Ecological Scavenger Hunt

Grade: 5-6

Time: 1 hr

Activity Overview :

Today you are going to be embarking on a scavenger hunt at home to investigate food pyramids and the interconnectedness of ecosystems. You will be assigned to an ecosystem (tundra, arctic, grassland, marine, mountain, or freshwater). Your parents (or whoever is around) will print out two food pyramids, one of which is based on your ecosystem and the other will be a random one. After, they will cut all the individual organisms out into cards and scatter these cards around the house. It will be your mission to find the animals that belong to your ecosystem and assemble your food pyramid correctly!

Before you begin the experiment, think about the following question:

- What is a food chain?
- What is a food pyramid? What is an ecosystem?
- Why are ecosystems important in our world? What can happen to harm ecosystems?
- What is an ecologist?

Materials:

- Printer
- A device with wifi that is connected to the printer (iPad, laptop, computer, tablet, etc)
- Paper
- Scissors
- Tape

If you do not have a printer your parents (or whoever is around) can write the names of the organisms on a piece of paper and cut them out.

Activity (parent set up):

1. Pick out two ecosystems from this list:
   - Tundra
   - Forest
   - Mountain
   - Marine
   - Freshwater
   - Grassland
   - Desert
2. Assign one of these ecosystems to be the food pyramid the other person has to assemble. The other ecosystem will be there to distract them.
3. From the handouts on pages 5-11 pring out the two ecosystems you chose.
4. Cut the two ecosystems' images out and scatter them throughout the house to set up the scavenger hunt. You can use tape to keep them in place.
5. Tell the person doing the scavenger hunt what ecosystem they have been assigned.

Activity (instructions for kids):

1. Once the scavenger hunt has been set up by your parents (or whoever is around), start looking for the images that pertain to your ecosystem. Remember that there should be organisms that belong to your ecosystem and organisms that belong to a random ecosystem, so make sure to collect the right ones! (You can also collect all the cards and then sort through them later).
2. Every ecosystem template has 2 tertiary consumers, 3 secondary consumers, 3 primary consumers, and 4 producers. So in total you should have 12 organisms (the random ecosystem will have 12 as well).
3. Once you have collected all 12 of the organisms in your ecosystem, organize them into a pyramid in the correct categories.
4. Whoever set up the scavenger hunt can see if you did it correctly with the answers on page 12.

Engineering and Science Connections:

What is a food chain? A food chain describes the order in which animals depend on one another for food. It is strictly a linear relationship. For example, a plant gets eaten by an insect, a mouse eats the insect, and the mouse gets eaten by a hawk (plant→ insect→ mouse→ hawk).

What is a food pyramid? What is a producer, primary consumer, secondary consumer, and tertiary consumer? A food pyramid is essentially many food chains put together. It is a graphical representation of the relationship between different organisms in an ecosystem. An ecosystem is a biological community of interacting organisms and their physical environment. Energy moves up the pyramid, starting with the primary producers, or autotrophs, such as plants and algae at the very bottom, followed by the primary consumers (herbivores), which feed on these plants, then secondary consumers, which feed on the primary consumers, and so on. As a result, it is very important that the shape of the food pyramid is the way it is, to maintain the energy balance. If there were more carnivores than herbivores, for example, the ecosystem would not work!

Why are ecosystems important in our world? What can happen to harm ecosystems?
Different ecosystems contribute differently to the world, but it is undeniable that they are important. Ecosystems provide us with clean air, oxygen, food, and natural resources like wood. They are also partly responsible for regulating climate, disease, and crop growth. To give a more specific example, let's take a look at the coral reef ecosystem. When water temperatures rise, the concentration of salt decreases, causing coral reefs to die. This is alarming as coral reefs provide a habitat for thousands of species as well as protects coastal areas by reducing the power of waves hitting the coast. Since ecosystems are so interconnected, even one factor changing can be significant. Factors that can damage an ecosystem include pollution, deforestation, over-hunting, invasive species (often transferred through humans), and changes in climate. It is important that we are aware of ecosystems so we know how to protect them.

What is an ecologist? An ecologist studies the interrelationships between organisms and their habitats. They can study how a certain invasive species affects an ecosystem, how two ecosystems interact, what factors are negatively impacting an ecosystem, what strategies to integrate to protect a habitat, and many more. The main goal of an ecologist is to minimize the harm we do to ecosystems and organisms. Often they work out in the field collecting data and accessing the environment

Extensions:

- Assemble the "random" ecosystem that was scattered around into a food pyramid as well
- Retry the activity with a different combination of ecosystems
- Try organizing a food chain with the animals you have, showing who eats who.
- Research another ecosystem and make your own food pyramid!

Share your creations! 

Don't for get to share your experiments and creations with us! We would love to see what you've made. You can Email us at: esqinfo@uwaterloo.ca or send us a message/tag us on our social media!

Facebook: @uwengoutreach

Twitter: @UWEngOutreach

Instagram: @uwengoutreach

Thanks for exploring, discovering, and learning with us!

Desert Food Pyramid Organisms

Gila Woodpecker[1]

Jackal[2]

Raven[3]

Roadrunner[4]

Hyena[5]

Antelope Squirrel[6]

Woodrat[7]

Brittlebush[8]

Prickly Pear Cactus[9]

Pallid Winged Grasshopper[10]

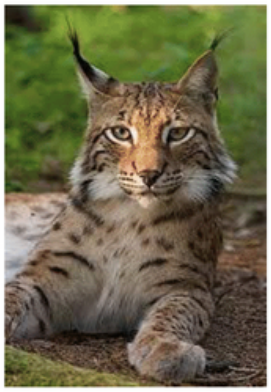
Yacca[11]

Saguaro Cactus[12]

Forest Food Pyramid Organisms

Forest Cobra[1]

Clover[2]



Lynx[3]

Opossum[4]

Fern[5]

Rabbit[6]

Grasshopper[7]

Mouse[8]

Moss[9]

Least Weasel[10]

Bark[11]

Hawk[12]

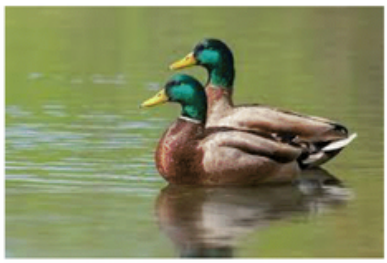
Freshwater Food Pyramid Organisms

Osprey[1]

Mussels[2]

Hydrilla[3]

Cattails[4]



Ducks[5]

Bald Eagle[6]

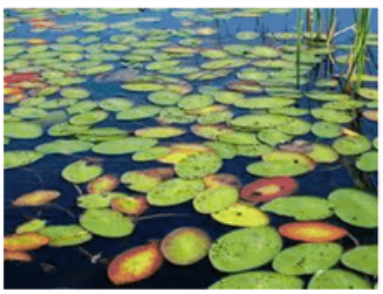
Eel[7]

Mollusk[8]

Heron[9]

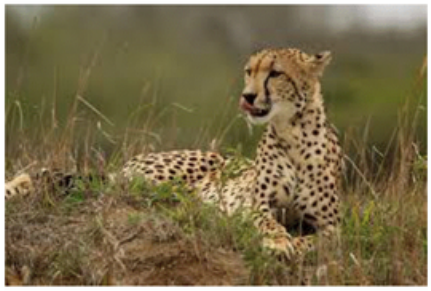
Duckweed[10]

Salmon[11]



Watershield[12]

Grassland Food Pyramid Organisms



Cheetah[1]

Foxtail[2]

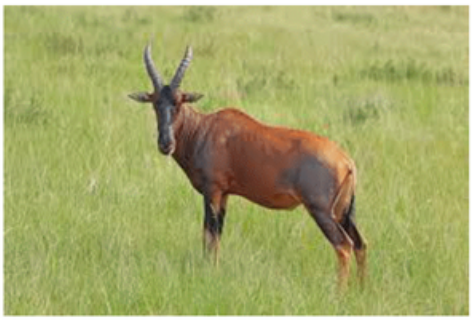
Acacia[3]

Gazelle[4]

Grass[5]

Warthog[6]

Red Harvester Ant[7]



Topi[8]

Aardvark[9]

Wildebeest[10]

Wild Oat[11]

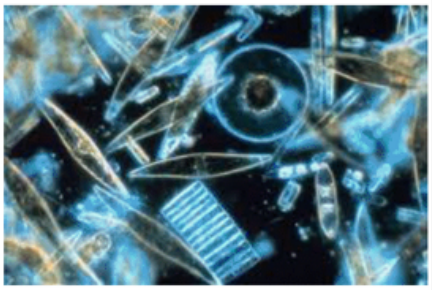
Lion[12]

Marine Food Pyramid Organisms

Crab[1]

Octopus[2]

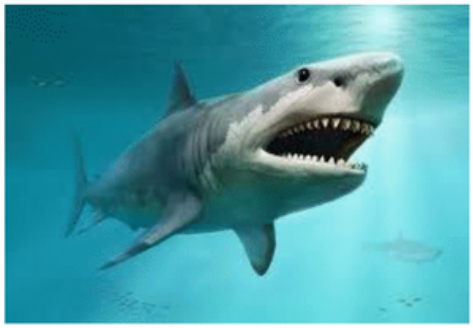
Zooplankton[3]



Phytoplankton[4]

Squid[5]

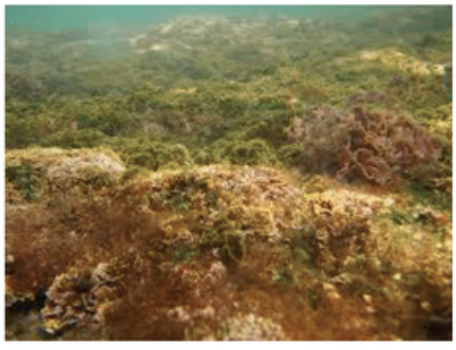
Sunfish[6]



Shark[7]

Mackerel[8]

Seal[9]



Algae[10]

Marlin[11]

Seaweed[12]

Mountain Food Pyramid Organisms

Mountain Weasel[1]

Northern Rocky Mountain Wolf[2]

White-tailed deer[3]

Coyote[4]

Mountain Lion[5]

Elk[6]

Pika[7]

Red fox[8]

Blackberry[9]

Hydrangea[10]

Bitternut Hickory[11]

Sugar Maple[12]

Tundra Food Pyramid Organisms

Snowy Owl[1]

Polar Bear[2]

Muskox[3]

Sedges[4]

Arctic Fox[5]

Lichens[6]

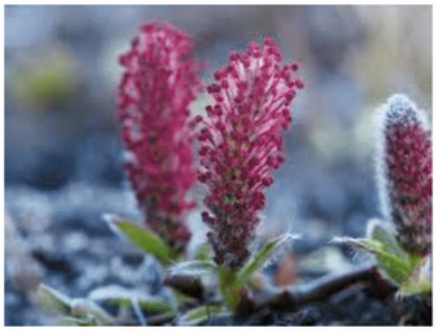
Ermine[7]

Arctic Hare[8]

Liverworts[9]

Reindeer[10]

Harp Seal[11]



Arctic Willow[12]

The Ecosystem Answers

Note: A lot of organisms can live in several different habitats- they are not limited to just one! The lists here are just one possible answer. If you have an organism in a different spot, search up if that organism can also live in that habitat.

Forest

1. Lynx, Hawk
2. Forest Cobra, Opossum, Least Weasel
3. Grasshopper, Rabbit, Mouse
4. Moss, Fern, Clover, Bark

Grassland

1. Cheetah, Lion
2. Wildebeest, Gazelle, Aardvark
3. Warthog, Red Harvester Ant, Topi
4. Grass, Acacia, Wild Oat, Foxtail

Desert

1. Hyena, Jackal
2. Roadrunner, Raven, Gila Woodpecker
3. Antelope Squirrel, Woodrat, Pallid Winged Grasshopper
4. Prickly Pear Cactus, Brittlebush, Yacca, Saguaro Cactus

Tundra

1. Snowy Owl, Polar Bear
2. Harp Seal, Ermine, Arctic Fox
3. Reindeer, Musk Ox, Arctic Hare
4. Liverworts, Lichens, Arctic Willow, Sedges

Freshwater

1. Osprey, Bald Eagle
2. Heron, Salmon, Ducks
3. Mussels, Eel, Mollusk
4. Cattails, Duckweed, Hydrillia, Watershield

Marine

1. Shark, Octopus
2. Seal, Marlin, Squid
3. Sunfish, Crab, Mackerel
4. Phytoplankton, Zooplankton, Algae, Seaweed

Mountain

1. Mountain Lion, Northern Rocky Mountain Wolf
2. Red Fox, Coyote, Mountain Weasel
3. Elk, Pika, White-tailed Deer
4. Blackberry, Hydrangea, Bitternut Hickory, Sugar Maple

3, 2, 1 Done!

3 - Write or draw 3 things you learned from this activity

2 - Write or draw 2 things you found super interesting or cool and want to learn more about

1 - Do you have any questions about the activity? Did something make you wonder...what if? how? or why?