**Monohybrid Worksheet answers**

1. In the garden pea plant, tall plants are dominant to short plants. Using this information, complete the following monohybrid crosses. Be sure to assign proper letters for alleles!
	1. For **each** cross, state the genotypic ratio and the phenotypic ratio.
2. homozygous tall x homozygous short **T T**

|  |  |
| --- | --- |
|  Tt |  Tt |
|  Tt | Tt |

Genotypic ratio t

**4 Tt**

 t

Phenotypic ratio

 **4 tall plants**

 b. heterozygous tall x heterozygous tall **T t**

|  |  |
| --- | --- |
| TT | Tt |
| Tt | tt |

 T

Genotypic ratio

 **1 TT: 2 Tt: 1 tt**

 t

Phenotypic ratio

 **3 Tall: 1 short**

 **T t**

|  |  |
| --- | --- |
| **TT** | **Tt** |
| **TT** | **Tt** |

1. heterozygous tall x homozygous tall

 T

 Genotypic ratio T

**2 TT: 2 Tt (reduce to 1:1)**

Phenotypic ratio

 **4 tall or 100% tall**

d. heterozygous tall x homozygous short **T t**

|  |  |
| --- | --- |
| **Tt** | **tt** |
| **Tt** | **tt** |

Genotypic ratio t

 **1 Tt : 1 tt**

 t

Phenotypic ratio

 **1 tall : 1 short**

In the garden pea plant, round seed is dominant to wrinkled seed. Using this information, complete the following cross**. Be sure to state the genotypic and phenotypic ratios for each cross.**

a. homozygous round x homozygous wrinkled **R R**

|  |  |
| --- | --- |
| **Rr** | **Rr** |
| **Rr** | **Rr** |

Genotypic ratio: **r**

**4 Rr or 100% Rr r**

Phenotypic ratio:

 **4 round or 100% round**

1. heterozygous round x homozygous wrinkled **R r**

|  |  |
| --- | --- |
| **Rr** | **rr** |
| **Rr** | **rr** |

Genotypic ratio: **r**

 **1 Rr : 1 rr r**

Phenotypic ratio:

 **1 round : 1 wrinkled**

|  |  |
| --- | --- |
| **RR** | **Rr** |
| **RR** | **Rr** |

c. heterozygous round x homozygous round **R r**

Genotypic ratio: **R**

 **1 RR : 1 Rr**

 **R**

Phenotypic ratio:

**4 round or 100% round**

d. heterozygous round x heterozygous round **R r**

|  |  |
| --- | --- |
| **RR** | **Rr** |
| **Rr** | **rr** |

Genotypic ratio:

 **1 RR: 2 Rr: 1 rr**

Phenotypic ratio:

 **3 round: 1 wrinkled**

1. **Explain** how you could use a testcross to determine the genotype of a pea plant with round seeds. (HINT: if it has round seeds the genotype is either homozygous dominant or heterozygous, you need to figure out which it is. How do you do that??)

R R(?) R r(?)

|  |  |
| --- | --- |
| Rr | Rr |
| Rr | Rr |

|  |  |
| --- | --- |
| Rr | rr |
| Rr | rr |

r r

r r

If offspring is 100% round, then original parent is RR and therefore more desirable seed.

If offspring is 50% round and 50% wrinkled, then original parent is heterozygous or Rr and less desirable.