EQ: Why do organisms look the way they do?

Heredity

You have traits, or characteristics, of both your mom and your dad but you don't look exactly like them. **Gregor Mendel** discovered the principles of heredity.

Heredity-the passing of traits (or characteristics) from parent to offspring through genes

Gene-a segment of DNA that carries hereditary instructions for a trait

Allele-different forms of the same gene
Ex. brown or blue eye color

DNA is the same in all of an organism's cells
Chromosomes (containing DNA) are located in the nucleus of eukaryotic cells

Genetics

--Genetics is the study of heredity

--Everyone has two alleles for each trait (one from each parent.)

--They can both be the same allele, or they can be different alleles.

Dominant allele-always expressed whether there is one or two present
Recessive allele-only expressed if both are recessive

Genotype and Phenotype

Genotype-the combination of alleles inherited from your parents.

Dominant alleles are written as capital letters, recessive as lowercase letters.

Curly hair (C) is dominant to straight hair (c). *Note that straight hair is a little c not a little s.*

Someone with curly hair could have the genotype CC or Cc. Someone with straight hair would be cc.

Homozygous-when two of the same allele are present (both dominant or both recessive); aka purebred. (RR or rr)
Remember, homo means same

Heterozygous-when two different alleles are present (one dominant, one recessive) (Rr)
Remember, hetero means different

Phenotype-an organism's physical appearance (inherited traits that you see)

Genotype	Phenotype
CC	Curly
Cc	Curly
cc	Straight

Is it possible for you to have straight hair when both of your parents have curly hair?
Yes, because they could both be heterozygous and you could have inherited the little c (straight) from both of them.

Sexual and Asexual Reproduction

Sexual Reproduction

--Requires two parents to produce offspring

--Offspring are diverse (different from parents and each other)

--Half of the genetic material comes from each parent

--Ex. humans, most animals, most plants

Asexual Reproduction
--Requires one parent to produce offspring

--Offspring are genetically identical to parent

--Budding-an organism grows off the side of the parent organism

--Binary Fission-a singled celled organism duplicates its DNA and splits in two

--Regeneration-a missing body part is re-grown (starfish can re-grow a leg)

Mitosis and Meiosis

Mitosis
--The process of cell division that creates two identical cells with a full set of chromosomes (DNA)

--Used for healing and growth

Meiosis
--The process of cell division that creates two cells with half the normal number of chromosomes (ex. egg and sperm cells)

--Used for sexual reproduction