

## Genetics Final Quiz: Part B

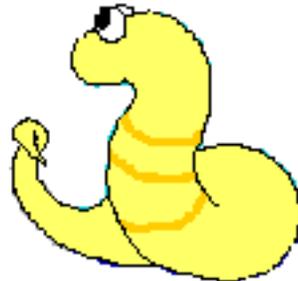
This packet includes a "NewWorm" Quiz.

### DIRECTIONS

1. Write your name on **EVERY** page.
2. Use a pen. To change an answer, cross it out.
3. Use empty spaces on the test for any scratch work.  
**DO NOT** use scratch paper or the backs of pages.
4. If you are worried about time, skip the parts where you are asked to explain your answers, and do them last.
5. Do your best.

### **The NewWorm**©

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**MONOHYBRID INHERITANCE II: TEXTURE**

Another inherited characteristic in the NewWorm is Texture. Both NewWorm1 and NewWorm2 have wrinkled skin. However when you mate them and produce 100 offspring, you find:

- 78 (38 males and 40 females) have wrinkled skin
- 22 (11 males and 11 females) have smooth skin

**Remember:** Males are XX and females are XY.

1. There are two alleles for Texture. Is the relationship between the two alleles simple dominance or incomplete dominance?

Answer: \_\_\_\_\_

- 1a. What is it about the **offspring** that indicates simple or incomplete dominance?

2. **If** one of the Texture alleles is dominant, which one is it (wrinkled, smooth, OR neither)?

Answer: \_\_\_\_\_

- 2a. What is it about the **offspring data** that shows you which, if any, allele is dominant?

3. Is the gene for Texture autosomal or X-linked?

Answer: \_\_\_\_\_

- 3a. What is it about the **offspring data** that indicates whether the gene is autosomal or X-linked?

**MONOHYBRID INHERITANCE II: EYELIDS**

Another inherited characteristic in the NewWorm is Eyelids. Both NewWorm1 and NewWorm2 have clear eyelids. However when you mate them and produce 100 offspring, you find:

- 74 (51 males and 23 females) have clear eyelids
- 26 (0 males and 26 females) have cloudy eyelids

**Remember:** Males are XX and females are XY.

1. There are two alleles for Eyelids. Is the relationship between the two alleles simple dominance or incomplete dominance?

Answer: \_\_\_\_\_

- 1a. What is it about the **offspring** that indicates simple or incomplete dominance?

2. **If** one of the Eyelids alleles is dominant, which one is it (clear, cloudy, OR neither)?

Answer: \_\_\_\_\_

- 2a. What is it about the **offspring data** that shows you which, if any, allele is dominant?

3. Is the gene for Eyelids autosomal or X-linked?

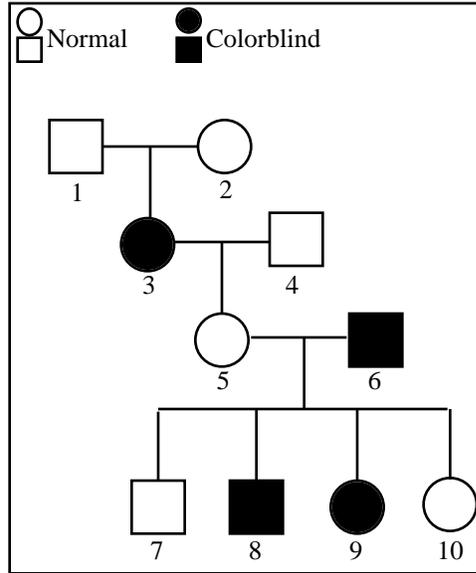
Answer: \_\_\_\_\_

- 3a. What is it about the **offspring data** that indicates whether the gene is autosomal or X-linked?

**PEDIGREE II: COLOR VISION–AUTOSOMAL OR X-LINKED?**

Consider another NewWorm characteristic–Color Vision.

- Color Vision has two phenotypes as shown with the pedigree.
- Females are represented by circles and males are represented by squares.
- **Remember:** Males are XY and females are XX.
- Decide if the pedigree is consistent with Color Vision being autosomal or X-linked.



1. Does the Color Vision gene **appear** to be autosomal or X-linked?

Answer: \_\_\_\_\_

1a. Using words and/or diagrams, explain your answer (use the numbers below each circle or square to refer to particular individuals).

2. Does this pedigree rule out the type of inheritance you did not choose?

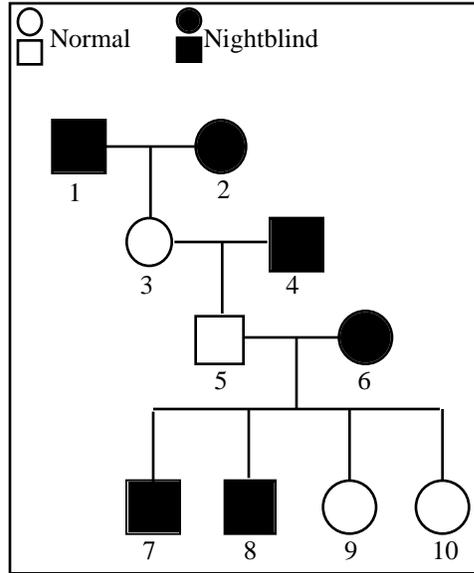
Answer: \_\_\_\_\_

2a. Using words and/or diagrams, explain your answer (use the numbers below each circle or square to refer to particular individuals).

**PEDIGREE II: NIGHT VISION–AUTOSOMAL OR X-LINKED?**

Consider another NewWorm characteristic–Night Vision.

- Night Vision has two phenotypes as shown with the pedigree.
- Females are represented by circles and males are represented by squares.
- **Remember:** Males are XX and females are XY.
- Decide if the pedigree is consistent with Night Vision being autosomal or X-linked.



1. Does the Night Vision gene **appear** to be autosomal or X-linked?

Answer: \_\_\_\_\_

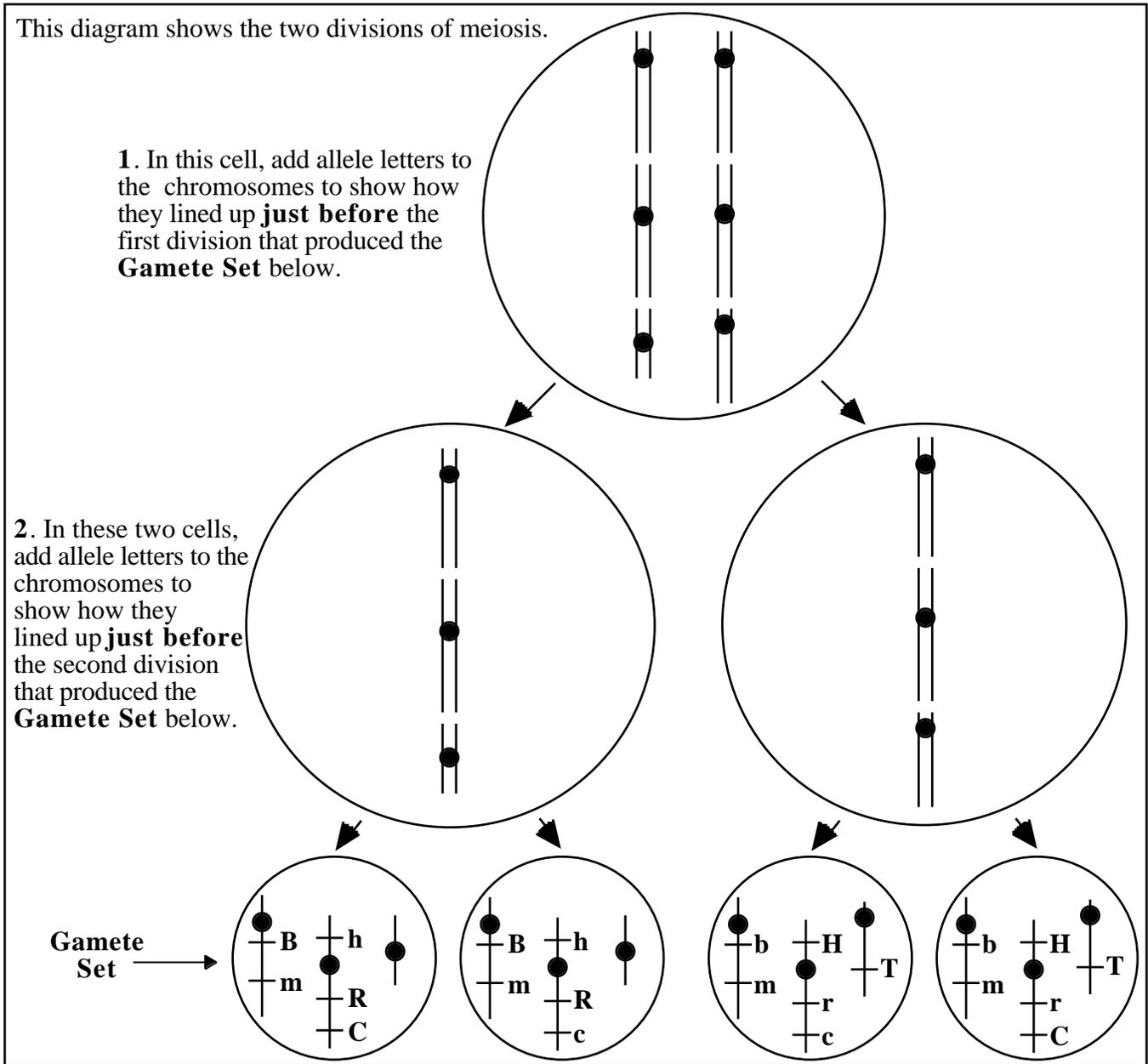
1a. Using words and/or diagrams, explain your answer (use the numbers below each circle or square to refer to particular individuals).

2. Does this pedigree rule out the type of inheritance you did not choose?

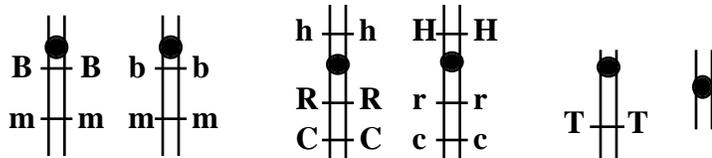
Answer: \_\_\_\_\_

2a. Using words and/or diagrams, explain your answer (use the numbers below each circle or square to refer to particular individuals).

### MEIOSIS: THE PROCESS

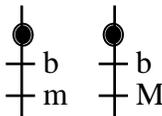
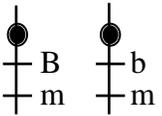
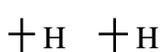
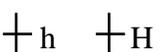
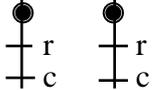
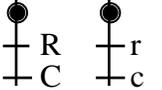
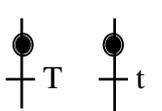
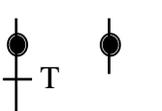


The diagram to the right shows NewWorm2's chromosomes at the **beginning** of meiosis.



3. Use **arrows** on the diagram to the right to show the exact location of any crossovers needed to produce the gamete set above.



NewWorm Genetics	Two NewWorm Genotypes	
<b>Body:</b> Flat: <b>BB</b> or <b>Bb</b> Round: <b>bb</b>	<b>NewWorm1</b>	<b>NewWorm2</b>
<b>Mouth:</b> Oval: ?? Slit: ??		
<b>Head:</b> Broad: ?? Medium: ?? Narrow: ??		
<b>Rings:</b> No Rings: <b>RR</b> or <b>Rr</b> Rings: <b>rr</b>		
<b>Color:</b> Green: <b>CC</b> Brown: <b>Cc</b> Black: <b>cc</b>		
<b>Tail (Male):</b> Pointed: <b>TT</b> or <b>Tt</b> Blunt: <b>tt</b>	<p>(The Tail gene is on the <b>X</b> chromosome.)            (The - [dash] stands for the <b>Y</b> chromosome.)</p>	
<b>Tail (Female):</b> Pointed: <b>T-</b> Blunt: <b>t-</b>		
<b>Sex:</b> Males: <b>XX</b> Females: <b>XY</b>		

### PROBABILITY II

In a mating of NewWorm1 and NewWorm2, the chance of getting babies with **round bodies** AND **no rings** is 1/4 or 25%.

1. Draw a Punnett square that shows this. Include genotypes and phenotypes.
  
2. Explain and/or draw a diagram that shows how the way that chromosomes line up and separate during meiosis in NewWorm2 contribute to the 1/4 chance of getting worms with round bodies and no rings from this cross.