# Using Punnett Squares to Predict the Outcomes of Crosses KEY

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1. Nn × NN**

|  |  |  |
| --- | --- | --- |
|  | **N** | **n** |
| **N** | **NN** | **Nn** |
| **N** | **NN** | **Nn** |

1. Genotypic ratio:

 **2:2**1. Phenotypic ratio:

**4:0** | **2. Aa × aa**

|  |  |  |
| --- | --- | --- |
|  | **A** | **a** |
| **a** | **Aa** | **aa** |
| **a** | **Aa** | **aa** |

1. Genotypic ratio:

**2:2**1. Phenotypic ratio:

**2:2** |
| **3. Tt × Tt**

|  |  |  |
| --- | --- | --- |
|  | **T** | **t** |
| **T** | **TT** | **Tt** |
| **t** | **Tt** | **tt** |

1. Genotypic ratio:

**1:2:1**1. Phenotypic ratio:

**3:1** | **4. Cross 2 plants that are heterozygous for green pods.**

|  |  |  |
| --- | --- | --- |
|  | **G** | **g** |
| **G** | **GG** | **Gg** |
| **g** | **Gg** | **gg** |

1. Genotypic ratio:

**1:2:1**1. Phenotypic ratio:

**3:1** |
| **5. Cross a plant that is heterozygous for axial flowers with a plant that has terminal flowers.**

|  |  |  |
| --- | --- | --- |
|  | **A** | **a** |
| **a** | **Aa** | **aa** |
| **a** | **Aa** | **aa** |

1. Genotypic ratio:

**2:2**1. Phenotypic ratio:

**2:2** | **6. Cross a homozygous tall plant with a short plant.**

|  |  |  |
| --- | --- | --- |
|  | **T** | **T** |
| **t** | **Tt** | **Tt** |
| **t** | **Tt** | **Tt** |

1. Genotypic ratio:

**4:0**1. Phenotypic ratio:

**4:0** |
| **7. Cross a plant that is heterozygous for smooth pods with a plant that has constricted pods.** 1. Genotypic ratio:

**2:2**1. Phenotypic ratio:

**2:2**

|  |  |  |
| --- | --- | --- |
|  | **N** | **n** |
| **n** | **Nn** | **nn** |
| **n** | **Nn** | **nn** |

 | **8. When a tall plant is crossed with a short plant, some of the offspring are short. What are the genotypes of the parents? What are the genotypic and phenotypic ratios of the offspring?**

|  |  |  |
| --- | --- | --- |
|  | **T** | **t** |
| **t** | **Tt** | **tt** |
| **t** | **Tt** | **tt** |

1. Parent Genotypes: **Tt X tt**
2. Genotypic ratio:

**2:2** 1. Phenotypic ratio

**2:2**  |
| **9. Three-fourths (¾) of the plants produced by a cross between two unknown pea plants have axial flowers and one-fourth (¼) have terminal flowers. What are the genotypes of the parent plants?**1. Parent Genotypes: **AaXAa**

|  |  |  |
| --- | --- | --- |
|  | **A** | **a** |
| **A** | **AA** | **Aa** |
| **a** | **Aa** | **aa** |

 | **10. What are the genotypes of the parents of a cross would result in ½ of the offspring having green pods and ½ of the offspring having yellow pods?**

|  |  |  |
| --- | --- | --- |
|  | **G** | **g** |
| **g** | **Gg** | **gg** |
| **g** | **Gg** | **gg** |

1. Parent Genotypes: **GgXgg**
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