

## Making Concept Maps (at the end of this document 3 exemplar concept maps are shown)

**It is your choice whether to do this digitally or pencil and paper (but it must be done neatly). All of the vocab terms must be on the concept map, however you may need to add terms in order for it to make sense for you.**

**There is no one perfect concept map that is perfect for everyone. No two concept maps should be the same.**

***Brainstorming Phase:*** From your memory the course material (textbook and notes) identify facts, terms, and ideas that you think are in anyway associated with the topic. Make a list of these items and print them neatly on small Post-It® notes, one per note, in very brief form, i. e. a single word or short phrase. This is a brain-storming process, so write down everything that anybody in your group thinks is important and avoid discussing how important the item is. Don't worry about redundancy, relative importance, or relationships at this point. Your objective here is to generate the largest possible list you can. Before your group completes this step, you may have more terms than the list I provided..

***Organizing Phase:*** Spread out your concepts (Post-It® notes or text boxes in google draw are a good idea) on a flat surface (or digitally) so that all can be read easily and, together, create groups and subgroups of related items. Try to group items to emphasize hierarchies. Identify terms that represent those higher categories and add them. Feel free to rearrange items and introduce new items that you omitted initially. Note that some concepts will fall into multiple groupings. This will become important later.

***Layout Phase:*** On a large sheet of paper (or online), try to come up with an arrangement (layout) that best represents your collective understanding

of the interrelationships and connections among groupings. Feel free to rearrange things at any time during this phase. Use a consistent hierarchy in which the most important concepts are in the center or at the top. Within sub-grouping, place closely related items near to each other. Think in terms of connecting the items in a simple sentence that shows the relationship between them. Do not expect your layout to be like that of other groups.

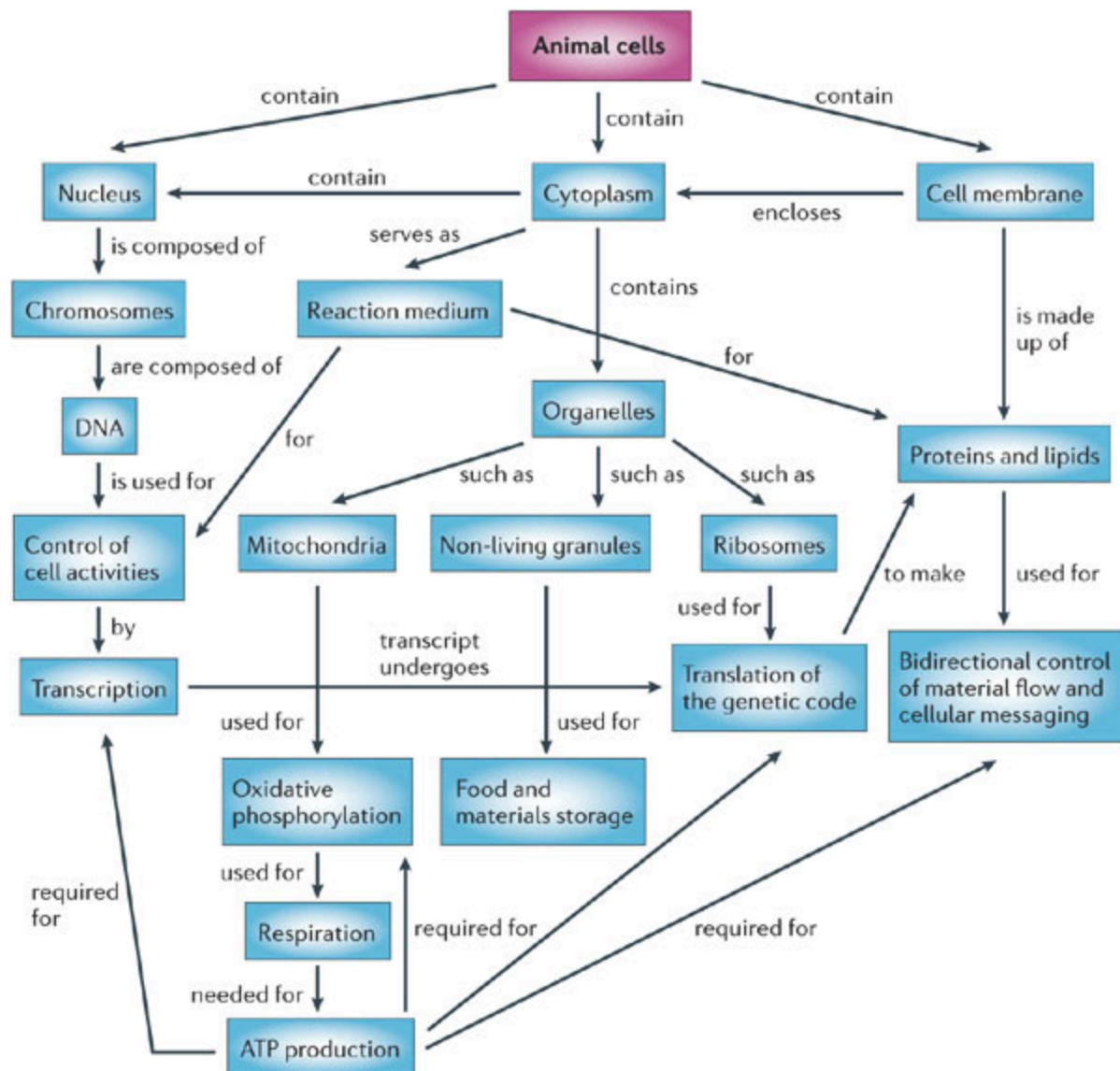
**Linking Phase:** The meaning behind a concept map reveals itself two ways: by the organization and by the words on the connecting lines. Use lines with arrows to connect and show the relationship between connected items (arrows point away from the main idea towards more and more specific details). Write a word or short phrase by each arrow to specify the relationship (this could be a definition but should show a deeper understanding). Many arrows can originate or terminate on particularly important concepts. In Physics we often would need to include formulas and algebraic models into our concept maps.

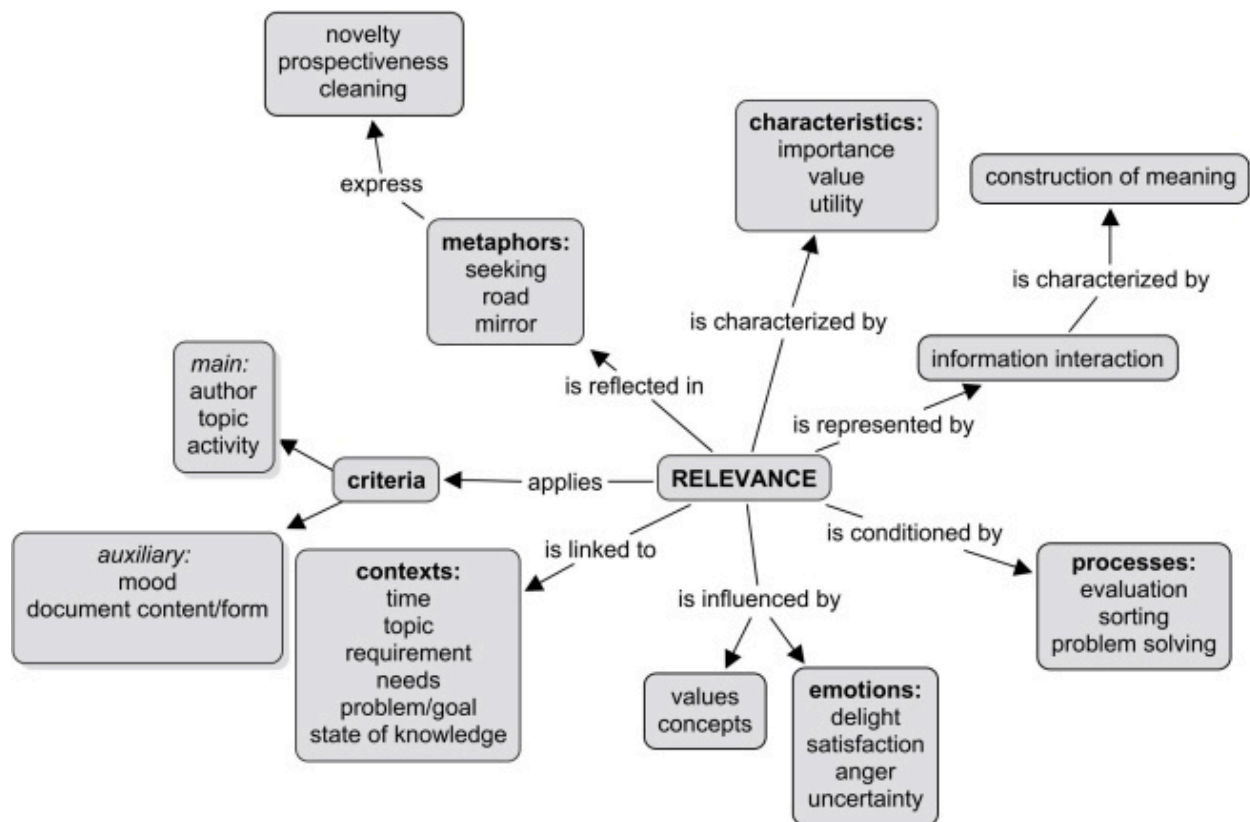
**Finalizing the Concept Map:** After a layout has been finalized you need to add details to the concept map. Be creative in a constructive way through the use of colors, fonts, shapes, border thickness, etc. to communicate your understanding. Meaning is generated both by how your terms are organized AND what is written on the connecting lines (all lines need words). Give your concept map a title.

- **Accuracy and Thoroughness.** Are the concepts and relationships correct? Are important concepts missing? Are any misconceptions apparent?
- **Organization.** Was the concept map laid out in a way that higher order relationships are apparent and easy to follow? Does it have a title?
- **Appearance.** Was the assignment done with care showing attention to details such as spelling and penmanship? Is it neat and orderly or is it chaotic and messy?

- **Creativity.** Are there unusual elements that aid communication or stimulate interest without being distracting?

Unlike some of the exemplars below I will need connecting ideas on EVERY arrow and in a course like physics there should be more detail than what is in some of the exemplars.





**Proposition: Without the industrial chemical reduction of atmospheric nitrogen, starvation would be rampant in third world countries.**

