



Single Trait Inheritance Problems

Complete the following problems using Punnett squares. Give the genotype, phenotype, percentage, and ratio (if applicable) of the offspring from each cross.

- In pea plants, yellow seeds are dominant over green seeds. If a purebred yellow seed plant and a green seed plant are crossed, predict what the offspring will be like. (Practice Question — see Process Notes for sample solution.)
- Cross two hybrid yellow seed plants.
- Cross a hybrid yellow seed plant with a green seed plant.
- In pea plants, smooth seeds are dominant over wrinkled seeds. Predict the offspring resulting from the cross of a hybrid smooth seed plant with a purebred smooth seed plant.
- Cross a wrinkled seed plant with a hybrid smooth seed plant.
- Cross two wrinkled seed plants.

Process Notes for Punnett Squares

Sample solution for practice question 1:

Questions	Solutions									
a) Which trait is dominant?	a) yellow = dominant b) green = recessive									
b) Assign letters to traits.	b) yellow = Y green = y									
c) Decide on letter combinations, (e.g., pure/hybrid).	c) YY and yy									
d) Write parental genotype around square.	d) <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>Y</td> <td>Y</td> </tr> <tr> <td>y</td> <td></td> <td></td> </tr> <tr> <td>y</td> <td></td> <td></td> </tr> </table>		Y	Y	y			y		
	Y	Y								
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e) Determine possible offspring (complete square).	e) <table style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>Y</td> <td>Y</td> </tr> <tr> <td>y</td> <td>Yy</td> <td>Yy</td> </tr> <tr> <td>y</td> <td>Yy</td> <td>Yy</td> </tr> </table>		Y	Y	y	Yy	Yy	y	Yy	Yy
	Y	Y								
y	Yy	Yy								
y	Yy	Yy								
f) Determine offspring genotypes (letters).	f) geno = Yy (100%)									
g) Determine offspring phenotypes (looks).	g) pheno = yellow (100%)									
h) Record percentage of phenotypes in offspring (yellow versus green).	h) see f & g above									

*Upper and lower case letters must look different.