

## Making a Network in Cytoscape

Your task is to create a food web using the computer program cytoscape. You have THREE ecosystems to choose from: African Grassland Ecosystem, Antarctic Ecosystem, and the Australian Grassland Ecosystem.

### Requirements for your network:

- Arrows must point in the correct direction (show energy flow)
- All of the organisms should be included as nodes in your network, and all of the information about what eats what should be included as edges in your network.
- Use the energy flow simulation software, and internet or book research, to answer the questions below about your ecosystem.

### What you should turn in:

- printout of the sif file you created
- printout of your network
- answers to the questions related to your ecosystem (written on a separate piece of paper)
- staple all of these together, and write your name and period on the top sheet

### Extra Credit:

- assign each of your consumers the label carnivore, omnivore, or herbivore by creating an noa file (see instructions on provided website)
- assign each of your organisms the label producer, primary consumer, or secondary consumer by creating an noa file (see instructions on provided website)

### How to do an energy flow simulation in Cytoscape:

- there is a simulation menu (just like with the cellphone activity) that lets you track energy flow (in a similar way to how the cellphone simulation let you track information flow)
- you can also knockout organisms, just like you knocked out individual cell phones, by following these instructions:
  - o select an organism's node by clicking on it
  - o to select more than one organism's node at once, hold shift key while clicking on additional nodes
  - o In cytoscape menu, go to Select/Nodes/Hide Selection. The selected nodes will then disappear
  - o There is a "show all nodes and edges/unhide nodes" button that is the fifth icon from the left on the cytoscape toolbar.

### **Questions: African Grassland Ecosystem**

*(answer these questions on a separate piece of paper)*

1. Do some background research on this ecosystem, either on the internet or in books at home or in the library. **Cite at least two resources** (websites, books, etc...). **Write two paragraphs** describing the ecosystem. The first paragraph should include information about the **abiotic** factors of this ecosystem (climate, location, etc...), and the second paragraph should include general information about the types of **organisms** that live in this ecosystem (tell me what a wildebeest is, for example)
2. Using your knowledge about this ecosystem and food web, list at least **THREE** limiting factors that you think might affect the population size of the baboon.
3. Trace the energy flow in your ecosystem starting with the acacia tree. How many organisms get energy (directly or indirectly) from the acacia tree?
4. Trace the energy flow in your ecosystem starting with grasses. How many organisms get energy (directly or indirectly) from grasses?
5. List the organisms that get energy from **BOTH** the acacia and the grasses.
6. If the population of Zebra is greatly reduced due to poaching, which other organisms will this affect? Predict how it will affect these populations

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### **Questions: Antarctic Ecosystem**

*(answer these questions on a separate piece of paper)*

1. Do some background research on this ecosystem, either on the internet or in books at home or in the library. **Cite at least two resources** (websites, books, etc...). **Write two paragraphs** describing the ecosystem. The first paragraph should include information about the **abiotic** factors of this ecosystem (climate, location, etc...), and the second paragraph should include general information about the types of **organisms** that live in this ecosystem (tell me something about whales, penguins, etc...).
2. Trace the energy flow in your ecosystem starting with phytoplankton. How many of the organisms get their energy (directly or indirectly) from the phytoplankton?
3. Trace the energy flow in your ecosystem starting with squid. WHICH organisms get energy (directly or indirectly) from the squid?
4. Trace the energy flow in your ecosystem in single-step mode, starting with krill. How many organisms get energy directly from krill?
5. Using your knowledge about this ecosystem and food web, list at least THREE limiting factors that you think might affect the population size of krill.
6. If the population of penguins is greatly reduced due to an oil spill, which other organisms will this affect? Predict how it will affect these populations.

### **Questions: Antarctic Ecosystem**

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3. Trace the energy flow in your ecosystem starting with squid. WHICH organisms get energy (directly or indirectly) from the squid?
4. Trace the energy flow in your ecosystem in single-step mode, starting with krill. How many organisms get energy from eating krill?
5. Using your knowledge about this ecosystem and food web, list at least THREE limiting factors that you think might affect the population size of krill.
6. If the population of penguins is greatly reduced due to an oil spill, which other organisms will this affect? Predict how it will affect these populations.

### **Questions: Australian Grassland Ecosystem**

*(answer these questions on a separate piece of paper)*

1. Do some background research on this ecosystem, either on the internet or in books at home or in the library. **Cite at least two resources** (websites, books, etc...). **Write two paragraphs** describing the ecosystem. The first paragraph should include information about the **abiotic** factors of this ecosystem (climate, location, etc...), and the second paragraph should include general information about the types of **organisms** that live in this ecosystem (describe the organisms)
2. Using your knowledge about this ecosystem and food web, list at least **THREE** limiting factors that you think might affect the population size of the wombat.
3. List all of the producers in this ecosystem
4. Trace the energy flow in your ecosystem, starting with the gum tree. **WHICH** organisms get their energy (directly or indirectly) from the gum tree?
5. Trace the energy flow in your ecosystem, starting with the frilled lizard. Which organisms get their energy (directly or indirectly) from the gum tree?
6. If the cricket population was drastically reduced one year due to insecticide pollution, which other organisms would this affect? Predict how it will affect these populations?

### **Questions: Australian Grassland Ecosystem**

*(answer these questions on a separate piece of paper)*

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6. If the cricket population was drastically reduced one year due to insecticide pollution, which other organisms would this affect? Predict how it will affect these populations?