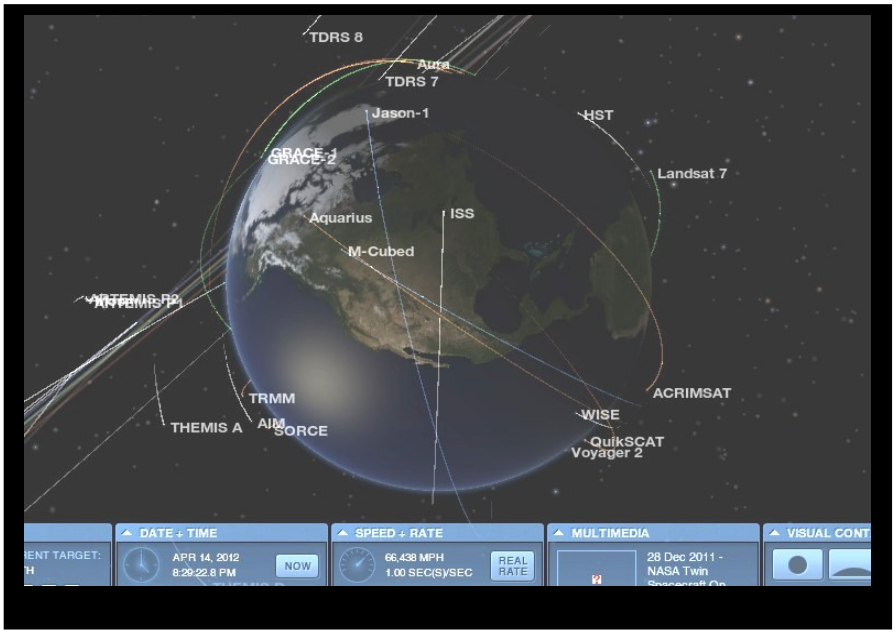
Eye Spy - The Altitude of the International Space Station



Get the Data

Visit EOSS **http://1.usa.gov/GC9x37** to recreate this exact scene. Recommended operating system: MS Windows Vista or later; Browser: Internet Explorer 8 or later.

Step 1 - Activate the measuring tool, and find the altitude of the ISS above North America on April 15, 2012.

Step 2 - Advance the clock date using the 'Speed and Rate' window, and re-measure the ISS altitude over North America on June 27, 2012 and September 27, 2012.

Answering Questions

Problem 1 – Using the tabulated altitude data, create a graph and plot the altitude in kilometers on the vertical axis and the number of days between measurements on the horizontal axis. Are the altitudes generally increasing, decreasing or remaining about the same?

Problem 2 - Describe in words the changes you are seeing in the altitude of the International Space Station between April and September?

Math Challenge

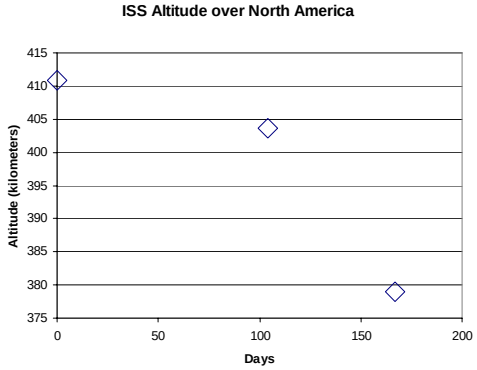
Use what you have learned in Problems 1 and 2 to determine how long it would take the ISS to reach a critical altitude of 200 kilometers where burn-up would likely occur if there were no re-boosts after September 2012.

Answer Key

Students should obtain measurements that are close to the following values:

April 15, 2012	255 miles	411 km	0 days
July 27, 2012	251 miles	404 km	104 days
September 27, 2012	236 miles	379 km	166 days

Problem 1 – Using the tabulated altitude data, plot the altitude on the vertical axis and the number of days between measurements on the horizontal axis. Are the altitudes generally increasing, decreasing or remaining about the same? Answer: Generally decreasing over this time interval



Problem 2 - Describe in words the changes you are seeing in the altitude of the International Space Station between April and September?

Example: The time period between April and July, and July and September are the same. Between April and July the ISS altitude is decreasing more slowly than between July and September. The ISS altitude decreased by (411-404) = 7 kilometers between April and July, and (404-379)= 25 kilometers between July and September. The altitude was decreasing nearly 3 times faster during the time period between July and September than between April and July.

Challenge Problem: If students use the data between July and September and extend the graph (see below example) to an altitude of 200 kilometers, **it will take about 620 days after April 15, or December 26, 2013**.