

**MATERIALS**



For each group of four students

colored pencils

1 plastic cup



For each pair of students

1 Student Sheet 65.1, "Critter Breeding Worksheet"

2 pennies

**THE MODEL**

The table below shows Skye's and Poppy's traits. It also shows the traits of all their offspring. In this activity, you will look at more traits in the Generation Three offspring, which are produced when Generation Two offspring mate with each other. Lucy, a female, and Ocean, a male, are the Generation Two critters who will mate.

Table 1: Generation One and Generation Two Traits

Characteristic	Skye	Poppy	100 Offspring (such as Lucy and Ocean)
Body segments (number)	2	3	3
Leg color	blue	red	blue
Eyes (number)	2	3	2
Nose length	short	long	medium
Tail color	blue	orange	blue
Tail style	straight	curly	48 curly, 52 straight
Antennas (number)	1	2	2
Spikes (color and number)	1 short blue	2 long green	1 short blue + 2 long green
Sex	male	female	53 female, 47 male

**PROCEDURE**

1. Work in pairs. Place Student Sheet 65.1, "Critter Breeding Worksheet," between you and your partner. The person sitting on the left side will toss a penny for Ocean, while the person on the right will toss a penny for Lucy.
2. For each toss, each partner should:
  - Hold a penny in cupped hands.
  - Shake it to the count of ten.
  - Allow it to drop from a height of about 20–40 cm (8–16 inches) onto the desk.

Table 2: Critter Code

Characteristic	Alleles	Trait
Body segments (number)	<b>BB</b>	3
	<b>Bb</b>	3
	<b>bb</b>	2
Leg color	<b>LL</b>	blue
	<b>Ll</b>	blue
	<b>ll</b>	red
Eyes (number)	<b>EE</b>	2
	<b>Ee</b>	2
	<b>ee</b>	3
Nose length	<b>NN</b>	long
	<b>Nn</b>	medium
	<b>nn</b>	short
Tail color	<b>TT</b>	blue
	<b>Tt</b>	blue
	<b>tt</b>	orange
Tail style	<b>SS</b>	curly
	<b>Ss</b>	*curly or straight
	<b>ss</b>	straight
Antennas (number)	<b>AA</b>	2
	<b>Aa</b>	2
	<b>aa</b>	1
Spikes (color and number)	<b>GG</b>	1 short blue
	<b>HH</b>	2 long green
	<b>GH</b>	1 short blue + 2 long green

3. The partner on the left tosses a penny to determine which allele for number of body segments Ocean gives to his offspring. If the penny shows heads, write **B** in the column titled "From Ocean" on Student Sheet 65.1. If the penny shows tails, write **b**. The other partner tosses a penny to determine the allele which Lucy gives. Write the letter for that allele in the column titled "From Lucy."
4. Determine the offspring's phenotype for number of body segments. Look at the alleles you wrote under "From Ocean" and "From Lucy." Compare these alleles with the Critter Code in Table 2 (or with the information in the first column of Student Sheet 65.1). Then write the appropriate trait in the next column. For example, if you wrote **Bb** for the alleles, the trait is "3 segments."
5. Continue tossing coins and filling in Student Sheet 65.1 until you have completed the table. Use the Critter Code to determine the phenotype for each characteristic, based on the genotype of the offspring. Note the special instructions for tail style.

\* To find out if an **Ss** critter's tail is curly or straight, toss a coin. If it shows heads, the critter's diet contains "crittric" acid, and it develops a curly tail. If the coin shows tails, the critter's diet does not contain "crittric" acid, and it develops a straight tail.