

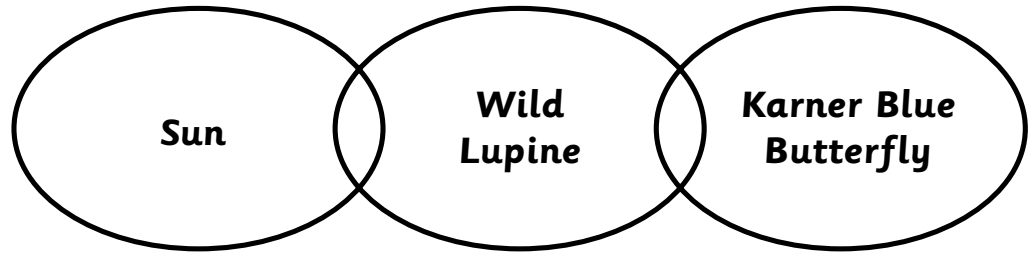


Life Connections

> Section A) Food Chains

A food chain is a diagram that shows how certain animals depend on each other for food. They are each like links in a chain, connected to each other for survival. Every food chain starts with the sun, because all living things rely on the sun's energy to live.

i) Here is an example of a basic food chain:



The wild lupine needs energy from the sun

The larval Karner blue butterfly needs the wild lupine for food

ii) Look at the following list of plants and animals. Pick a group of four life forms that are linked, and draw their food chain in the ovals below (don't forget to start with the sun).

lion

shark

palm tree

mountain goat

polar bear

wasp

grass

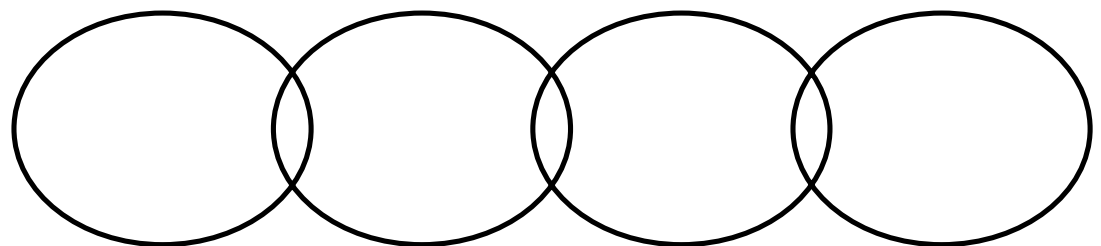
penguin

hummingbird

lake trout

antelope

tube worm





Name: _____

> **Section B) The Yarn Game**

The Yarn Game helps us to understand the effects of removing even one living creature from the food chain.

1. Divide into groups of six.
2. Form a circle.
3. Each student in the circle picks an identity: frog, hawk, snake, sun, grasshopper, grass.
4. The sun holds on to one end of a ball of yarn, and passes the ball across the circle to the next link in the food chain. That student holds the line of yarn taught between them, and passes the ball to the third link in the food chain. Continue the process until the group reaches the top of their chain. Be sure to keep the line of yarn taught as it crisscrosses the circle.
5. Once all groups have completed their food chains, the teacher will call out the name of one of the creatures in the chain, who immediately lets go of the yarn.
6. What happens to the yarn? How many other members in the group are affected by the missing link in the chain? As a class, discuss what the effects of removing that link would be in nature.
7. Repeat steps 5 and 6 until you've discussed the role of each link in the chain, and the effects of removing each one.

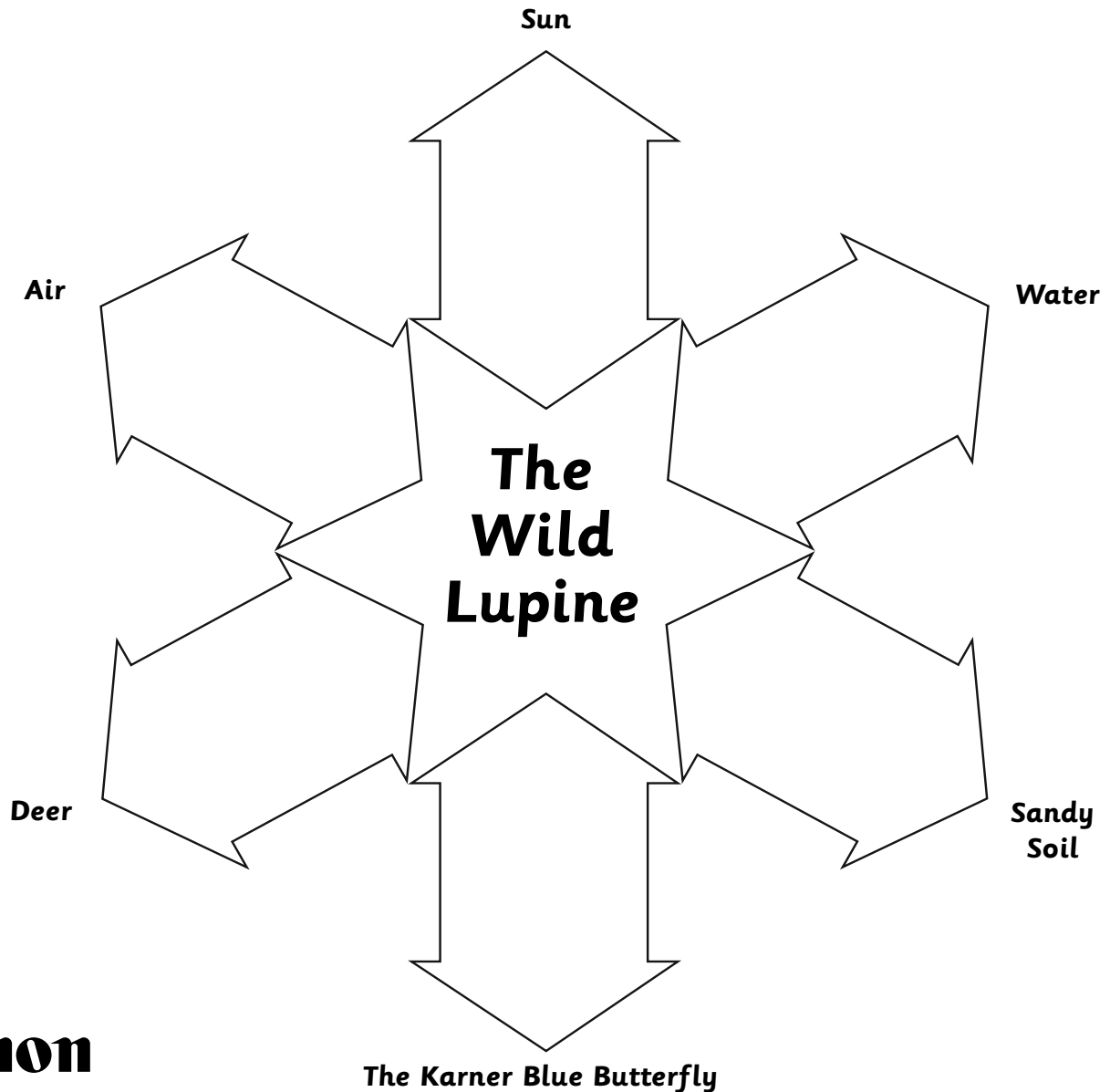


Name: _____

> **Section C) More Life Connections: What Else Do We Need to Survive?**

i) **Food** is not the only thing that living things need to survive. All plants and animals also need **sun, air, and water**. Since *all* living things need these elements to survive, we must share them. In this way, all plants and animals are linked in very complex ways. In the reading passage, you learned that changing even one of the conditions in the wild lupine's ecosystem set off a series of events that threatened the survival of the Karner blue butterfly.

In the diagram below, write in the arrows to explain how these elements are connected.

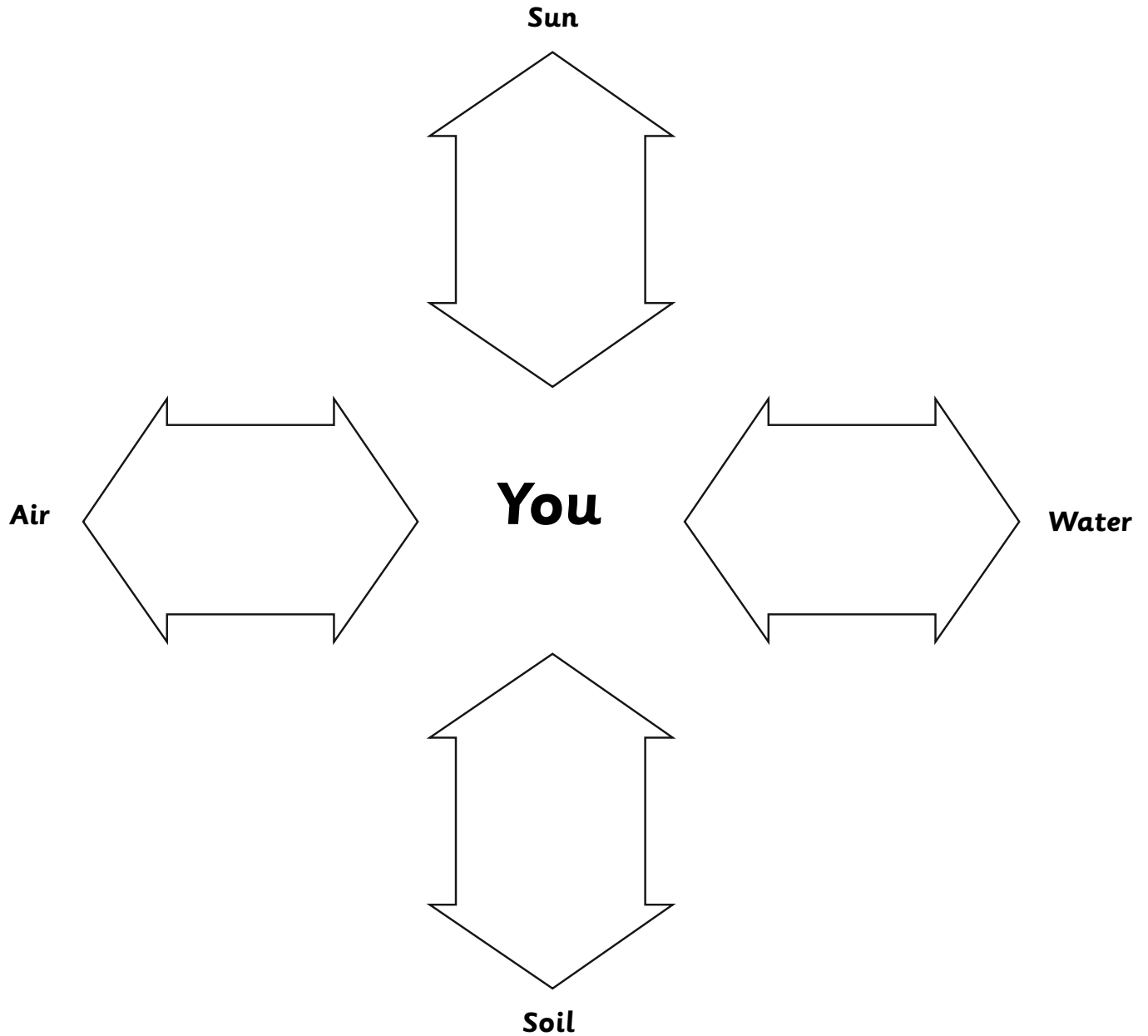


The Karner Blue Butterfly



Name: _____

ii) Create a similar diagram that explores some of the non-living elements that you depend on for survival. Don't forget to write in the arrows to explain why you need these elements to live.





Name: _____

iii) Can you think of any human activities that are causing changes to sunlight? What effect are those changes having on humans? On other animals and plants?

iv) Can you think of any human activities that are causing changes to the air? How are those changes affecting plants, humans, and other animals?

v) Can you think of any human activities that are causing changes to the soil? How are those changes affecting plants, humans, and other animals?





Name: _____

vi) Can you think of any human activities that are causing changes to the water? How are those changes affecting plants, humans and other animals?

vii) What would happen if there were no more plants? Could humans survive?





> **Section D) Mother Earth, May I?**

Here's a game to help you think about what you can do to help fix the damage that human activity has had on other living and non-living things. How can the things you use, eat and do help stop or reverse these changes?

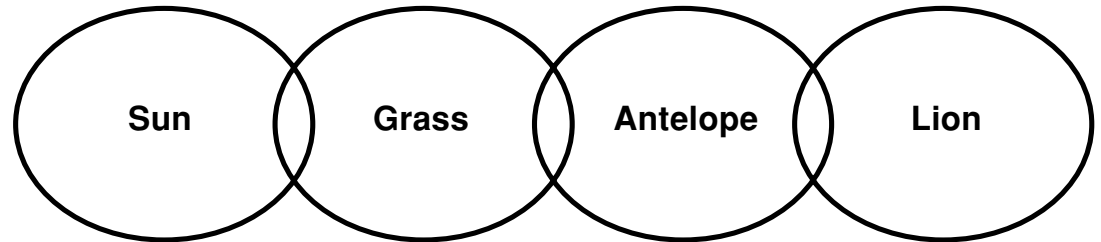
1. To start, all students stand at the back of the classroom. Your teacher (Mother Earth) stands at the front of the class.
2. Each student takes a turn asking, "Mother Earth, may I take a step forward?"
3. In response, Mother Earth will ask, "What will you do to help my _____?" Her question could be about water, air, soil, sun, animals or plants. For instance, she might ask, "What will you do to help conserve my water?" or "What will you do to conserve wood from my trees?"
4. The student must then offer one suggestion that answers her question. If the student makes a good suggestion, Mother Earth will say "Yes!" and the student will be allowed to take a step forward. If Mother Earth says "No!" the student must stay in place and give another student a turn.
5. The first student to get close enough to tag Mother Earth gets to take her place and ask the questions. All other students must return to the back of the class and start again.



Answers: Life Connections

Section A) Food Chains

ii)



Section B) The Yarn Game

Once the web is completed, help students understand what happens when an organism is removed from the chain. Help students understand how each link is connected to other organisms.

- Sample question: What happens when the grasshopper is removed from the chain?
- Sample answer: The frog wouldn't have enough to eat. The grasshopper wouldn't have control over its population. And indirectly, the snake wouldn't have enough frogs to eat, and then the hawk wouldn't have enough snakes to eat.

Section C) More Life Connections: What Else Do We Need to Survive?

i) **Sun:** The lupine needs the sun's energy to grow.

Water: Plants need water to drink.

Air: Plants absorb air, they need it for energy.

Karner Blue Butterfly: The larval Karner blue butterfly only eats wild lupines.

Sandy Soil: Wild lupines only grow in sandy soil.

Deer: Deer eat wild lupines.



Answers: Life Connections (continued)

ii) **Sun:** We need sunlight for energy.

Air: We need air to breathe.

Water: We need water to drink.

Soil: We need soil to grow our food.

iii) Open:

- The ozone layer acts like a shield, protecting us from harmful sun rays.
- In the past, humans caused damage to the ozone layer by using CFCs, chemicals that humans used to cool things (in refrigerators) or to make the foam used in disposable take - out food containers.
- Holes in the ozone layer let in more UV rays, causing eye and skin damage to animals and humans, and damage to plants.

iv) Open:

- Burning fossil fuels (used to heat houses and power planes, cars and trucks) pollute the air.
- Air pollution causes respiratory illnesses in humans and animals, making it harder to breathe.
- As carbon dioxide pollution accumulates in the air, it causes the greenhouse effect, causing global warming.
- Increased global warming causes droughts, floods and drastic changes to ecosystems that will wipe out many species of plants and animals.

v) Open:

- Cutting down trees removes roots that help keep soil moist. Without enough plants, the soil erodes, dries out and loses nutrients.
- Soil erosion, in turn, kills off other plants and the animals that rely on those plants for food or habitat.
- Pesticides (used to get rid of unwanted insects) and herbicides (used to get rid of weeds) contaminate the soil, causing damage to the plants and animals who live in the soil or eat the plants that grow there.

Canon



Answers: Life Connections (continued)

vi) Open:

- Water pollution caused by oil spills or water traffic from ships and boats harms plants and animals in our lakes and oceans.
- Dumping of toxic waste and garbage into the water is also a threat to plants and animals.
- Fertilizer and pesticide runoff also pollute water, and can alter ecosystems in the water by killing off certain plants and animals.
- Global warming is melting the glaciers, causing rising water levels around the world. Ensuing climate change, floods and droughts would drastically change ecosystems, wiping out many species.
- When we destroy wetlands, we lose natural water purification, which can result in more contaminated water for plants and animals.

vii) No. Possible reasons include:

- We directly rely on fruit, vegetables and grain for food.
- Even carnivores indirectly rely on plants because fruits, grains and vegetables feed their prey.
- Without trees we wouldn't have any wood products for shelter.
- Without plants we wouldn't have most of the medicines that we depend on.
- Plants absorb carbon dioxide from the air, which reduces greenhouse gases, helping to regulate the Earth's temperature.

Section D) Mother Earth, May I?

Sample questions:

Note: Questions can be repeated, as they have multiple answers.

- What will you do to help prevent global warming?
- What will you do at home to waste less water?
- What will you do in the classroom to waste less energy?
- What will you do to burn less fossil fuels?
- What will you do to protect my forests?
- What will you do to use less paper?
- What will you do to help protect (an endangered animal or plant)?
- What will you do to help protect my oceans?
- What will you do to produce less garbage?

Canon



Answers: Life Connections (continued)

Sample answers:

- Lobby the government to make companies stop pouring pollutants into lakes and rivers.
- Invest in cleaner forms of energy, like solar, hydro, or wind power.
- Stop using chemical pesticides, herbicides, and fertilizers.
- Write letters to your M.P. to protect our resources.
- Support environmental and conservation groups.
- Take shorter showers and fewer baths.
- Use cleaning products without harmful chemicals.
- Don't run the tap while you're brushing your teeth.
- Don't flush chemicals like paint down the drain.
- Use sustainable forestry methods, replant trees.
- Protect the species of plants and animals that we have by learning more about their ecosystems.
- Don't clear land without finding ways to protect the species in the ecosystem.
- Re-use scrap paper.
- Buy recycled paper products.
- Make rags out of scraps of old fabric.
- Wash your clothes in cold water.
- Reuse glass and plastic containers.
- Bring your lunch in a reusable container rather than a paper bag.
- Turn off electrical appliances and lights when you are not using them.

Canon