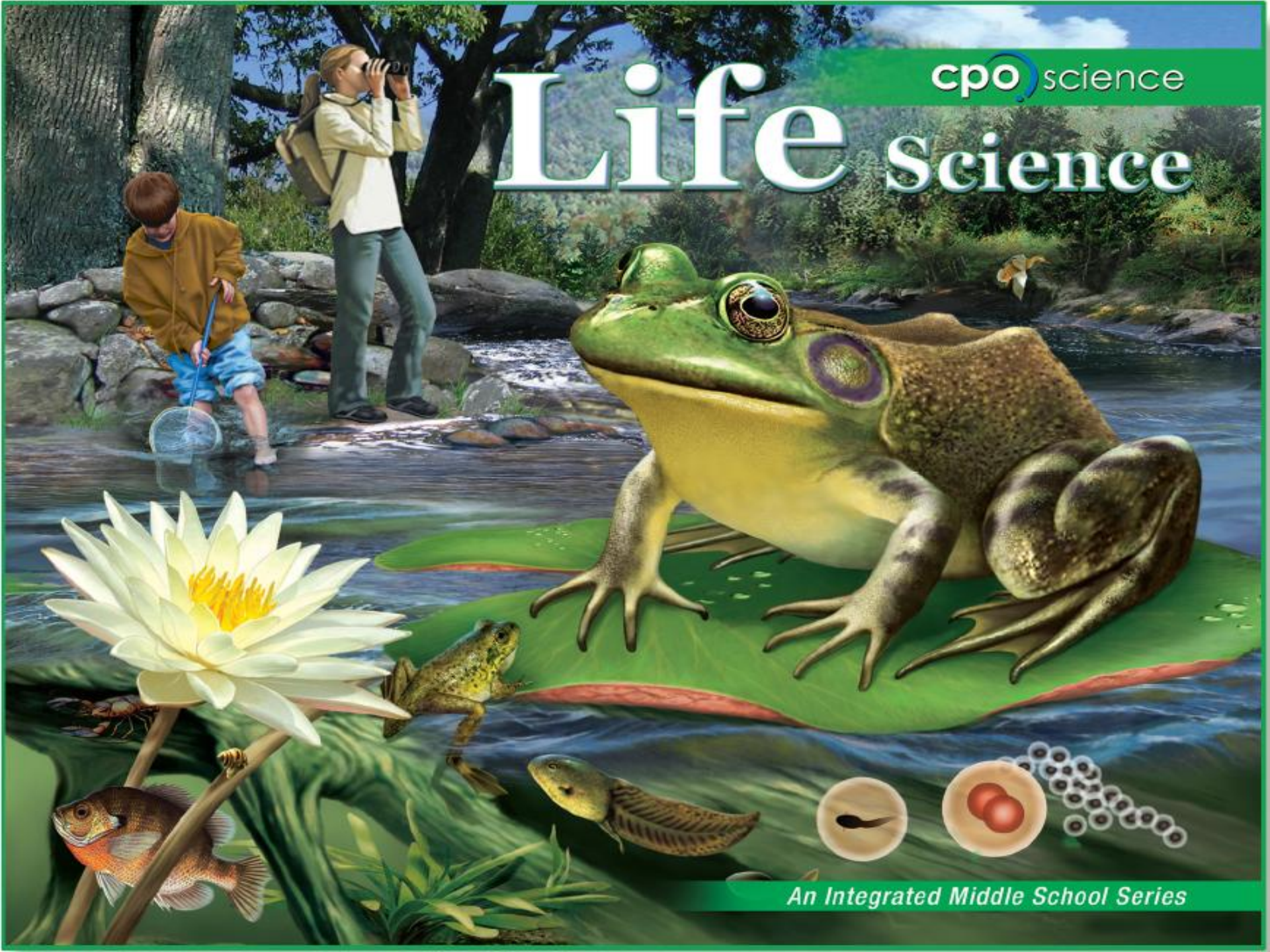


cpo science

Life Science



An Integrated Middle School Series



Traits,
Genes
&
Chromosomes

My
Family

UNIT
4

Genetics

A blue-tinted background image of a science laboratory. It shows various pieces of equipment including a microscope, a computer monitor displaying a grid, a globe, and other lab instruments.

Chapter Eleven: Heredity

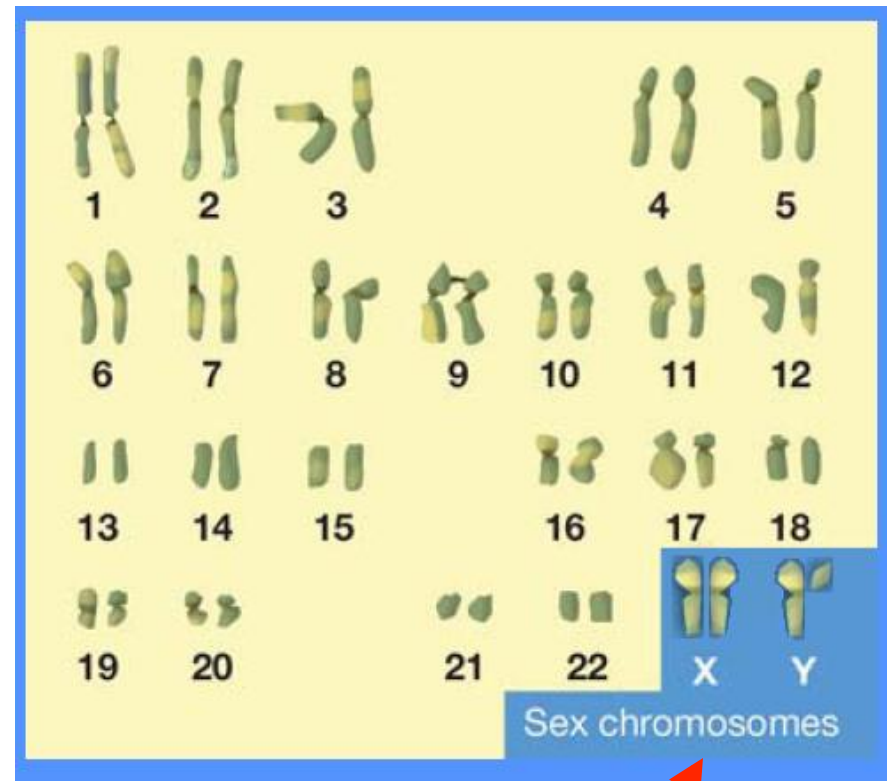
- **11.1 Traits**
- **11.2 Predicting Heredity**
- **11.3 Other Patterns of Inheritance**

11.3 Other Patterns of Inheritance

- Plant and animals have *thousands* of genes.
- Some have patterns of inheritance that are different from the ones Mendel discovered.
- We have learned that some traits do show **complete dominance**.

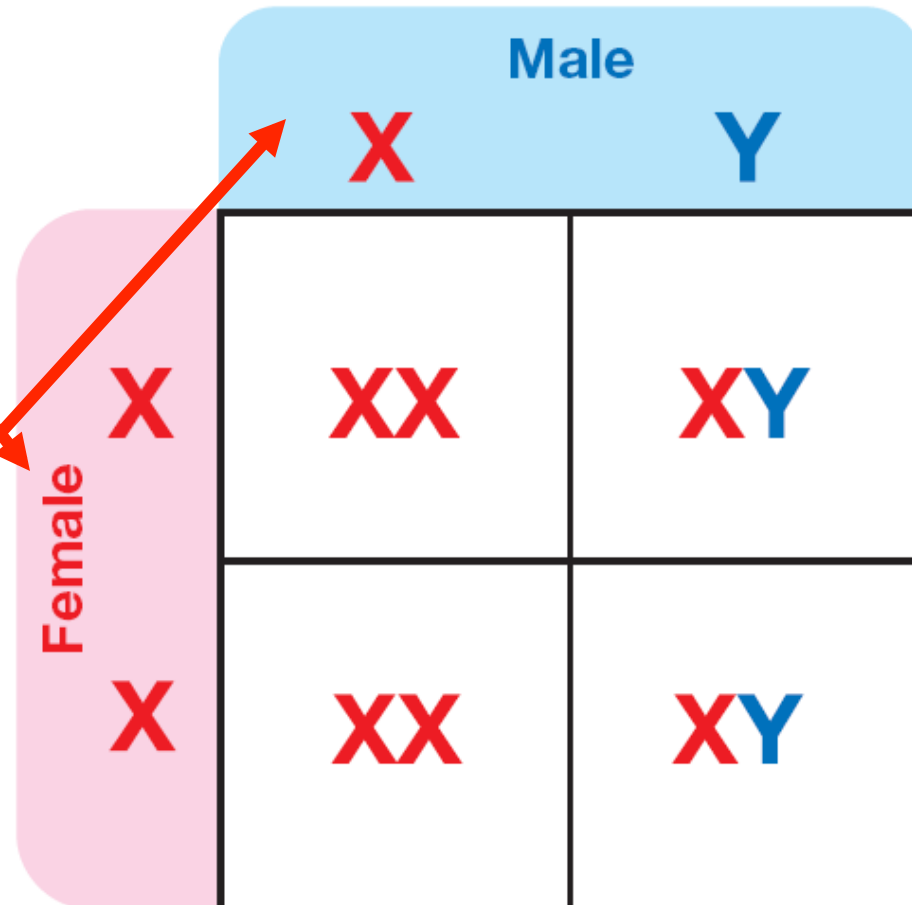
11.3 Male or Female?

- In humans, sex is determined by the last pair of chromosomes.
- **Sex chromosomes** carry genes that determine whether an individual is female or male. (Mendel's peas did not have sex chromosomes.)



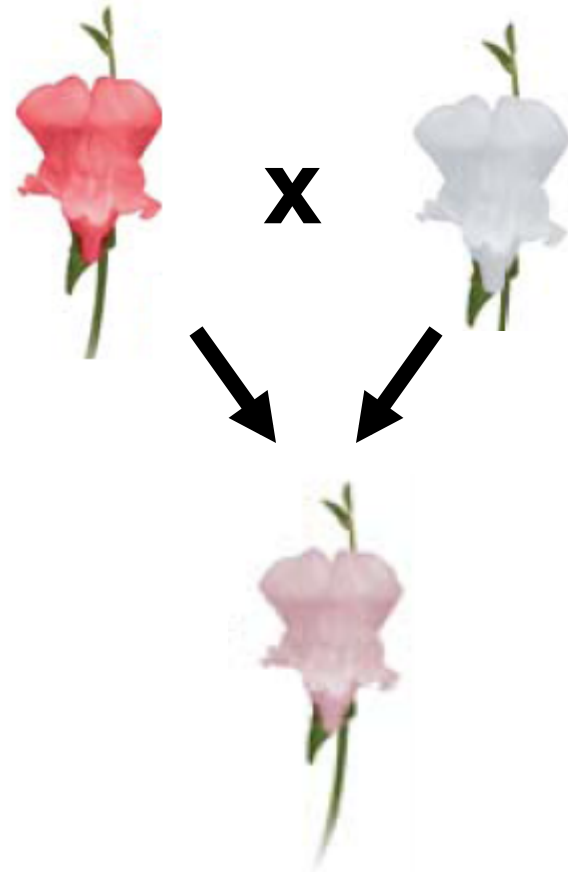
11.3 Male or Female?

- Females produce eggs with only **X** chromosomes.
- Males produce sperm with either an **X** or a **Y** chromosome.
- What is the probability for having a girl or boy child?



11.3 Incomplete Dominance

- Sometimes one allele isn't completely dominant over the other.
- Cross a true-breeding, **red**-flowered snapdragon with a true-breeding, *white*-flowered snapdragon and you end up with **pink** snapdragons!



11.3 Incomplete Dominance

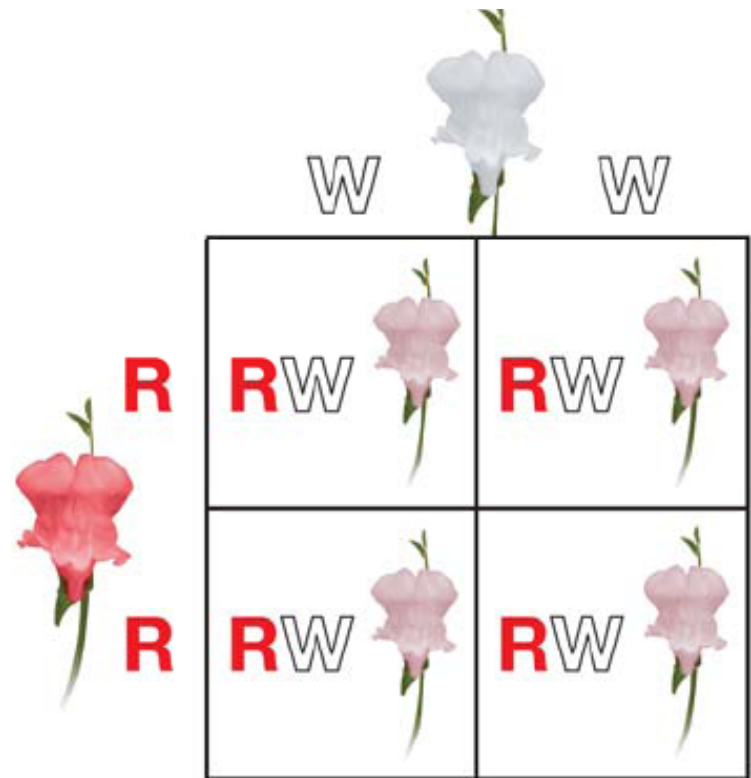
We use these letters:

RR is a red flower

ww is a white flower

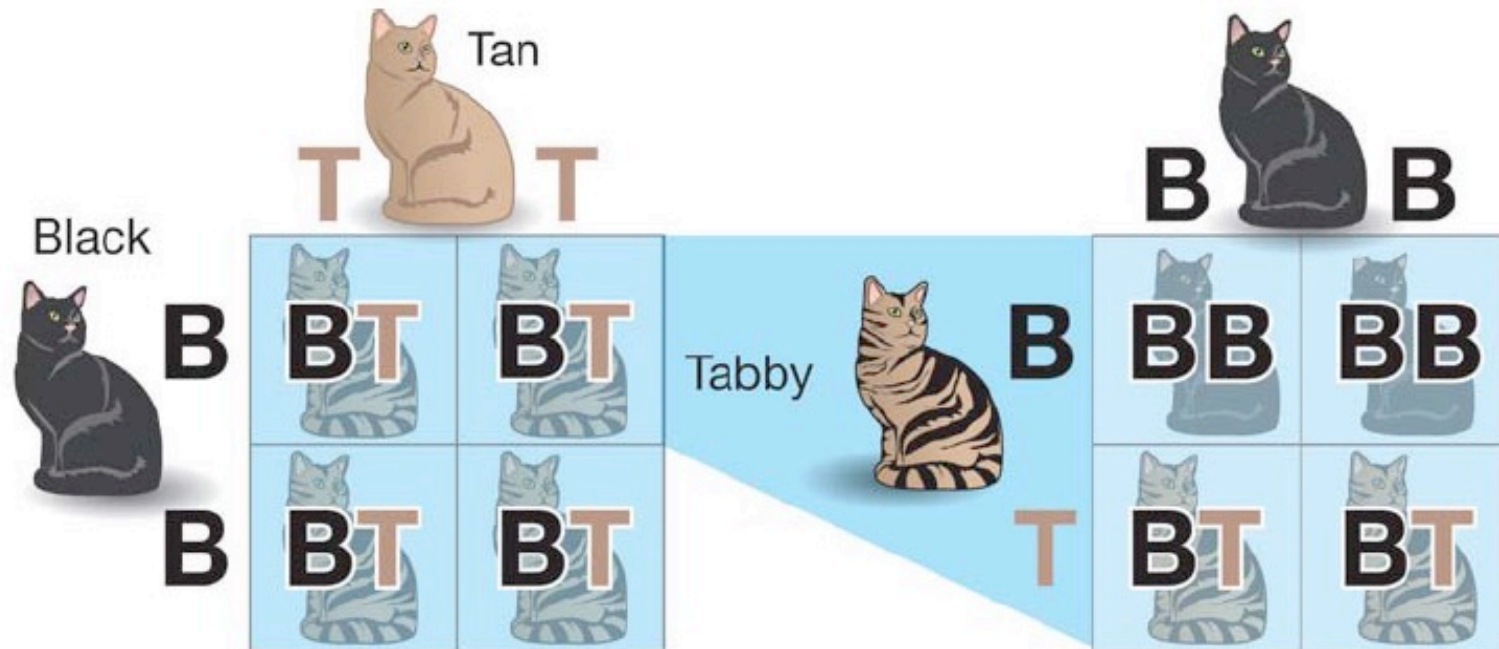
Rw is a pink flower

What would happen if
2 PINK snapdragons
are crossed?



11.3 Codominance

- In **codominance**, an organism has two different alleles of a gene and shows both phenotypes at the same time.



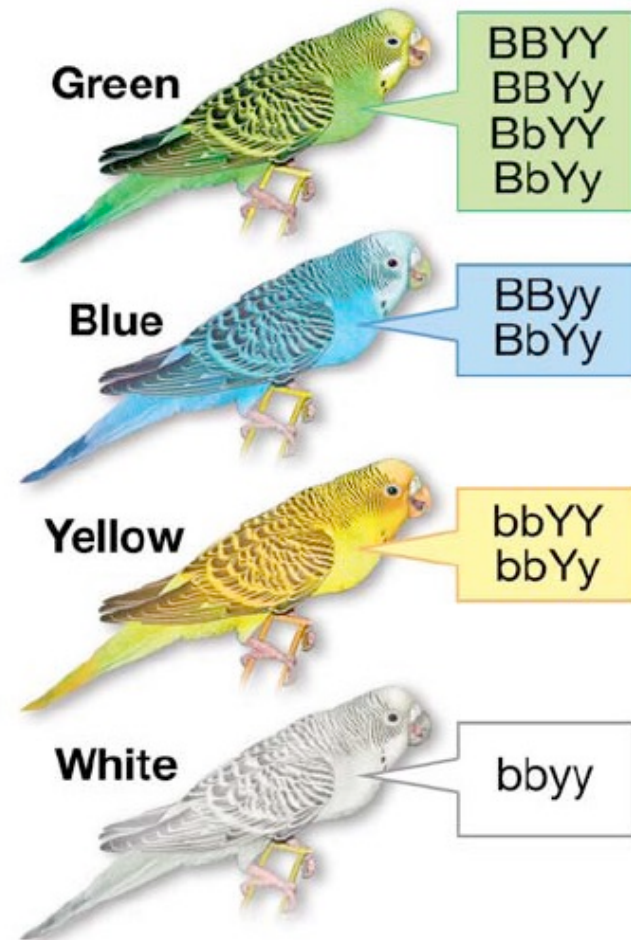
11.3 Multiple alleles

- **Multiple alleles** are also common in organisms.
- In humans for example, three alleles determine blood type (**A**, **B**, and **O**).

Parent Alleles	A	B	O
A	AA (Type A)	AB (Type AB)	AO (Type A)
B	AB (Type AB)	BB (Type B)	BO (Type B)
O	AO (Type A)	BO (Type B)	OO (Type O)

11.3 Polygenic Traits

- Inherited traits that are determined by more than one gene are called **polygenic traits**.
- Feather color in parakeets is determined by two genes.
- One gene controls yellow color and the other controls blue color.



11.3 Environmental factors

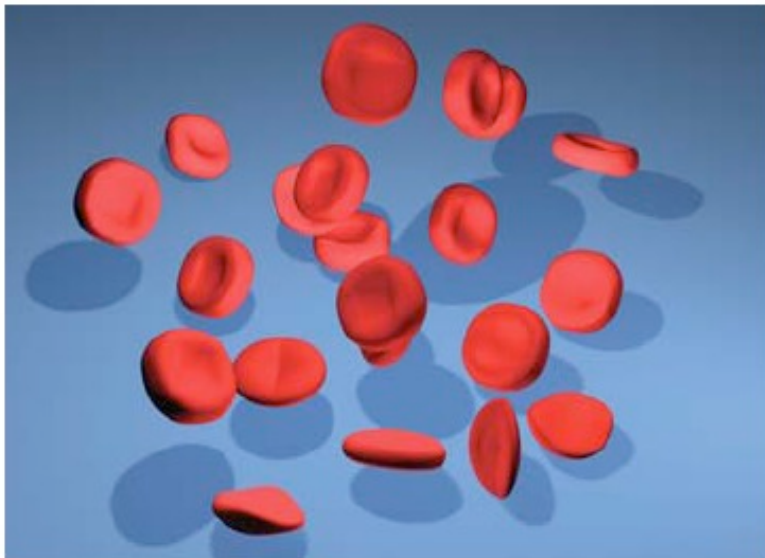
- Environmental factors may also influence traits.
- For instance, in certain reptiles, sex is determined by temperature.
- During development in the egg, higher temperatures favor the production of males.



Health Connection

An Inherited Disease

- Normally, red blood cells are round and disk-shaped.
- With sickle cell anemia the red blood cells are sickle-shaped.



Activity

Making a Pedigree

- A **pedigree**, or family tree, is a diagram that shows the generations of a family.
- Use the pedigree below as a model for this activity.

