Name:
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## **Concept Mapping**

## What is concept mapping?

Concept mapping is a technique that allows you to understand the relationships between ideas by creating a visual map of the connections. Refer to the chart below regarding concept maps:

Allow you to	This helps YOU when
See connections between ideas you already have	Studying for a test
Connect new ideas to knowledge you already have	Organizing ideas as you find them in researching
Organize ideas in a logical structure that allows future information/viewpoints to be added (see how new knowledge connects with prior knowledge)	Absorbing and adapting to new information and ideas

## How to draw a concept map



#### **Step 1: Brainstorming Phase**

- · Identify facts, terms, and ideas you think are associated with the topic of interest
- Make a list of these items and print them on sticky notes, one per note
  - Write down EVERYTHING
  - Do NOT discuss importance of items at this time
  - Do NOT worry about repeating or relationships of words
  - Generate the LARGEST list possible

#### **Step 2: Organizing Phase**

- Spread out sticky notes on a flat surface so they can be read easily
- Create groups and sub-groups of related items by identifying the "important" and "broad" concepts
  - Identify terms that represent categories and add those concepts on a sticky note if necessary
  - Rearrange items and introduce new items by adding more sticky notes
  - Note that some concepts fall in multiple categories or groupings

#### Step 3: Layout Phase

- On a large piece of paper, come up with an arrangement that best represents your understanding of the relationships and connections among the groupings
- Broadest concepts are placed in the center
  - Work outward by adding more specific concepts
  - o Place closely related items near 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 look like other groups
  - DO rearrange throughout this phase by adding concepts that help explain, connect, and/or expand ideas

#### **Step 4: Linking Phase**

- Enclose each term in a box or circle
- Use arrows to show the relationship between connected items
  - Arrows show the direction of the relationship
  - Not all links need to be one-way!
- Identify the word(s) that accurately describes the relationship between the concepts (linking words)
  - Examples of linking words: composed of, includes, increases, depends on, is influenced by, causes, is affected by...
- Write the linking words by each arrow
  - Note that many arrows will start or end on a particularly important concept

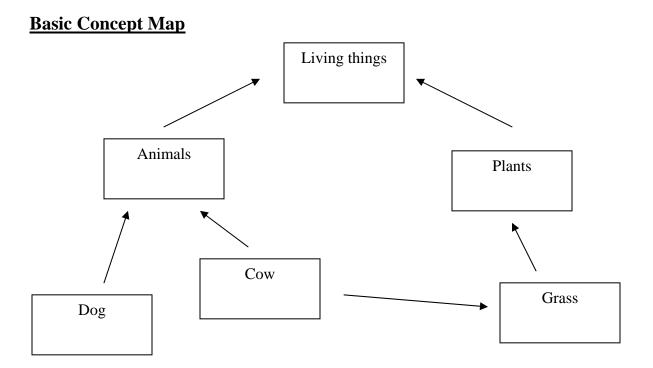
#### **Step 5: Finalizing the Concept Map**

- Study the map to see if there are any other relevant relationships that should be illustrated
  - CROSS-LINKS are relationships that exist between two concepts in different segments of the concept map
    - Can be constructed at any point of the mapping process
- Convert the map into a permanent form that others can view and discuss (transfer writing from sticky notes to paper)
- Check your map for the following:
  - Accuracy and thoroughness
    - Are concepts and relationships correct?
    - Are important concepts missing?
    - Are linking words precise and accurate in showing the relationships?
    - Are cross-links included? Do they demonstrate a high level of integration between segments of the concept map?
  - o Organization
    - Is the concept map laid out so that most general/broad concepts in the middle and more specific concepts are on the outsides?
  - Appearance
    - Was the map done with care showing attention to details?
    - Was the map edited correctly?



#### Hints for concept mapping success

- Great concept maps are like great writing they are usually the product of several drafts!
   Make changes to the words used to describe a link and reorganize parts of the map during the construction process.
- Discuss parts of the maps with your group and your teacher. This will help clarify misunderstandings.
- Realize all concepts maps will look different! Although maps may cover the same content, organization/layout and descriptions may vary.



## PRACTICE CONCEPT MAPS

## PROPERTIES OF MATTER: TEACHER OBSERVATIONS

## **Good linking words:**

- Measured by...
- Measured in...
- Goes down (Decreases) when...
- Goes up (Increases) when...
- Makes more of/less of...
- Does not affect...
- Caused by...
- Divided by volume =...
- If higher than object's, object will...

## Using too many "weak" linking words like...

- Includes...
- Involves...
  - o HOW? Measured by? Caused by? Divided by...?
- Example...
  - o SOME uses of the word "example" are good!
- Affected by...(this is an ok linking word, but could be improved)
  - o INSTEAD, say "decreases when..." (Tell HOW it is "affected by")!

#### Ask yourself...

Does your map show that you understand... the <u>definition</u>, <u>application</u>, <u>AND</u> <u>relationships</u> of *mass*, *weight*, *volume*, *and density*?

• If not, you need to change linking words and cross-links to show a deeper understanding of **definitions**, **applications**, **and relationships**!

**DEFINTIONS:** what the word MEANS

<u>APPLICATIONS:</u> <u>how</u> the term or concept is USED in science or real life, <u>why</u> it is important, giving the term/concept purpose

**RELATIONSHIPS:** how the term or concept is connected to other terms

• HINT: the presence of an ARROW shows a relationship...the linking words ON the arrow show DIRECTION, MEANING, and IMPORTANCE of the relationship!

Concept Map Rubric Name:	✓	Additional Comments
<b>ALL</b> concepts, connections between concepts, and arrow to show the direction of the connections between concepts are well defined and make sense.		
MOST concepts, connections between concepts, and arrow to show the direction of the connections between concepts are well defined and make sense		
SOME concepts, connections between concepts, and arrow to show the direction of the connections between concepts are well defined and make sense		
<b>FEW</b> concepts, connections between concepts, and arrow to show the direction of the connections between concepts are well defined and make sense		

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<b>FEW</b> concepts, connections between concepts, and arrow to show the direction of the connections between concepts are well defined and make sense		

#### **Finalizing Your Concept Map**

- Study the map to see if there are any other relevant relationships that should be illustrated
  - o Do you have CROSS-LINKS? (Relationships that exist between two concepts in different segments of the concept map)
- Is your map in a permanent form (NEAT) that others can view and discuss (or grade)?
- Check your map for the following:
  - Accuracy and thoroughness
    - Are concepts and relationships correct?
    - Are important concepts missing?
    - Are linking words precise and accurate in showing the relationships?
    - Are cross-links included? Do they demonstrate a high level of integration between segments of the concept map? (DEEP connections, show HOW things are related, not just simply telling that they are related)
  - o Organization
    - Is the concept map laid out so that concept with the most connections is in the middle and more "specific" concepts are on the outsides?
    - Do arrows connect word bubbles?
    - Does every arrow include linking words?
  - Appearance
    - Was the map done with care showing attention to details?
    - Is the map neat and legible? (Arrows crossing neatly, erasing done neatly, etc)

## **Concept Map Rubric**

ACCURACY AND THOROUGHNESS	4	3	2	1	0
ALL important/major concepts are included, well defined, and make sense.					
<b>ALL</b> linking words between concepts are well defined and make sense, showing accurate relationships.					
AT LEAST 2-3 cross links per major concept are included, well defined, and make sense, showing deep connections between major concepts.					
ORGANIZATION					
<b>ALL</b> concepts circled/boxed and are connected with arrows, concept with most connections in middle, specific concepts on outside, and each arrow includes linking words					
APPEARANCE					
ALL parts of the map are neat and legible with attention to detail.					
TOTAL SCORE:					

# **Concept Map Rubric Self Assessment**

ACCURACY AND THOROUGHNESS		3	2	1	0
ALL important/major concepts are included, well defined, and make sense.					
Why did you give the map the above score?					
<b>ALL</b> linking words between concepts are well defined and make sense, showing accurate relationships.					
Why did you give the map the above score?					
<b>AT LEAST</b> 2-3 cross links per major concept are included, well defined, and make sense, showing deep connections between major concepts.					
Why did you give the map the above score?					
ORGANIZATION					
ALL concepts circled/boxed and are connected with arrows, concept with most connections in middle, specific concepts on outside, and each arrow includes linking words					
Why did you give the map the above score?					
APPEARANCE					
ALL parts of the map are neat and legible with attention to detail.					
Why did you give the map the above score?					
TOTAL SCORE:					