Genetics & Heredity
Day 2

How does heredity work?

- **Genes have the information for a trait**
- **You get 23 chromosomes from your mom**
- **You get 23 chromosomes from your dad**
- **Each of those chromosomes have genes, so you end up with at least TWO genes for each trait**
- **The genes that your chromosomes actually have, whether expressed or not is called GENOTYPE**
- **When a trait can actually be "seen" or expressed is called PHENOTYPE**

How does heredity work?

Genes that have two or more possible <u>phenotypes</u> (ways that they show up) are called <u>ALLELES (ah-leel)</u>
For example:
If you can roll your tongue you HAVE the allele for "tongue rolling"
If you can't roll your tongue you DON'T have the allele for "tongue rolling", you only have the allele for NOT ROLLING TONGUE
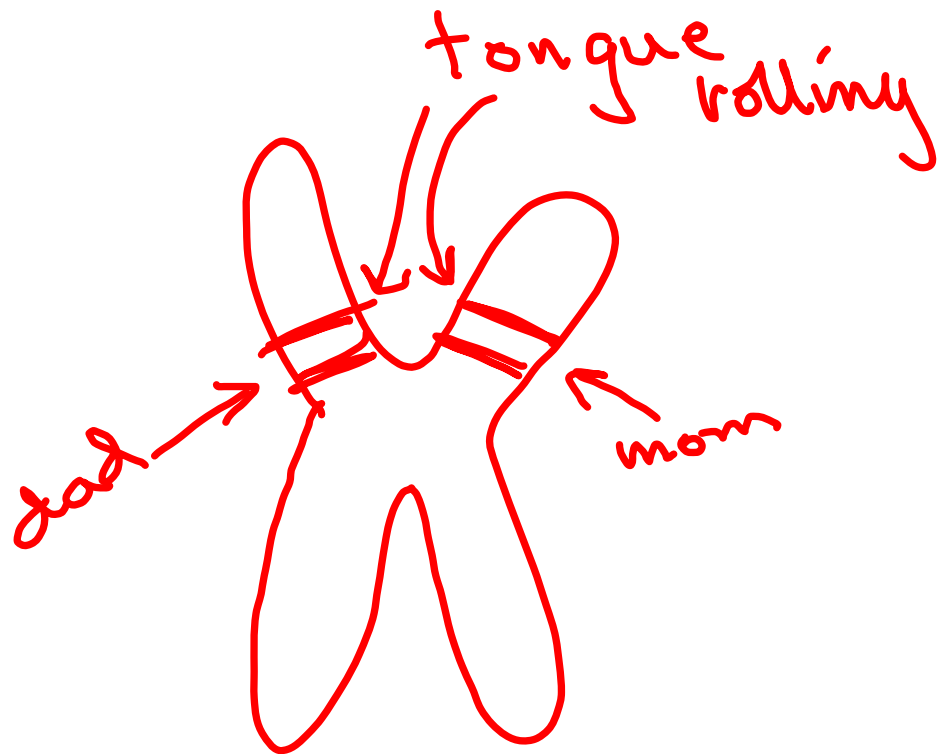
How does heredity work?

Example 1:
Tongue Rolling
You have two genes for tongue rolling
One comes from mom and one comes
from dad:

tongue
rolling

dad

mom

How does heredity work?

Example 1:

Let's say your dad gives you the "not rolling" gene but your mom gives you the "rolling" gene- you will be able to roll your tongue because the "rolling tongue" is DOMINANT. A dominant allele will always show up or be expressed in the PHENOTYPE

The "not rolling" gene is RECESSIVE and only shows up if you got both those alleles from your parent…

How does heredity work?

Tongue Rolling
Symbols:
T= dominant trait, CAN roll tongue
t= recessive, NOT rolling
a) **CAN ROLL TONGUE…that is your phenotype**
Your GENOTYPE could be TT or Tt
b) **CAN'T ROLL TONGUE…that is your phenotype**
Your GENOTYPE (for sure) is tt

How does heredity work?

Example 2:
"Red Hair"
Symbols:
B= dominant trait, BROWN HAIR
r= recessive, RED HAIR
Mom has brown hair
Dad has brown hair
Daughter has "red hair"
Daughter Genotype= *r r*
MOM Genotype= *Br*
DAD Genotype= *Br*

Heredity & Genetics Vocabulary Week 32

1. **Trait** A physical characteristic in an organism. Examples: eye color, color of fur
2. **Gene** a piece of DNA, in a chromosome that has the instructions for a trait
3. **Allele** One of the possible "instructions" for a trait, Example: tongue rolling vs. not tongue rolling
4. **Genotype** the actual genes that an organism has
5. **Phenotype** the observable trait that the organism has. Example: brown hair, big toe length
6. **Dominant** a gene for a trait that always shows up in the phenotype if it is in the genotype
7. **Recessive** a gene for a trait that only shows up in the phenotype if there are TWO sets of this gene in the genotype
8. **Homozygous** a genotype where both sets of genes are the same (both recessive or both dominant)
9. **Heterozygous** a genotype where both sets of genes are different,
10. **Offspring** the product of asexual or sexual reproduction
11. **Punnet** tool for determining the probability of genotype of offspring between two parents
12. **Asexual** type of reproduction that produces offspring identical to the parent
13. **Sexual** type of reproduction that uses gametes
14. **Sexual** type of reproduction that produces offspring that are unique
15. **Gametes** special cells that only have half of the chromosomes, used in sexual reproduction
16. **Chromosomes** structures made up of DNA that hold the genes
17. **DNA** molecule in the nucleus of eukaryotic cells transmits genetic information
18. **mutation** any change in the DNA when it is copied