BOOKLET 2: MULTIPLE ALLELES

KNOW TO WORK THESE EXAMPLES (BE ABLE TO COME UP WITH AN ANSWER) AND NOT JUST MEMORIZE THINGS LIKE: "what an apricot genotype looks like" or "what are the 3 kinds of blood alleles"

Multiple Alleles:

-many traits are controlled by multiple alleles

In The Case Of: Eye Colour in Fruit Flies

-4 alleles control eye colour

WILD (RED) dominant over APRICOT dominant over HONEY dominant over WHITE

Can be represented by "E" menaning eye colour and superscript numbers with 1 being dominant over all and 4 not dominant over

$$E^1 >\ E^2\ >\ E^3\ >\ E^4$$

These are the possible eye colour combinations in this example:

Phenotypes	Genotypes
• Wild Type	E^1E^1, E^1E^2, E^1E^3, E^1E^4
• Apricot	E^2E^2, E^2E^3, E^2E^4
• Honey	E^3E^3, E^3E^4
• White	E^4E^4

Predict the phenotypic outcome if a honey colored heterozygous fly is crossed with a white fly

Parents:
$E^3 E^4$ x $E^4 E^4$

	E^3	E^4
E^4	E^3E^4	E^4E^4
E^4	E^3E^4	E^4E^4

-What offspring phenotype and genotypes are shown here?

In The Case Of: Human Blood Types

-3 alleles control blood type $(I^A, I^B$ and i)

-the A or B are antigens and cannot be mixed with others of a different type

-only way to get type "O" is to have two "**ii**"'s ----"***i***" *is recessive*

-Type AB if from Type A and Type B being CODOMINANT together

What if a "type AB" person mates with a "type O" person...

What are the phenotypes?

What are the genoptypes?

What if a "type AB" mated with a Heterozygous "type B" blood?

-what would be the offspring blood types?

	I^A	I^B
i	$I^A i$	$I^B i$
i	$I^A i$	$I^B i$

PROBABILITY = $\dfrac{\text{number of chances}}{\text{number of possible combinations}}$

   (eg) in the above example the probably of being a "type A" offspring is 2 out of 4 chances = (.5) = 50% chance

PRODUCT RULE= to calculate the probably of TWO events happening at the SAME time

(eg) in the above example what are the odds of getting a boy that is "type B" blood?

_____   X   _____ =

probability of boy   probability of type B

Incomplete Dominance…what is it?
Example…
>> Colors of a Flower (F)
>> B = blue, and Y=yellow

What if a blue, homozygous flower was crossed with a yellow, homozygous flower….what would the offspring look like if blue and yellow were incompletely dominant to each other?

$F^B F^B$ X _____ = ???punnett square???

Codominance…what is it?
> The word "roan" often used to describe livestock(cows)

Example…
>> Colors of a Cow (C)
>> R = red, and W = white

What if a roan cow mated with a white bull. What would that Punnett square look like?

$C^R C^W$ X _____