



United Nations  
Educational, Scientific and  
Cultural Organization



**MOUNT  
ARROWSMITH**  
BIOSPHERE REGION

# BIOSPHERE BOOKLETS

Lesson Plans & Activities

## BIODIVERSITY

### SUMMARY/OVERVIEW

**Grades:**  
1-2

**Prep Time:**  
1 hour

**Learning  
Environment:**  
Outdoor & Indoor

**Total Lesson  
Length:**  
4 hours

#### DESCRIPTION:

This booklet introduces the concept of biodiversity to students and promotes a greater awareness of their environment, the importance of biodiversity, and how it affects us (including economically). Activities involve outdoor exploration as well as indoor worksheets and discussion topics. Students will examine some of the current threats to biodiversity as well as what can we do to help. Activities can be delivered separately or on the same day.

#### CURRICULUM EXPECTATIONS:

##### Questioning and predicting:

- Observe objects and events in familiar contexts
- Demonstrate curiosity and a sense of wonder about the world
- Ask questions about familiar objects and events

##### Processing and analyzing data and information:

- Experience and interpret the local environment
- Compare observations with predictions through discussion

#### BACKGROUND:

Biodiversity refers to the total number of different species found in the same area/habitat. Different species are interconnected and depend on each other for food, shelter, defense, etc. Biodiversity provides us with several "ecological services". The number of species in each habitat (biodiversity) is distributed differently across the globe, with more species found in the tropical/equatorial latitudes.

### LESSON PLAN

TIME	ACTIVITY	LOCATION	MATERIALS
1 hour	1. Introduction – What is Biodiversity?	Outdoor	Printed worksheet
30 mins	2. Benefits of Biodiversity	Indoor	Printed worksheet
2 hours	3. Threats to Biodiversity	Indoor	Printed worksheets, coloring pencils
30 mins	4. Conclusion – Survival of the Fittest	Indoor	Printed worksheet

TIME	ACTIVITY	LOCATION	MATERIALS
1 hour	1. Introduction – What is Biodiversity?	Outdoor	Printed worksheet

# Introduction: What is Biodiversity?

**GOAL:** Introduce students to the concept of biodiversity.

**PREPARATION:** Print page 3. Bring pens and clipboards (optional) to nearby park or school park.

**LESSON PLAN:**

**INTRODUCTION: Initial Discussion**

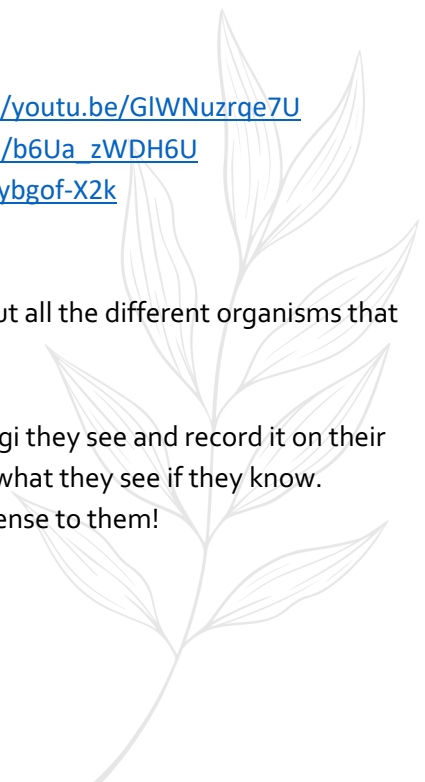
Ask students if they have heard the term “**biodiversity**” before. If so, ask them to explain what it is. If not, ask what they think it means by breaking down the name (bio=biological=living, and diversity=different)

**Biodiversity is the total amount (number) of species found in a certain area**

1. Ask if they have noticed or counted the **number of animals and plants** around them when they go out for a walk or even in their own backyard.
2. Explain the **interconnectedness** between species - as different animals eat different things. Animals can either be a **GENERALIST** (eats several different types of food), or it can have a specific **NICHE** diet, meaning it is very “picky”. (Disappearance of its food = Disappearance of the animal as well).
3. Here are some video links to help explain biodiversity to your students:
  - a. Why is Biodiversity Important with David Attenborough (5 min): <https://youtu.be/GlWNuzrqe7U>
  - b. What is Biodiversity with David Attenborough (3 min): [https://youtu.be/b6Ua\\_zWDH6U](https://youtu.be/b6Ua_zWDH6U)
  - c. Biodiversity with Bill Nye the Science Guy (23 min): <https://youtu.be/-Sybgof-X2k>

**HANDS ON: Counting Biodiversity - Gathering Data**

4. Take the students to a nearby park and explore the area with them, pointing out all the different organisms that exist there to highlight the biodiversity in that park.
5. Ask students to count the number of different animals, plants, insects, and fungi they see and record it on their worksheet. Students can also draw what they see or write down the names of what they see if they know. Encourage the students to record what they observe in whatever way makes sense to them!



# Our Park Findings!

At a nearby park, count the number of different plants, fungi, insects, and animals that you see! You can either count the number of different things you see, write down the names if you know them, draw pictures of what you see, or any combination of these. The goal is to record what you observe!

TIME	ACTIVITY	LOCATION	MATERIALS
30 min	2. Benefits of Biodiversity	Indoor	Printed worksheet

# What are the Benefits of Biodiversity?

## *What is biodiversity "good" for?*

**GOAL:** Understand the importance and effects of biodiversity.

**PREPARATION:** Print page 6 for each student.

**LESSON PLAN:**

**INTRODUCTION:** Ecological services "checklist".

Ask students why they think biodiversity is important. In other words, what is biodiversity "good" for? Biodiversity is beneficial because it provides us with several benefits or "services" that make life possible, and for free! Look over the checklist below to view some of the main biodiversity benefits:

- **SOIL** formation and quality maintenance – did anyone use any soil lately? The food you eat is certainly dependent on quality soil.
- Upkeep of **WATER QUALITY** by plants and filter-feeder organism such as clams, sponges and cyanobacteria. We need water to drink, to cook, to clean, and most importantly, our cells need water to work well.
- **WASTE REMOVAL** is done by decomposing fungi and bacteria. Waste includes not only animal droppings but dead/decaying leaves, trees, and animals, etc. These things don't just "disappear", they are recycled by animals that eat decomposing organisms (called detritivores).
- **POLLINATION AND SEED DISPERSAL** is crucial for the life cycle of plants, flowering or otherwise. It is the spread of pollen from one plant to another which ensures that the genetic material is passed on. Without pollination, most of the crops we have would disappear. Has anyone recently eaten plants that need pollination? Absolutely! Most berries, tomatoes, oranges, almonds, watermelons, cabbages, peppers, pumpkin, broccoli, apples, bananas, etc. require pollination.
- **MEDICINE & ECOTOURISM** are also provided by biodiversity. A lot of the medications we use today are derived from plants. Ecotourism refers to enjoying the outdoors while travelling. Medication that is dependent on plants include: aspirin, morphine, quinine. The horseshoe crab's blood is collected to be used in medications that help with our immunological system, frog skin components are used in some antibiotics, as well as some snake venoms. Has anyone ever taken a medication before?

**See word search for students below that uses terms from the above information.**

# Benefits of High Biodiversity

ANSWER KEY

W	A	S	T	E	A	B	W	R	B
E	T	O	U	R	I	S	M	P	I
C	M	G	S	U	N	L	O	O	O
O	E	F	G	S	O	I	L	L	D
S	D	P	O	F	T	Y	M	L	I
Y	I	Q	F	O	O	D	T	I	V
S	C	J	K	A	R	E	N	N	E
T	I	W	A	T	E	R	Q	A	R
E	N	L	M	F	V	B	Y	T	S
M	E	F	S	W	A	I	R	E	E

# Benefits of High Biodiversity

**WORD BANK:** WASTE SOIL WATER AIR POLLINATE FOOD MEDICINE TOURISM  
BIODIVERSE ECOSYSTEM

W	A	S	T	E	A	B	W	R	B
E	T	O	U	R	I	S	M	P	I
C	M	G	S	U	N	L	O	O	O
O	E	F	G	S	O	I	L	L	D
S	D	P	O	F	T	Y	M	L	I
Y	I	Q	F	O	O	D	T	I	V
S	C	J	K	A	R	E	N	N	E
T	I	W	A	T	E	R	Q	A	R
E	N	L	M	F	V	B	Y	T	S
M	E	F	S	W	A	I	R	E	E

TIME	ACTIVITY	LOCATION	MATERIALS
2 hours	3. Threats to Biodiversity	Indoor	Printed worksheets

# Threats to Biodiversity:

## *What is affecting biodiversity?*

**GOAL:** Show students that biodiversity isn't a fixed and permanent thing. It is delicate, currently vulnerable and needs to be protected.

**PREPARATION:** Print pages 8-10 for each student. Provide coloring pencils.

**LESSON PLAN:**

**INTRODUCTION: Initial Discussion**

Ask the students if they think **biodiversity is threatened** in any way. Give examples of threats to biodiversity. Some of the biggest threats to biodiversity are:

**HABITAT DEGRADATION**

Human developments often disrupt and/or destroy the natural habitat of many species. We expand and grow our cities, remove natural areas, and pollute, for example.

**INVASIVE SPECIES**

When animals are found in a habitat where they do not originate, meaning they are not in their natural habitat.

**CLIMATE CHANGE**

Many years of observation and research describe a trend in variations on Earth's climate. Global warming is just one consequence of climate change. Others are ocean acidification and species extinction.

**LOW POPULATION**

The higher the number of individuals a population has, the more variation of DNA (*an organism's "blueprint"*) there will be, leading to a healthier and stronger population of that species.

EXTRA VOCABULARY:  
**ENDEMIC** = a species that only exists in one area of the world.

EXTRA VOCABULARY:  
A species that is often **INTRODUCED** accidentally by humans can be also called an **ALIEN** species.

EXTRA VOCABULARY:  
**EXTIRPATION** = when a species disappears completely from an area that used to be its habitat. The species isn't **EXTINCT**, as populations in other locations of the world still remain.

EXTRA VOCABULARY:  
A small population leads to low **GENETIC VARIATION** (or **GENETIC DIVERSITY**), meaning that species has a lower chance of survival in the case of a catastrophic event or disease.

**HANDS ON:**

**Part 1: Biodiversity Drawing**

Have students draw two different images, one of what they think a very biodiverse area would look like, and the other of an area with very poor or no biodiversity.

**Low (or no) biodiversity:**

**High biodiversity:**



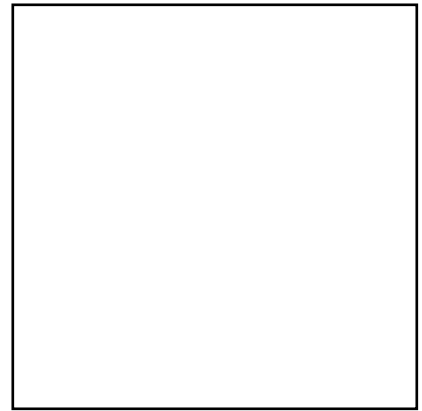
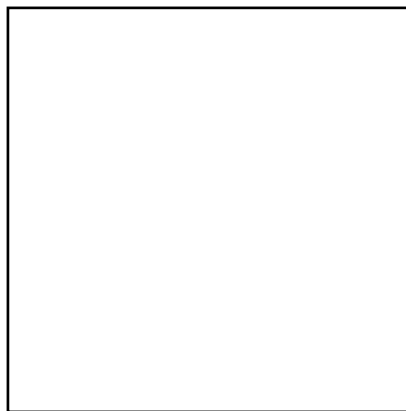
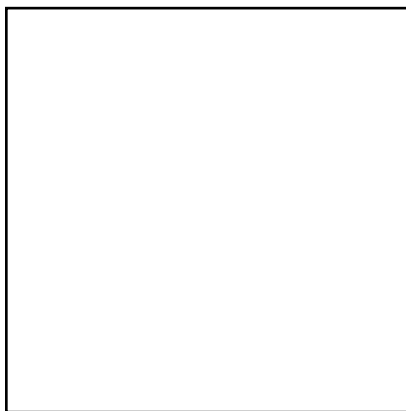
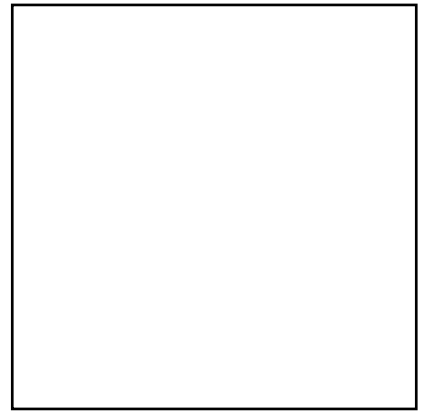
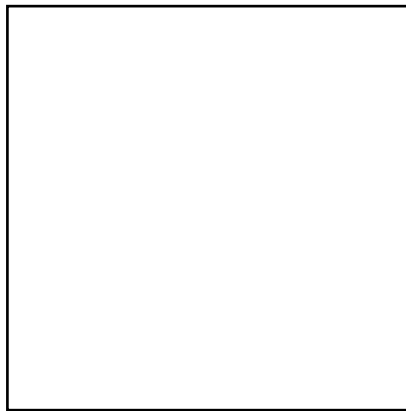
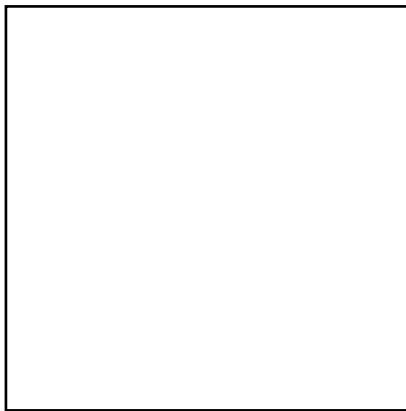
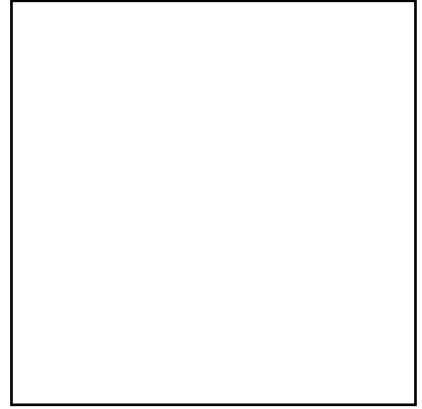
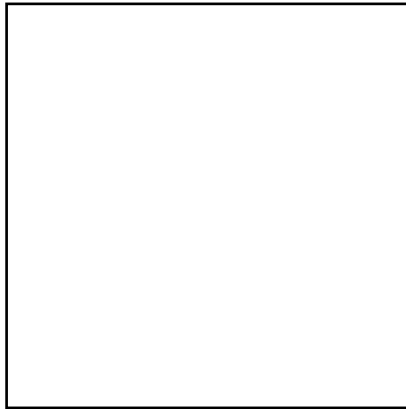
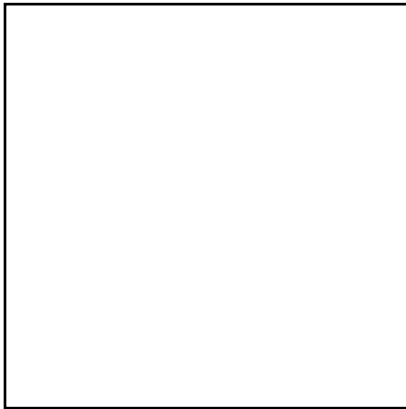
**Part 2: Create a Comic Challenge!**

Ask students to draw a comic strip (page 9 and 10) telling a story where they create a solution for a threat to biodiversity. The story can be a real-life case, or it can be a made-up case. The main focus is for students to create a viable solution for the problem.

Use the frames below to create your own comic story highlighting a threat to biodiversity, as well as a plan to preserve and save biodiversity.

Name:	Comic title:
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Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**TIME**  
30 min

**ACTIVITY**  
4. Conclusion

**LOCATION**  
Indoor

**MATERIAL**  
Printed and cut cards, tape

## Conclusion: Survival of the Fittest!

**GOAL:** Conclude the topic by understanding and playing with the famous phrase “survival of the fittest”.

**PREPARATION:** Draw a BLANK table like the one below (without the answers) on the board. Print the cards on the following pages (page 12-16).

ORGANISM	HABITATS			
	DESERT	TREE	CAVE	SEA
PLANT	CACTUS	ORCHID	NOT FIT (needs sunlight)	KELP
MAMMAL	MEERKAT	SQUIRREL	BAT	WHALE
FISH	NOT FIT (needs water)	NOT FIT (needs water)	CAVEFISH	SHARK
ARTHROPOD (insects + crustaceans)	SPIDER	BEETLE	CAVE MILLIPEDE	LOBSTER
BIRD	GREATER ROADRUNNER	WOODPECKERS	NOT FIT (uses sight to fly)	NOT FIT (cannot survive underwater)

### LESSON PLAN:

**INTRODUCTION:** With our new knowledge of the importance and meaning of biodiversity, it now becomes clear that the famous phrase “survival of the fittest” actually means “**survival of the one that is most fit to survive in its environment**” and not necessarily the *strongest* individual in a population, as it is commonly thought.

### HANDS-ON:

1. Give each student one card and ask them to place/stick their card in one of the available spots on the table drawn on the board. Check if the answer is correct and discuss with class. Encourage questioning and make sure the answer is correct before the student goes back to their desk. The goal is to complete the table and understand all the different (DIVERSE) types of “fitness”.

**CACTUS**

**ORCHID**

**NOT FIT**

**KELP**

**MEEKAT**

**SQUIRREL**

**BAT**

**WHALE**

**NOT FIT**

**NOT FIT**

**CAVEFISH**

**SHARK**

**SPIDER**

**BEEBLE**

**CAVE MILLIPEDE**

**LOBSTER**

**GREATER  
ROADRUNNERS**

**WOODPECKERS**

**NOT FIT**

**NOT FIT**



## HOW DO I HELP BIODIVERSITY?



Create beautiful, easy-to-maintain naturoscapes that attract birds and butterflies by



# Gardening with Native Plants



MountArrowsmithBR



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Mabr.ca

Show us your results! Snap a picture and share it with us on social media, or email it to the MABR Coordinator at



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