

Topic 1.1: How does an understanding of DNA help us investigate living things?

- The _____ in living things we see around us is due to DNA.
- DNA is made of many _____ linked together in a specific order.
- DNA exists in _____, which contain thousands of _____.
- The _____ of DNA is important to passing on information.
- The different genetic make-up of organisms is reflected in the _____ of living things.

Concept 1: The variation in living things we see around us is due to DNA.

- All living things have _____.
 - _____ among all organisms are due to _____.
 - **DNA:** _____ acid, a _____-stranded nucleic acid that stores _____ information
 - Differences in DNA result in variations in _____ and allow organisms to exist
 - in _____ aquatic and terrestrial ecosystems.
1. Why is there variation among organisms on Earth?
 2. Choose one group of organisms in Figure 1.1 and describe some of the similarities and differences between species in that group. Use examples not already listed in the text.

Concept 2: DNA is made of many nucleotides linked together in a specific order.

- _____ are the basic building blocks of _____ acids.
- There are _____ types of nucleic acids:
 - 1) DNA (_____ acid)
 - 2) RNA (_____ acid)

_____ consists of three components:

- 1) a _____ group
- 2) a _____
- 3) a _____ base

_____ **bases** in DNA include:

- 1) _____ (A)
- 2) _____ (C)
- 3) _____ (G)
- 4) _____ (T)

Characteristics of the DNA molecule:

- _____ strands of nucleotides
- Twisted ladder (double helix) structure
- Sides of ladder made up of _____ and _____ groups
- Rung of ladder is made of _____ _____ bases held together by _____ bonds

Nitrogenous bases that pair together are _____ **bases**:

- _____ (A) and _____ (T)
- _____ (C) and _____ (G)
- DNA stores _____ information.
- Parents pass their _____ on to their offspring.
- DNA codes for specific _____ that are essential for life functions.

- A complete sequence of DNA is called a _____
1. If the bases on one strand of DNA are ATGGGCTA, what is the sequence of complementary bases on the other strand of DNA?
 2. Think of an analogy to describe base pairs. Share it with a classmate.

Concept 3: DNA exists in _____, which contain _____ of genes.

- During _____, DNA exists as condensed fibres called _____.
- During _____, DNA is found in a very condensed form called _____.
- There are _____ chromosomes in human _____ cells.
- Half the chromosomes come from the _____ _____ and the other half are from the _____.
- Chromosomes are organized into _____ pairs:
 - - One pair consists of the _____ *chromosomes* (X and Y chromosomes).
 - The other 22 pairs are called _____.
- _____ **chromosome:** a chromosome that contains the same sequence of genes as another chromosome
- _____ chromosomes are not _____ to each other.
- _____: a part of a chromosome that governs the expression of a trait and is passed on to offspring
- _____: a different form of the same _____

Examining Chromosomes: The _____

_____ : a photograph of pairs of _____ chromosomes in a cell

1. Describe the relationships among chromatin, a chromosome, DNA, and a gene.
2. Make an analogy that helps explain homologous chromosomes.

Concept 4: The _____ of DNA is important to passing on genetic information.

- A cell replicates its DNA once in the _____.
- _____: a process that makes _____ copies of a DNA molecule
- Each new DNA molecule consists of an _____ strand and a _____ strand.
- _____ is used to produce _____.
- RNA is then translated to produce a _____.
- The sequence of _____ in the DNA molecule determines the specific sequence of _____
- _____ in the protein molecule.
- _____
- Explain how the structure of DNA is related to how genetic material is passed from one generation to the next.
- How are genes involved in the production of proteins?

Concept 5: The different genetic make-up of organisms is reflected in the _____ of life.

- _____ exists at three different levels:
- _____
- 1) _____ diversity
- 2) _____ diversity
- 3) _____ diversity
- **Species** _____: variety and _____ of species in a given area
- **Species:** group of organisms that can _____ in nature and produce _____ offspring
- _____ **diversity:** variety of inherited traits _____ a species
- _____ diversity is due to mutations in genes.
- **Gene pool:** genetic diversity within a _____
- _____: members of the same _____ living in the same geographical area at the same time

- **Ecosystem diversity:** variety of ecosystems in the _____
 -
 - Ecosystems are made up of _____ (living) factors and _____ (non-living) factors.
1. Describe the differences among the three types of biodiversity.
 2. Explain how variation in genes is related to all three types of biodiversity.

Topic 1.1 Summary: How does an understanding of DNA help us investigate living things?

The variation in living things we see around us is due to _____.

DNA is made of many _____ linked together in a specific order.

DNA exists in _____, which contain _____ of genes.

The structure of DNA is important to passing on _____.

The different _____ make-up of organisms is reflected in the _____ of living things.