Feeding frenzy

Background

All plants and animals require energy to live. Plants obtain energy from combining sunlight, carbon dioxide gas and water in a process called photosynthesis. Animals obtain their energy from consuming or eating other organisms so energy from one organism is transferred to another. A way to represent how food and energy is passed through a group of organisms is by constructing a food chain diagram. Here is an example of a food chain from the Kimberley region.

grass → grasshoppers → frogs → quolls

The diagram shows that grass is eaten by grasshoppers; grasshoppers are eaten by frogs; and frogs are eaten by quolls. The arrows show the direction that the energy (food) is flowing.

In this activity you'll role-play these three animals from the Kimberley region to show how their feeding relationships work.

It is important that the numbers of each type of animal in an ecosystem are balanced. There needs to be a certain number of each type of organism to survive predation and to be able to share their food supplies. You will explore what happens to numbers of organisms should the overall balance be changed.

Procedure

Your aim is to eat enough to survive, and not to be eaten yourself!

As a class you need to work out how to create a food chain so that enough of each species survives to create a balanced ecosystem. To balance the food chain in this game, at least two grasshoppers, two frogs and one quoll must survive.

After each round, you may make changes to the rules until you balance your food chain. Note any rule changes in the 'special conditions' column of your results table. Examples of rule changes may include: changing numbers of some types of animals at the start of the round, timed release of animals or having a 'safe' spot.

When you've balanced the food chain, add an introduced species: cane toads, to see how it affects the balance.

GAME RULES:

- Divide into 3 equal groups: grasshoppers, frogs and quolls.
- Collect, and put on, colour bib or ribbon that shows group you're in.
- Teacher spreads popcorn on ground to represent grass.
- Collect plastic bag (to represent your animal's stomach).
- Grasshoppers pick up popcorn (grass) and put in bags (stomachs).
- Frogs tag (eat) grasshoppers. If tagged, grasshoppers empty bags (stomach contents) into frog's bag. Tagged (dead) grasshoppers sit out of game until round ends.
- Quolls tag frogs. If tagged, frogs empty stomach contents into quoll's bag. Dead frogs sit out.
- Animals catch only species directly before them in food chains (quolls don't eat grasshoppers or grass, only frogs; frogs eat only grasshoppers).
- Play game in rounds. Each lasts 5 minutes or until all one species is dead.
- At end of round, grasshoppers need bags filled to bottom line (4 cm); frogs and quolls to top line (6.5 cm), or they starve to death and are also out.
- On sheet below, record number of each animal alive at end of round.
- After each round class may change rules, to try to balance food chain, and teachers may scatter more 'grass'.

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When you have balanced the food chain:

- Introduce cane toads by adding extra frogs (to the balanced food chain).
- Ask frogs to agree on which one (or two or three) of them, is a cane toad. Keep this secret from quolls.

Results

ROUND	NUMBER ALIVE AT START			NUMBER ALIVE AT END			SPECIAL CONDITIONS
	grasshoppers	frogs	quolls	grasshoppers	frogs	quolls	
1							
2							
3							
4							
5							
6							

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