Probability Practice!! Name Key

If I flip a coin what is the probability that it will land heads or tails? Explain why!

1/2 or 50% Heads & 1/2 or 50% Tails: Each Coin is basically Hetero-zygous.

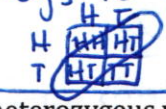
If I have 2 coins what is the probability of the first landing heads AND the second landing heads? Show the Math!

1/2 x 1/2 = 1/4 → Each Coin must land Heads

If I have 2 coins what is the probability that one will land heads and one will land tails? Show the math!

$(1/2^{H} \times 1/2^{T}) + (1/2^{H} \times 1/2^{T}) = 1/2\,(1/4 + 1/4)$

Each coin can land Heads or tails... 2 ways to get 1 heads & 1 tails



Why would a coin be considered Heterozygous in genetics?

It has two sides/Versions... not Homozygous

Now that we know all of this, what is the probability that a person with the genotype Aa or heterozygous will pass on the A allele to an offspring?

They will pass A to 50% (1/2) of their offspring.

If I have two parents that are both heterozygous, what is the probability that they will both pass on the A allele to an offspring?

$(1/2_{1}) \times (1/2_{2}) = 1/4$ or

	A	a
A	AA	
a		

GENETICS PRACTICE 1: BASIC GENETICS

1. If a blue-eyed woman had children with a homozygous brown-eyed man, what is the chance any of their children having blue eyes. Show the Punnett Square. Brown is dominant

woman \ man	B	B
b	Bb	Bb
b	Bb	Bb

A. What are the Genotypes of the parents?

man BB woman bb

c- What are the expected phenotypic numbers if these people somehow produced 1000 progeny?

1000 brown (heterozygous)

2. If a blue-eyed woman had children with a heterozygous brown-eyed man, what is the chance of any of their children being a male with blue eyes? Show the work and the math!!

woman \ man	B	b
b	Bb	bb
b	Bb	bb

1/2 chance of being male

1/2 chance or having blue eyes

1/2 x 1/2 = 1/4

GENETICS PRACTICE 2: NON-MENDELIAN GENETICS

1. Consider a non-specific new alien species that is landing outside as we speak. They have a gene with two alleles. Individuals show three distinct phenotypes where one has 3 horns on their forehead and another has 1 horn on the forehead. Amazingly the third phenotype is 2 horns on the forehead. Explain this phenomena in terms of genotypes for the observed phenotypes.

3 Horns is incompletely Dominant to 1 horn. 2 horns is Heterozygous

Now perform a cross between two of your heterozygous individuals and write all of the potential offspring genotypes and phenotypes in the lines below.

	3	1
3	3 Horns 33	2 horns 31
1	2 horns 31	11 1 horn

Genotypes	Phenotypes
25% 33	25% 3 horns
50% 31	50% 2 horns
25% 11	25% 1 horn

4. Once again Albanism is a Recessive gene. If normal parents have an albino child, what is the probability that their next child will be normal for pigment? If Parents are Heterozygous

	A	a
A	AA	Aa
a	Aa	aa

25% Chance EVERY Time they have a child.

5. Huntington's disease is a non sex linked Dominant Disorder. If a Man had a parent that was homozygous with Huntington's disease and a parent that didn't have the disorder, What would the genotype of the man in question be?

1st Parent is HH / 2nd Parent hh So He is Hh

If the man married a woman that did not have Huntington's disease, what would be the probability of their children being affected with Huntington's disease?

	H	h
h	Hh	hh
h	Hh	hh

Children have 1/2 Chance of having Hun. Disease