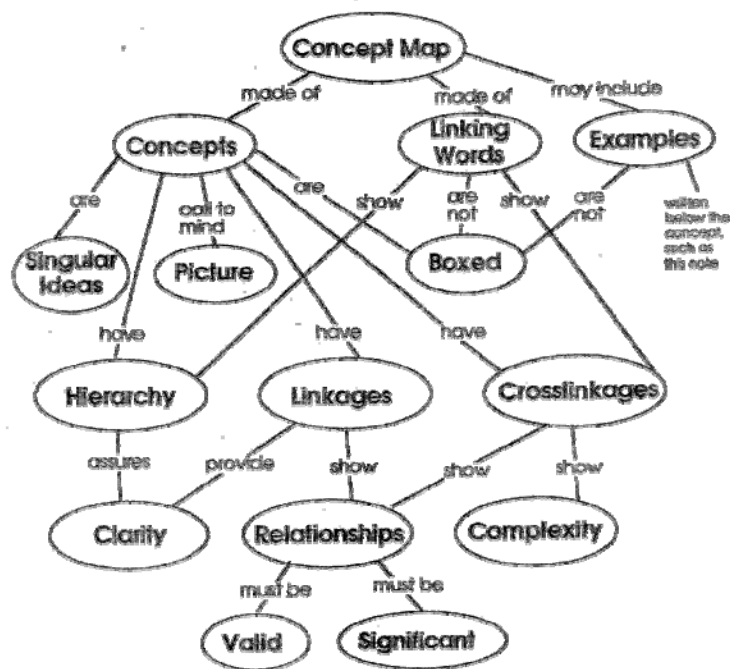
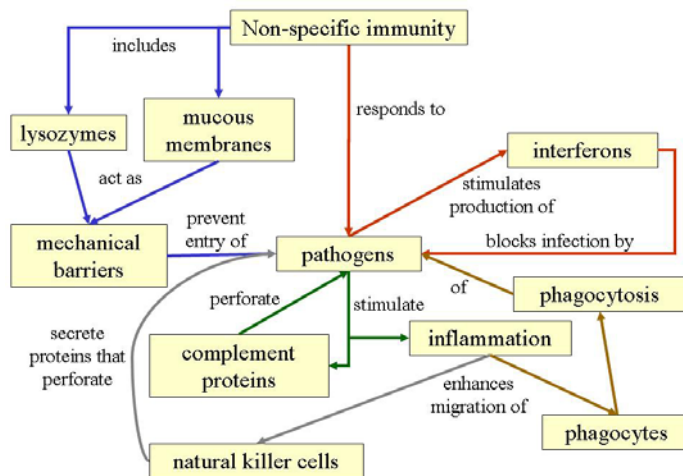
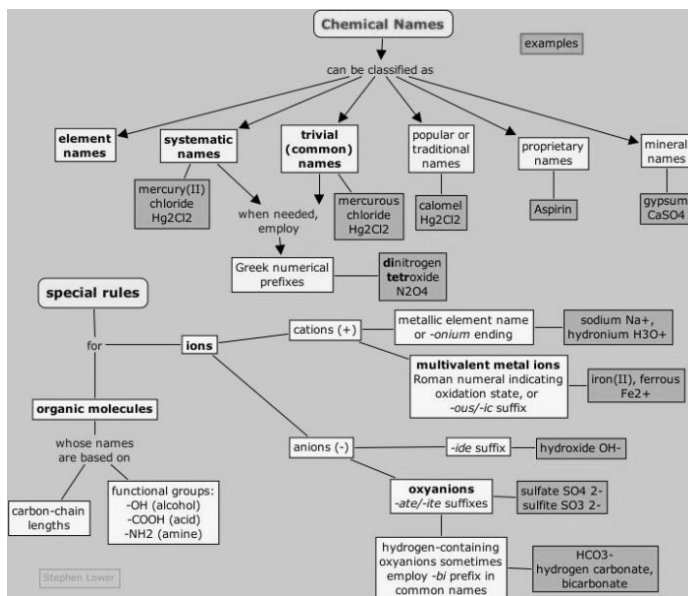


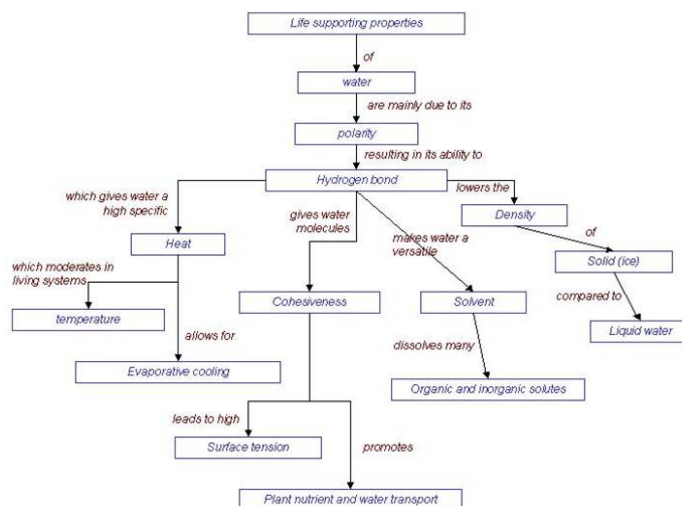
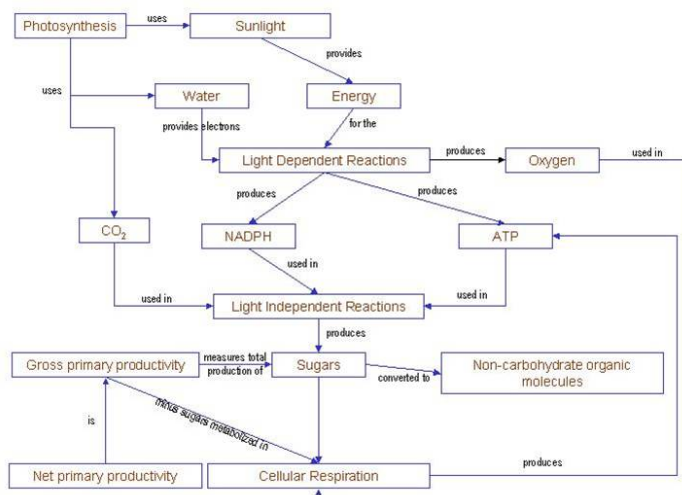
Concept Mapping

Divide the group into small teams of 2-5 people (3 is best). Have each team make concept maps that visually show the relationship between terms or concepts discussed in class. Here is an example of a concept map of the concept of concept mapping!



Some other examples of concept maps!





Constructing the Concept Map

- Start by thinking about the concept you wish to map (i.e. the different kinds of metabolism employed by different forms of life, acid-base chemistry, models of speciation etc...). Make a list of terms or phrases that relate to this concept. Use the textbook or class notes and highlight important terms or phrases that relate to the overarching concept. Try to limit the concept map to no more than about 10-15 terms. Make sure each team is aware of the following before they start the activity:
 - The “why” behind doing a concept map! Help students understand that organizing information in a meaningful way is an important part of learning. Additionally, understanding how concepts are related to one another is essential to learning and their ability to do this will be a vital part of doing well on exams!
 - Their map will be critically assessed by another team. This will give them additional motivation to work hard on their map.
 - Sometimes it may be necessary (for very difficult material) to begin a concept map activity with a vocabulary review activity before starting the map. This can be done by having students highlight new terms in their notes and share definitions of those terms.
- Have the teams write the terms on post-it notes, or index cards and then begin to organize the terms on a according to logical relations between terms. This can be done using a large sheet of paper, a 2' x 2' dry erase white board, or can be done in a concept mapping app like [Popplet](#), [Bubble](#) or [Idea Sketch](#) if computers or mobile devices are available. Often it is best to start with the most inclusive terms or concepts at the top of the page and work down, or at the center of the page and work out from the center.
- Once you have the terms organized, draw lines that logically connect individual terms or phrases, and write a BRIEF BUT SPECIFIC phrase next to the line that explains the connection. You can also use different colored lines to show distinct “concept routes” within the whole map. Arrows at the end of connecting lines can denote “direction” in the map. Encourage teams to make as many accurate connections as possible. Concept mapping usually engenders much discussion as teams work to reach consensus on how the map should be organized.
- During the activity the facilitator should be wandering around from team to team making sure the teams are on task, understand the directions for completing a concept map, and challenging the teams to think more deeply about the connections they are making. However, let the teams make mistakes. Students will learn from their mistakes in the evaluation phase of the activity.

5. Once the map is completed students can take a picture of their map with their phones or other mobile devices. This will give you a permanent record of their initial thinking on the concept connections.

II. Evaluation of Concept Maps

1. It is imperative that sufficient time be devoted to evaluating the maps. Without this, students may leave the session having cemented a number of misconceptions (or mis-connections) which were made during the map construction. The evaluation phase of the activity is meant to clearly reveal those misconceptions to everyone and then intervene to fix them. So be sure to leave plenty of time to evaluate!
2. Once all concept maps are complete, post them on the wall, and have team's critically assess ONE other teams' concept map by looking for inaccurate or vague connections, or missing connections. Have them also pay attention to particularly insightful connections, or connections they missed in their own maps. Have the critiquing team write (in a different color marker or pen) their corrections or changes. Prior to the start of the evaluation, inform the evaluating teams that one person from the group (chosen randomly by the facilitator at the end of the evaluation) will be asked to defend/explain their corrections to the map to the whole class. Again, this process of randomly assigning a person to report out on the teams' ideas encourages everyone on the team to participate (contribute or actively listen) in the evaluation process.
3. After the evaluation process the critiquing teams are then asked to justify why they made the corrections they did. The team that originally did the map also has a chance to respond (i.e. agree or argue for why they disagree with the changes). It is the facilitator's responsibility to moderate this discussion and make sure that misconceptions are clarified and understood by all.

Developing concept maps can be fun, but also difficult, and sometimes frustrating; however, it is the process of doing the concept map that will help students synthesize concepts AND, perhaps more importantly, REVEAL misconceptions which can be addressed in the evaluation phase (Part II) of the activity.

Here is a [Concept Mapping PowerPoint presentation](#) which provides guidance to students during the session. Show this the first time you do a concept map (or have students in your session that have never concept mapped before) as most students will not have ever tried this learning strategy.