

Answer Key:

1. Ho - TT, dd, FF; He - Pp, Ff, Tt; Purebred = TT, dd, FF

2. BB - blue, Bb - blue, bb - green

3. Tall eyeballs - TT, Tt; short eyeballs - tt

4. A. Heterozygous round = Rr, Oval = rr

B. See square at right

C. Rr - round & rr - oval

D. 50%

E. 50%

5. A. Patrick - TT, Patti = tt

B. See square at right

C. Tall head is most likely, since all genotypes that result would represent a tall head (100%).

D. The children would not be considered purebreds, since they would each have a dominant gene and a recessive gene.

6. Everyone in Squidward's family has light blue skin, which is the dominant trait for body color in his hometown of Squid Valley. His family brags that they are a "purebred" line. He recently married a nice girl who has light green skin, which is a recessive trait. Create a Punnett square to show the possibilities that would result if Squidward and his new bride had children. Use B to represent the dominant gene and b to represent the recessive gene.

	B	B
b	Bb	Bb
b	Bb	Bb

B = blue b = green Squidward = BB Bride = bb

A. List the possible genotypes and phenotypes for their children.

Geno = Bb or hybrid Pheno = Blue

B. What are the chances of a child with light blue skin? 100%

C. What are the chances of a child with light green skin? 0%

D. Would Squidward's children still be considered purebreds? Explain!

No. They carry the recessive trait.

7. Assume that one of Squidward's sons, who is heterozygous for the light blue body color, married a girl that was also heterozygous. Create a Punnett square to show the possibilities that would result if they had children.

	B	b
B	BB	Bb
b	Bb	bb

Bb x Bb

A. List the possible genotypes and phenotypes for their children.

Geno: homozygous blue (BB) heterozygous blue (Bb) homozygous green (bb) Pheno: Blue : Green

B. What are the chances of a child with light blue skin? 75%

C. What are the chances of a child with light green skin? 25%

Ratios: Geno = Pheno =

8. Mr. Krabbs and his wife recently had a Lil' Krabby, but it has not been a happy occasion for them. Mrs. Krabbs has been upset since she first saw her new baby who had short eyeballs. She claims that the hospital goofed and mixed up her baby with someone else's baby. Mr. Krabbs is homozygous for his tall eyeballs, while his wife is heterozygous for her tall eyeballs. Some members of her family have short eyes, which is the recessive trait. Create a Punnett square using T for the dominant gene and t for the recessive one.

	T	t
T	TT	Tt
T	TT	Tt

TT x Tt

A. List the possible genotypes and phenotypes for their children.

Geno: purebred Tall (TT) hybrid Tall (Tt) Pheno: Tall

B. Did the hospital make a mistake? Explain your answer.

Yes. Mr. Krabbs does not carry the recessive trait. Short eyeballs is recessive so each parent must pass it on.

