

# Alien Bugs

## Overview

This activity is another opportunity for students to apply knowledge of genetics and the use of Punnett squares. It can be used as an embedded assessment.

## Textbook References

### McDougal Littell

Unit C Chapter 4, pp. 101-107, Living Things Inherit Traits in Patterns

Unit C Chapter 4, pp. 100-116, Patterns of Heredity Can Be Predicted

### Prentice Hall

Chapter 14, Section 3 pp. 530-535, Mendel's Work

Chapter 14, Section 4 pp. 538-545, Probability and Heredity

## Materials

\*Materials to be supplied by the teacher or the students are marked with an asterisk.

### Materials for the whole class

- 1 transparency of *Sample Bug*

### Materials for small groups

- 1 scissors
- 1 glue stick
- 1 *Alien Bug Crosses I* worksheet
- 1 *Alien Bug Crosses II* worksheet
- 1 *Alien Bug Traits Information* sheet
- 2 pennies

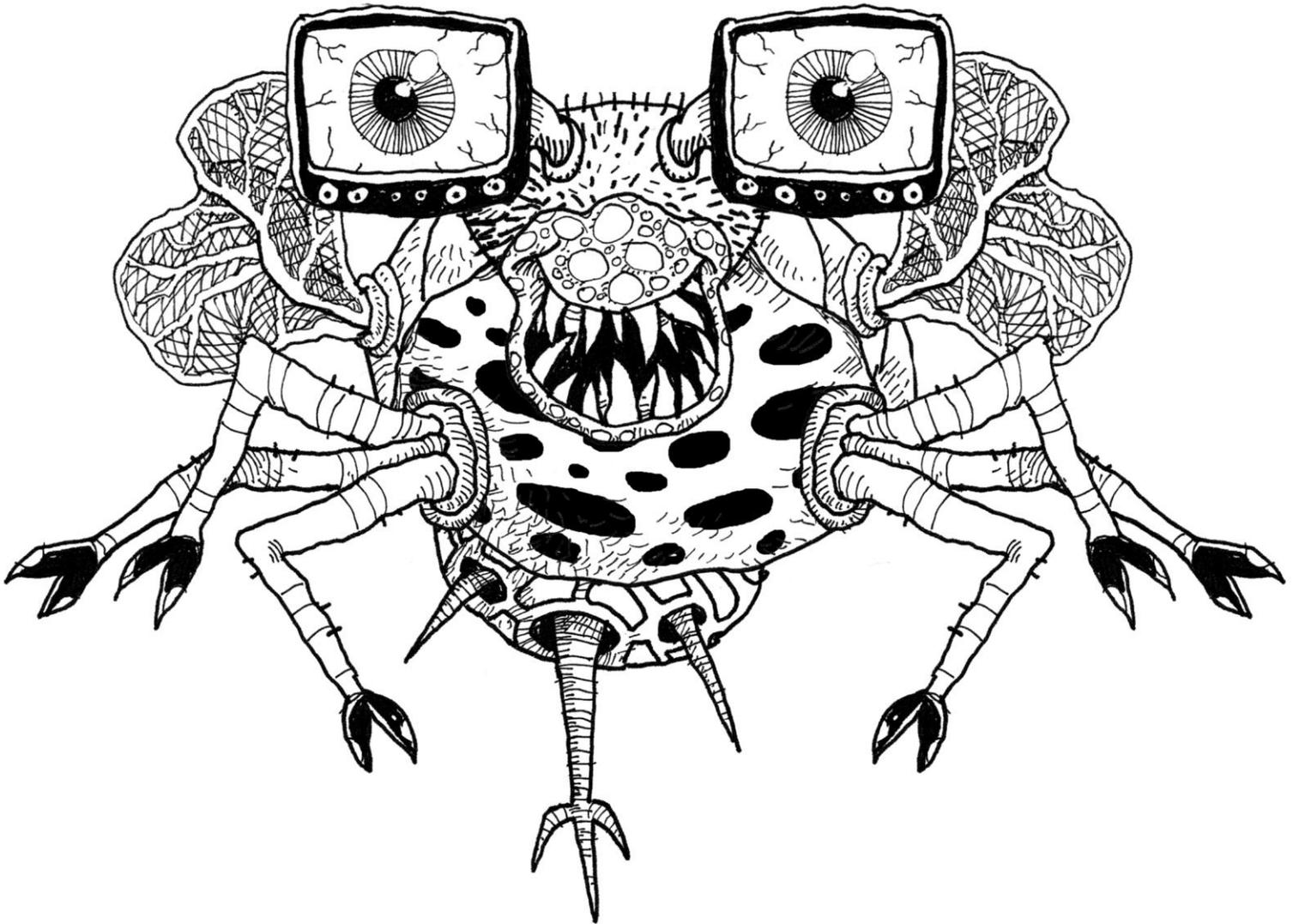
### Materials for individual students

- 1 *Alien Bug Traits* cut-out sheet
- 1 *Alien Bug Thorax—Spotted* worksheet
- 1 *Alien Bug Thorax—Striped* worksheet

## Procedure

1. Explain to the students that while visiting the space ship, we noticed a strange little creature scurry under a bookshelf. The aliens told us that they have these bugs, that they are terrible pests, and that they can't seem to get rid of them. (Show the overhead of the *Sample Bug*.)
2. The aliens explained that these bugs have lots of different features. After speaking with the aliens, we made a list of all the different traits, and now we're going to see what different types of bugs there could be.
3. Inform students that they are each going to make their very own bug. Each student will decide how they want their bug to look. They must first decide if

- they want the body to be striped or spotted. After they choose, hand each student the appropriate sheet.
4. Hand out one copy of the *Alien Bug Traits* cut-out sheet to each student. Have scissors and glue sticks available. Instruct students to choose one version of each trait. They should cut and glue the traits on the labeled places of the alien bug body.
  5. After each person has created his or her own bug, two students will need to work together to have their bugs produce a new baby bug. Tell the class that the genetics work the same for the bugs as they do for the alien people.
  6. Hand out one *Alien Bug Traits Information* sheet and one copy of each *Alien Bug Crosses sheet (I and II)*. Explain to the students that in order to determine what their offspring will look like, they need to know its genotype. One student's adult will be Bug #1 and the other student's will be bug #2. In order to fill in the genotype on the sheet, the students need to look at their bug and write the correct genotype. If their bug has the dominant trait, tell the students that they *must record a heterozygous genotype*. This will result in more diversity of offspring.
  7. After the genotypes are filled in, have students determine what traits their baby bug will have by flipping a coin. Refer to the rules in the Wilbur and Wilma II activity. (Reminder: They only need to flip the coin for heterozygous genotypes.)
  8. After the sheet is complete, have students name and create their baby using the cut out sheets.





# Alien Bug Crosses I

Name \_\_\_\_\_

Date \_\_\_\_\_

## Trait: Eyes

Bug 1  
genotype \_\_\_\_\_

Bug 2 genotype  _____	Possible sex cells	(       )	(       )
	(       )		
	(       )		

% TV eyes \_\_\_\_\_

% Big eyes \_\_\_\_\_

% Periscope eyes \_\_\_\_\_

Heads = E<sup>T</sup> (TV eyes)

Tails = E<sup>P</sup> (Periscope eyes)

Bug 1 gives: \_\_\_\_\_

Bug 2 gives: \_\_\_\_\_

Offspring

Genotype: \_\_\_\_\_

Offspring Phenotype:

## Trait: Legs

Bug 1  
genotype \_\_\_\_\_

Bug 2 genotype  _____	Possible sex cells	(       )	(       )
	(       )		
	(       )		

% Six legs \_\_\_\_\_

% Four legs \_\_\_\_\_

Heads = L (six legs)

Tails = l (four legs)

Bug 1 gives: \_\_\_\_\_

Bug 2 gives: \_\_\_\_\_

Offspring

Genotype: \_\_\_\_\_

Offspring Phenotype:

## Trait: Mouth

Bug 1  
genotype \_\_\_\_\_

Bug 2 genotype  _____	Possible sex cells	(       )	(       )
	(       )		
	(       )		

% Pincers \_\_\_\_\_

% Teeth \_\_\_\_\_

Heads = M (Pincer)

Tails = m (teeth)

Bug 1 gives: \_\_\_\_\_

Bug 2 gives: \_\_\_\_\_

Offspring

Genotype: \_\_\_\_\_

Offspring Phenotype:



# Alien Bug Crosses II

Name \_\_\_\_\_

Date \_\_\_\_\_

## Trait: Stinger

Bug 1  
genotype \_\_\_\_\_

Bug 2 genotype  _____	Possible sex cells	(      )	(      )
	(      )		
	(      )		

% Multi-stinger \_\_\_\_\_

% Single stinger \_\_\_\_\_

Heads = S (Multi-stinger)

Tails = s (Single stinger)

Bug 1 gives: \_\_\_\_\_

Bug 2 gives: \_\_\_\_\_

Offspring

Genotype: \_\_\_\_\_

Offspring Phenotype:

## Trait: Wings

Bug 1  
genotype \_\_\_\_\_

Bug 2 genotype  _____	Possible sex cells	(      )	(      )
	(      )		
	(      )		

% Long \_\_\_\_\_

% Short \_\_\_\_\_

Heads = W (Long)

Tails = w (Short)

Bug 1 gives: \_\_\_\_\_

Bug 2 gives: \_\_\_\_\_

Offspring

Genotype: \_\_\_\_\_

Offspring Phenotype:

## Trait: Body

Bug 1  
genotype \_\_\_\_\_

Bug 2 genotype  _____	Possible sex cells	(      )	(      )
	(      )		
	(      )		

% Striped \_\_\_\_\_

% Spotted \_\_\_\_\_

Heads = B (Striped)

Tails = b (Spotted)

Bug 1 gives: \_\_\_\_\_

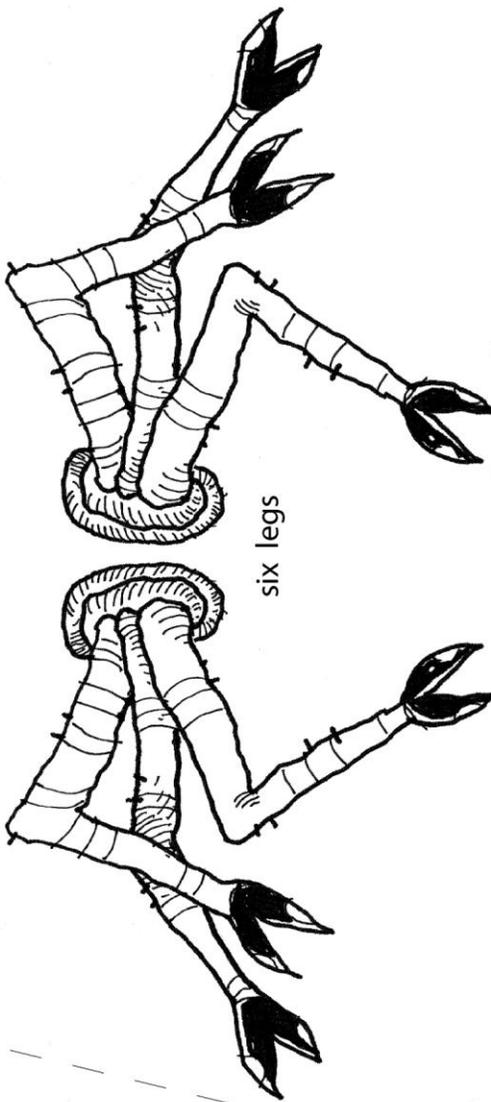
Bug 2 gives: \_\_\_\_\_

Offspring

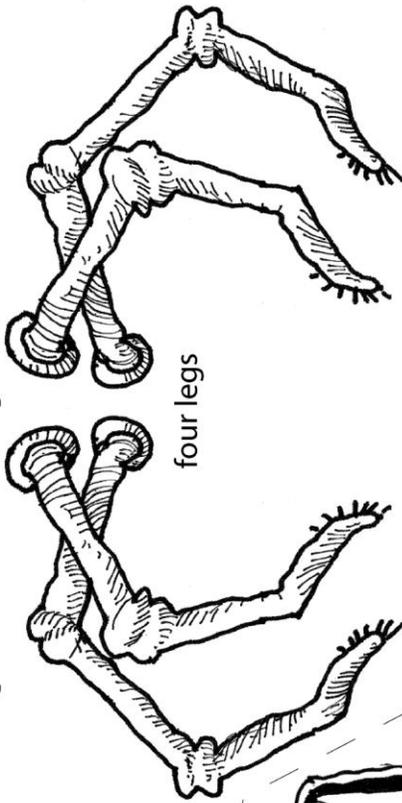
Genotype: \_\_\_\_\_

Offspring Phenotype:

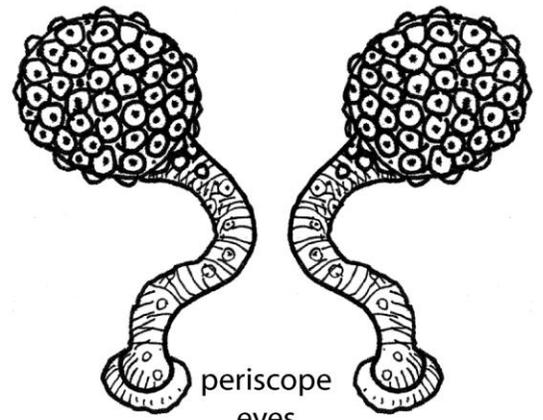




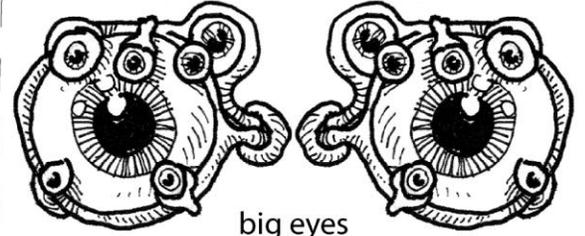
six legs



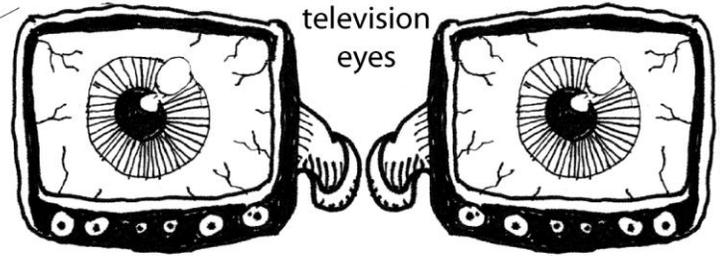
four legs



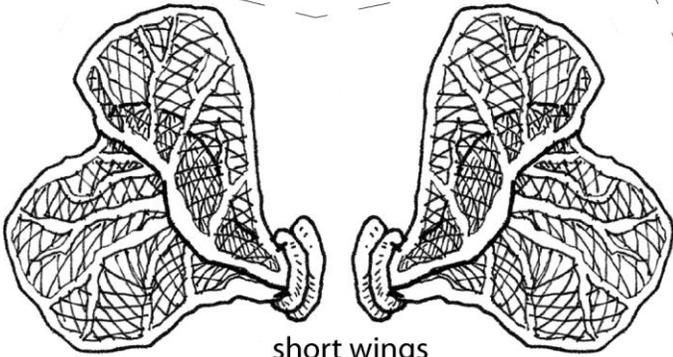
periscope eyes



big eyes



television eyes



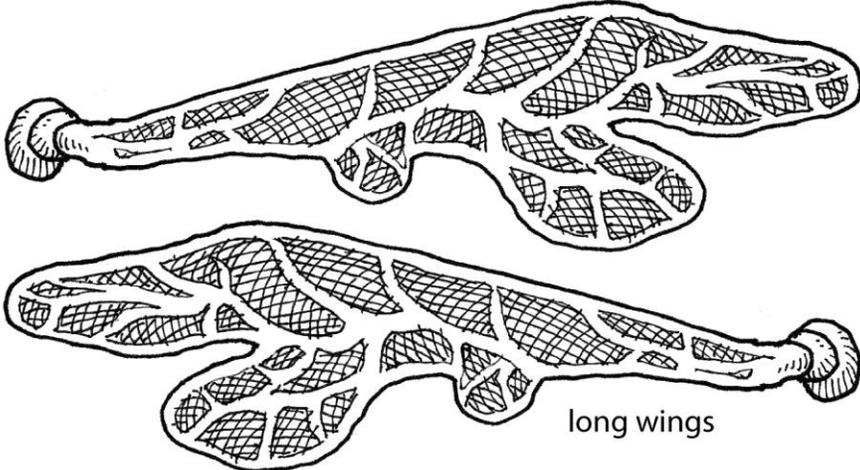
short wings



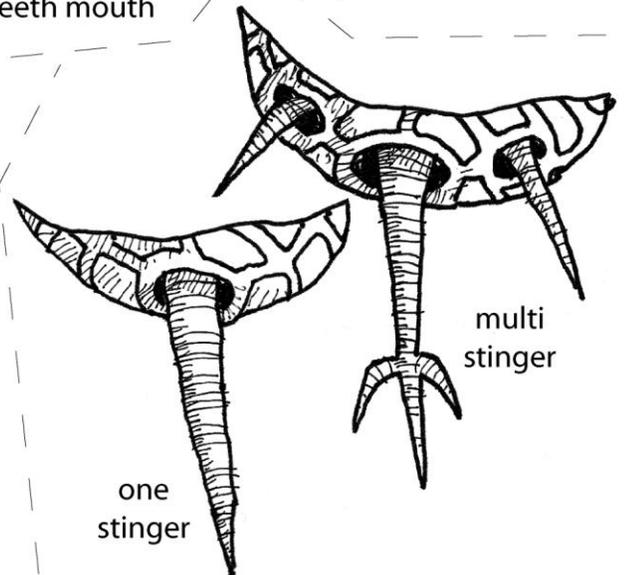
teeth mouth



pincher mouth



long wings



one stinger

multi stinger



# Alien Bug Traits

## Dominant/Recessive

Trait	Symbols	Dominant Phenotype	Recessive Phenotype
Legs	L, l	six legs	four legs
Mouth	M, m	pincer	teeth
Stinger	S, s	multi-stinger	single stinger
Wings	W, w	long	short
Body	B, b	striped	spotted

## Incomplete Dominance

Eyes	$E^T E^T$ = TV eyes	$E^P E^P$ = periscope eyes	$E^T E^P$ = big eyes
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