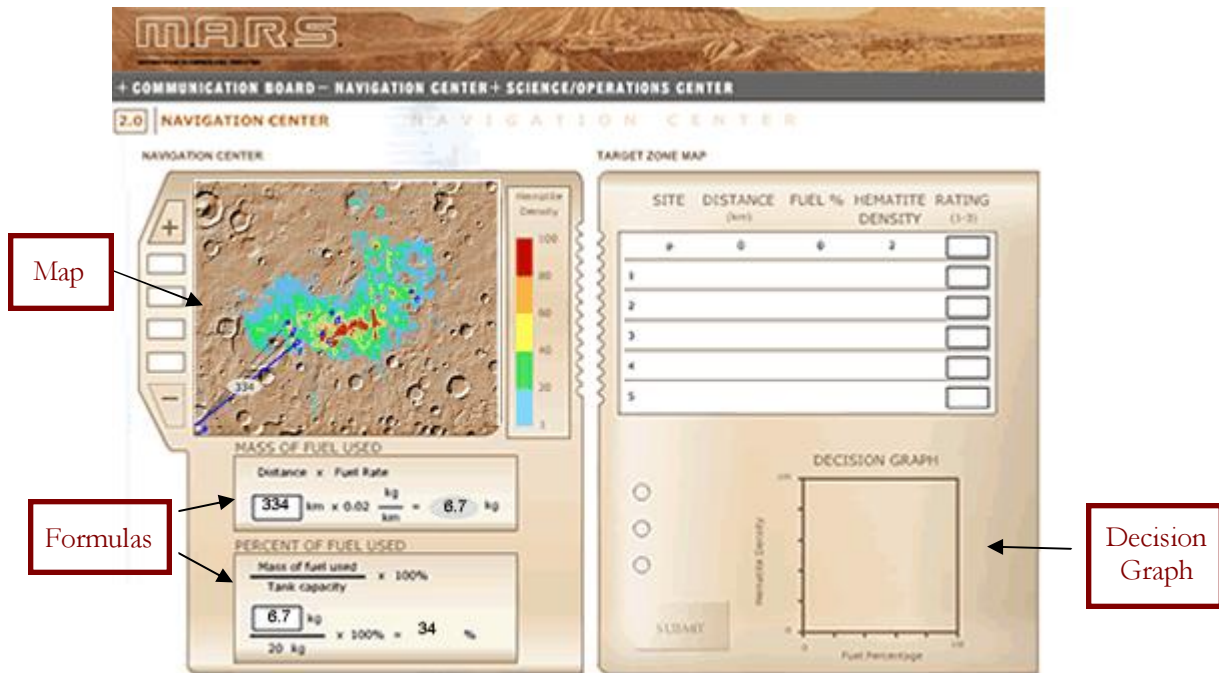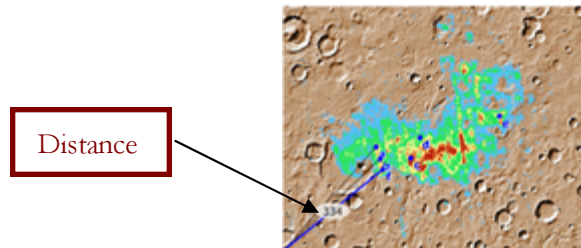# Navigation Tool Tutorial

This tutorial shows you step by step how to use the navigation tool. Start by getting the Internet address for the tool from your teacher. Get on a computer and go to that address. This address is different than the address you will use on mission day.

As a navigation expert, you want to give the science/operations experts on your team a site to visit. To choose a site, you have to compare how much fuel it will take to get there against the density of the hematite in that location. The navigation tool helps you compare three or more sites before you make a choice.
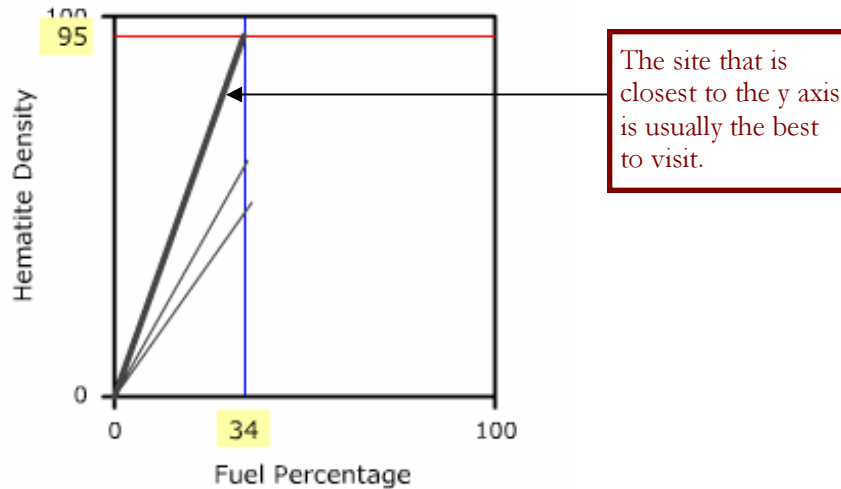

1. Click on the map on the first site you would like to compare. A line appears on your map, and the distance to that site appears on the line.

2. Use your mouse to pick up and drag the distance into the empty box within the formula called "Mass of Fuel Used." The computer will automatically calculate the amount of fuel your plane would use to reach this site.

3. Drag the answer from the calculation in step 2 into the empty box within the formula called "Percentage of Fuel Used." The computer will automatically calculate the percentage of fuel used. This value is the percentage of all the fuel in your original fuel tank that would be used if you decided to visit this site.

4. Repeat steps 2-3 for two more sites.

5. The decision graph in the lower right-hand corner of your screen compares each site's fuel percentage to its hematite density. See a picture of the graph below. Select the site that gives you the greatest reward while burning the smallest amount of fuel. The line with the greatest slope on the graph usually is the best to visit. (This also is the line closest to the y axis).

The site that is closest to the y axis is usually the best to visit.

6. Decide on the best site to visit.

7. Use the nav report form to record the site name with a lowercase letter. Also record the percentage of fuel used.

8. Tell the science/operations experts which site you have selected and then give the report form to the communications experts.

9. Select the name of the site you have chosen beside the decision graph and click the Submit button at the bottom of the screen.

   NOTE: The Submit button will appear only if you have compared three sites.

10. The computer permanently draws in the line to the site you have selected, and the graph in the lower right-hand corner shades in the percentage of the fuel you consumed to reach that site.

11. Starting from the site your team just selected, continue this process of comparing three sites and choosing the best site to visit. Repeat this process until most of your fuel is consumed, but try to save enough fuel to reach a site where you can land the plane. (On mission day the flight director will guide you through the landing.)

The mission is complete when you use up all the fuel.