

**NAME:**

**Class:**

**Science 9 Unit 1: Biological Diversity**  
***Reading Logs – SCIENCE FOCUS***

<b>Topic #</b>	<b>Topic Title</b>	<b>Science Focus Page</b>	<b>Due</b>	<b>Complete ✓ or X</b>	<b>Teacher Initial</b>
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<b>2</b>	Habitat and Lifestyle	16-26			
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## Grade 9 - Unit 1 – **Biological Diversity** Concepts

**Competition**

**Between Ecosystems**

**Within Ecosystems**

**Within Species**

**Species Distribution**

**Resource Partitioning**

**Niches**

**Interdependence (Symbiosis)**

<b>Commensalism</b> One Benefits, the other is not affected	<b>Mutualism</b> Both benefit	<b>Parasitism</b> One benefits, the other is harmd
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**Classification System**

Kingdom  
Phylum  
Class  
Order  
Family  
Genus  
Species

**Asexual**  
Binary Fission  
Budding  
Spore Production

**Vegetative**  
**Reproduction**

- cutting
- tuber
- runner
- sucker

**Selection**

**Natural**  
Occurs when the environment 'selects' which individuals within a species will survive to reproduce

**Artificial**  
Occurs when humans intervene using biotechnologies to select desirable characteristics

**Biotechnology**  
Cloning  
Artificial insemination  
In vitro fertilization  
Genetic engineering

**Variation**

**Heritable**  
Discrete  
Continuous

**Non-heritable**

**REPRODUCTION**

**Asexual**

**Sexual**

Flower

Human

**Science of Genetics is the study of how heritable characteristics are passed on from generation to generation.**

**DNA**

**Genetic Code**

**Chromosomes (46 in humans)**

**Genes (alleles)**

**Mitosis**

**Meiosis**

**Traits**

<b>Dominant</b> Always show when they are present	<b>Recessive</b> Show only when dominant traits are not present
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**Incomplete dominance**  
Offspring unlike either parent

**Environmental Factors**

**Impacts on Biodiversity**

**Natural causes**  
(earthquakes, volcanoes, floods, fires, lack of food, disease, overspecialization)

<b>Endangered</b>
<b>Extinction</b> <b>CRISWIC</b> <b>Extirpation</b>
<b>Threatened</b>

**Human causes**  
(habitat destruction, introduced species, over-hunting, pollution)

**Biodiversity Conservation Strategies**

- Protected Areas
- Restoration Programs
- Regulations and Restrictions
- Controlling Exotic Species
- Genetic Resources Conservation

**Biological Diversity and Survival****Page 6 – 15**

The \_\_\_\_\_ and \_\_\_\_\_ of organisms is called **Biological Diversity**.

Define Variation, and then give an example of a variation between you and a classmate (variation within a species) and an example of a variation between two different mammals (variation between species).

**Variation –**

Example 1 –

Example 2 –

**“Species”** refers to one type of plant or animal. Organisms are grouped as species if:

1 –

2-

**Explain why lions and tigers are not the same species:**

**What is SPECIATION? Define and give an example:**

**Provide a definition and example of each:**

<b>Adaptation</b>	
<b>Behavioural Adaptation</b>	<b>Structural Adaptation</b>

**Why is variation important? Convince me.**

**Formula for calculating Diversity Index**

**Good Diversity Index =**

**Bad Diversity Index =**

**Who came up with the system we use to classify animal populations? \_\_\_\_\_**

A Mnemonic is a learning technique that aids information retention. Come up with a mnemonic that will help you memorize:

**Kingdom – Phylum – Class – Order – Family – Genus - Species**

**Topic 1 Review:**

**Species diversity** – occurs within individual organisms of the same species.

**Genetic diversity** – occurs within organisms at a **cellular level**, as it describes the variety of genetic material in all living things.

**Species Distribution** – Plant and animal species are not distributed evenly throughout the various eco-regions of the world. Most of the different species of plants and animals can be found in tropical regions and, more specifically, in the rainforests. As you move closer to the poles of the Earth, there is less biological diversity.

**Topic 2: Habitat and Lifestyle  
16-26**

**Pages**

An organism’s **niche** includes two parts:

1. –
2. –

Give an example (not the deer example from your text) of how a variation between species may give one of them an advantage when competing for food or habitat:

The warblers on page 18 share a habitat by **resource partitioning**.

Using diagrams AND words, explain what resource partitioning is.

Niche Type	Resident Species	Species Example	Habitat Example
Broad			
	Specialist		

Explain “the trap of specialization” so that a grade 4 student could understand:

A \_\_\_\_\_ relationship is one in which two organisms live in direct contact. List the 3 types we discussed in class.

Type	Explain	Example

**What is an Invasive species?**

Are invasive species typically GENERALISTS or SPECIALISTS? (circle one)

Give 3 examples of invasive species in Canada, include 1 that is invasive to Alberta: (bonus points of diagrams)

**Topic 3: Passing it On**

**Pages 26 – 36**

What are **Heritable Traits**? Give 2 Examples.

	<b>Asexual Reproduction</b>	<b>Sexual Reproduction</b>
# of Parents		
Variation (Y/N)		
<b>Forms</b>	<p><b>Binary Fission:</b></p> <p><b>Budding:</b></p> <p><b>Spores:</b></p> <p><b>What is Vegetative Reproduction?</b></p> <p>Briefly describe the following and give an example of a plant that does it.</p> <p><u>Cuttings</u></p> <p><u>Runners</u></p> <p><u>Tubers/Bulbs</u></p>	<p><b>In Animals:</b></p> <p>Fertilization:</p> <p>_____ + _____ = _____</p> <p>a zygote develops into a _____</p> <p>New life develops either:</p> <p><i>IN-</i></p> <p><i>EX-</i></p> <p><b>In Plants:</b></p> <p>Pollination:</p> <p>Fertilization:</p> <p><u>Cross Pollination:</u></p> <p><b>What structures make up a seed?</b></p>

	<u>Suckers</u>	
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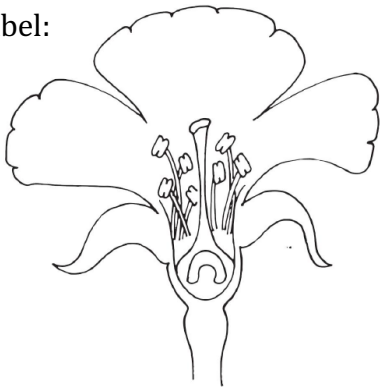
**Bacterial Conjugation:**

Diagram

Explanation

**Plant Reproduction:**

Label:



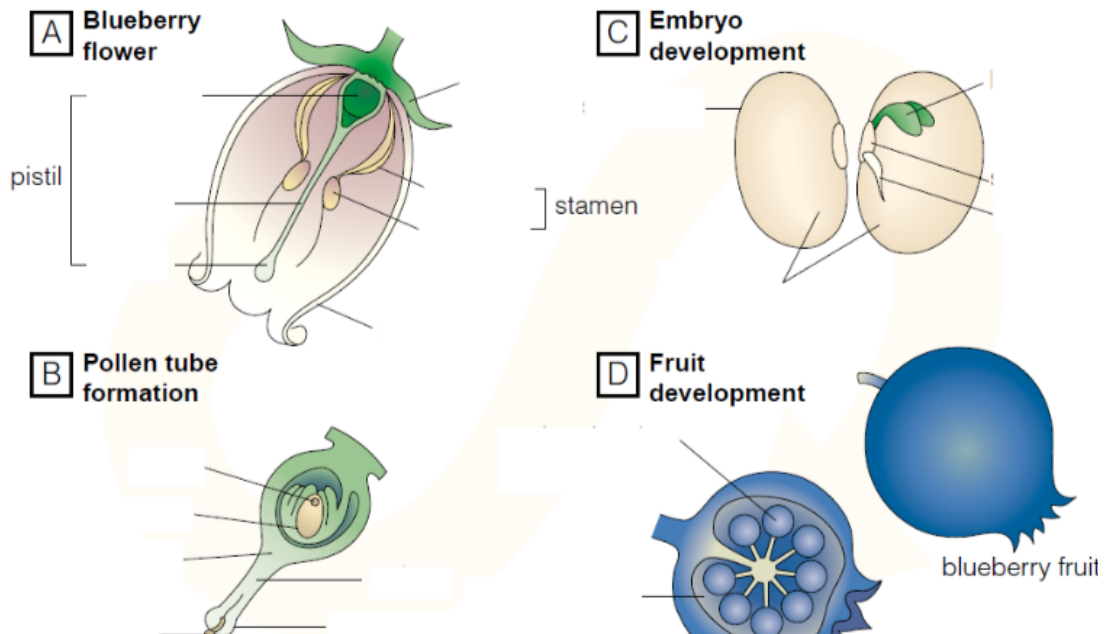
Explanation

**DEFINE**

Hermaphrodite:

Monotremes:

**LABEL**





**Topic 4: Wearing your Genes**

**Pages 37 – 45**

**Mendel's Laws of Heredity**

1. Each trait is controlled by two factors-genes (one from each parent)
2. Each gene has two forms (alleles) – dominant or recessive
3. For each trait an organism could inherit either:
  - Two dominant alleles
  - Two recessive alleles
  - One dominant and one recessive allele
4. The distribution of dominant and recessive genes from the parents to the offspring is determined by chance

Variation	Definition	3 Distinct Examples
Continuous Variation		- - -
Discrete Variation		- - -

**Environmental Influences**

True or False: Variations can result from interactions with the environment. (support your choice)

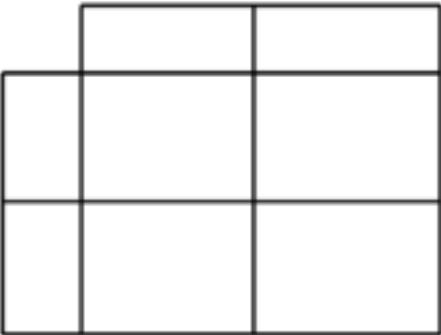
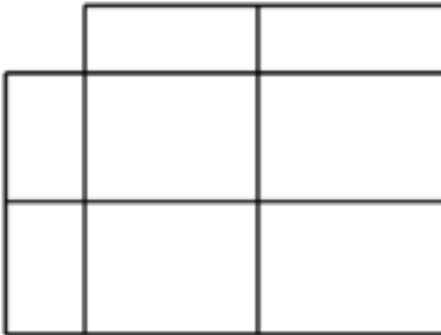
<b>Chromosomes</b>	<b>Genes</b>	<b>Alleles</b>

Use the terms dominant, recessive and alleles to define:

<b>Homozygous</b>	<b>Heterozygous</b>

\_\_\_\_\_ is known as the Father of Genetics.

Let's say that in seals the gene for the length of whiskers has two alleles. The dominant allele (W) codes long whiskers and the recessive allele (w) codes for short whiskers. Use a **Punnett Square** to answer the following questions.

<p><i>What percentage of offspring would be expected to have short whiskers from the cross of two long-whiskered seals, one that is homozygous dominant and one that is heterozygous?</i></p> <div style="text-align: center;">  </div> <p style="text-align: right;">_____ %</p>	<p><i>If one parent seal is pure long-whiskered and the other is short-whiskered, what percent of offspring would have short whiskers?</i></p> <div style="text-align: center;">  </div> <p style="text-align: right;">_____ %</p>
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**1.5 When Plans Change**

**Pages 46 – 57**

First identified by:

Structure

Discovered by (no relation):

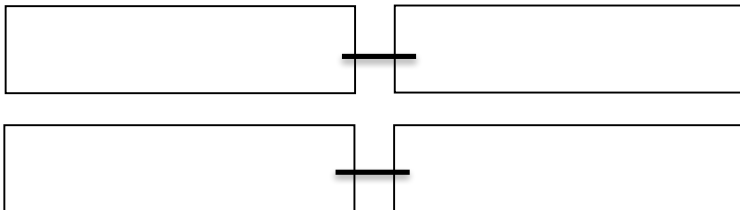
Detailed/labelled structure of a DNA Molecule:

**DNA:**  
**Deoxyribonucleic Acid**

Why are the terms "blueprint" and "code" used to describe DNA?

Where is DNA found?

**Nitrogen Base Pairs**



Humans have \_\_\_\_\_ PAIRS of Chromosomes for a total of \_\_\_\_\_.

Cells of multicellular organisms (like us) divide for growth of the organism and repair and replacement of tissues.

Somatic Cells (all cells other than sex cells) undergo \_\_\_\_\_

Sex Cells undergo \_\_\_\_\_

The major difference between the two processes is that to form sex cells, cell division occurs \_\_\_\_\_ times. The final result is that the gametes have only \_\_\_\_\_ the original number of chromosomes.

The process of randomly dividing 23 pairs of chromosomes in half creates the possibility of  $2^{23}$  different combinations of chromosomes! That's a lot of variation!

Most Cats have **19 pairs** of chromosomes (Meow). Draw and label the process for cellular division of a somatic and a sex cell in Fluffy:

<p><b>Somatic Cell Division:</b></p>          	<p><b>Sex Cell Division:</b></p>          
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Super Happy Fun Definition Time:

<b>Biotechnology</b>	
<b>Genetic Engineering</b>	
<b>Artificial Insemination</b>	
<b>In Vitro Fertilization</b>	

**Draw a picture to demonstrate your understanding of the hierarchy of the following:** Gene, Chromosome, DNA, Allele, Cell, Nucleus, DNA

**Fun Fact** - If you took the DNA from all the cells in your body and lined it up, end to end, it would form a strand 6000 million miles long (but very, very thin)! To store this important material, DNA molecules are tightly packed around proteins called histones to make **chromosomes**.

**Topic 6: The Best Selection**

**Pages 58 – 65**

<p><b>Artificial selection</b> <i>Definition</i></p>	<p><u>Example</u></p>	<p><u>Pros</u></p>	<p><u>Cons</u></p>
<p><b>Natural selection</b> <i>Definition</i></p>	<p><u>Example</u></p>	<p><u>Pros</u></p>	<p><u>Cons</u></p>

The Theory of Natural Selection can be summed up in four statements:

- 1.
- 2.
- 3.
- 4.

How did humans influence the natural selection of peppered moths?

**Topic 7: The Sixth Extinction**

**Pages 66 – 72**

Some areas in the world support greater biological diversity than others: why?

**What other factors influence biological diversity over the globe?**

Term	Definition	Example	Canadian Example
<b>Extinction</b>			
<b>Extirpation</b>			
<b>Bioindicator Species</b>			

**1.8 Pains and Gains**

**Pages 73 – 79**

How do Zoos and Seed Banks help prevent the decline of biodiversity?

Zoos	Seed Banks
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What happened in 1992?

What does COSEWIC stand for?

Complete the following table for COSEWICs classification of wildlife species: (hint- you need to look this up online!)

	<b>X</b>	
	<b>XT</b>	
	<b>E</b>	
	<b>T</b>	
	<b>SC</b>	
	<b>NAR</b>	

**Tell me about your favourite topic in this unit and why you enjoyed learning about it!**

**Biological Diversity Review – Key Terms**

Variation	Meristem	Mutation
Biological Diversity	Clone	Mutagen
Specie's	Budding	DNA
Speciation	Sexual reproduction	Chromosome
Structural Adaptation	Zygospore	Gene somatic cells
Behavioural Adaptation	Bacterial conjugation	Genetic engineering
Diversity Index	Zygote	Biotechnology
Environment	Pistil	Transgenic
Competition	Stamen	Aquaculture
Broad Niche	Ovule	Artificial selection
Generalist	Pollen Tube	Selective breeding
Specialist	Embryo	Natural selection
Narrow Niche	Cotyledon	Extirpation
Specialization	Self-Pollination	Bioindicator species
Symbiotic Association	Genetics	Seed bank
Heritable	Continuous Variation	Global treaties
Asexual reproduction	Discrete variation	Protected areas
Binary fission	Dominant trait	
Spore	Recessive trait	