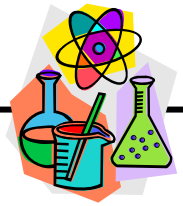


## Reproduction

**Did You Know?** The Mexican whiptail lizard has only one parent. The female lays eggs that are not fertilized by the males!

**Sexual reproduction:** Males and females of a species supply sperm or eggs to create young. Genetic material (DNA) comes from both parents. There is genetic mixing and variation within the species, e.g., gorillas, frogs, humans.

**Asexual reproduction:** Adult cells split to create new cells exactly like the adult. There is no genetic mixing, e.g., fungi, bacteria.

1. With a partner or by yourself, list examples of organisms that reproduce sexually. Then, make a chart of advantages and disadvantages of sexual reproduction.

| Advantages | Disadvantages |
|---|---|
| • increased variation within species<br>• species is more adaptable to changing environment | • time and energy needed to locate reproductive partner<br>• risks to health and safety |

Do the same for asexual reproduction.

2. Write summary statements about organisms that reproduce sexually and asexually. Be sure to comment on the species' ability to adapt to change in the environment.

Use Tools Paragraph Planner I or Paragraph Planner II and Information Summary III.

**Cloning:** Cloning is a form of asexual reproduction.

A cell that is not a reproductive cell is treated to act like a fertilized egg and produce a new organism. For example, in recent experiments, scientists have cloned sheep.

In cloning, genetic material comes from the original cell. There is no genetic mixing.

3. Using the Internet, newspapers, magazines or other sources, find articles or stories about cloning.
   - Identify the issues raised in the stories.
   - Examine and discuss the benefits and risks of cloning technology to human beings and other organisms.
   - Examine and discuss the effects of cloning on the diversity of a species.

Use Tools Preparing for an Internet Search, Analyzing Purpose, Identifying the Main Idea and Evaluating Sources II or Evaluating Sources VI.

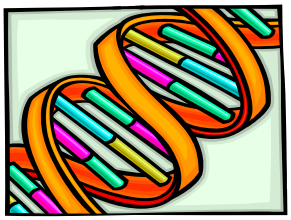
**Heredity:** Passing on characteristics and traits from parents to children through genetic material. For example, hair colour and eye colour are hereditary traits.

**DNA:** Genetic material that is passed on from parents to offspring and determines hereditary traits.

DNA is made up of:

**genes:** the units of code in human cells that are passed on from parents to children

**chromosomes:** strands of genes.



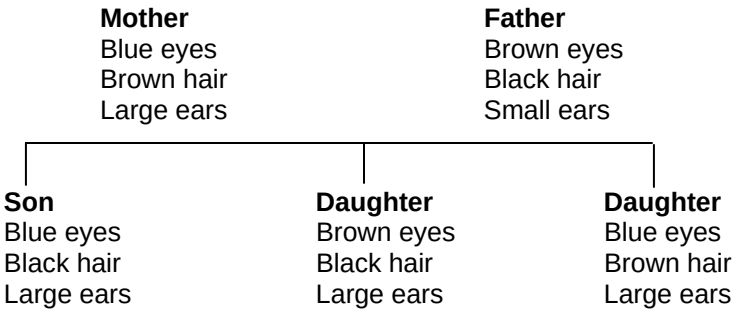
Growth and development in organisms is a result of:

- heredity (genetic material)
- environment (factors that influence us in our environment, such as nutrition).

Some of our characteristics are largely determined by genetics, but the environment still has a great impact on how we develop. If we relate human development to an elastic band, the elastic band is the genetic material, the stretching of the elastic band is the result of the environment.

4. Investigate and explain how human skin colour is influenced by both heredity and the environment. Use the following questions to guide you.
   - How does the colour of the parents' skin affect the skin of their children?
   - How do sunlight and other environmental factors affect the colour of skin?

5. Reflect on your family members, or the family of a friend or neighbour. Within one family, list physical traits of parents and children. Complete a chart similar to the one below.




Respond to the following questions.

- Why are the children not **exactly** like one parent or each other?
- How do inherited traits influence **diversity** in humans?
- How does diversity influence the **survival** of humans?

6. What traits can be inherited and what traits cannot be inherited? Discuss with a partner and fill in the chart below.

| Traits that **Cannot** Be Inherited | Traits that **Can** Be Inherited |
|---|---|
| *scars* | *eye colour* |