Bug Builders, Inc.

ASK A QUESTION

1. There are 128 possible combinations. (Calculation: There are two forms of each of seven characteristics, so $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^7 = 128$)

ANALYZE THE RESULTS

1. Student ratios should be similar to the ratios determined when the alleles were selected by the teacher.
2. If any students have offspring bugs that look like one of the parents, have them compare the genotype of the offspring with the genotype of the parents. The offspring and parents look alike but still have different geno-types for some traits.

DRAW CONCLUSIONS

3. Students answers should reflect the data on parent alleles that were recorded in step 5.
4. Students answers should include Punnett squares based on the parental traits. Except for the results obtained by parental genotypes that are all homozygous recessive, the student will see other possibilities for genotypes and phenotypes from the same parents.

APPLYING YOUR DATA

Students should create Punnett squares to show the possible genotypes, anddescribe phenotypes that follow the rules of dominance for each characteristic.

Making a Punnett Square

Three of the offspring would have round seeds, and one would have wrinkled seeds.

Taking Your Chances

4. Students should get bb on average 1/4 or 25% of the time.
5. 1/4 or 25%
6. 1/4 (If brown fur results from genotype Bb, then brown fur is dominant, and white fur will result from the genotype bb.)

Tracing Traits

ANALYZE THE RESULTS

1. Answers may vary.
2. Answers may vary.

, 3. The genotype of the recessive form of the characteristic must be *hh* (homozygous recessive). Each allele came from one of the individual's parents. Possible genotypes for the parents of the individual expressing the recessive form are *Hh* and *hh.* Does the student know whether either of the parents expresses the recessive form of the trait? Does the student know if the individual chosen has brothers or sisters? Are their genotypes known? If so, have the student decide if each of them has a dominant or recessive genotype. If a dominant genotype is found among the siblings and one of the parents is known to have the recessive form, ask the student what the genotype of the other parent must be *(Hh).*

DRAW CONCLUSIONS

4. The Punnett square should show hh in the bottom right-hand corner. One of the parents must have the genotype *hh.* The other parent must have either *hh* or *Hh.* If any sibling has the dominant trait, the genotype of the other parent must be *Hh.*

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