

TA Guide for
ASTR 311 Tutorial: Concept Map about Stars
 ver. 100408

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| Description |
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After an introduction and a warm-up exercise, groups of students create a concept map about stars. Near the end of the activity, they look at other groups' maps.

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| Learning Goals |
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Students are often overwhelmed by the number of concepts, facts and relationships that rarely fit together in a linear or sequential order. Retrieving and using the concepts becomes difficult because their memory decays, the concepts interfere with each other and there are no cues for recalling the right concepts at the right time. A concept map organizes the content, revealing relationships and patterns and making the content easier to recall later.

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| Materials and Set-up | 10 minutes |
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Concept maps are usually more effective when created in groups because there will likely be more concepts with additional links. We'll encourage students to work in groups of 3-4. (In groups of 2, there is often one leader and one follower and in larger groups, it is difficult to crowd around the activity when working at desks.) Each group needs

- 1 overhead transparency
- 1 or 2 overhead pens
- scrap paper (old 11 × 15 inch dot-matrix paper, for example)
- 1 sheet of flipchart paper
- 1 or 2 coloured flipchart markers
- Instruction sheet

Other materials:

- During the Introduction, you'll make a simple concept map in front of the class, so you should make one up ahead of time. For example, a 4-5 item concept map about coffee or tea (or whatever you drink to keep you awake) would be good. It should be about something everyone in the room is already quite familiar with: we want them learning about the structure of concept maps, not about the content of the map, itself.
- A "master list" of concepts about stars. There is recognized benefits to the students generating their own list of items to include in the concept map. During the activity, you'll be watching how each group progresses and you may need to feed in any critical concepts they've left out. More about that below.

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| Part 1a: Introduction to concept maps with an example | 5 minutes |
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Students will not generally engage in an activity if they can't see why it's useful to them. Concept maps need extra motivation because they are usually different than anything the

students have done before or been tested on. The main “selling point” of this activity is that it will help them prepare for the upcoming exam. We’ll motivate them to participate to reminding them why this activity will help them learn:

It’s easy to get overwhelmed by the number of concepts, facts and relationships about stars. Remembering those concepts during an exam is hard because

- our memory decays
- the concepts interfere with each other
- there are no cues for recalling the right concepts at the right time.

Share an example with the students: use the whiteboard or overhead to create the concept map you made up ahead of time. Do it out loud so they can hear what’s going on in your head, how you decide what to include, where to put the nodes, how to links them together. This is a great opportunity to use different sized bubbles or different kinds of lines and arrows to indicate which concepts and relationships are more important.

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| Part 1b: Concept map practice | 10 minutes |
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Before creating their star concept map, the students need some practice. We’ll give them a topic they’re already familiar with so they can concentrate on the process instead of the content: the Vancouver 2010 Olympics. Invite each group to take **5 minutes**

1. Make a list of the **5 things** they remember most about the Olympics.
2. Put them **on the overhead transparency** and join them together with lines and arrows telling the actions or relationships that connect them.

We’re asking them to use the overhead transparency because after 5 minutes, we’ll take 5 minutes (or less) to look at a few of their maps. Take the maps and put them the overhead and ask for comments. If no one has suggestions, you might ask

Did anyone else have these things? What different ones did you include?

Do you have some of the same things but with different relationships?

With this practice planning, creating and assessing concept maps, they’re ready for the real one...

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| Part 2: Concept map about stars | 25 minutes (until 10 min remaining) |
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The students are going to create a concept map about stars. In order to produce something in the time allowed, we need to give them clear instructions:

- the concept map is about stars
- pretend you’re doing it for other ASTR 311 students with the same vocabulary and knowledge as you
- you have 25 minutes: 10–15 minutes to plan (use the scrap paper) and 10–15 to create the map (use the big, flipchart paper)

For the next 25 minutes, wander from group to group, checking on their progress. If they don't move to the big paper after 10–15 minutes, coach them not to over-plan and start getting something on the big paper. Compare their concepts to the “master list”: if there are some important concepts missing, suggest they add it (“I notice you don't have fusion in your map. That's pretty important, isn't it?”)

We'll use the last 10 minutes of the tutorial to go look over each other's maps. It's very likely you'll have to cut them off and get them to stop. Just reassure them that concept maps are hardly ever “finished” and it's okay if they're not done. And remind them to write their names and student numbers on their maps because we'll be keeping the concept maps.

Invite them to wander around and look at other groups' maps. It might be useful for people to explain their maps to each other, so maybe *half* the group wanders for 5 minutes and the other half stays to explain, and then switch? The TAs should wander around and assess the maps, too: Now, instead of making suggestions about more concepts and links, you can talk about the concepts and links you see (or don't see.)

Cleanup

Collect the overhead pens and coloured markers in separate containers, check that there is enough scrap paper, overheads and flipchart paper for the next session.