Grassland Food Webs: Teacher Notes

Alan Henderson ©

Activity 1

Food chains & food webs in a grassland ecosystem

Objectives

After completing this activity students will be able to:

- Create a food web and identify producers, consumers, herbivores and carnivores.
- Explore adaptations of herbivores and carnivores.

Target audience

Year 5

Activity 1

Food chains & food webs in a grassland ecosystem (Level 5)

Duration

Two 50-minute sessions

Materials

- Whiteboard and whiteboard markers
- Sixteen food chain role play cards, printed and laminated with a hole in the top middle, with a piece of string attached (to form a necklace)
- Printed copy of the food web role play answers
- Ball of string
- Class set of computers with BWVP Grassland Food Webs learning object
- Student workbook
- Pencil

Activity

All living things require energy for survival including growth, reproduction and repair. Some organisms produce their own food while others need to consume other organisms to obtain nutrients and energy. The interaction between organisms and the flow of nutrients and energy through ecosystems will be explored in this activity.

Introduction

Begin this lesson by engaging students in a brainstorming session about grassland food chains. Students should list the animals and plants that live in grasslands. Discuss how plants create energy and introduce the term photosynthesis. Discuss the diets of grassland animals and introduce the terms habitat, herbivore, carnivore, omnivore and predator. Record student responses on the board and consider these prompts to keep the discussion lively (answers have been provided).

What is a habitat?

A habitat is the place where an animal or plant makes its home.

What plants and animals live in grasslands habitats?

Students may talk about tussock grasses, wildflowers, shrubs, trees, birds of prey, insects, wallabies,

kangaroos, lizards, etc.

How do plants and animals make food?

Plants make food using a process called photosynthesis. Photosynthesis uses the sun, carbon dioxide from the air and water containing dissolved materials from the soil to make energy. Animals rely on plants or other animals for their food.

What is a herbivore?

A herbivore is an animal that only eats plants, such as leaves, grass, berries, bark, etc., e.g. a cicada.

What is a carnivore?

A carnivore is an animal that only eats other animals e.g. an Eastern Brown Snake.

What is an omnivore?

An omnivore is an animal that eats plants and animals e.g. a Southern Brown Bandicoot.

What is a predator?

A predator is an animal that hunts for food e.g. a Brown Falcon.

Food chains

Students will explore food chains in grasslands. Pose the following questions to explore food chains.

What is a food chain?

A food chain shows who eats who.

Write the following food chain on the board.

Tussock Grass → Cricket → Lizard → Wedge-tailed Eagle

Ask students to explain the food chain. If needed explain that the Tussock Grass is eaten by the Cricket… which is eaten by the Lizard… which is eaten by the Wedge-tailed Eagle. The arrows point in the direction in which the energy flows. The Tussock Grass gets its energy from the sun. The first organism is the producer, which is always a plant. All the other organisms in the food chain are consumers. Ask students to identify the producer and consumers in the food chain. Also, ask students to identify the herbivore

(Crickets) and the carnivores (Lizard and Wedge-tailed Eagle), and the top predator (the Wedge-tailed Eagle).

Of course, many different animals eat Tussock Grass, and Crickets can eat other grasses and plants. Lizards and Wedge-tailed Eagles can eat many different types of animals too. Each of these living things can be a part of a multitude of food chains. All of the interconnected and overlapping food chains in an ecosystem make up a food web.

Food chain and food web role play

Students will further develop their understanding of these concepts by undertaking the following group exercise. You will need the 16 organism cards and a ball of string. The idea of this exercise is for students to visualise who eats who in the grassland and to understand how animals are linked in a food web. First, hand out all the cards, one per student (there may not be enough cards for all students however those that miss out can assist with the links). Then choose a plant, and ask the student to read out what eats it. Students with these cards stand next to the plant and then ask a student (without an organism card) to link the organisms with the string. Ensure the links are going in the correct direction. Continue until the food chain is complete. Use the remainder of the cards and keep adding more food chains. When there are many food chains and they start to link together, explain that a food web is forming. The food web answers are provided in the Teacher Resource section.

Discuss the results of the food web as a class. Ask students to identify the following in the food web:

- Producers
- Consumers
- Herbivores
- Carnivores
- Omnivores
- Predators

Food chains unbalanced

Explore what happens in an ecosystem if one organism is removed (from causes such as extinction). Use the following example to explore this. Explain that an insecticide has been sprayed on the grassland and the cicadas have died. Ask the cicada to sit down. Explain to students that to show the impact this has on the grassland, could all the students who are directly linked to the cicada to also sit down. Ask all of those students who are directly linked to also sit down and so on. Ask students who are left? Producers and a couple of insects should remain. Ask students how the death of the cicadas affected the grassland? Also

ask what would happen to the producers and the other insects? Conclude this discussion by explaining that life in any ecosystem is in a delicate balance and changing one organism in a food chain can alter that balance. Ensure students understand that all plants and animals are linked and depend on each other and their environment. Ask students to complete questions 1-3 in their workbook.

BWVP Grassland Food Webs Learning Object

Students can now put their knowledge to the test by completing the Very Easy Food Chain and Easy Food Web online activity. It is recommended that students at Level 5 complete the Very Easy Food Chain first then complete the Easy (no feral cat) Food Web. When finished ask students to draw their food chain and food web in their workbook and complete questions 4-8. Students may wish to complete the Medium (no feral cat) Food Web as an extension activity.

Adaptations

Students will now explore teeth in mammals with varying diets. Initially, talk about adaptations and how they benefit a plant or animal. Record student responses on the board and consider these prompts to keep the discussion lively (answers have been provided).

What is an adaptation?

An adaptation helps an organism survive in its environment. An adaptation is passed down from one generation to the next. An adaptation can be structural; it is a physical part of the organism, or behavioral; affecting the way an organism acts.

What is a structural adaptation?

A structural adaptation is a physical part of the organism.

What is a behavioral adaptation?

A behavioral adaptation affects the way an organism acts.

Do teeth differ between herbivores and carnivores? Why?

Yes. Diets differ between herbivores and carnivores therefore their teeth will differ too.

What do carnivores eat? What would your teeth need to be able to do if you were a carnivore?

Carnivores eat meat. These animals will need sharp teeth to pierce and rip apart prey and other teeth to grind the food.

What do herbivores eat? What would your teeth need if you were a herbivore?

Herbivores eat plants. These animals will need teeth to tear and grind their food.

Are teeth a structural or behavioral adaptation?

Teeth are a structural adaptation.

After the brainstorm, ask students to answer questions 9-10. Students will look at the diets and compare the teeth of herbivores and carnivores. Prompt students to refer to the animals diet and then examine the teeth to determine why they are present.

Conclusion

Conclude the session by engaging students in a brainstorming session about the activities. Here are some examples of discussion points to keep the discussion lively.

Can you give me an example of a producer?

How does a producer gain energy?

Can you give me an example of a consumer?

How does a consumer gain energy?

Give an example of a food chain?

What is a food web?

What organism is always at the start of a food chain?

What does a herbivore eat?

What does a carnivore eat?

What does an omnivore eat?

What are incisor teeth used for?

What are canine teeth used for?

What are molar teeth used for?

How do the teeth of a herbivore differ from a carnivore?

Students will complete the conclusion questions in their workbook.

Food chains and food webs in the grassland ecosystem

1. **What is a food chain?**

A food chain shows who eats who.

2. **Link the following terms to their meaning:**

Term	Meaning
Producer	These organisms eat plants.
Consumer	These organisms produce their own energy using the sun, carbon dioxide and nutrients in the soil. These organisms are always at the start of a food chain.
Herbivore	These organisms eat animals.
Carnivore	These organisms eat plants and animals.
Omnivore	These organisms consume other organisms to gain energy.

3. **If an insecticide (chemical used to kill insects) is sprayed on a grassland what might happen to the animals and plants?**

The insects may die which means that the animals that rely on these animals as a food source may not survive. This also means that the plants will not be eaten. This would affect the balance within the ecosystem.

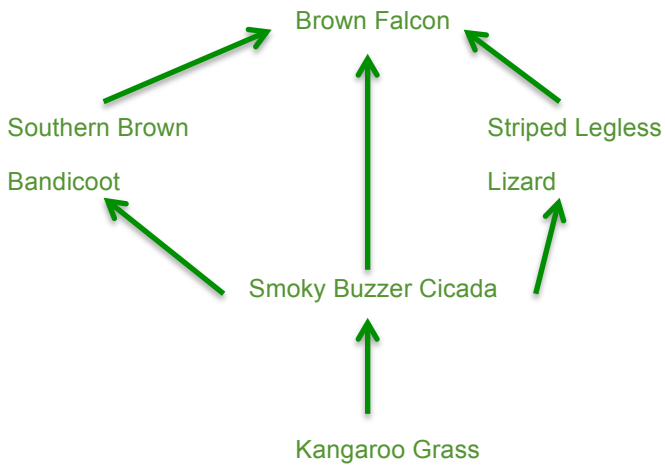
BWVP Grassland Food Webs Learning Object

Complete the Very Easy Food Chain and Easy Food Web using the BWVP Grassland Food Webs learning object.

4. **Draw the food chain in the space below.**

Common Everlasting Daisy → Australian Painted Lady → Spotted Marsh Frog → Growling Grass Frog → Tiger Snake

5. **Draw the food web in the space below.**



6. **Complete the following table. Tick whether the organism is a producer or consumer, herbivore or carnivore.**

Organism	Producer	Consumer	Herbivore	Carnivore
Common Everlasting Daisy	✔			
Australian Painted Lady		✔	✔	
Spotted Marsh Frog		✔		✔
Growling Grass Frog		✔		✔
Tiger Snake		✔		✔

7. **Which organism is the top predator?**

The Tiger Snake is the top predator.

8. **Which organisms eat other animals?**

Spotted Marsh Frog, Growling Grass Frog, Tiger Snake

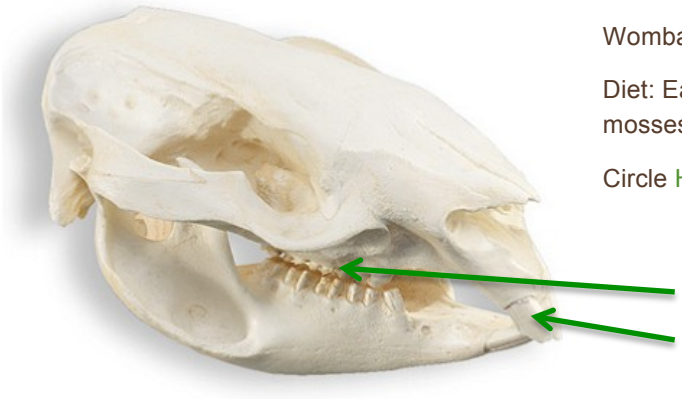
Adaptations

You can guess the diet of a mammal by looking at its teeth. There are three different types of teeth:

- Incisors are located at the front of the mouth and used for biting and cutting
- Canines are next along and are long and sharp, and used for tearing and piercing
- Molars are at the back of the mouth and used for chewing and grinding

Explore teeth in mammals with different diets.

9. **Look at the skull images and diet information. Identify whether the animal is a herbivore or carnivore. Label the teeth in the spaces provided as incisor, canine or molar.**



Wombat

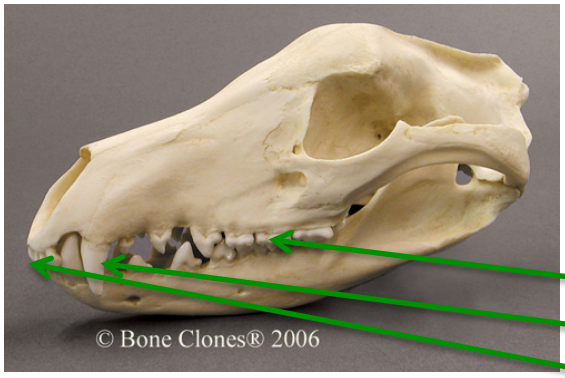
Diet: Eats roots, shoots, leaves, grasses, herbs and mosses.

Circle Herbivore or Carnivore

Molars

Incisors

Source: Southern Biological



Tasmanian Tiger

Diet: Eats wallabies and other small animals and birds.

Circle Herbivore or Carnivore

Molars

Canines

Incisors

Source: Southern Biological

10. Which type of teeth are present in carnivores but not present in herbivores? Why?

Canines are not present in herbivores. These teeth are used to pierce and tear meat, which is not needed in plant eating animals.

Conclusion

11. Are plants always at the base of the food chain?

Yes, plants are always at the base of a food chain.

12. Why are green plants called producers?

Green plants make their own food through a process called photosynthesis.

13. Why are animals considered consumers?

Animals get their energy by consuming plants and other animals.

14. The arrows in a food chain point in which direction?

The arrows in a food chain point in the direction the energy flows.

15. If you take one organism out of a food chain, how does this affect all the other plants and animals in the food chain?

Taking one organism out of the food chain can affect the balance and the ability for other organisms to survive.

16. What adaptation do you think animals need to effectively hunt prey?

Teeth are an adaption of animals that enables them to hunt effectively.

17. How are teeth of a herbivore and carnivore different?

Carnivores have canine teeth that are used to pierce and tear meat. Carnivores generally have more incisors at the front of their mouth.