

16 The language of genetics – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
gene	基因	_____	_____	_____
allele	等位基因	_____	_____	_____
dominant	显性	_____	_____	_____
recessive	隐性	_____	_____	_____
genotype	基因型	_____	_____	_____
phenotype	表现型	_____	_____	_____
Punnett square	庞纳特方格	_____	_____	_____

Recall

Genetics has its own exact words. Learn them, then you can predict the offspring of a cross.

New ideas

Read these first, then do the Practice.

■ 1 The words

	T	t	
T	TT	Tt	3 tall : 1 short
t	Tt	tt	

- a **gene** 基因 is a length of DNA; an **allele** 等位基因 is one version of it;
- a **dominant** 显性 allele shows with one copy; a **recessive** 隐性 allele needs two;
- the **genotype** 基因型 is the alleles present; the **phenotype** 表现型 is what you see.

■ 2 The Punnett square

A **Punnett square** 庞纳特方格 is a grid that shows every way the gametes can combine. For $Tt \times Tt$, the offspring are 3 tall : 1 short.

Worked example. $Tt \times Tt$: each parent gives gametes T or t, so the square gives TT, Tt, Tt and tt —genotypes 1 TT : 2 Tt : 1 tt, and phenotypes 3 tall : 1 short.

Watch out: the *genotype* is the alleles present (e.g. Tt); the *phenotype* is what you see (e.g. tall). A dominant allele shows with *one* copy; a recessive one needs *two*.

Practice

Try these in order.

16.6 What is an *allele*? [1]

16.7 How many copies does a *recessive* allele need to show? [1]

16.8 What is the difference between *genotype* and *phenotype*? [1]

16.9 In a $Tt \times Tt$ cross, what is the ratio of tall to short? [1]

16.10 In that cross, what genotype is the one short plant?

[1]

16.11 Challenge. A heterozygous tall plant (Tt) is crossed with a short plant (tt). Work out the ratio of tall to short offspring.

[2]