Exercise 1, Page 1:
Plan a trip to Crooked Lake in Kalamazoo County to study water quality issues.

DATA SOURCE 1: Base Features
Open MapImage Viewer. Double-click on the shortcut icon on the Desktop.

Open Kalamazoo County. Click on the Open Map or Image tool in the upper left of the application. When the Open Map or Image window opens, select Kalamazoo from the list of counties and click on Open Map. Note that your screen will only show the counties that you have installed.

Find Crooked Lake. Click on the Find Feature tool above the map. When the Find Location window opens, select the Search tab. This allows you to run a keyword search across the layers. Type Crooked Lake in the Search Phrase entry box and press Enter (or click Search). Double-click the last entry (LakePoly: Crooked Lake) to zoom the map to that feature.

Clear the selected features. Click on the Un-Select Query Features tool above the map. This will remove the yellow selection graphics from the screen.
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DATA SOURCE 2: Topographic Map

Turn on the topographic map. Click on the Toggle Topo Quad On/Off tool. You may also want to turn off the line and polygon features, which obscure the topo map, with the Map Lines On/Off tool. These tools are both on the Toggle Toolbar to the left of the map.

- Is the terrain around the lake hilly? Swampy? Variable?
- Note that there are houses on lake shown on the topo map.

How old is this map? Click on the Map Properties tool to the upper left of the map. When the Map Properties window opens, be sure that the Base Features tab is active. The Map Properties window allows you to turn features on and off and to change the symbolization of the layers. Turn on the index for the topo map by selecting DRG Date from the pull-down list to the right of the words Topo Map. Click Apply, and then click Close.
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Turn the map layers on again. From the index (which appears as a large red number), we can see that the map is from 1979. These houses are at least 23 years old. Note that you might need to Zoom Out or Pan the Map to see the index date.

Open the Map Properties window again; set the index for the topo map to No Index.

DATA SOURCE 3: MIRIS Land Use and Land Cover

Turn on the MIRIS Land Use/Land Cover layer. Open the Map Properties window and select the User Features tab.

The User Features tab gives you access to your own data that you have added to the Viewer. Some layers come with the Viewer to get you started. Check the box to the right of the Theme Layer called Land Cover/Use. Click Apply.

Look at the map; the default symbology for this layer is not terribly helpful to us, as all areas are symbolized in the same way. To improve the symbology, double-click on the olive-colored box to the left of Land Cover/Use. This opens the Symbol Properties window.
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Create a Unique Value Legend. Select Unique Value from the Legend Type pull-down list. The window changes, and now you can choose a Values Field. For this dataset in this example, choose LABEL1.

![Legend Properties window]

Change the colors by double-clicking in the color column. You can widen the column by clicking near the edge of the column header and dragging. Uncheck the Outline Polygons box. Click Close, then Click Apply on the Map Properties window.

This dataset is based on interpretation of 1978 aerial photography. It classifies much of the area around the lake as Urban and Built Up land.

Find out more about the land use. Use the Identify tool to get more detailed information. Right-clicking with the Identify tool gives us database information; left-clicking just gives us the label in the Information Box above the map. Much of the area is Single Family, Duplex. What types of problems might we anticipate? How might we tell if these are seasonal homes?

DATA SOURCE 4: MDEQ Data – Watersheds and Sites of Environmental Contamination

Look at the watersheds dataset. Turn on the watersheds layer and its labels. What watershed (watercourse name) does this lake belong to? Is Kalamazoo upstream or downstream?

Look at the Sites of Environmental Contamination datasets. There are 4 datasets in this group, titled SEC Environmental, SEC Hazardous, SEC Oil and Gas, and SEC Solid Waste. Use the Identify tool to find out about the point just south of Crooked Lake.

Measure the distance from this point to the lake. Use the Measure Distance tool. The distance appears in the Information Box. You can change the distance units in the Map Properties window on the Defaults tab. Are there any wetlands in between? (Turn on the wetlands layer or look at the Land Use/Land Cover dataset.)
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DATA SOURCE 5: MSU LandScan CD (Only available if LandScan CD is available.)

Open the LandScan image of the area. Click on the Open Photo at Map Point tool, and then click on the map in the area for which you would like to see a photo. If you have been a LandScan user, this saves you from having to find the Town/Range/Section location of the image.

Make notes on the photo. Add the Draw Toolbar by right-clicking in a blank area of the application border and adding a checkmark next to the Draw Toolbar entry. This allows you to add text and graphics to the photo. LandScan images can be converted to other formats using the File Menu.

PRESENTING YOUR RESULTS

Change symbology. If you want to highlight a particular feature for a report or field map, you may wish to turn layers on and off. You can make lines wider or narrower. You can change the color of features. Use the Map Properties window to work with feature symbology and layer visibility. This map has rivers displayed in a thicker line than roads.

Print your map. Use the Print Map option on the File Menu. After clicking OK, you will have the option to add a title, scale bar, a legend, and other map marginalia.

Copy the map to the clipboard. Use the Copy Map option on the File Menu. Immediately paste the map into Microsoft Word or PowerPoint using the Paste option on the Edit Menu within these programs.