Detective
The Case of the Appearing Lake

This is no magic trick. This is what capturing 5.9 billion cubic meters (7.7 billion cubic yards) of water looks like from space. Satellite images are used to monitor changes on Earth’s surface over time. Scientists can compare images to calculate how much has changed. In the case of the Karkheh Dam, scientists can calculate how much of the landscape is covered with water after a dam is built.

The dam on Iran’s Karkheh River was completed in 2001. It was designed to capture enough fresh water to irrigate a patch of farmland the size of Rhode Island and to produce electricity for almost 400,000 homes – that is one home for every person who lives in Cleveland, Ohio.

—T. Owen

1. What is the total area of each satellite image (1 square = 1 km²)?
2. How many square kilometers of the 1990 image contained river water?
3. How many square kilometers of the 2006 image is covered by the lake?
4. How much of the satellite image has changed?

Be a Data Detective and find out how much of the Karkheh Valley is now covered with water.
Data Detective:
1. The satellite image is 11 km by 27 km. $11 \times 27 = 297 \text{ km}^2$.
2. In the 1990 image, the river runs through 53 squares. Approximately $53 \text{ km}^2$ contain some portion of the river.
3. In the 2006 image, water covers some or all of 193 squares. That means approximately $193 \text{ km}^2$ of land is covered with water.
4. The difference between 2006 and 1990 is: $193 - 53 = 140 \text{ km}^2$. 