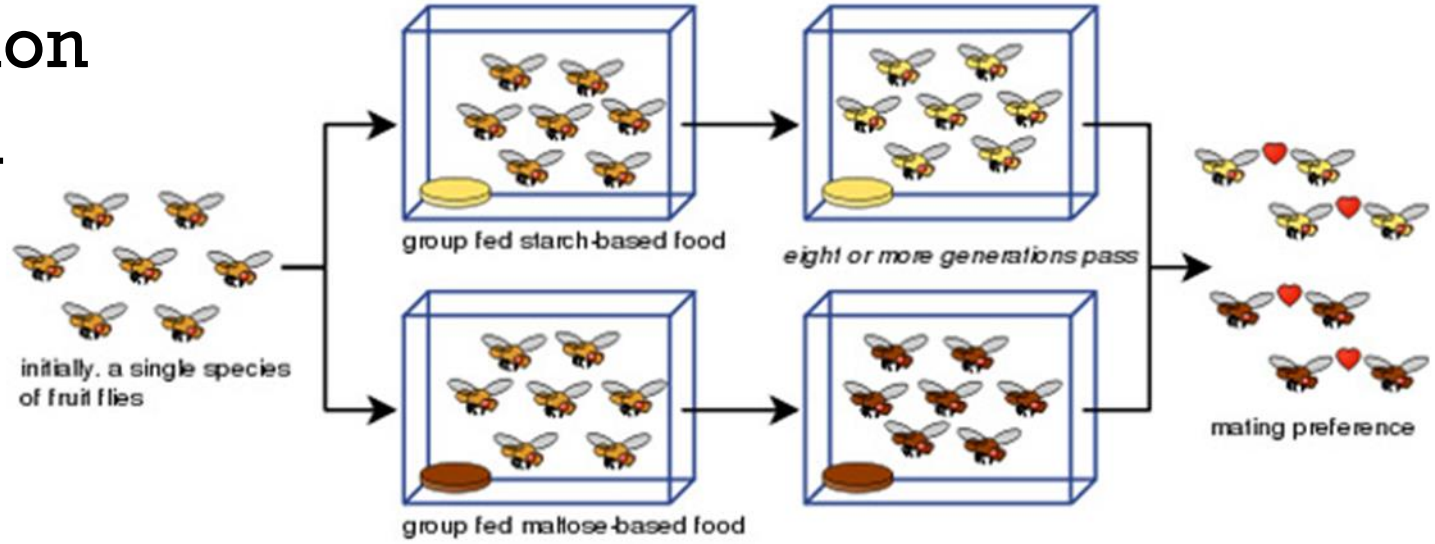
# REPRODUCTIVE ISOLATION

- Gene pools of 2 populations must become separated for them to become new species.
- Reproductive Isolation
  - When members of two populations cannot interbreed and produce fertile offspring
    - They are separated far enough that they don't mate or reproduce with one another
    - They end up having different gene pools



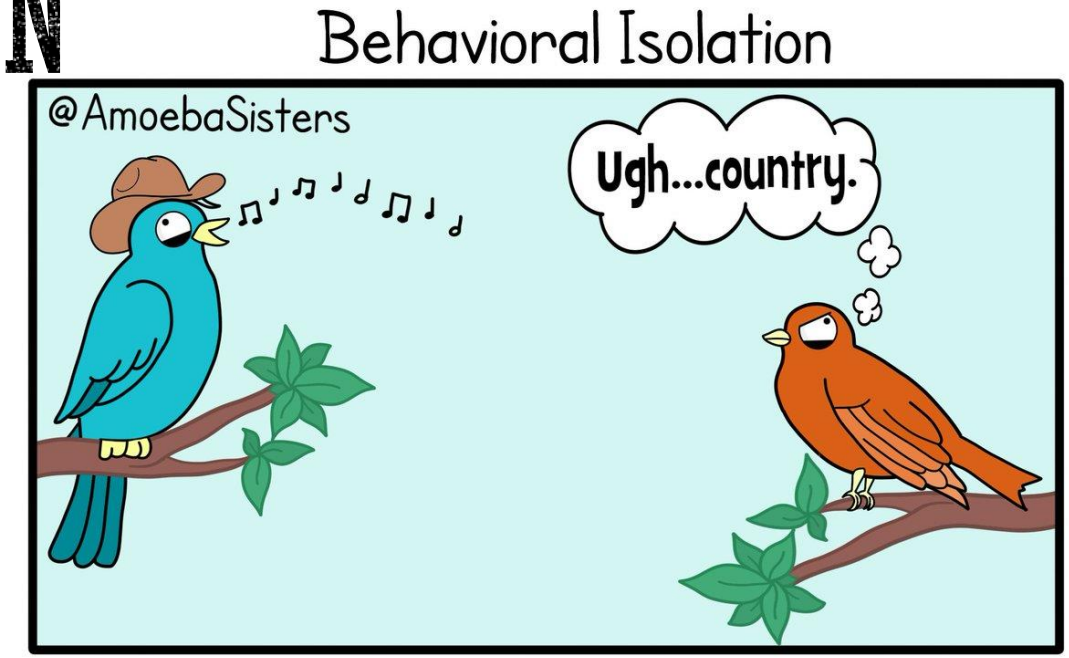
# HOW DOES THIS OCCUR?

- Reproductive Isolation can develop in a variety of ways
  - Behavioural isolation
  - Geographic isolation
  - Temporal isolation



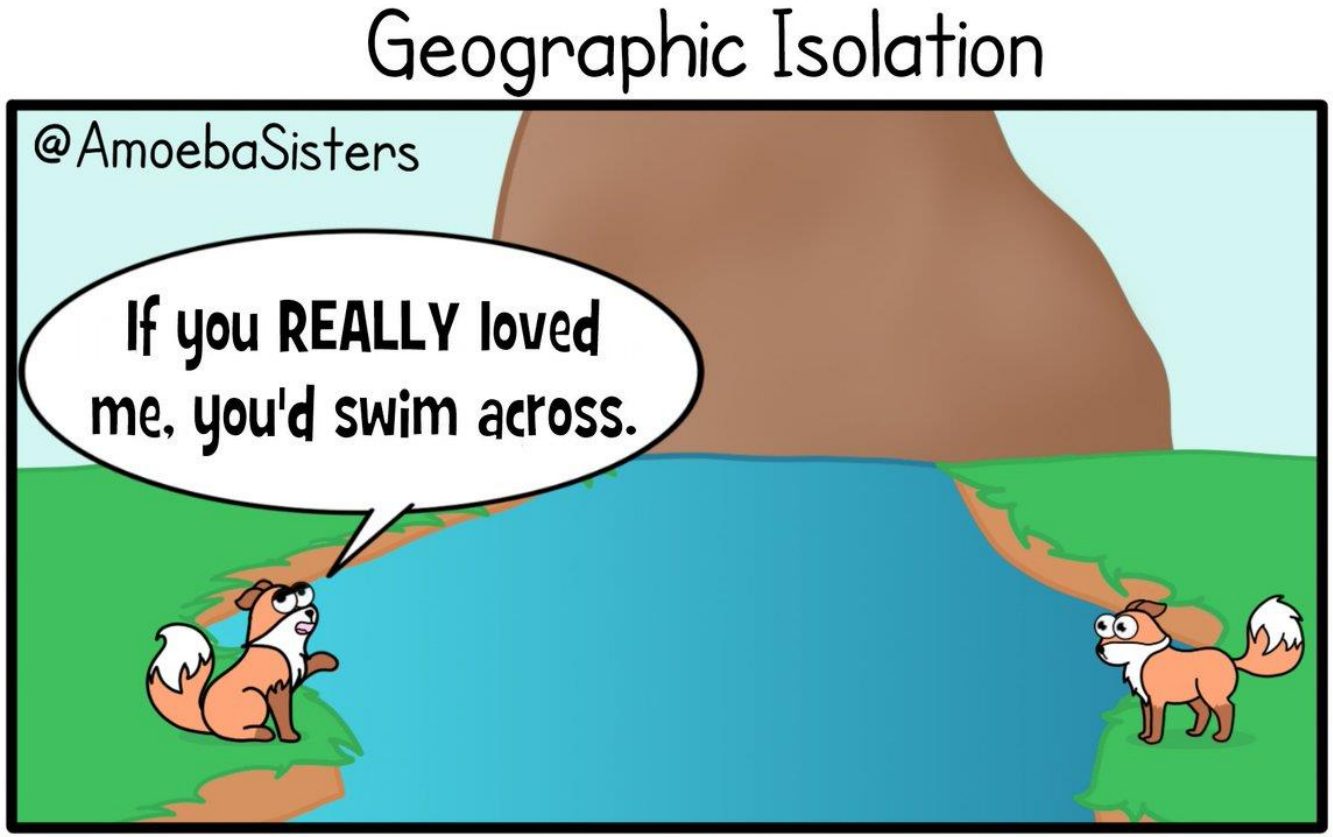
# BEHAVIOURAL ISOLATION

- Occurs when 2 populations are capable of interbreeding but have differences in courtship rituals or other reproductive strategies involving behaviour.
- Ex
  - Eastern Meadowlark vs Western Meadowlark
    - Overlap habitats however do not interbreed due to different mating songs



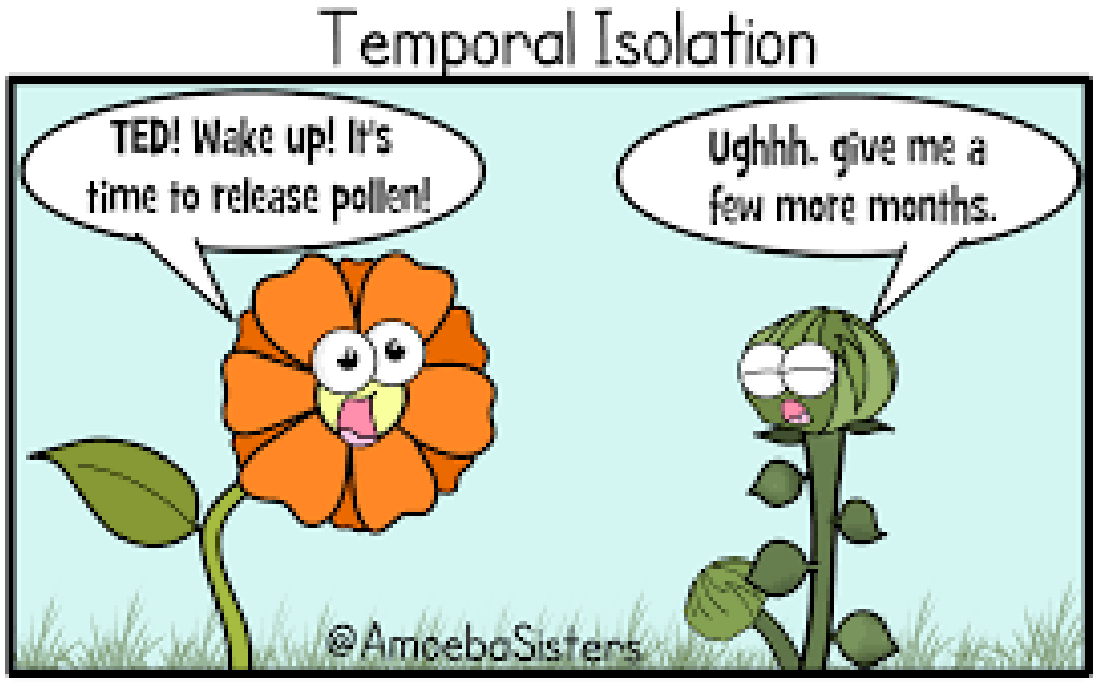

# GEOGRAPHIC ISOLATION

- Two populations are separated by geographic barriers such as rivers, mountains or oceans.
  - Barrier splits population
    - Two gene pools form
    - Natural selection works independently on each group
- Geographic barriers do not guarantee speciation
  - It will only occur if the populations are ISOLATED



# TEMPORAL ISOLATION

- Two or more species reproduce at different times
  - Ex
    - 3 similar orchid species all live in the same rainforest
      - Only release pollen on a single day
      - They all release on different days therefore cannot pollinate one another
    - INDIVIDUALS ONLY BREED WITH THOSE THAT ARE SIMILAR TO THEMSELVES



# WHAT HAPPENS AFTER REPRODUCTIVE ISOLATION?

- Natural selection usually increases the differences between the separated populations
- In time, the populations may become more adapted to their environment.
- Their gene pools gradually become more dissimilar through variations due to sexual reproduction and mutation
- If this persists for long periods of time they will become a separate species