

Concept Maps

Introduction

Most of you are familiar with graphic organizers, such as Venn Diagrams and T-charts. Graphic organizers are useful tools for organizing information. Today we are going to learn how to use a graphic organizer that is useful when you have lots of important information to remember. You may find it particularly useful today when you design your Mars Rover.

Teach

The graphic organizer we will look at today is called a Concept Map. Let's look at an example together. (Show the sample concept map for "**CAR**".) In this example, an engineer was designing a car and started thinking about all of the things he needed to remember as he made his model. The engineer thought of 4 things that would be critical for his car (The car needed to move; it had to be designed so that people could operate it; it required storage space and it required safety devices). As you can see on the concept map, the engineer made these requirements into ovals attached to the central oval of "**CAR**". Then, he looked at each one of the four needs he identified and thought about how he would make certain he included what he needed in his final design. He added each of these ideas to his concept map. For example, under "*People need to operate it*", he included a way in and out of the vehicle (**doors**), a place for people driving it to sit (**seats**), **controls** to operate the vehicle (steering wheel, gas pedal and brakes) and a **dashboard** so drivers could see how the car was operating.

Each of these in turn could have specific things associated with them. For example, for the **dashboard**, drivers need to know their speed (**speedometer**), the amount of fuel they have (**fuel gauge**), and **warning lights** that indicate when particular systems are malfunctioning.

Likewise, for **controls**, operating the vehicle requires an **ignition** to start the car, a **steering wheel** to navigate the car, a **gas pedal** to provide fuel to make the car move, and **brakes** to stop the car.

[If time permits, take another bubble, such as seat, and have the students think about what features the seat should have (shape, comfort level, adjustable, materials that don't get hot)]

Practice

Now it is your turn to create a similar concept map for your group's Mars rover. Each group's concept map will look different because each of you has selected a different mission for your rover. As you think about your Mars rover, consider all of those things you will need to have a successful mission. On your concept map, your central box will be the "Mars Rover". From the Mars Rover, you will need at least two boxes that connect to your Mars Rover. First, to have a successful Mars rover mission, you will have to get to Mars. You will be thinking about all of the crucial things your rover will have to do in order to reach Mars. Second, once you arrive on Mars, you will have to complete your mission and report the data back to Earth. Here is the beginning of a concept map that you can use. Consider all of the things

that will lead to a successful mission and how you can best accomplish them. Brainstorm ideas on your own paper. Once you have a clear idea of what your Mars Rover will need, ask me for a large piece of Kraft paper to create your concept map.

Monitor

As your students brainstorm, move about the room listening to conversations and making suggestions. You may wish to post a list of questions on your overhead projector or Elmo.

Questions to Consider

Getting to Mars

- How will your rover land on Mars without crashing?
- What will be your Mars Rover's power source?

Mission

- What is your mission?
- What does your Mars rover need to carry out its mission?
- How will you communicate with your Mars rover and receive data from it?