Name _____ Date _____

FRANKENFISH: Create your own creature

Objective:

- Students will review genotype and a phenotype and demonstrate that the recombination of gametes (coins) will result in the formation of unique individuals.

Materials Needed for each student:

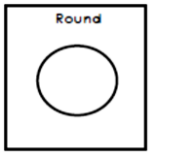
- white paper
- colored pencils, crayons, or markers
- 2 coins (pennies)
- copy of 8 trait genotype and phenotype options

Procedures:

1. For each of the 8 trait options, flip your coin (Heads = **H** and Tails = **T**) to determine the genotype and phenotype of your new fish species.
   HH = Homozygous dominant
   HT = Heterozygous
   TT = Homozygous recessive
   You should toss the coins for each different trait that is listed, and circle what the genotype will be.
2. Determine Dad's genotype.
3. Repeat this step to determine Mom's genotype.
4. From the parent's genotype, you must complete genetic crosses (Punnett squares) for each trait to determine what their offspring might look like. Then, flip your coin again to determine which square to choose from.
   HH – top left **HT** – top right
   TH –bottom left **TT** – bottom right
5. Complete the genotype and phenotype chart for your offspring and draw your family fish portrait.

DETERMINE THE GENOTYPES

BODY SHAPE



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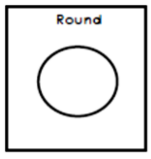

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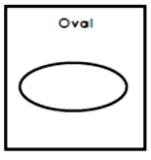

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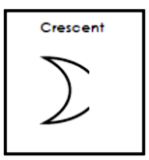
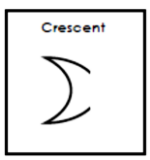
	GENOTYPE	PHENOTYPE
DAD		
MOM		

TAIL FIN SHAPE



TT



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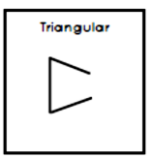


tt

	GENOTYPE	PHENOTYPE
DAD		
MOM		

DORSAL FIN SHAPE

DD

Dd

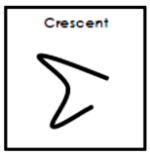
dd

	GENOTYPE	PHENOTYPE
DAD		
MOM		

PECTORAL FIN SHAPE

FF

Ff



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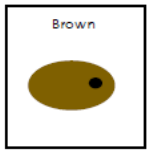
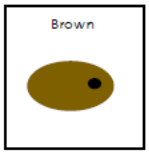
	GENOTYPE	PHENOTYPE
DAD		
MOM		

EYE COLOR



EE



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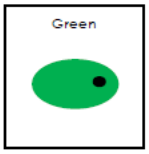


ee

	GENOTYPE	PHENOTYPE
DAD		
MOM		

MOUTH SHAPE

MM

Mm

mm

	GENOTYPE	PHENOTYPE
DAD		
MOM		

SCALES SHAPE

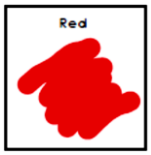
HH

Hh

Hh

	GENOTYPE	PHENOTYPE
DAD		
MOM		

SCALES COLOR



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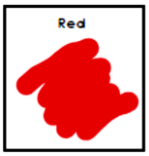


Aa

aa

	GENOTYPE	PHENOTYPE
DAD		
MOM		

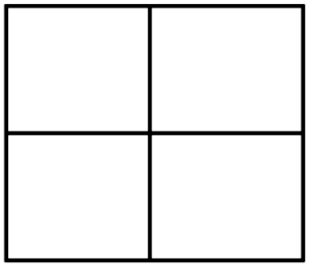
PARENT GENOTYPES								
	Body Shape	Tail Fin	Dorsal Fin	Pectoral Fin	Eye Color	Mouth Shape	Scales Shape	Scales Color
DAD								
MOM								

PUNNET SQUARES FOR POTENTIAL OFFSPRING

FLIP your coin again to determine which genotype belongs to your child!
HH – top left HT – top right TH –bottom left TT – bottom right

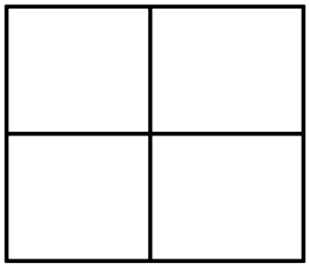
BODY SHAPE
FATHER'S GENES

MOTHER'S GENES



TAIL FIN
FATHER'S GENES

MOTHER'S GENES

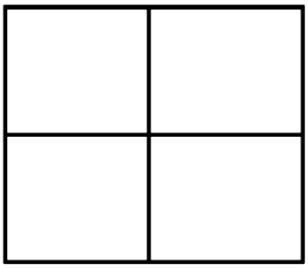


DORSAL FIN
FATHER'S GENES

MOTHER'S GENES

PECTORAL FIN
FATHER'S GENES

MOTHER'S GENES



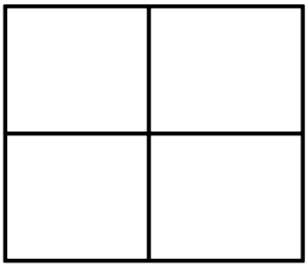
Don't forget to flip your coin again to determine which genotype belongs to your fish offspring!
HH - TOP LEFT
HT - TOP RIGHT
TH - BOTTOM LEFT
TT - BOTTOM RIGHT

EYE SHAPE
FATHER'S GENES

MOTHER'S GENES

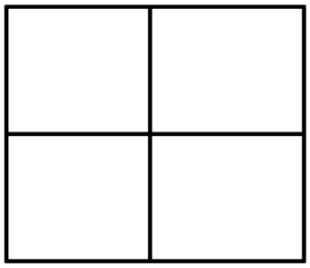
MOUTH SHAPE
FATHER'S GENES

MOTHER'S GENES



SCALES SHAPE
FATHER'S GENES

MOTHER'S GENES



SCALES COLOR
FATHER'S GENES

MOTHER'S GENES

OFFSPRING GENOTYPE & PHENOTYPE

TRAIT	GENOTYPE	PHENOTYPE
Body Shape		
Tail Fin		
Dorsal Fin		
Pectoral Fin		
Eye Shape		
Mouth Shape		
Scales Shape		
Scales Color		

Draw a **FAMILY FISH PORTRAIT** that represents father, mother and baby fish on the space below.

Questions:

1. What are the two kinds of eye color? Which color is a result of the dominant allele?

2. What combination of alleles will produce round lips?

3. In the Frankenfish cross for tail fin shape, what contrasting traits did the fish in the P generation exhibit?

4. Referring to eye color,
   a) How many possible genotypes are produced by this mating and what are they?

   b) How many possible phenotypes are produced by this mating and what are they?

5. Under what conditions would the recessive form of one of these traits appear?