Station 1

Use the word bank and your notes to complete each statement.

Word Bank:
Different
Genetic
Heterozygous
Homozygous
Letters
Physical Yellow
Same

1. Purebred - Also called homozygous and consists of gene pairs with genes that are the same.
2. Hybrid - Also called heterozygous and consists of gene pairs with genes that are different
3. Genotype is the actual genetic makeup represented by letters.
4. Phenotype is the physical appearance of a trait, such as a yellow body color.

Fill in the blank:

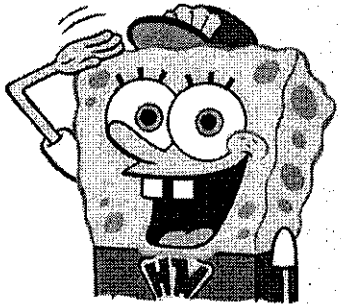
5. A test cross is carried out when you are trying to determine if an individual has a homozygous or heterozygous form of a trait. It is done by mating that individual with another individual with a homozygous recessive genotype.

6. The genotype of a carrier is heterozygous. This can only be used when the trait is choose one: (dominant/recessive) recessive.

Station 2: 2 Factor Cross

Key:

Trait	Dominant Gene	Recessive Gene
Body Shape	Squarepants (S)	Roundpants (s)
Body Color	Yellow (Y)	Blue (y)
Eye Shape	Round (R)	Oval (r)
Nose Style	Long (L)	Stubby (l)



SpongeBob is heterozygous for his yellow body color and his squarepants, while his wife SpongeSusie is blue and has roundpants. Use this information to answer the following questions.

1. Give the genotypes for each.
SpongeBob = YySs SpongeSusie = yyss

2. What are the possible gamete combinations for each person?
SpongeBob = YS Ys yS ys SpongeSusie = ys

3. Set up a Punnett square to predict the genotypes and phenotypes for their first child. (If you have time, complete the problem.)

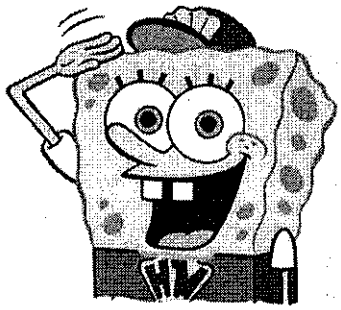
	YS	Ys	yS	ys
ys	YySs	Yyss	yySs	yyss
ys				
ys				

¼ YySs - Yellow square 25%
¼ Yyss - Yellow, round 25%
¼ yySs - blue, square 25%
¼ yyss - blue, round 25%

Station 3: 2 Factor Cross

Key:

Trait	Dominant Gene	Recessive Gene
Body Shape	Squarepants (S)	Roundpants (s)
Body Color	Yellow (Y)	Blue (y)
Eye Shape	Round (R)	Oval (r)
Nose Style	Long (L)	Stubby (l)



SpongeBob is heterozygous for his round eyes and his long nose. SpongeSusie is also heterozygous for her round eyes. She too has a long nose. But her father had a stubby nose.

1. Carry out all of the steps necessary to set up a Punnett Square to show the possible crosses that could take place to produce their first child.

2. Predict the phenotype ratio of the possible traits their first child could have.

♂ RrLl × ♀ RrLl

	RL	Rl	rL	rl
RL				
Rl				
rL				
rl				

9:3:3:1

9/16 round, long

3/16 round, stubby

3/16 oval, long

1/16 oval, stubby

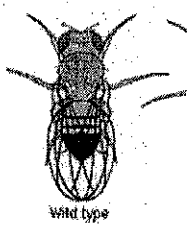
Station 4: X-Linked Trait

In fruit flies, long wings are x-linked dominant to short (vestigial) wings. Complete a cross between a short winged male and a heterozygous female. What are the possible genotypes and phenotypes for the offspring?

X^L = long

X^l = short

$X^lY \times X^LX^l$



	X^l	Y
X^L	X^LX^l	X^LY
X^l	X^lX^l	X^lY

1/4 long, female

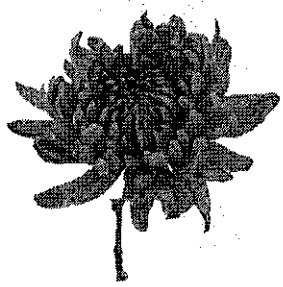
1/4 short, female

1/4 long, male

1/4 short, male

Station 5: Incomplete Dominance

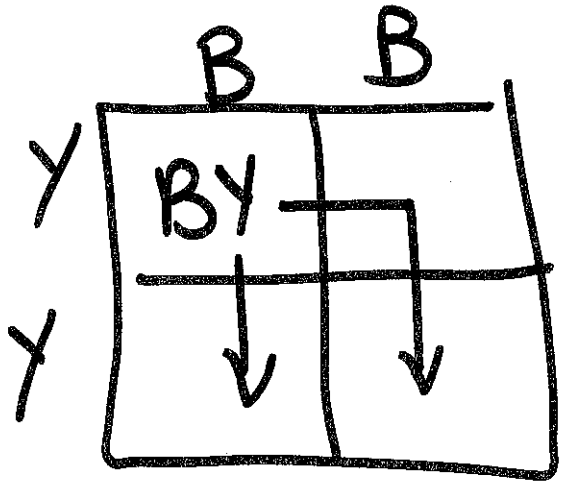
In certain flowers, blue and yellow flowers are incompletely dominant to each other. Show the cross between a pure blue flower and a pure yellow flower. Identify the phenotypic and genotypic ratios of the offspring.



B = Blue

Y = yellow

BY = green



100% BY = green

Station 6: Codominance

In some chickens the gene for feather color is controlled by codominance. Feathers are either black or white. The heterozygous condition is called barred or erminette. Show the cross between a rooster with black feathers and a barred female. What is the probability that the offspring will inherit barred feathers?

B = black
W = white
BW = black + white

♂ BB × ♀ BW

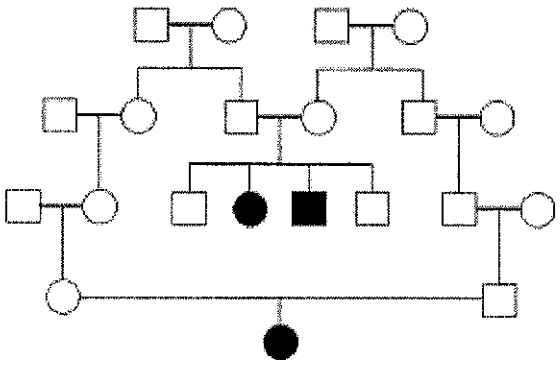
	B	B
B	BB →	
W	BW →	

½ BB = 50% Black

½ BW = 50% Black + White

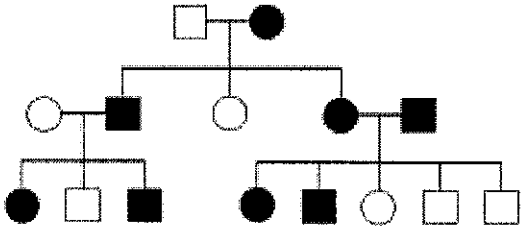
Station 7: Pedigrees

Identify each pedigree as autosomal recessive, autosomal dominant, X-linked recessive, or Y-linke



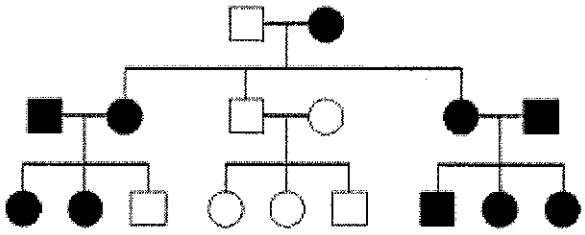
a.

autosomal recessive



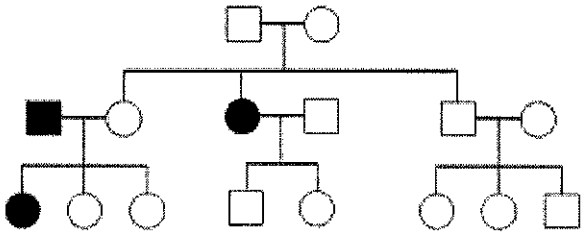
b.

autosomal Dominant



c.

autosomal dominant



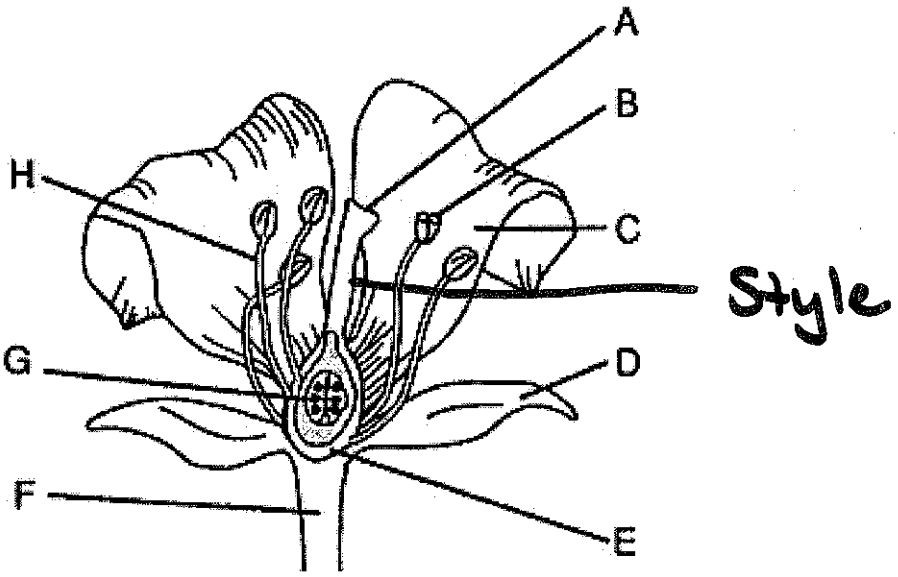
d.

autosomal recessive

Station 8: Flower Diagram

Label the following flower parts on the diagram:

1. Ovary E
2. Ovule G
3. Anther B
4. Stigma A
5. Style C
6. Filament H

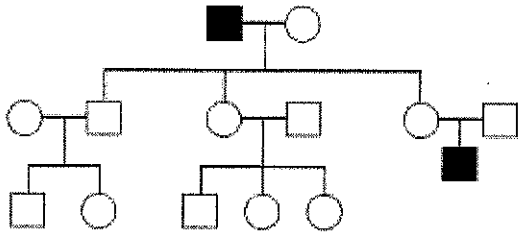


7. List the parts that make up the pistil: ovary, ovule, stigma, style

8. List the parts that make up the stamen: anther, filament

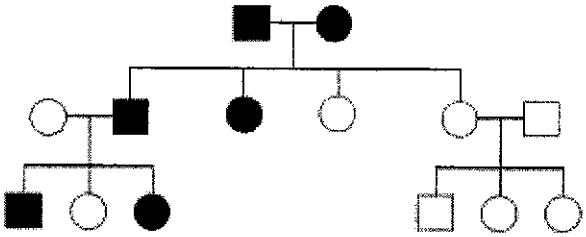
Station 9: Pedigrees

Identify each pedigree as autosomal recessive, autosomal dominant, X-linked recessive, or Y-linke



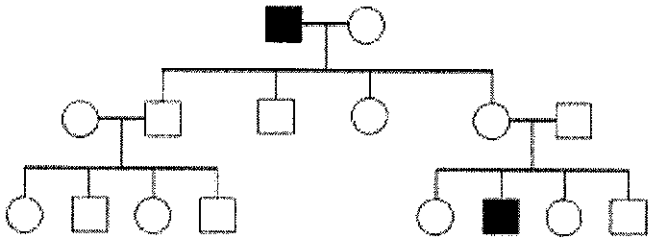
e.

X-linked recessive (carriers not shaded)



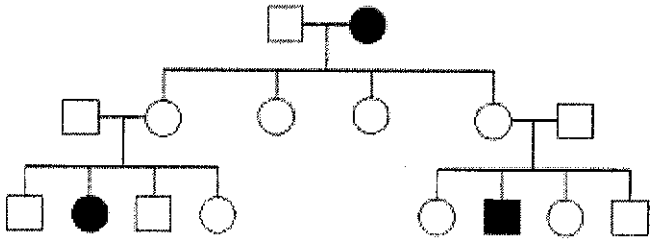
f.

dominant



g.

X-linked recessive



h.

recessive