Locating Provinces, Territories and Capital Cities on a Map of Canada in ArcGIS 9.x

Introduction:

In this exercise you will learn how to create a map of Canada using ArcGIS 9.2 GIS software, and to locate and label the provinces, territories, and capital cities. If you have used ArcGIS 9.2 before, you will be familiar with the tools and buttons required for this activity. If you are new to ArcGIS 9.2, be sure to read and follow all the instructions carefully. You may need to refer to an Atlas of Canada to help you locate the capital cities later in this lesson.

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Grade Level: Grade 4 -10

Social Studies Learning Outcomes

Students will:

4 KL-019   Locate provinces, territories and capital cities on a map of Canada

6 KL-025   Locate on a map of Canada the provinces, territories and capital cities

9 KL-024   Identify on a map distinguishing elements of the physical and human
                    geography of Canada (include political boundaries, capital cities)

10 KL-013   Locate provinces, territories and capital cities on a map of Canada

10 S-201   Organize and record information in a variety of formats and reference
                   sources appropriately

10 S-202   Select and use appropriate tools and technologies to accomplish tasks

10 S-203   Construct maps using a variety of information sources and technologies

10 S-204   Select, use and interpret various types of maps

Note: When creating projects in ArcGIS, it is best to create a new folder for each project to save to. You can give the folder a name that corresponds with the nature of your project. Whenever you add or create theme layers in your project, select the corresponding folder to save your changes. Also, note that the directory paths shown in the screen shots will differ from the paths in your system. Ask your instructor if you need help creating a folder or selecting an appropriate file directory.
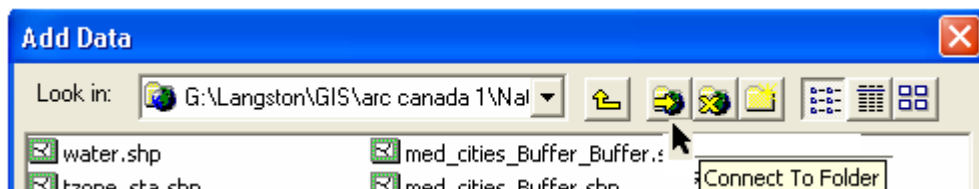
Required Files: ArcCanada 3.1 Disk 1
- National/shp/canada2001.shp
- National/shp/cities.shp

Instructions:
1. Launch ArcMap, when prompted choose a new empty map.
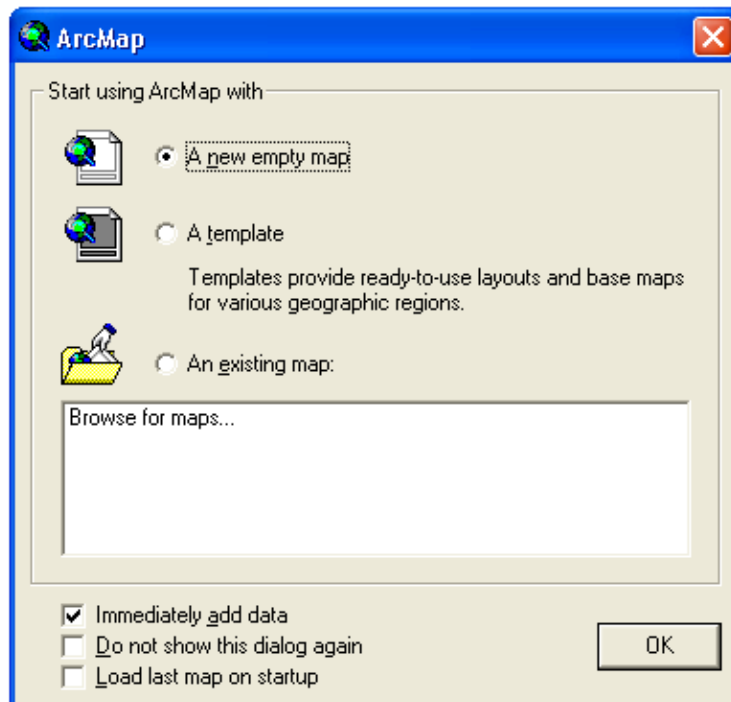
2. Using the **Connect To Folder** button navigate to the location of **Canada2001.shp**. The file path will be different in your setup. If you do not know where the ArcCanada data is stored, ask your instructor for help.


3. Highlight the **canada2001.shp** label, then click the **Add** button to this theme layer to your map. An outline map of Canada should appear in your data frame (view); you will change the projection in #5 below.
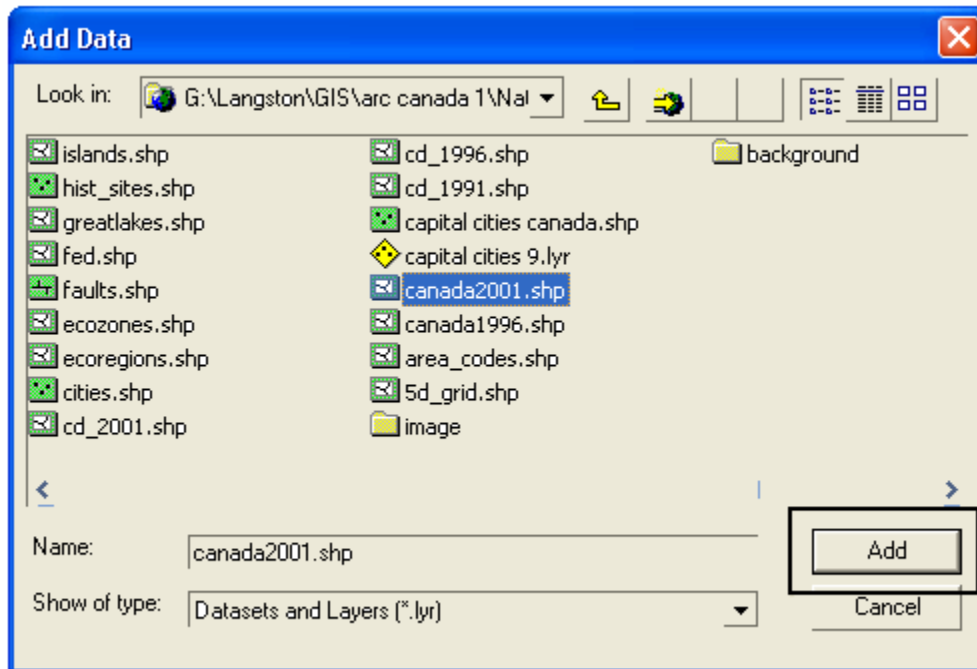
4. Using the **Add data** button [icon] navigate to the location of **cities.shp** and add this shapefile to your map. (This should be located in the same location as Canada2001.shp)

5. This is a good time to save your project. Go **File → Save As**, navigate to the folder you created for your project, create a title for your project, and select **Save**. Save your project frequently as you go along.

6. To make the map appear more accurate you can change the projection. To do this, **double click** on the **Layers** in the table of contents.
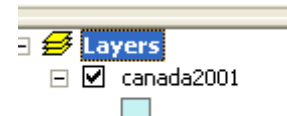

7. The desired projection is **North America Lambert Conformal Conic**. To obtain this projection, select the tab **Coordinate system** and in the selection box select **Predefined → Projected Coordinate System → Continental → North America** and select **North America Lambert Conformal Conic**. Hit **Apply** and **OK**. (If warning messages appear select **OK** to continue).
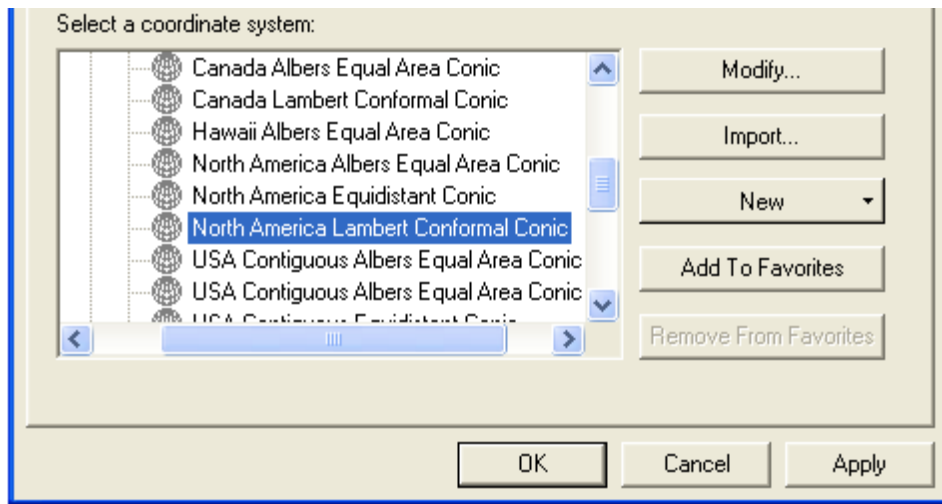
8. To enlarge your map, select the **Zoom In** button from the toolbar and draw a box around Canada, the map will enlarge to fill the Data Frame (View).
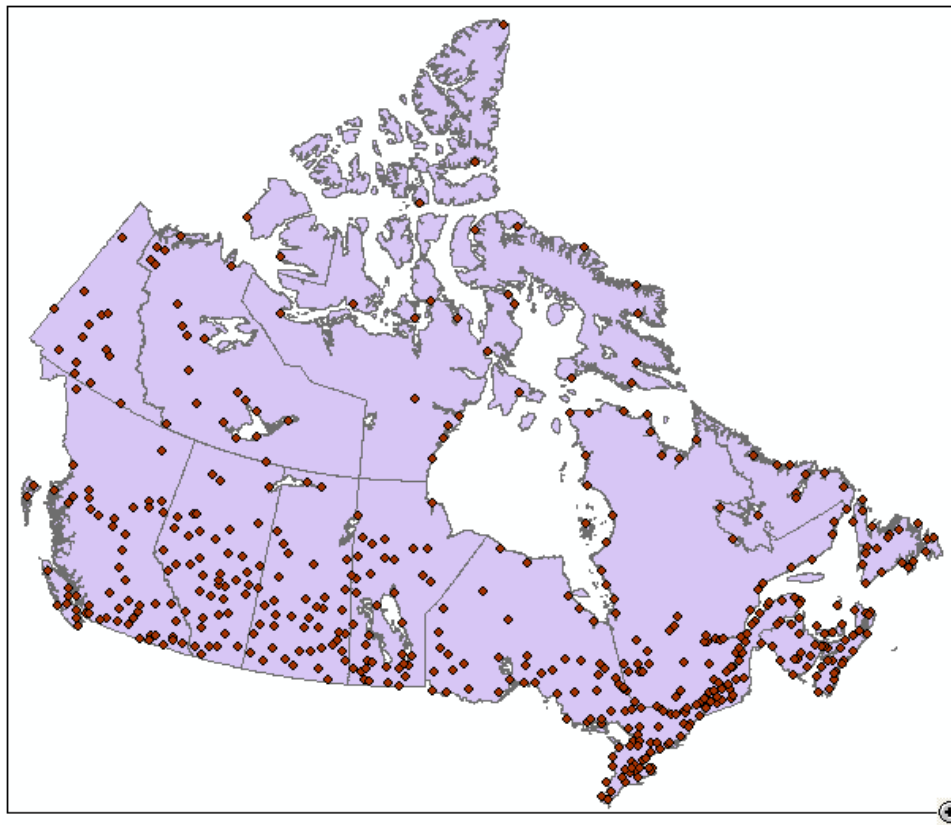
9. It is now time to add the capital cities to your map of Canada. The ArcCanada cities theme contains a large number of cities; however, for this exercise we only want the capital cities. You can select the capital cities from the **Cities Attribute Table** in this file (#10 below) or you can **Digitize** your own cities theme (#16 below). If the social studies outcome requires students to **locate** and **label** the capital cities, then you should proceed to #16 (in the case of Grade 10).

10. To select the capital cities from the cities attribute table, right click on **cities** in the table of contents and left click on **Open Attribute Table**.
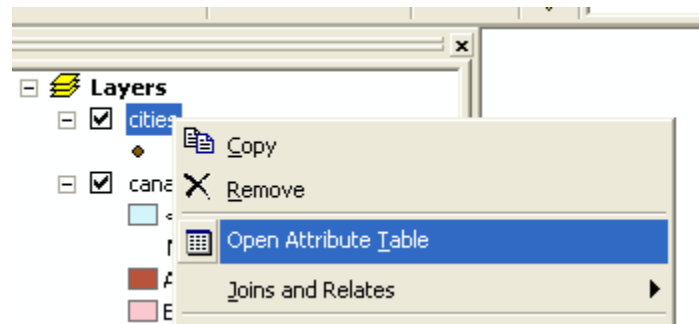
11. With the attribute table open, right click on the **Capital** column heading and select **Sort Descending**.   All capital cities will be moved to the top of the table and will now have a value of 1,2,or 3 in the Capital column.
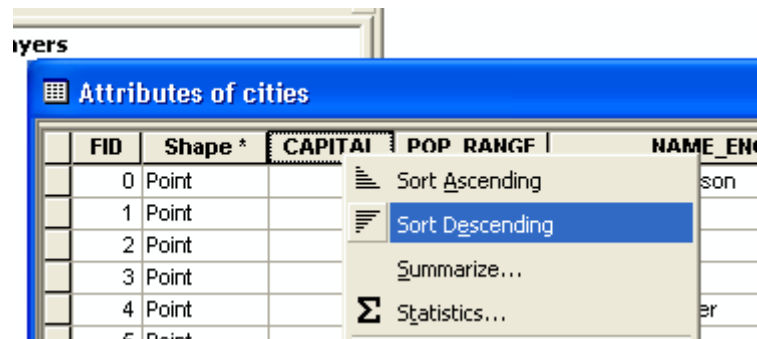

12. With the attribute table still open, highlight (select) all the capital cities by moving your cursor to the small upper left corner box (see screen shot below), click and hold as you move the cursor down to select all the capital cities – they should now be highlighted. In the options bar below the table, go to **Show** and click on **Selected.**

13. Close the attribute table. In the table of contents in your map, right click on the **cities** layer and go **Selection → Create Layer From Selected Features.**
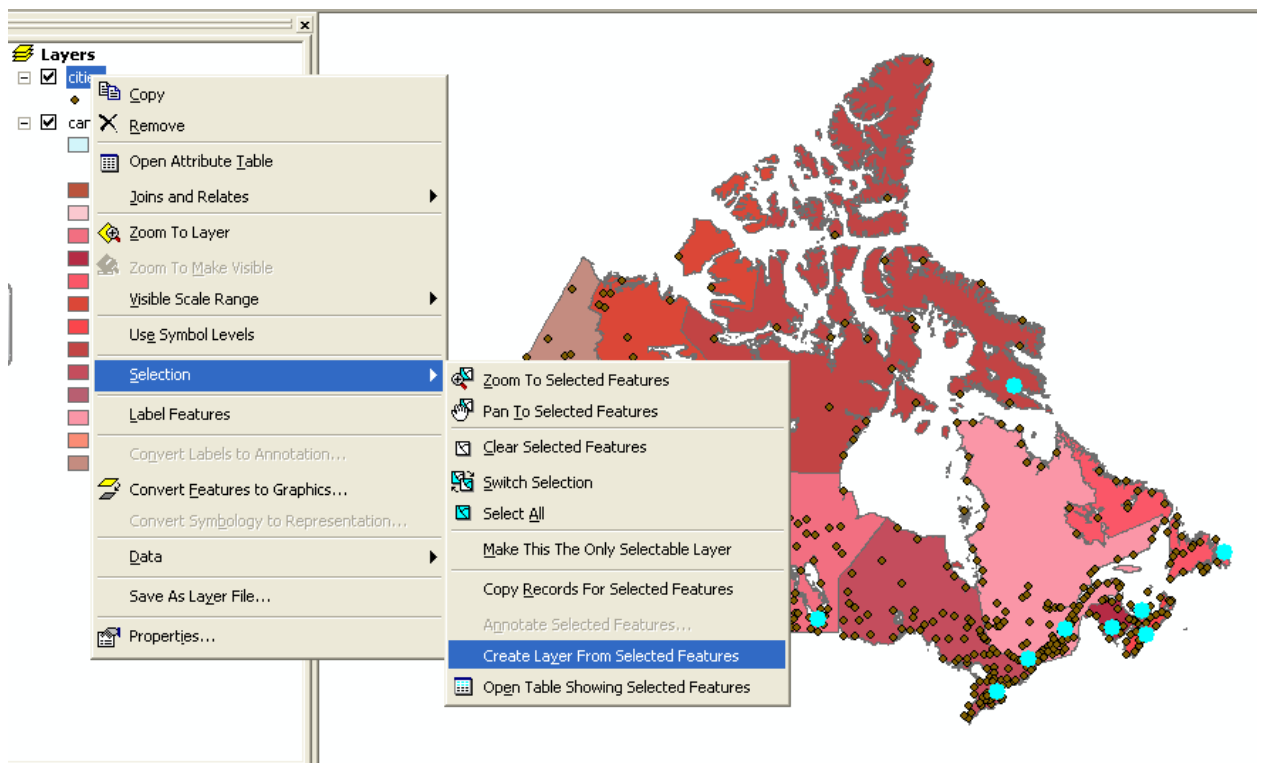
14. There should now be a layer called **cities selection** in the table of contents. Right click on **cities selection** and go **Save As Layer File**. Save this new layer as *Capital Cities* in the same location (folder) where you saved the project.

15. The **cities** layer in the table of contents is no longer needed. It can now be turned off by clicking on the checkmark in the small box next to it. Alternatively, you can delete this layer by right clicking on **cities** and left click on **Remove.** Proceed to #17 below.

16. **OPTIONAL:** An alternative method of creating the capital cities theme is by **Digitizing** a new theme. (You can see a more detailed explanation of digitizing in ArcGIS 9.2 Toolbox found on the **GIS in the Classroom** website of Manitoba Education). To create a new theme by digitizing:
   - Open **ArcCatalog** and next to **Location** navigate to the folder where you saved your project.
   - Go **File → New → Shapefile**
   - Name the new file *Capital Cities* and under **Feature Type** select **Point,** and hit **OK**.
   - Close ArcCatalog.
   - Click the **Add Data** button , navigate to the newly created theme and add it to your data view.
   - Using the Editor button activate the **Editor** toolbar, and select → **Start Editing →** and navigate to the folder where you saved your project - ensure that the new Capital Cities theme is selected (it will likely be the only one shown)
   - Now select the **Sketch Tool** and draw a point at the locations of all the capital cities in Canada (you may need to refer to an atlas or online map of Canada).
   - When you have marked each location, go **Editor → Stop Editing** and **Save** your edits.

17. You can edit the entries in the table of contents (e.g. change *canada2001* to *Canada*) by clicking once on the theme name to highlight it, then clicking once on the highlighted line to make it editable (the cursor will appear). Similarly, change the **cities selection** title to Capital Cities.

18. You can improve the appearance of your map by giving each province and territory a different colour symbol. Double click on **Canada** in the table of contents, select the **Symbology** tab → **Categories → Unique Values**. Here you can also select your choice of **Colour Scheme**. Under **Value Field** select **Name;** then select **Add All Values → Apply → OK.**
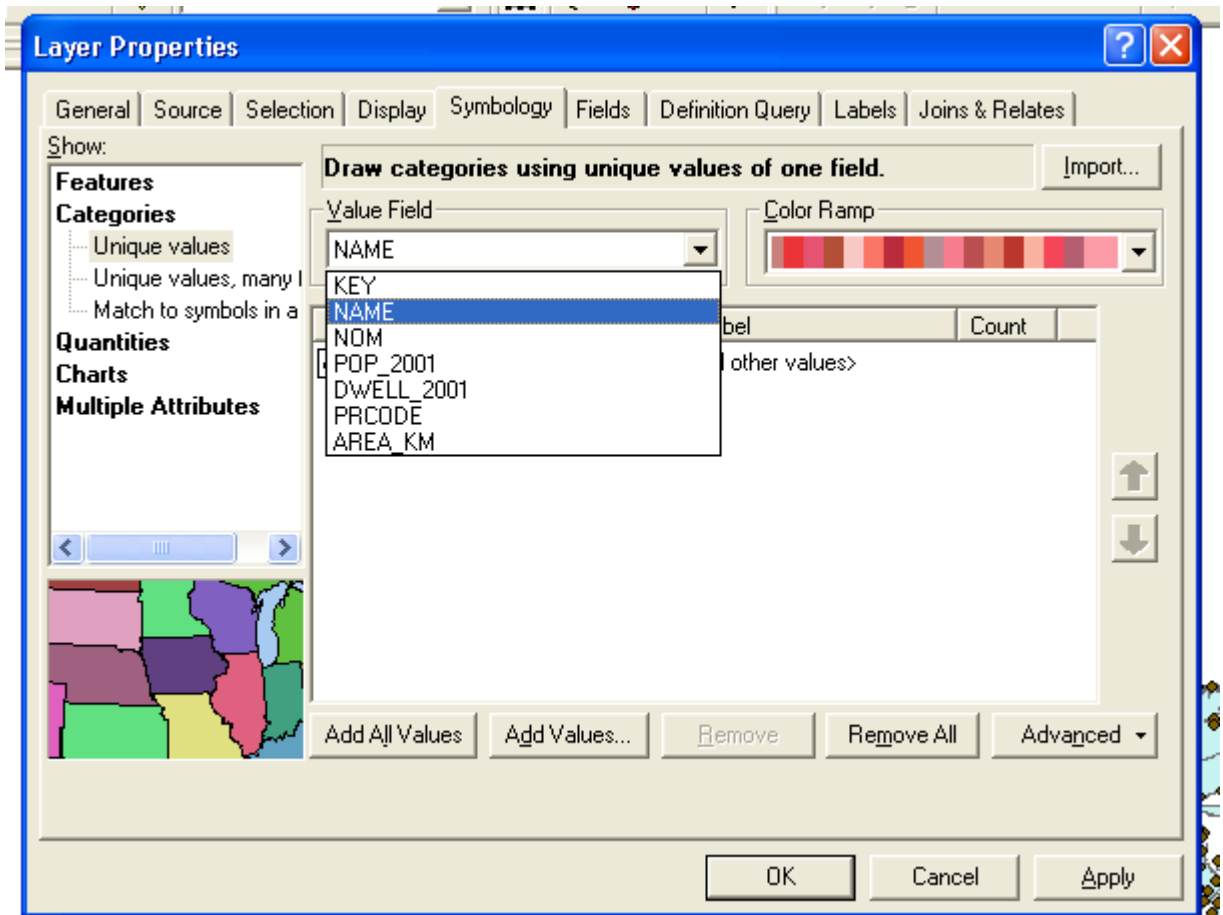
19. Double click on **Canada** in the table of contents, select the **Symbology** tab, click on **Categories** and under **Symbol** uncheck the box which is associated with **<all other values>**.


20. The capital cities have now been located, but they require labeling. Use the **Label Tool** 🅰 , select the kind of labels you want, and then click on the location of a capital city. When a textbox appears type in the appropriate name.

21. If you make a mistake while labeling, use the **Select Elements** button and **double click** on the incorrect text; a new textbox appears to start over.

22. Now your map of Canada is completed and it is time to create a **Layout** which allows you to add all the necessary map basics such as legend, scale, north arrow, name, title and border. The easiest way to complete this is by using a map layout template. Click on **View** in the toolbar and select **Layout View** and then click on the **Change Layout** in the Layout toolbar.
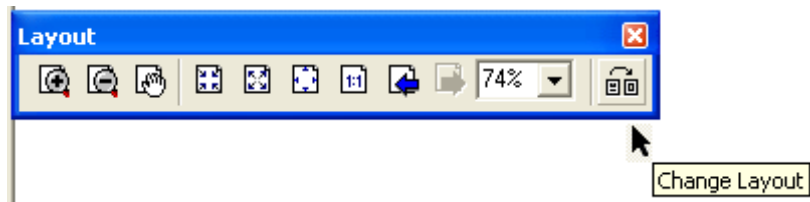
23. Once you have clicked on the **Change Layout** button, click on the **General** tab, select **Letter Landscape** and click on **Finish**. You should now see a map with all necessary map components. (Whatever is visible in the Data View will appear in the Layout View. If your map is too small or too large, use the zoom tools in Layout toolbar to zoom to the appropriate size).
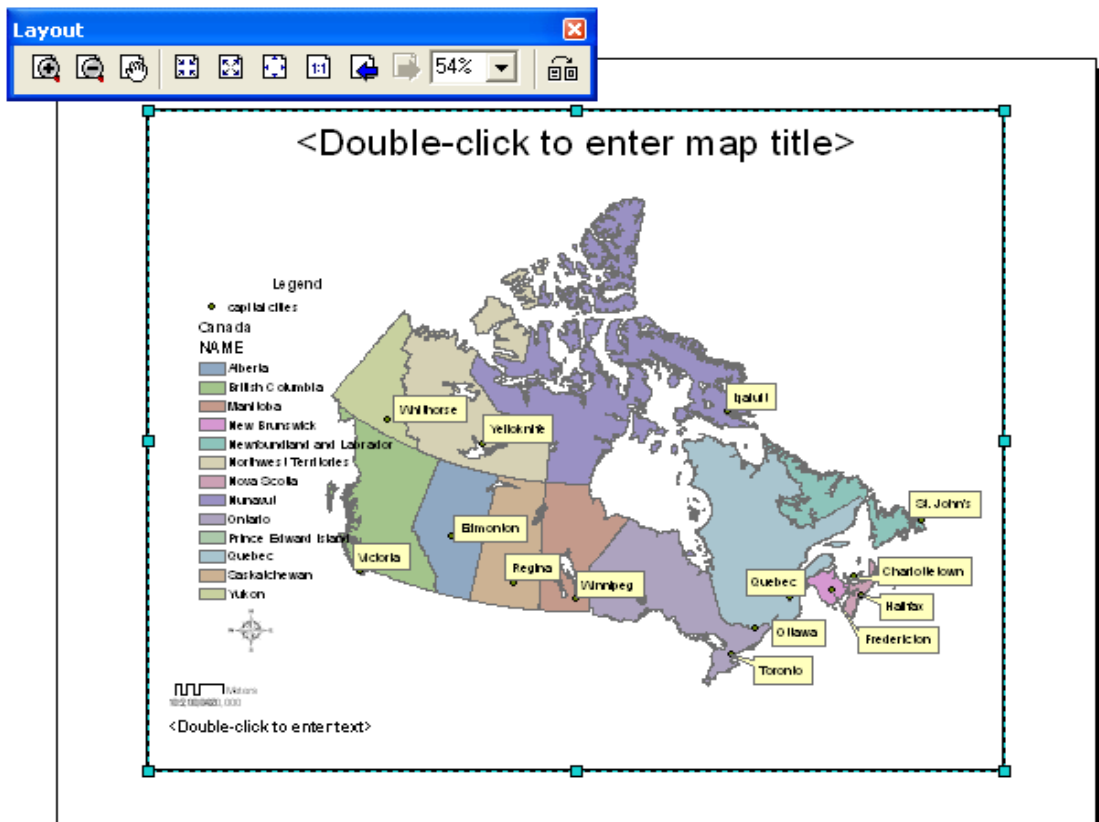
24. Using the cursor double click on the title line and add an appropriate title.

25. Double click where prompted and add your name and date.

26. Using your cursor click on and drag the north arrow and legend to a suitable location. You can change the size of the legend and north arrow by clicking on the item and dragging the corner to enlarge or reduce the feature.

27. Double click on the **Scale** and under the **Scale and Units** tab, go to **Units →
Divisional Units** and change the units to **Kilometers**.

28. Your map is now complete and the layout is ready to show to your teacher, or for printing.

<u>**Optional Activities**</u>**: (Return to the Data Frame)**

1. Using the **Identify** button found on the toolbar, click on any city/province or territory. This will give you the attribute data associated with the feature on the map. This demonstrates a key feature of ArcView that links information with geographic locations. You can see all the data in a table when you open the attribute table for a specific theme layer.

2. Using the **Measure** button you can measure the distance between two locations on the map. Click once to start measuring, click once to change direction, and double click to end the measurement. The distance is displayed in the bottom left of your screen.

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