

Population Genetics

Population vs Community meanings

What makes a species, a species?

Define Gene pool.

Natural Selection...what is it...give an example...what determines who survives?

What are 5 various ways that organisms can show “variation”

Sexual reproduction ensures that variations get passed down

How does one study a population...”population sampling”

Gene Frequencies: indicates proportion of a population that have a certain gene

-give an example what would be a “high” gene frequency...

Hardy-Weinberg

6 conditions needed so the Hardy-Weinberg equilibrium holds true

-know what each means (see applications of H-W)

$p + q = 1$ -what does “p” represent...what does “q” represent?

$P^2 + 2pq + q^2 = 1$ -what does each part represent?

In the above two equations, which parts represent alleles and which genotypes.

Remember: In questions if they refer to something that is showing its “condition” or “physical appearance” like dwarfism, black hair, cystic fibrosis, other syndromes, they are referring to **genotypes** (eg) “AA, Aa, or aa” or in reference to the Hardy Weinberg equations “ P^2 , $2pq$, or q^2 ”

Frequencies calculated will ALWAYS be less than 1

Applications of Hardy -Weinberg

Changes in HW equilibrium = evolutionary change

The 6 items that need to be true for the H-W equilibrium to work also mess up the H-W equilibrium if they occur

-AGAIN...know what those 6 things are

Founder effect...what is it? What are its results?

Bottleneck effect...what is it? What are its results?

What is special about mitochondrial DNA?

Adaptions

Are inherited traits that improve the chances of survival and reproduction of organisms

-(eg) polar bears have hollow hair so it keeps them warmer and drier

(eg) birds have wings and feathers for flight

Ecology

What is ecology?

Differences between abiotic and biotic factors

Difference between a community and population...

Variables of Populations

1. Geographical range – what does it mean?

2. Habitat- what is it...difference from geographical range?

3. Ecological Niche – what is a niche? What does the ecological niche include (2 things)

4. Population distributions: what are the 3 types...

-which one is most common

5. Population size – how are they determined?

6. Population density- number of organisms per area OR volume

-formula for population density- know how to use

7. Population Growth – what are 4 factors that determine it?

-formula for population CHANGE IN SIZE

-how do you calculate “ ΔN ” (**MEMORIZE IT**)

Growth rate formula – know how to use ΔN and ΔT in it

WHERE DOES MOST RECENT DATA GO?

CGR formula – know how to use

MEMORIZE how to get ΔN

Dynamic Equilibrium

What is dynamic equilibrium?

Two population types? What occurs or not occur in each?

Growth Curves

What are 4 phases of growth curves? What each mean and WHERE OCCUR ON GRAPH?

Closed Population growth curve

-J shaped growth curve also known as Exponential growth curve

Open Population Growth Curve

-Logistic growth curve also known as S-shaped curve

Compare and contrast J shaped vs S shaped curved graphs

-what kinds of species generally involved in each

Carrying Capacity is in OPEN pop. Growth curves? What is it?

Dynamic equilibrium in OPEN systems is a balance between which 2 factors?

What 4 things is Biotic Potential regulated by?

What 2 things is Environmental Resistance regulated/limited by?

Limiting factors

Limiting factors- what do they do and how?

There are 2 types of limiting factors...what are they?

Compare Density Dependent vs Density Independent Factors

-give examples of each

Classifications of Populations

Are classified as “r” selected or “K” selected

KNOW ATTRIBUTES AND EXAMPLES OF EACH

Predator- Prey Relationship

What does the cycle look like...which one changes first though out cycle?

Predator – Prey relationship similar to producer – consumer relationship

Producer-consumer is like grass as the producer and cattle as consumer

Prey avoiding predators- what 6 ways can they do this? Details of each.

Competition

Difference between inter-specific competition and intra-specific competition

-what are they competing for? Examples?

Causes Principle or Competitive Exclusion...what is this?

Symbiosis

-what is symbiosis?

What three symbiotic relationships are there? What do they mean or kinds of examples?

Succession

3 general types of communities during succession ..what are they?

-what are examples of each?

Pioneer Community- What is this? ...what would be in this community?

Climax Community – What is this?...what would be in this community?

TWO TYPES OF SUCCESSION

Primary vs Secondary Successions

*****KNOW DIFFERENCES BETWEEN THEM*****

-What do each start with? When do they occur?