

Diversity of Organisms (HL)

BIOLOGICAL SPECIES CONCEPT

To be classified as the same species, two organisms must be able to breed together and produce fertile offspring

PROBLEMS?

- Hybrids are NOT always infertile (see page 2)

- Extinct Species.

(By using the fossil record we cannot tell whether organism were able to interbreed to produce fertile offspring). For example; woolly mammoth.

- Organisms made up of DNA from multiple organisms.

- Asexually Reproducing Organisms.

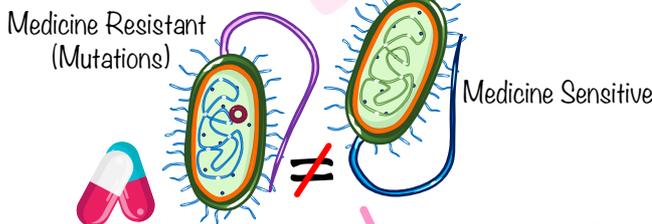
How can genetic material transferred?

1. VERTICAL GENE TRANSFER

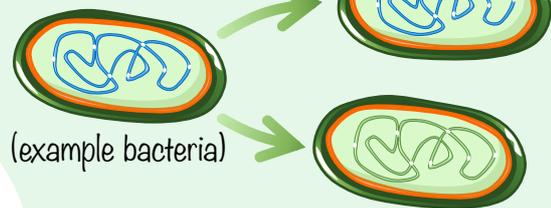
Transferring genetic material to the next generation (offspring) – e.g., humans

2. HORIZONTAL GENE TRANSFER

Transferring genetic material to another bacteria that already exists (same generation). This way an organism can have mixed genes from different species. Mosaic of genes from different sources. Not only bacteria to bacteria. Bacteria to eukaryotes. Bacteria to Archaea. Example – plasmid transfer



BINARY FISSION



PARTHENOGENESIS

Mother produces egg without mating with male. Egg matures into adult female (example Walking sticks).

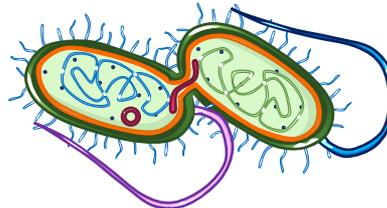
VEGETATIVE PROPAGATION

(example strawberries)

@TeachMe-Official

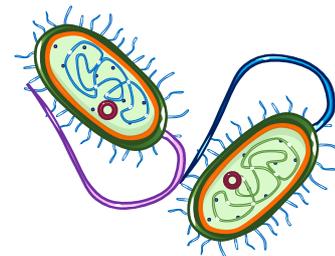


Plasmid Transfer



Xenologs (Jumping genes)

Both Medicine Resistant



Try for yourself!

DICHOTOMOUS KEY

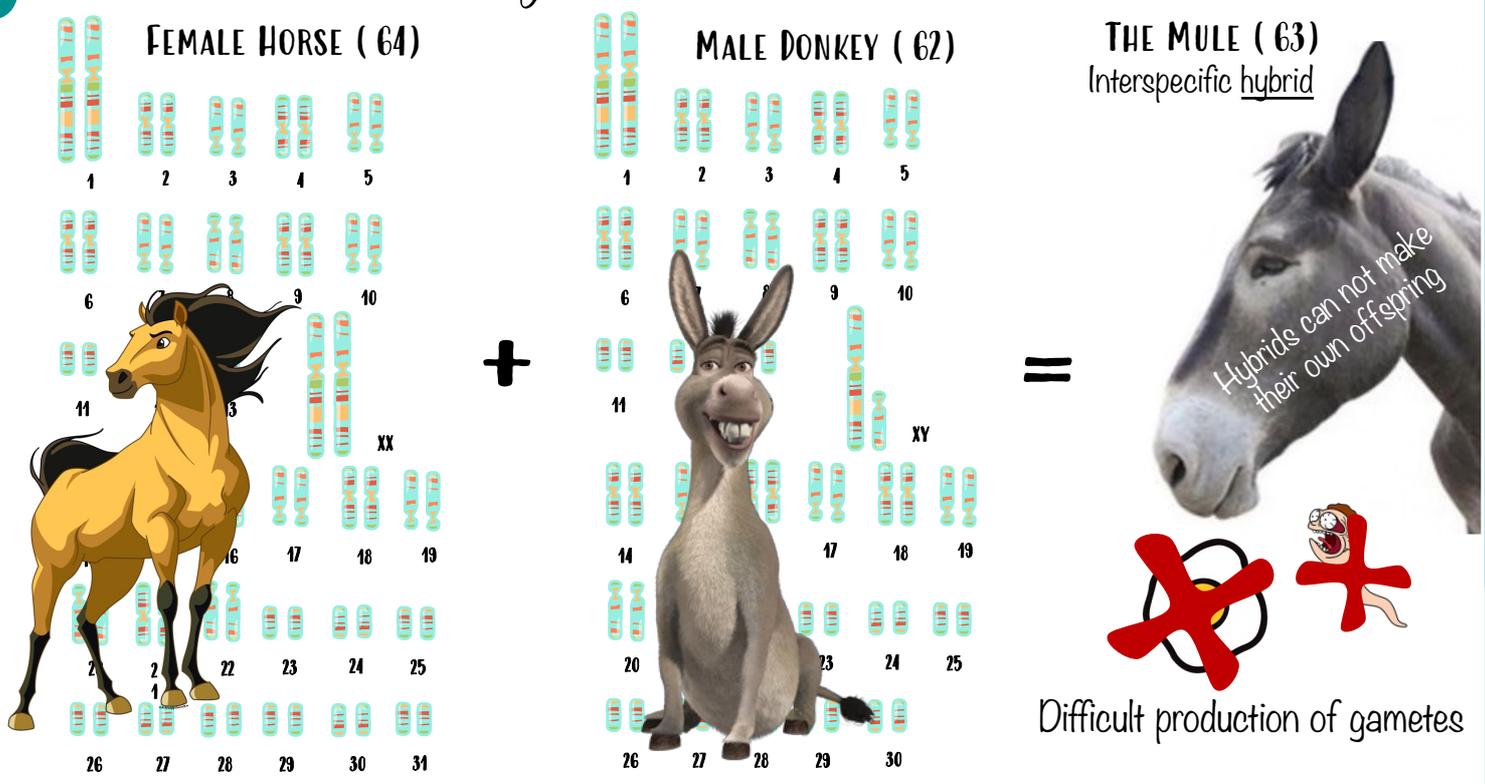
- | | | |
|--------|--|------------------|
| STEP 1 | The organism has FUR ----- | GERBOA |
| | The organism does not have FUR ----- | Go to Step 2 |
| STEP 2 | The organism has FEATHERS ----- | SEAGULL |
| | The organism does not have FEATHERS ----- | Go to Step 3 |
| STEP 3 | The organism has LEGS ----- | LIZARD |
| | The organism does not have LEGS ----- | Go to Step 4 |
| STEP 4 | The organism has SCALES ----- | CLOWNFISH |
| | The organism does not have SCALES ----- | ORCA |



Diversity of Organisms (HL)

What are hybrids?

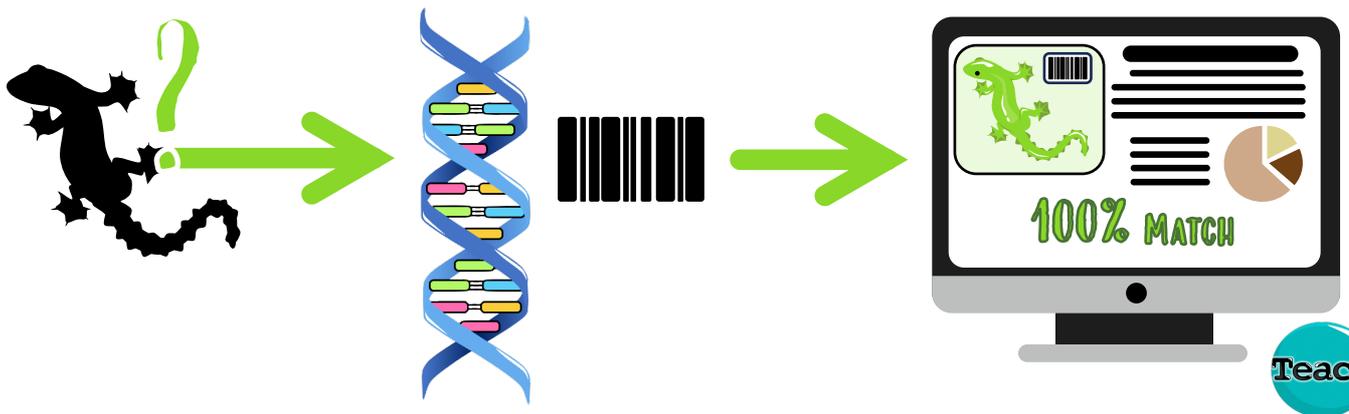
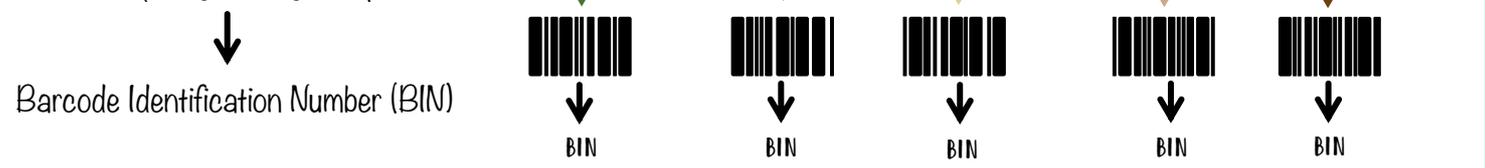
It has been seen sometimes that hybrids are able to reproduce and form fertile offsprings.



"Different species have different number of chromosomes"

DNA BARCODING

DNA Barcode - A short sequence of DNA inside an organisms' cells that that can be used to quickly identify the species.



Diversity of Organisms (HL)

IS BIODIVERSITY AFFECTED?

(Identify & count the number of species)

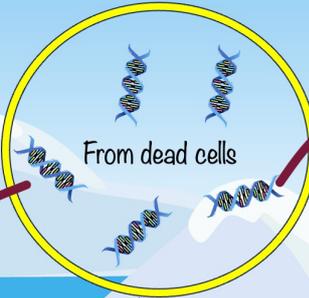
Dichotomous key & expert eyes may not be enough

BIOINDICATORS (OR INDICATOR SPECIES)

Caddisfly larva

These organisms are so sensitive to certain types of pollution.

When present = Pollution absent.
When absent = Pollution present.



eDNA
(environmental DNA)

Disadvantage? (of eDNA)

- (1) Does not indicate number
- (2) Does not indicate dead or alive
- (3) Chemicals in sample can interfere with process

Advantage? (of eDNA)

- (1) Time efficient
- (2) Less disruption

@TeachMe-Official



