This QuickBird Satellite image was taken of downtown Las Vegas Nevada from an altitude of 450 kilometers. Private companies such as Digital Globe (http://www.digitalglobe.com) provide images such as this to many different customers around the world. The large building shaped like an upside-down 'Y' is the Bellaggio Hotel at the corner of Las Vegas Boulevard and Flamingo Road. The width of the image is 700 meters.

The scale of an image is found by measuring with a ruler the distance between two points on the image whose separation in physical units you know. In this case, we are told the field of view of the image is 700 meters wide.

Step 1: Measure the width of the image with a metric ruler. How many millimeters long is the image?

Step 2: Use clues in the image description to determine a physical distance or length. Convert this to meters.

Step 3: Divide your answer to Step 2 by your answer to Step 1 to get the image scale in meters per millimeter. Report your answer to two significant figures.

Once you know the image scale, you can measure the size of any feature in the image in units of millimeters. Then multiply it by the image scale from Step 3 to get the actual size of the feature in meters to two significant figures.

Question 1:   How long is each of the three wings of the Bellaggio Hotel in meters?
Question 2:   What is the length of a car on the street in meters?
Question 3:   How wide are the streets entering the main intersection?
Question 4:   What is the smallest feature you can see, in meters?
Question 5: What kinds of familiar objects can you identify in this image?

Answer Key:

        This QuickBird Satellite image was taken of downtown Las Vegas Nevada on October 14, 2005 from an altitude of 450 kilometers. Private companies such as Digital Globe (http://www.digitalglobe.com) provide images such as this to many different customers around the world. The large building shaped like an upside-down 'Y' is the Bellaggio Hotel at the corner of Las Vegas Boulevard and Flamingo Road. The width of the image is 700 meters.

        The scale of an image is found by measuring with a ruler the distance between two points on the image whose separation in physical units you know. In this case, we are told the field of view of the image is 700 meters wide.

Step 1: Measure the width of the image with a metric ruler. How many millimeters long is the image?
Answer: 150 millimeters.

Step 2: Use clues in the image description to determine a physical distance or length. Convert this to meters.
Answer: The information in the introduction says that the image is 700 meters long.

Step 3: Divide your answer to Step 2 by your answer to Step 1 to get the image scale in meters per millimeter.
Answer: 700 meters / 150 millimeters = 4.66 meters / millimeter. To two sig.fig this becomes 4.7 meters/mm

Once you know the image scale, you can measure the size of any feature in the image in units of millimeters. Then multiply it by the image scale from Step 3 to get the actual size of the feature in meters to two significant figures.

Question 1:   How long is each of the three wings of the Bellaggio Hotel in meters?
Answer: About 25 millimeters on the image or 25 mm x (4.7 meters/mm) = 120 meters.

Question 2:   What is the length of a car on the street in meters?
Answer: About 1 millimeter on the image or 1 mm x 4.7 meters/mm = 4.7 meters.

Question 3:   How wide are the streets entering the main intersection?
Answer: About 8 millimeters on the image or 8 mm x 4.7 meters/mm = 37 meters.

Question 4:   What is the smallest feature you can see, in meters?
Answer: Some of the small dots on the roof tops are about 0.2 millimeters across which equals 1 meter.

Question 5: What kinds of familiar objects can you identify in this image?
Answer: Will vary depending on student.
        1. Cars, busses
        2. Swimming pools and reflecting ponds
        3. Trees
        4. Lane dividers
        5. Shadows of people walking across the plaza to the Hotel.

Note: Ask the students to use image clues to determine the time of day (morning, afternoon, noon); Whether it is rush-hour or not; Time of year, etc.