

# Hierarchical Concept Mapping



A concept map is a diagram of terms (concepts) that are linked together by arrows to show relationships or links between concepts. As useful tools for organizing knowledge, concept maps create a visual representation of what is known, assumed, or believed to be true by an individual or group. Guiding students through the process of creating a concept map can be an effective technique for assessing students' current understanding (including misconceptions) of a complex topic or research question. Additionally, the process helps students synthesize information and construct new knowledge through opportunities to address misconceptions and discover the interrelated of concepts to the topic or question. Concept mapping helps students see the big picture of a complex topic and prepares them for further research.

A hierarchical concept map organizes concepts from more general to more specific, with the more general overarching terms above and the more specific terms below. Labeled lines with arrows show linkages between concepts and how they are related. A concept map can be developed by an individual or group. The creation of a concept map can occur during one class session, or can continue over several classes or weeks as learners add concepts and linking arrows between these ideas.

The procedures for creating a hierarchical concept mapping below can be used when exploring any complex topic or research question with students. The example provided here examines interrelated concepts linked to the question, "What are the impacts of food production on the environment, wildlife, and people?" (See the Project WILD activity "Food Footprint.") These procedures can be used for exploring many other types of impacts to wildlife relating to complex systems—including the effects of energy production, transportation systems, urbanization, and climate change.

## Procedures for Concept Mapping

1. Ask students to consider how their food choices might affect our natural resources. After a brief discussion, explain that the class will take about 30 minutes to create a map of concepts that will help them better understand the impacts of food production on wildlife and people.
2. With a large piece of paper sticky notes, start a concept map to help students examine ideas about the impact of food production on the environment, wildlife, and people. Post the following focus question at the top of the concept map: **WHAT ARE THE IMPACTS OF FOOD PRODUCTION?** Allow students time to generate several terms (written on small sticky notes) that relate to this guiding question. **OPTION:** Instead of asking about the impacts of food production in general, pick one food item, such as bread or meat, and create a concept map about the specific impacts of that food item.
3. On the map, post a second row of terms (concepts) labeled respectively "Environment," "Wildlife," and "People." These will help as students begin to organize their many related concepts on the map. Use connecting arrows labeled "on" to link the focus question to the each of these three terms (see image XX below).
4. Give students five sticky notes each, and instruct them to write down a term or concept that relates to the guiding question. Ask students to try and limit terms to a single word, or two to three words at most.
5. Have students place their sticky notes to the side of the large paper. As a class, begin arranging the concept map so that general terms are towards the top and more specific terms are towards the bottom. Have students connect related terms with arrows. Write connecting words on the arrows that explain the relationships between concepts.
6. Over the next several days, as students gather more information on impacts of food production, or gain new insights about relationships between concepts, students can continue to add to the chart new terms and new connecting arrows labeled with linking words.