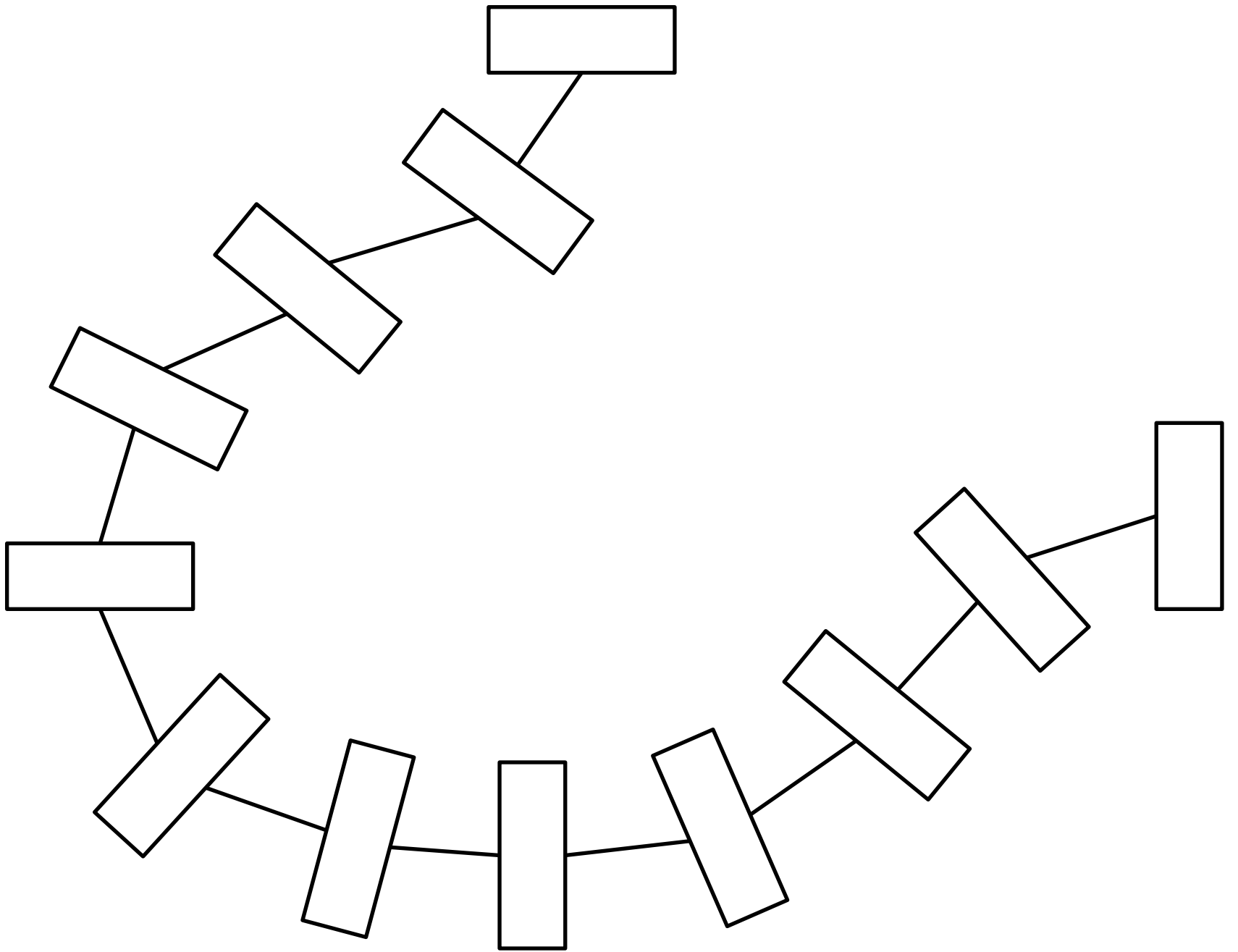
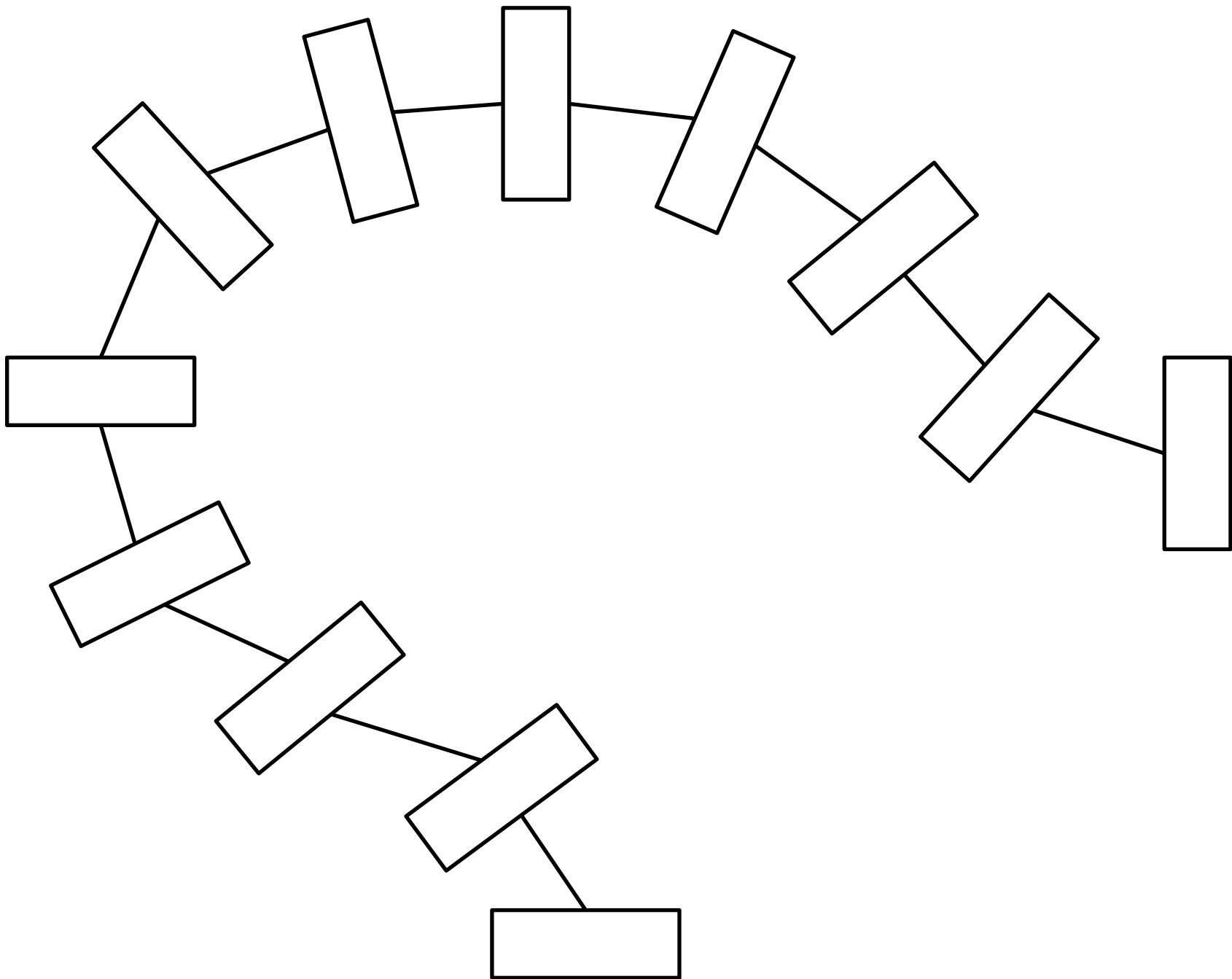
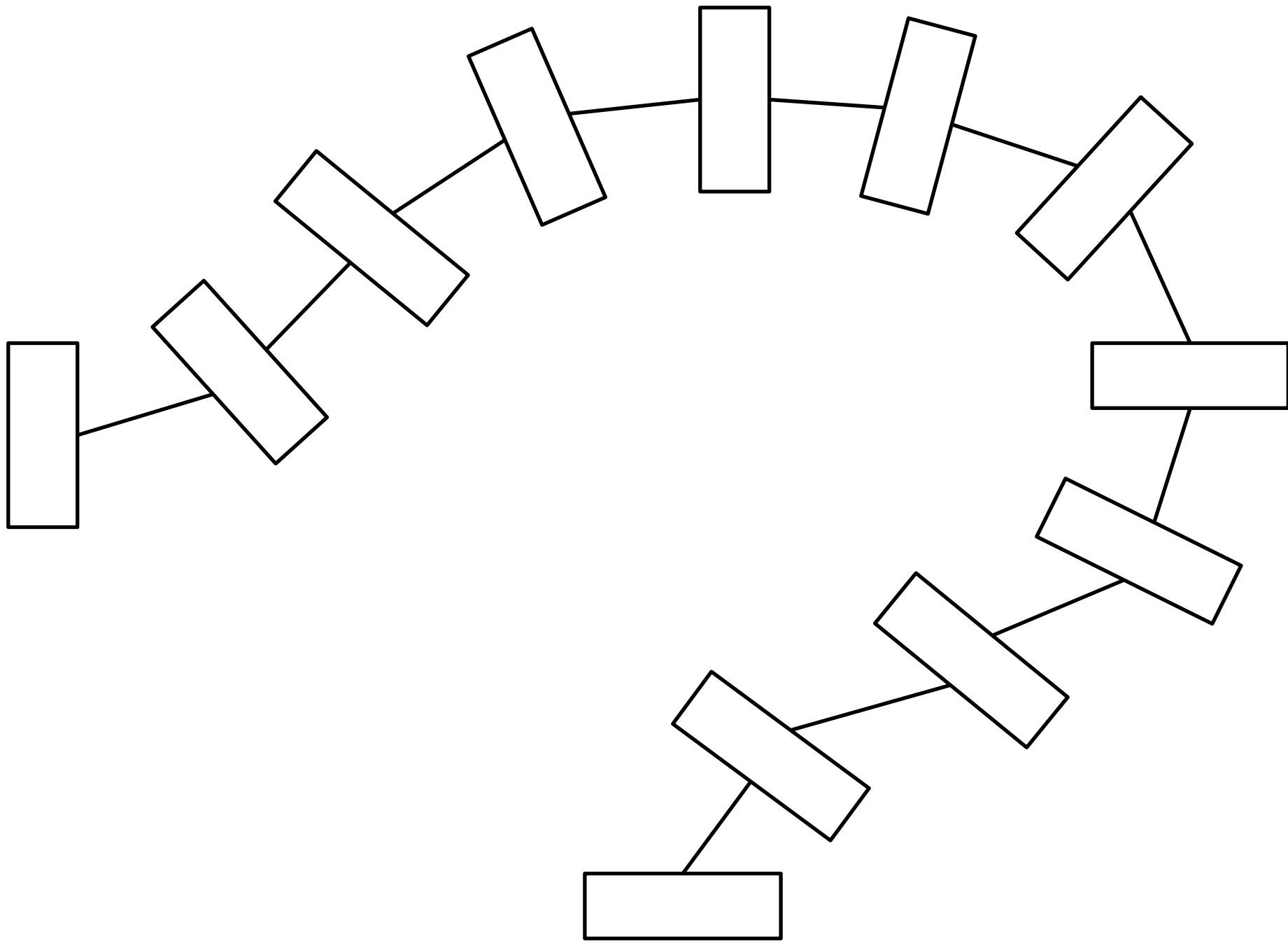


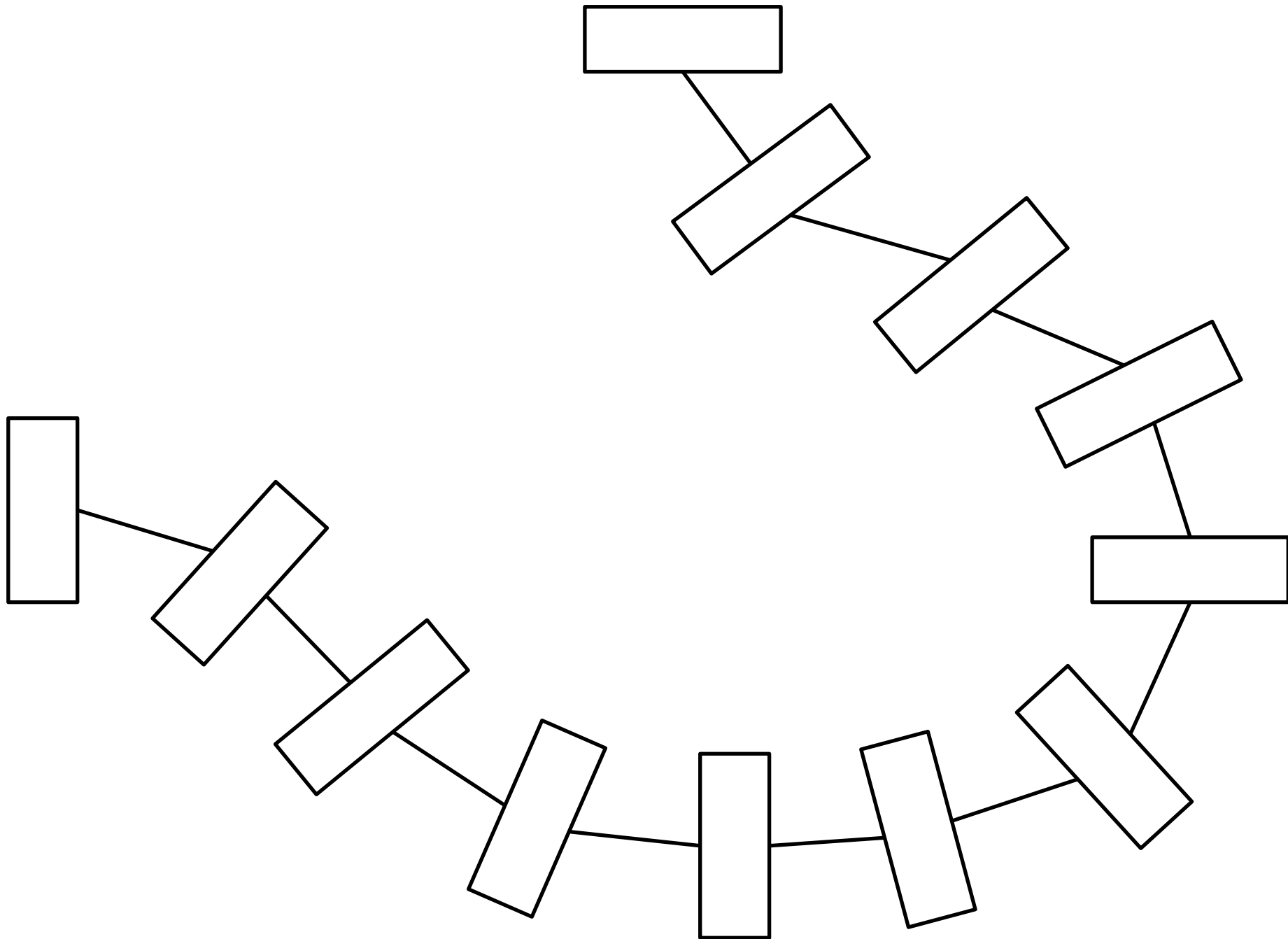
Game Pieces

Next pages: Game Board Sheets (four sheets make up one game board)









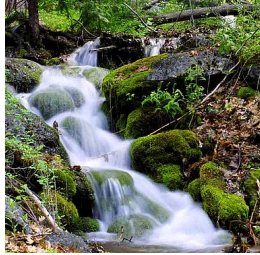
Day 1 – Game Path Colour Coding

Green	Green	Green	Green	Green	Green
Green	Green	Green	Green	Green	Green
Green	Green	Green	Green	Green	Green
Green	Green	Green	Green	Green	Green
Grey	Grey	Grey	Grey	Grey	Grey
Grey	Grey	Grey	Grey	Grey	Grey
Grey	Grey	Grey	Grey	Grey	Grey
Grey	Grey	Grey	Grey	Grey	Grey
Red	Red	Red	Red	Red	Red
Red	Red	Red	Red	Red	Red
Red	Red	Red	Red	Red	Red
Red	Red	Red	Red	Red	Red

Day 1 Abiotic Cards

Stream

A stream of water runs through this ecosystem. Streams are abiotic but support many life forms by supplying water and habitats.



1 Point

Boulder

A boulder lies in the way. Boulders provide many places to hide for small animals. Plants such as mosses and lichens love to grow on rocks.

1 Point

Question:

Ask the other players:

Is sand a biotic or abiotic component?

Answer: Abiotic.

Everyone who has the right answer gets

1 point.

You receive one point as well.

Light

Light is essential for most life forms. Light provides energy for plants to grow. Plants convert carbon dioxide into oxygen and their own carbon based structures through **photosynthesis**. Light also provides warmth to all life forms.

2 Points

Day 1 Abiotic Cards

Temperature

Temperature has a huge impact on an ecosystem. Think how different a river valley looks in Canada, in a jungle, or in a desert.

1 Point

Humidity

Humidity is the amount of water in the air and soil. In a humid environment ecosystems tend to be a lot more diverse than in a dry environment.

1 Point

Question:

Ask the other players:

Is the atmosphere an important abiotic component?

Answer:

Yes, without our atmosphere life would not be able to exist. The atmosphere provides air that we breathe.

1 point for everyone who said yes.

Soil

Not all soils are the same. Some are nutrient rich and support lush vegetation. Others are poor soils and only small plants can grow there.

1 Point

Day 1 Abiotic Cards

Atmosphere

Besides providing the air we breathe, the atmosphere also helps regulate the temperature on Earth. Without atmosphere it would be much colder, and there would be huge swings in temperature between night and day.

1 Point

Shade

Some life forms prefer shade. Shady areas can support certain plants and provide shelter for certain animals.

1 Point

Challenge:

Ask the other players to:

Give one example of something abiotic you drew on YOUR part of the game board.

Everyone who can come up with something gets 1 point.

Dam

A dam holds back water allowing a pond or lake to form. Many life forms depend on this still water for survival. Beavers are a good example – they even make their own dams!

1 Point

Day 1 Biotic Cards

Birds

Have you ever wanted to see a dinosaur? Well, just look at a bird! They are the closest living relatives to dinosaurs and can be found almost anywhere above ground or water! Birds are consumers!

1 Point

1 Bonus Point: Give an example of what birds consume.

Fish

Some of the most amazing ecosystems are under water. Where there is water there are almost always fish.

Some of the most famous aquatic ecosystems are coral reefs, which team with colourful fish large and small.

1 Point

Challenge:

Ask the other players to:

Name their favourite ecosystem. Why is it their favourite ecosystem? Also tell them about your favourite ecosystem.

Answers:

Could be anything from a jungle to the Serengeti , Antarctica or the local pond!

1 Point for everyone.

Mammals

Mammals are animals who's young drink their milk. They can be top predators (and big consumers) or small scurrying animals like mice. A mouse is a **primary consumer**, while an animal eating a mouse is a **secondary consumer**.

2 Points

Day 1 Biotic Cards

Coral

No ecosystem in our seas and ocean is more abundant than coral reefs. Corals themselves are living organisms that support the most amazing life forms.

Corals form the largest structures made by living organisms.

1 Point

Fungi

Fungi are present everywhere. They are all **decomposers**. Examples include the mold on food that's been left out too long and the mushrooms we eat for dinner!

1 Point

Question:

Ask the other players:

What is the name of the largest living organism on Earth? (Hint: It's a coral reef)

Answer: The Great Barrier Reef.

The player who answers correctly FIRST gets one point.

Plants

Plants are the **producers** so many other life forms depend on. Humans, for example, eat many plants. The animals we eat also got their nutrition from plants. Without plants the food chain of most ecosystems would collapse!

2 Points

Day 1 Biotic Cards

Trees

Trees can be an ecosystem all on their own and of course they are important parts of many larger ecosystems. They provide food and shelter to animals. Many small plants grow on or under trees as well.

1 Point

Microbes

We can't see them but microbes do extremely important work in breaking down waste materials. Microbes are **decomposers**.

1 Point

Question: Ask the other players:

Is your own body an ecosystem?

Answer:

YES! Our body is home to billions of tiny organisms that live within us. It may sound gross but most of those microbes do beneficial work that we depend on for our survival.

1 Point to any player who said yes.

Virus

Viruses can be present in many ecosystems. They especially love living within animal and human hosts.

1 Point

Day 1 Biotic Cards

Earthworms

You may think the earthworm is a decomposer, but strictly speaking it is actually a consumer as it eats rather than absorbs material the way fungi or microbes do. Still, it helps with decomposition of materials through its hard work.

1 Point

Lice

Yes, lice come in many varieties in many ecosystems. They are definitely **consumers!**

1 Point

Challenge:

Ask the other players to:

Name a producer in the ecosystem around the school.

Examples:

Apple tree, berry bush, grass, pretty much all animals (they consume but also produce waste, that for example bugs may feed on).

1 Point to every player who made a good guess.

Mosquitos

We know them well. We are their source of food as they consume blood (at least when they want to lay eggs).

Though annoying, they are important in the **food web**. Birds eat them and they help **pollinate** many plants.

1 Point

Day 2 Cards - Producers

Trees

Trees produce many things that many animals can consume. For example nuts, fruits, and leaves.

2 Green Points

Grass

Grass is the main source of food for many animals large and small. Can you name one?

2 Green Points

A Pine Tree

Some animals eat the needles of pine trees.

1 Green Point

Plants

Plants are the **producers** so many other life forms depend on. Humans, for example, eat many plants. The animals we eat also got their nutrition from plants. Without plants the food chain of most ecosystems would collapse!

2 Green Points

Day 2 Cards – Producers

Algae

Many water creatures love to feast on algae. Water snails for example.

1 Green Point

Apple Tree

Many animals love apples. In winter, squirrels may pick frozen apples right from the branches. In summer, you may find a lot of wasps feeding on apples that have fallen from the tree.

1 Green Point

Lichen

Especially in the northern tundra lichen can be an important source of food, making it a key producer in that ecosystem.

1 Green Point

Phytoplankton

Phytoplankton are small algae that use solar energy for photosynthesis. They are a key producers in the aquatic food chain.

2 Green Points

Day 2 Cards – Producers

Dandelion

Dandelion make a tasty treat for cows.
They are producers!

1 Green Point

Clover

Clover make a tasty treat for cows. Many
other animals also love clover.

1 Green Point

Berries

Berries are small fruit that many plants
produce. Birds, bears, and humans are
just a couple of examples of consumers of
berries!

1 Green Point

Phytoplankton

Phytoplankton are small algae that use
solar energy for photosynthesis. They are
a key producers in the aquatic food chain.

2 Green Points

Day 2 Cards - Consumers

Birds

Have you ever wanted to see a dinosaur? Well, just look at a bird! They are the closest living relatives to dinosaurs and can be found almost anywhere above ground or water! Birds are consumers!

1 Point

1 Bonus Point: Give an example of what birds consume.

Mammals

Mammals are animals who's young drink their milk. They can be top predators (and big consumers) or small scurrying animals like mice (who are consumers, but also producers since they are a food source for many larger animals).

2 Points

Water snails

Water snails eat food like algae. They in turn become food for some fish.

Convert 1 green point to 1 red point.

Mosquitos

We know them well. We are their source of food as they consume blood (but only when they want to lay eggs). A mosquitoes' primary food source is actually plant nectar.

Though annoying, they are important in the **food web**. Birds eat them and they help **pollinate** many plants.

Convert 1 green point to 1 red point.

Day 2 Cards - Consumers

Wasps

Wasps love to **consume** fruit such as apples. They also use wood to make their papery nests.

Convert 1 green point to 1 red point

Caribou

Caribou can survive in a very harsh ecosystems by being creative eaters. They are one of the few animals eating lichens!

Convert 1 green point to 1 red point

Water snails

Water snails eat food like algae. They in turn become food for some fish.

Convert 1 green point to 1 red point.

Wolves

Wolves are top predators in their ecosystems. They eat small animals like mice but also large ones like caribou in Northern Canada.

Convert 1 green point to 1 red point

Day 2 Cards - Consumers

Zooplankton

Zooplankton are tiny animals that live close to the surface of lakes and oceans. They feed on phytoplankton. They are **primary consumers** in the aquatic food web.

Convert 1 green point to 1 red point

Salmon

Salmon eat many things, including zooplankton.

Convert 1 green point to 1 red point

Bears

Bears actually eat a lot of berries. They will also wait for **salmon** jumping up water falls and rapids. Bears are top predators who depend on the whole food web below them for survival.

Convert 1 green point to 1 red point.

Cows

Cows almost never stop eating. They love grasses and flowers of all kinds.

Convert 1 green point to 1 red point

Day 2 - Decomposers

Microbes

We can't see them but microbes do extremely important work in breaking down waste materials. Microbes are **decomposers**.

Erase 1 red point

Fungi

Fungi are present everywhere. They are all **decomposers**. Examples include the mold on food that's been left out too long and the mushrooms we eat for dinner!

Erase 1 red point

Button Mushroom

The button mushroom is a decomposer. It break downs and "eats" dead **plants**, like your compost pile does.

Erase 1 red point

Bacteria

Bacteria break down organic matter. They are extremely important in our ecosystems. All the bacteria of the world may weigh more than all humans, animals, AND plants combined!

Erase 1 red point

Day 2 – Decomposers

Honey Fungus

The honey fungus can cover huge areas. One fungus in Oregon measures over 3.8 km across, making it **the largest living organism on Earth**. Individual mushrooms poking out of the soil are just small parts of this one giant organism!

Erase 2 red points

Fungi

Fungi are present everywhere. They are all **decomposers**. Examples include the mold on food that's been left out too long and the mushrooms we eat for dinner!

Erase 1 red point

White Truffle

This mushroom grows underground and is considered a great delicacy. Some large truffles have been sold for over \$300,000!

Erase 1 red point

Why do they matter?

What do you think the Earth would look like without decomposers? If nothing that died vanished and became soil? Indeed there would be no soil – and hence no life forms depending on soil, such as plants and humans!

Erase 1 red point

Day 2 Special Cards

1. A break in the food web!

Due to a disease the berry crop has failed this year. Look through the **consumer cards** (red) and find any animals that eat berries. These animals now have to move somewhere else to look for food. Therefore remove these cards from the red playing deck.

2. A break in the food web!

Algae growth has failed in a local lake. Can you find any **consumers** that eat algae? If so, remove them from the red playing deck.

3. A break in the food web!

There is a phytoplankton shortage. Find **ALL consumers** who are affected by this. So if an organism eats phytoplankton, continue now to find what other animals eat THIS organism etc.

Remove all cards that are affected. Had any of these animals already been affected by the berry shortage? What might happen to them now?

Day 3 – Animal Profiles

Invasive Species - Goldfish

Habitat to start: 1 unit



Resource use (every turn):

Food = 1 unit if dice roll is 1 or 2

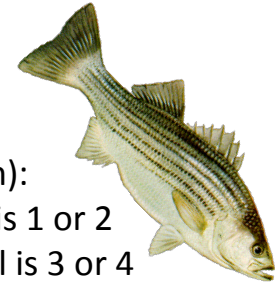
2 units if dice roll is 3 or 4

3 units if dice roll is 5 or 6

Habitat: 1 unit + 1 unit if you roll 5 or 6

Native Species – Bass

Habitat to start: 7 units



Resource use (every turn):

Food = 1 unit if dice roll is 1 or 2

2 units if dice roll is 3 or 4

3 units if dice roll is 5 or 6

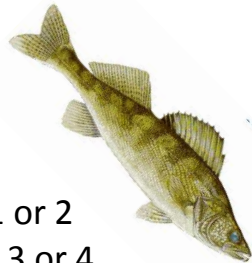
Habitat = +1 unit if dice roll is 5 or 6

-1 unit if dice roll is 1 or 2

otherwise, no change.

Native Species – Walleye

Habitat to start: 7 units



Resource use (every turn):

Food = 1 unit if dice roll is 1 or 2

2 units if dice roll is 3 or 4

3 units if dice roll is 5 or 6

Habitat = +1 unit if dice roll is 5 or 6

-1 unit if dice roll is 1 or 2

otherwise, no change.

Native Species – Water Snail

Habitat to start: 7 units



Resource use (every turn):

Food = 1 unit if dice roll is 1 or 2

2 units if dice roll is 3 or 4

3 units if dice roll is 5 or 6

Habitat = +1 if dice roll is 5 or 6

-1 if goldfish has more than 5

habitat units

Day 3 - Rule Reference Cards

Keep these handy to make playing the game easier. For every round you complete follow the steps on the first card.

Actions each round:

1. Add 6 food resources to the food bank
2. Determine order of play for the round. Player with the most habitats goes first, followed by the others in order of habitat size.
3. Each player takes a turn:
 - a. Roll dice and move token.
 - b. Pick up food resources
 - c. Pick up/lose habitat resources

Rule summary:

- Food: If food bank doesn't have enough, take what there is, **but you lose one habitat resource** no matter what you rolled. Place the resource back in the bank.
- Habitat: If bank is empty take a habitat resource from any other player EXCEPT the invasive species.
- If your roll gives you a habitat resource you can take it even if you lost one due to lack of food just before.

Actions each round:

1. Add 6 food resources to the food bank
2. Determine order of play for the round. Player with most habitats goes first, followed by the others in order of habitat size.
3. Each player takes a turn:
 - a. Roll dice and move token.
 - b. Pick up food resources
 - c. Pick up/lose habitat resources

Rule summary:

- Food: If food bank doesn't have enough, take what there is, **but you lose one habitat resource** no matter what you rolled. Place the resource back in the bank.
- Habitat: If bank is empty take a habitat resource from any other player EXCEPT the invasive species.
- If your roll gives you a habitat resource you can take it even if you lost one due to lack of food just before.

Day 4 Human Impact Cards

Photocopy each of the two pages 2 times per group so that you have 24 cards in total per group

A new road has been built.

The road cuts off your usual migration route and there is a chance you could get hit by a car.

If you roll **4 or higher** you are able to adapt and find a new safe way to cross this area.
If you roll **below 4** you lose **1 point**.

Sewage Leakage

Due to heavy rains, raw sewage has washed into the water.

If you roll **3 or higher** you are able to adapt by avoiding the polluted waters.
If you roll **below 3** you lose **1 point**.

Residential Development

Several new houses have been built where previously there was a forest. This was your habitat.

If you roll **5 or higher** you find a new suitable habitat where you find shelter and food.
If you roll **less than 5** you lose **1 point**.

Hunting

It's hunting season and you (the deer) might be in the target!

If you roll **4 or higher** the hunter got a wolf and you luckily now have one fewer predator to worry about.
If you roll **below 4** the hunter got a deer! You lose **1 point**.

Noise Complaint

A noisy park has just opened up nearby. Especially young animals may need to be in a peaceful and quiet environment to feel safe.

If you roll **3 or higher** you are able to find a den a bit further away that is quieter.
If you roll **below 3** you lose **1 point**.

Garbage Dumped-Not

Someone carelessly threw their fast food leftovers out of the car window.

If you roll **4 or higher** the garbage was collected by someone and did not wash through the river to the ocean where it could seriously harm wildlife.
If you roll **below 4** you lose **1 point**.

Day 4 Human Impact Cards

(Photocopy each of the two page 2 times per group so that you have 24 cards in total per group)

Fire

Someone did not properly extinguish their campfire. A wild fire has now started to spread.

If you roll **5 or higher** you can escape the blaze safely.

If you roll **less than 5** you lose **1 point**.

Oil spill

Oil has leaked from a car and has run into a stream.

If you roll **4 or higher** you are not in the path of the oil.

If you roll **below 4** you lose **1 point**.

Huge oil spill

A train has derailed and a major oil spill has taken place. Oil can coat birds feathers, pollute drinking water, and poison aquatic life.

If you roll a **6** you are able to escape this mess.

If you roll **below 6** you lose **1 point**.

Battery Recycling – Not

Someone threw batteries into the regular garbage. The acid can leak out and pollute ground water.

If you roll a **3 or higher** the leak is contained within the dump.

If you roll **below 3** you lose **1 point**.

Pesticide use

This area is exposed to heavy pesticide use due to industrial farming. Pesticides can kill life forms who were not meant to be targeted, such as bees.

If you roll **4 or higher** you did not get caught up in the toxic cloud.

If you roll **below 4** you lose **1 point**.

Heavy storms

Due to climate change the number of heavy storms has increased significantly. This can lead to great destruction, such as flooding, and erosion.

If you roll **5 or higher** are able to adapt to this higher frequency of climate induced weather events.

If you roll **below 5** you lose **1 point**.

Day 4 "No Impact" Cards
(One photocopy per group)

Humans were careful to keep the cat inside. No impact (on the birds).

Humans did not release goldfish into pond. No impact.

Humans rode their bike instead of driving. No impact.

Humans stayed on the trail. No impact.

Humans took their garbage with them today. No impact!

Humans used biodegradable shampoo. No impact.

Humans were careful not to start a wildfire. No impact.

Humans helped a turtle across the road. No negative impact.

Humans didn't pick any endangered flowers. No Impact.

Humans didn't carve their names into the tree. No impact.

Day 5 Protection Program Cards
(One photocopy of each of the two pages per group)



Animal Bridge

We can build bridges for animals in areas where many cross roads. Animals can safely cross the highway by using the bridge.

If you roll **4 or higher** you find the bridge and safely cross the highway and **gain 1 point**.



Wetland

An area has been protected as a wetland. Wetlands can absorb water during a flooding event and help to clean the water as well.

If you roll **3 or higher** the wetland absorbed flood waters, preventing pollution from washing into the river. **You gain 1 point**.



Urban Park

Even in areas where many people live we can allow for many animal and plant species to survive if we build an urban park. These parks are especially valuable along rivers and lakes.

If you roll **5 or higher** you are a lifeform that found a safe home in a park. **You gain 1 point**.



Hunting Season

By setting up hunting seasons that give the animals peace when they have babies we can ensure their populations don't decline.

If you roll **4 or higher** the hunting season allowed you to raise your young successfully without being hunted. **You gain 1 point**.



Large Park (e.g. Provincial Park)

Some animals and plants really need large areas of land to be protected so they can get away from human disturbances. Wolves are a good example of such animals.

If you roll a **3 or higher** you have found a home in a park large enough to allow your species to thrive. **You gain 1 point**.



Garbage Cleanup

A group of caring citizens collected all the trash that was left behind by others, blown here by wind, or washed up here in a flood.

If you roll **4 or higher** this is your habitat and you are much happier now that it is clean. **You gain 1 point**.

Day 5 Protection Program Cards
(One photocopy of each of the two pages per group)

Fire Fighters!

Often humans are able to stop wildfires. We can also reduce the occurrence of uncontrolled wild fires by burning areas in a controlled burn from time to time.

If you roll **5 or higher** you benefit from a good fire management plan and survive. **You gain 1 point.**

Protected Area

Some areas are very sensitive to pollution. If , for example, we can ban oil from being transported through such areas we can ensure that no disaster will strike here.

If you roll **4 or higher** an important area was protected so that it is safe from any oil spill. **You gain 1 point.**

Clean-up After a Spill

Rapid response after an oil or chemical spill is crucial to reduce the impact of such disasters.

If you **roll a 6** humans reacted quickly and effectively and saved you from a spill of chemicals or oil. **You gain 1 point.**

Recycling Programs

Recycling programs allow us to use materials over and over again without having to extract more through mining. These programs also reduce pollution.

If you roll a **3 or higher** a good recycling program exists which makes this environment cleaner. **You gain 1 point.**

Organic Farming

Organic farms do not use products that can negatively affect many life forms living on the land.

If you roll **4 or higher** you are able to find a home on an organic farm. **You gain 1 point.**

Global Action

Some issues require action on a global scale. Politicians and industry must agree to change the way they do things in order to prevent catastrophic outcomes. Acid rain, climate change, and the ozone hole are such issues.

If you roll **5 or higher** we all worked together to make the world a better place. **You gain 1 point.**