# MAP LAYOUT DESIGN WITH ARCMAP

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# MAP DESIGN IN ARCMAP

# WORKING WITH THE MAP LAYOUT

One of the essentials of mapping and map design is a map layout that explains and depicts the purpose of the map. The map has to be properly symbolized/displayed and arranged in the map layout view. *See (https://www.invclick.com/wp-content/uploads/2019/05/VISUALIZING-DATA-WITH-ARCMAP-1.pdf)* for guides on visualizing data.

The layout view is the section where the map is designed. It is in the layout view that the title, scale, legend, north arrow and other map elements are put-in to create a good map.

To toggle from the data view to the layout view, Go to:

1. **View** on the Menu Bar.

2. Select **Layout View**.

OR

Simply Select the data view bottom at the lower left-hand corner of the data view

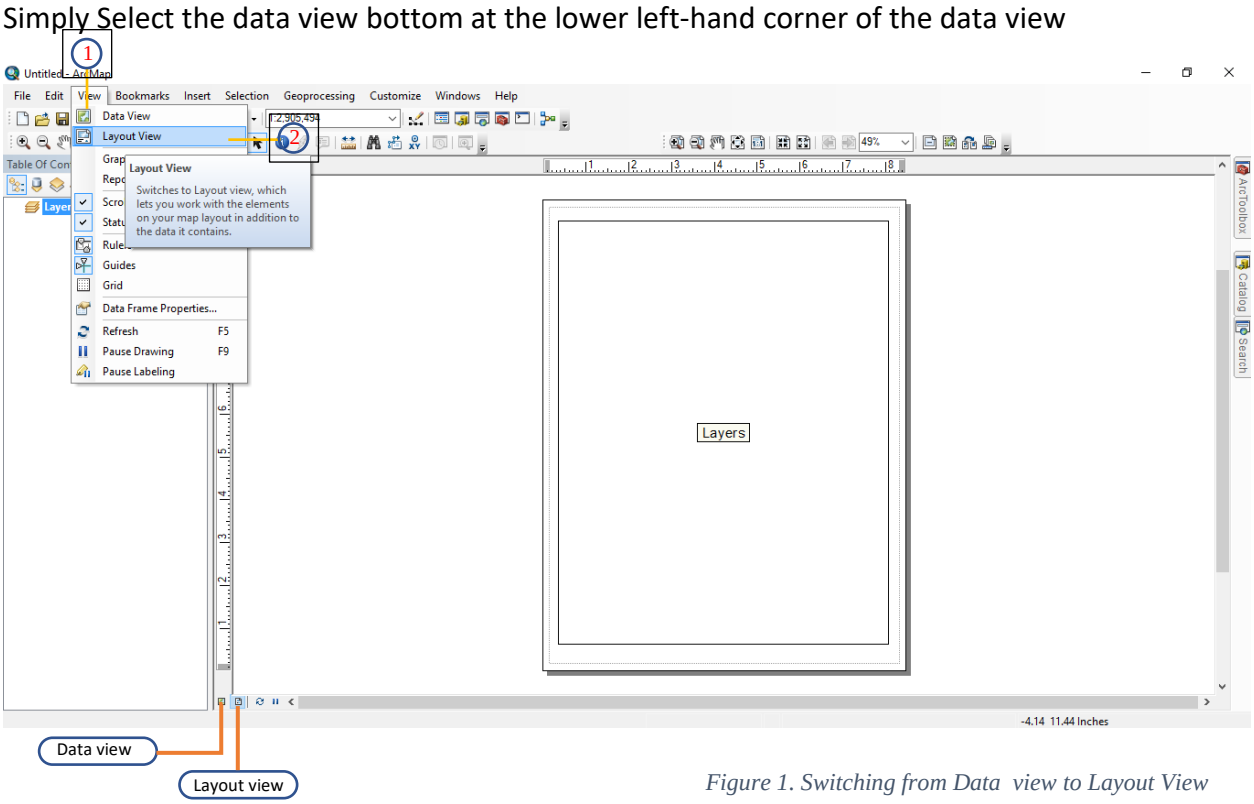


*Figure 1. Switching from Data view to Layout View*

To switch back to the data view, follow the same procedure.

## Paper Setting (Size and Orientation)

By the default, the paper size and orientation is set based on the template that was selected after opening ArcMap. To change the paper size and orientation, Go to:

1. **File** on the menu bar.

2. Select **Page and Print Setup**.

3. Select and Set the paper size and orientation

4. Tick **Scale map elements proportional to change in page size**

5. Click **Ok** to apply changes.

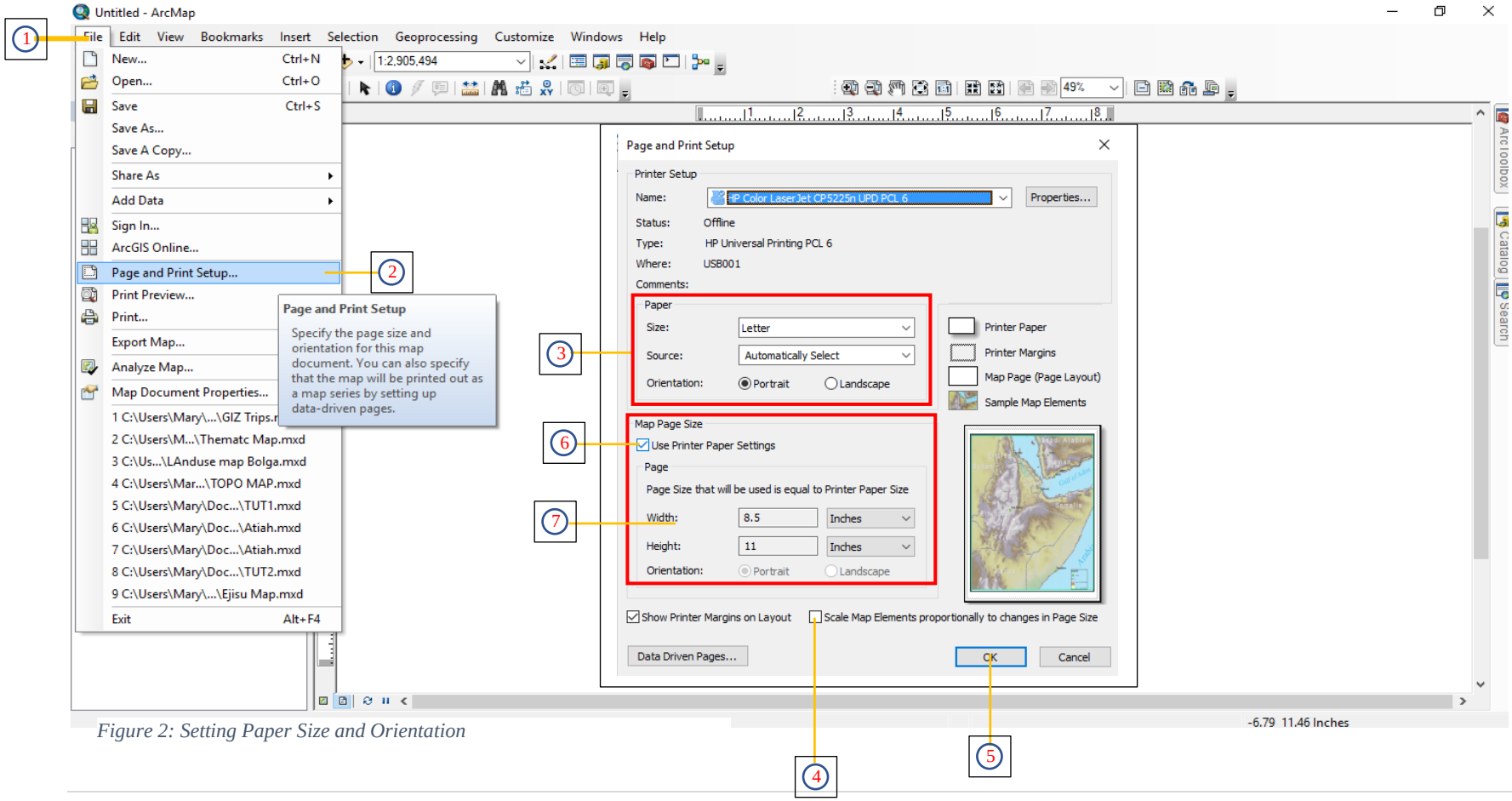


*Figure 2: Setting Paper Size and Orientation*

The paper size can manually be set by

5. Unticking the "**Use Printer Paper Settings**".

6. Manually putting the dimensions.

## Using Rulers and Guides

The alignment and position of map data and other map elements in the layout view determines the aesthetic of the final layout. Rulers and Guides are used to align and position map elements on the layout. The guides act more like margins for each element, they are used as guides as to where map elements should be used. Rulers are used alongside with guides to make more accurate guides.

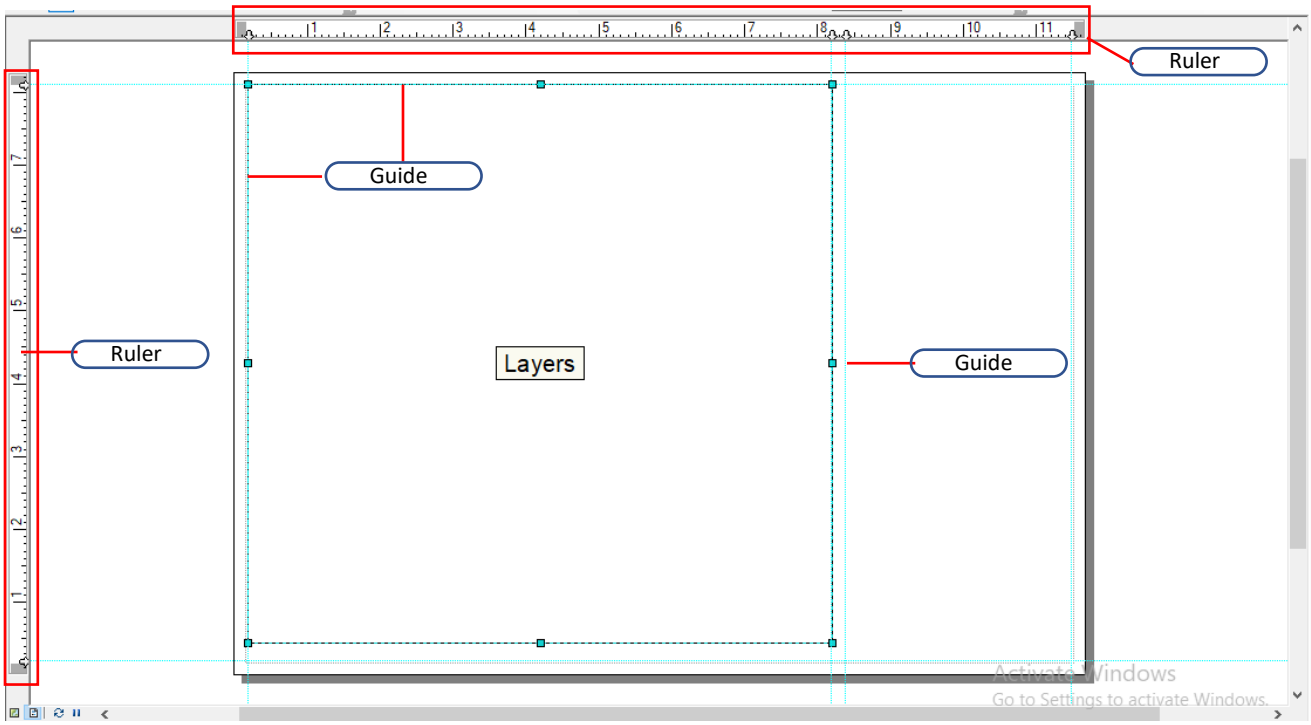


*Figure 3: Rulers and Guides*

***NB: Guides and rulers are used only in the layout view***

If the rulers don't appear when you switch to the layout view, go to

1. **View** on the menu bar

2. Select **Rulers** and **Guides**

Click on a calibration(s) on the ruler(s) to place a guide there.

You can drag a guide along on the rule to reposition it.

Before setting guides, you should first perceive the final output so as to set the guides to help prepare the layout as desired.

## Setting the Data Frame

The data frame is the section of the layout where the map from the data view will be displayed. Basically, the data frame is the map area. It is very important to provide enough space for the data frame, so as to enable a clear display of the map.

After positioning and structuring the data frame, create a bookmark. The bookmark serves as specification recall setting for the data frame. In the case there are any changes to the data frame, due to activities in the data view, you can simply click on the bookmark to revert the changes to the desired (bookmarked) setting. To create a bookmark, Go to:

1. **Bookmarks** on the menu tab.

2. Create a new bookmark.

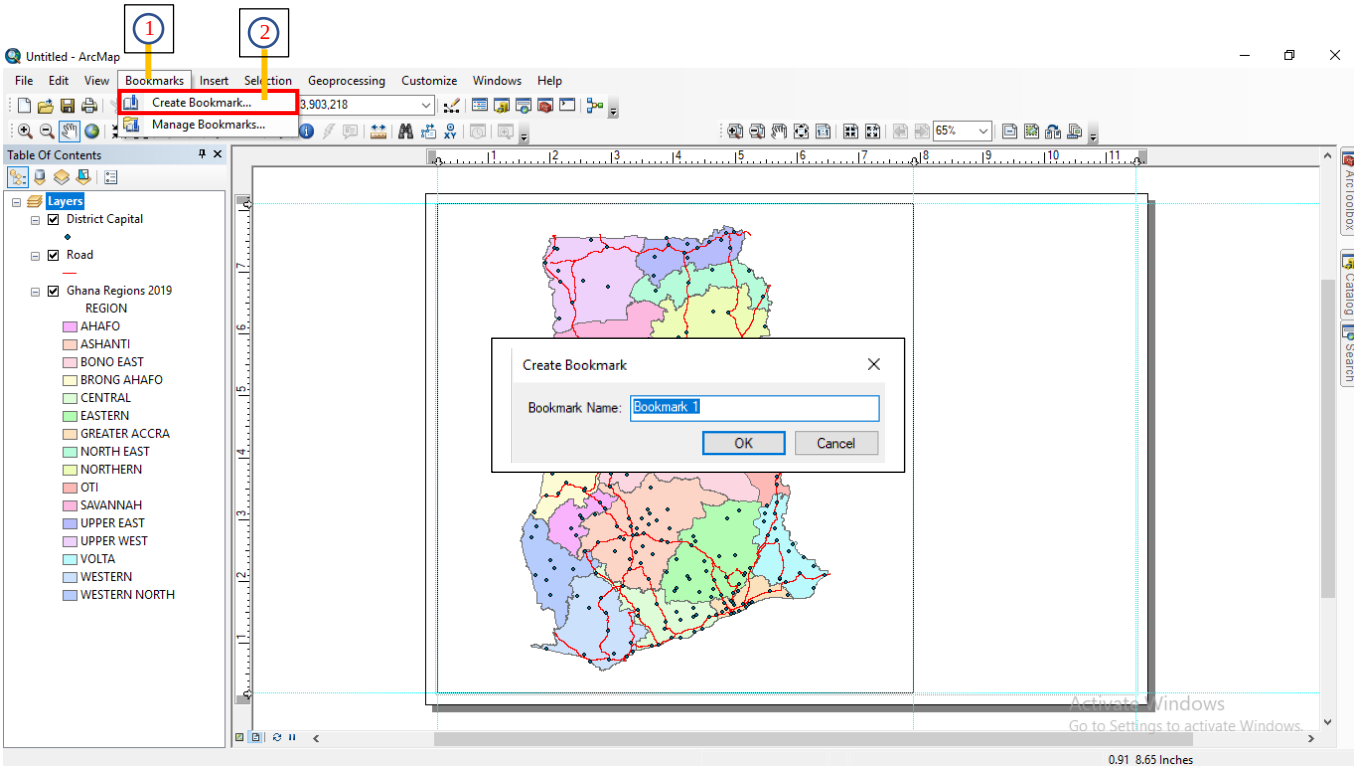


*Figure 4: Creating Bookmarks*

## Adding Map Elements to Layout

A map layout without data or elements is as good as a sketch at the banks of a sea. A Map layout must contain:

**1. A Data Frame:** A data frame is a portion of the map that display the data layers, as displayed in the data view.

**2. A Title:** a title describes or gives the map an identity. A map without a title is difficult to locate or understand. Titles can either be used to identify the region being displayed in the data frame, (e.g., Map of Ghana, Map of Mozambique, Map of France etc). titles like this, makes the viewer quickly know the area or region they are viewing. Titles can also be used to describe the map (e.g. Flood Analysis Map of Accra, Elevation Map of West Europe).

**3. Legend/Key:** the legend is used to describe what each feature on the map symbolizes. It decodes the symbols on the map, and better enables the viewer to understand the map.

**4. North Arrow:** the north arrow is a symbol used to orientate the reading and usage of the map. It is used to indicate directions (north, east, south and west) on the map.

**5. Scale:** The scale is used as a reference in measuring the distance(s) on the map. A scale can only be put on the map if the map has a **Projected Coordinate System.**

**6. Grid/ Reference:** Grids are geographical tags that can be used to locate the area being displayed on the map. A classic example is the longitude and latitude grid lines.

Other map elements can be added to a map, but the above stated elements are the basic elements of a good map.

## Adding a Map Title

To add a title to the map layout, go to:

1. **Insert** in the Menu tab and select **Title**.

2. Type the title, as you would like it to appear.

3. Click on **OK**

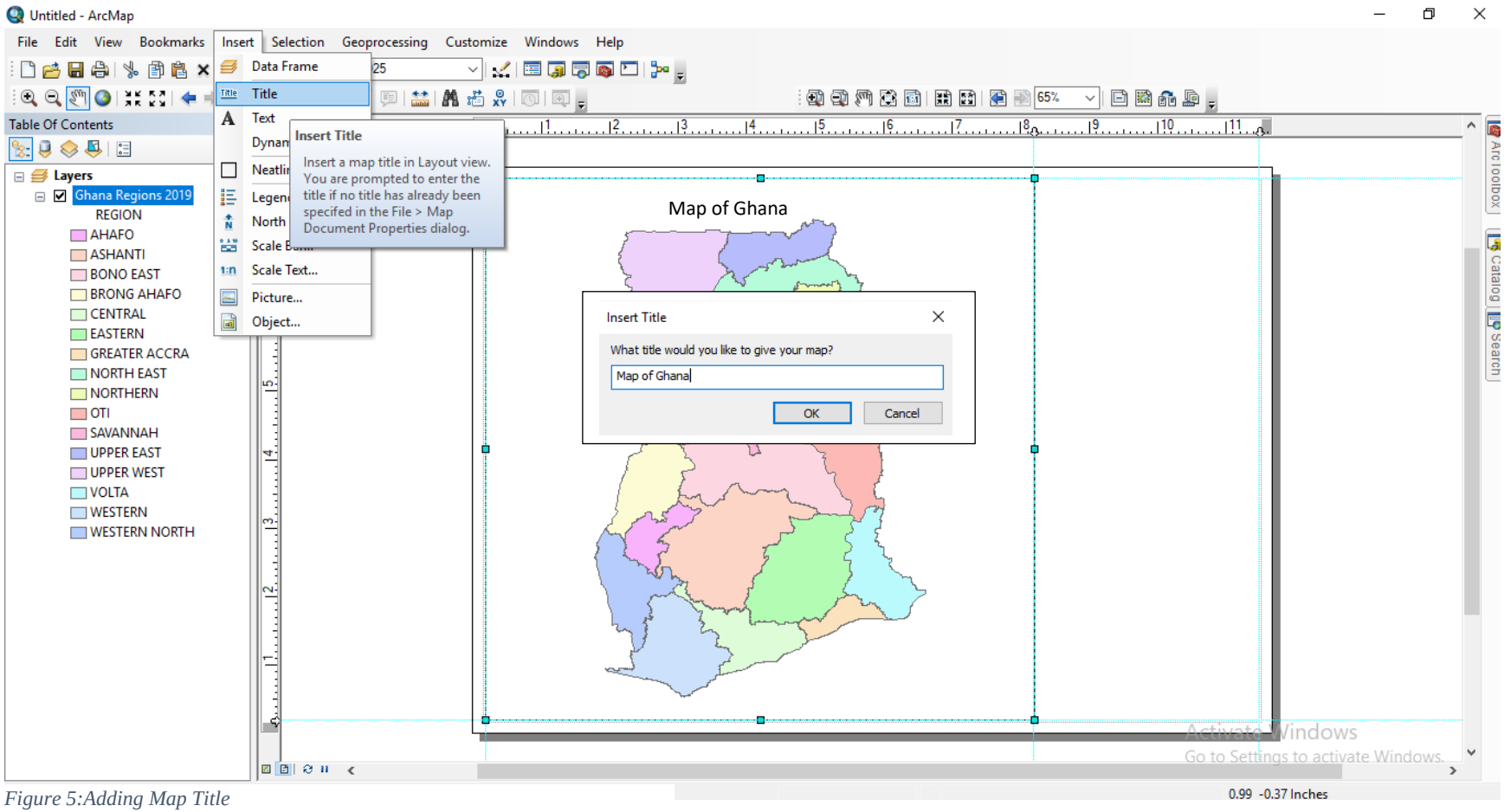


*Figure 5:Adding Map Title*

To increase the size of the title or change the font type: double click on the inserted title

2. Click on **Symbol.**

3. Make the Necessary changes then click on **ok**.

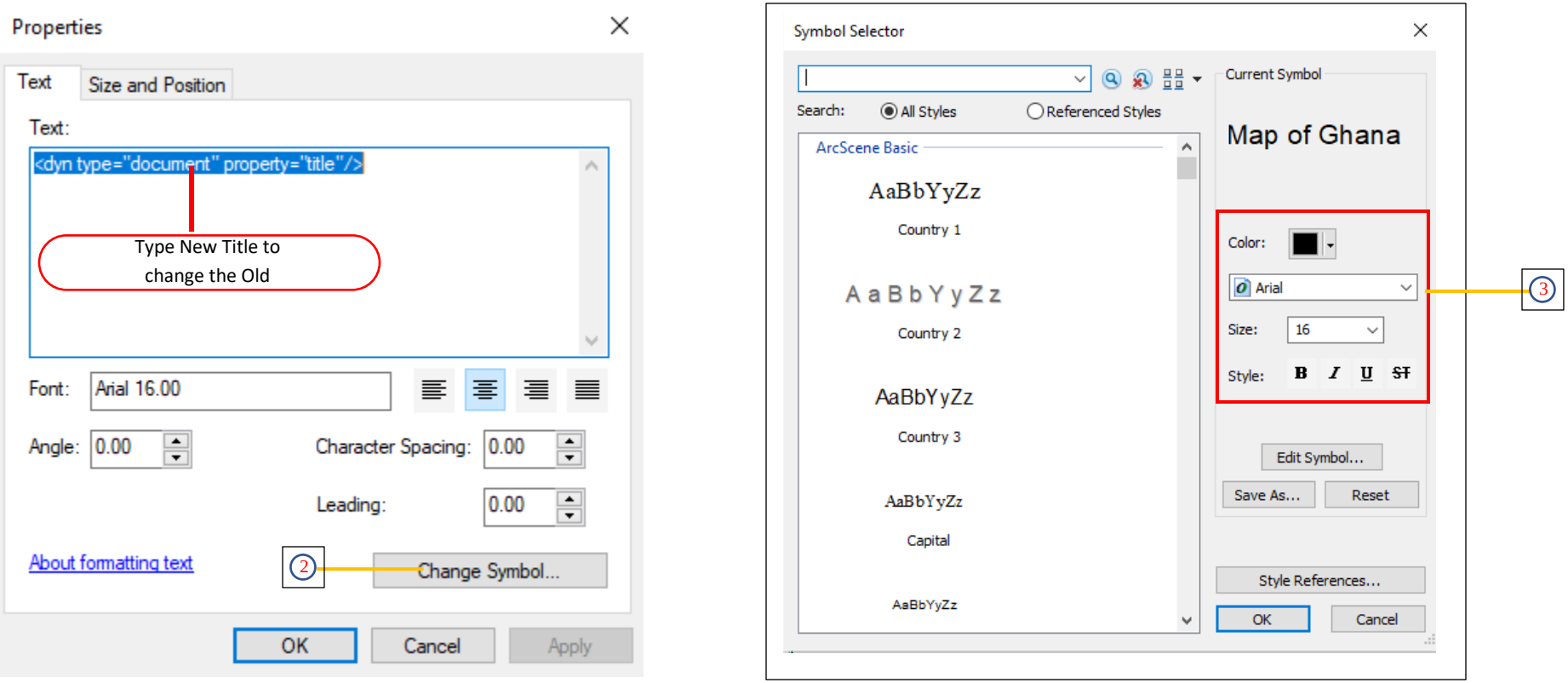


*Figure 6: Map Title Properties*

To Change the title, type the new title under the text section as indicated above.

## Adding a Legend/Key

Information displayed in the legend/ key represents data in the data view, or symbology of a particular dataset. To add a legend, Go to:

1.**Insert** on the Menu tab

2. Select **Legend**

3. Select attributes you would like to add from the layer and use the **>** arrow to move them into the legend item box (do the opposite to remove/exclude features from the legend list).

4 Set the number of columns you would like your legend to have.

5. Select **Next**.

6. Set the legend title properties then click on **Next**.

7. Set the frame properties then click on **Next**.

8. Click **next** in the wizard dialog box

9. Then click on **finish** to set up the legend.

**NB:** ***you do not necessarily have to change all properties if you don't want to. You can simply select next till you finish***.

After generating the legend, find a suitable position on the map layout to place it.

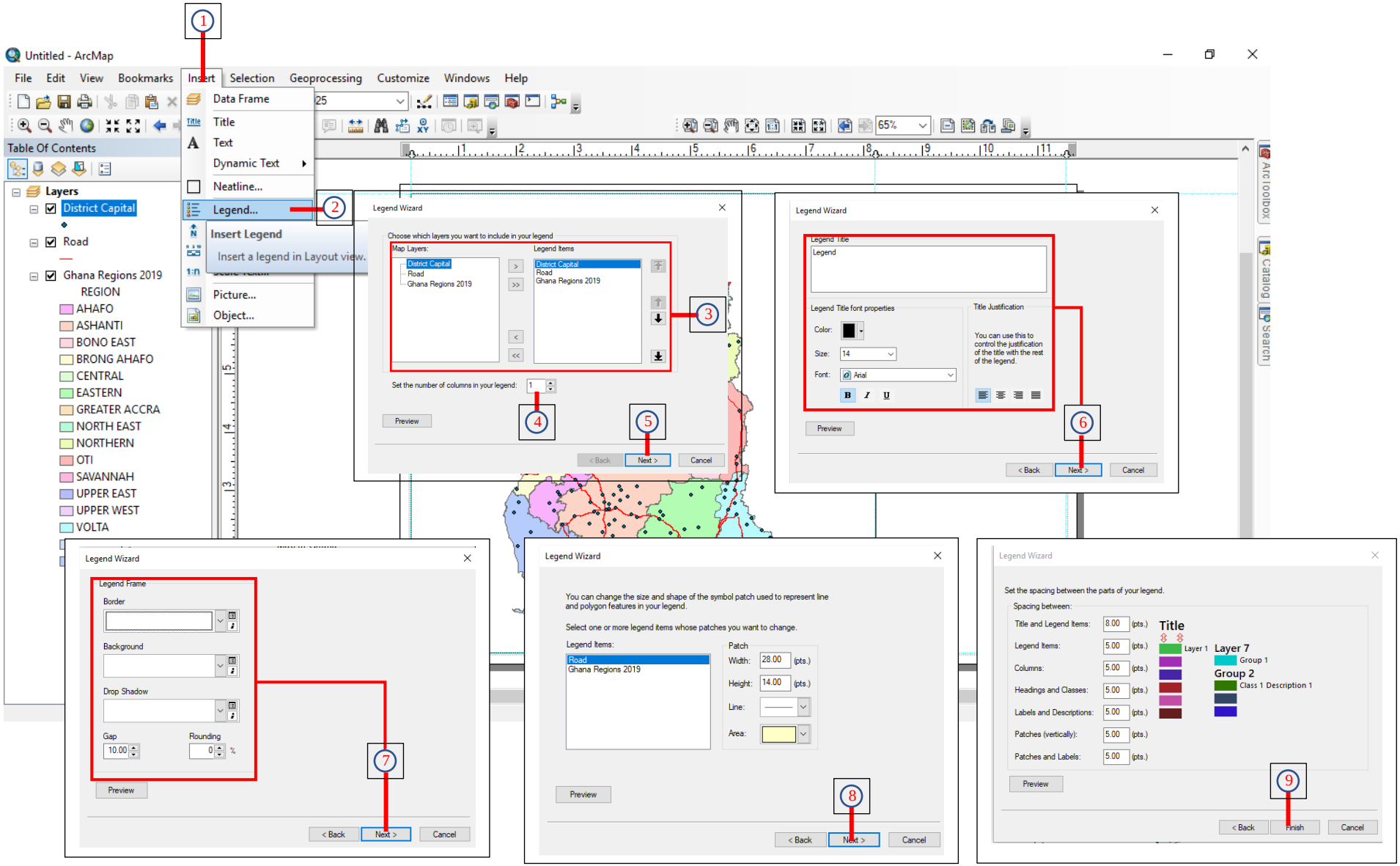


*Figure 7: Adding a Legend to Map Layout*

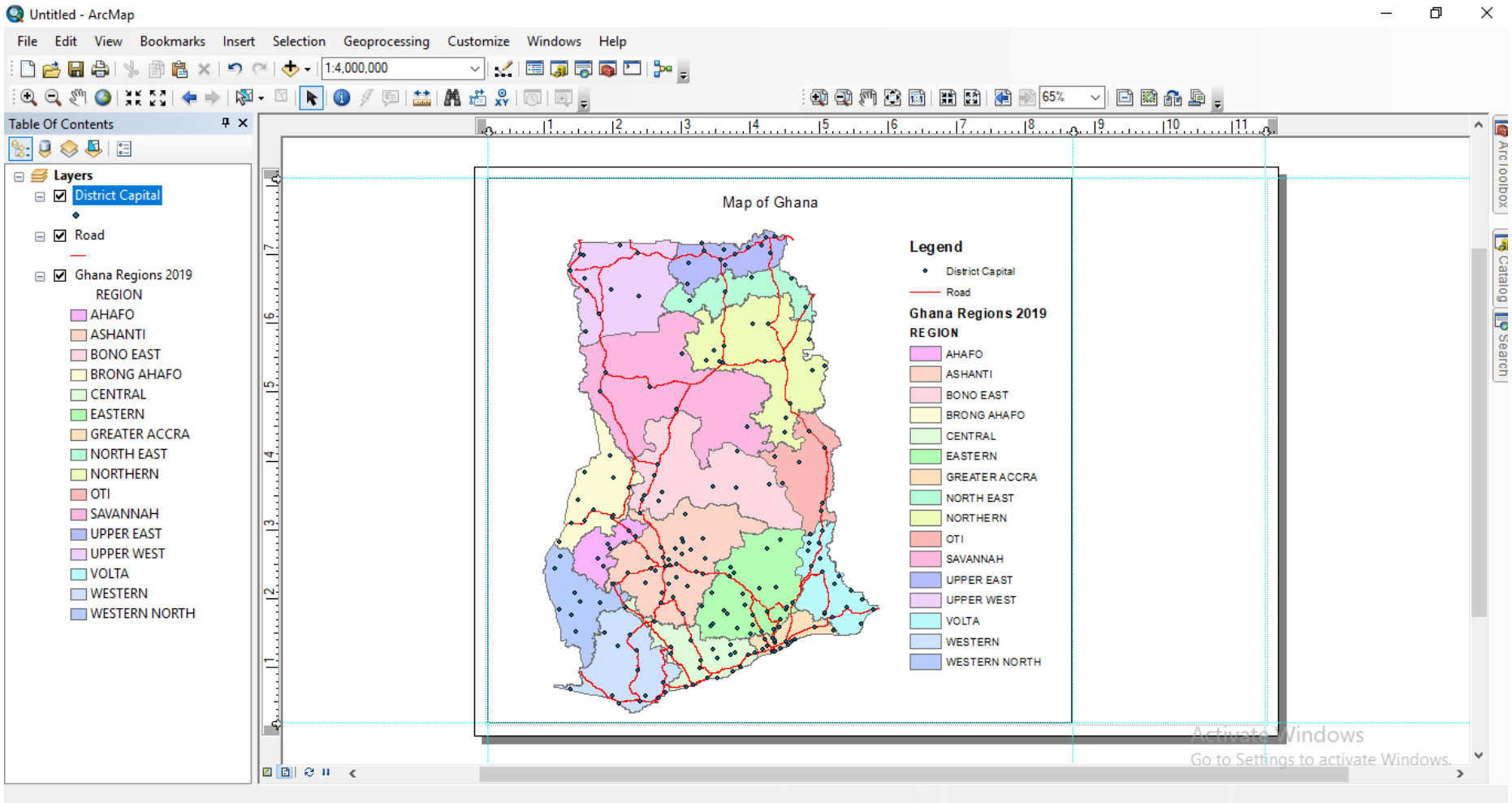


*Figure 8: Placing a Legend on the Map Layout*

## Adding a North Arrow and Scale Bar

To add a North Arrow or a Scale Bar, go to:

1. **Insert** in the Menu Bar.

2. Select **North Arrow** or **Scale Bar**

3. Select the Arrow or Scale Bar (*depending on which tab was selected from the insert*) you would want to use

4. Click **Ok**

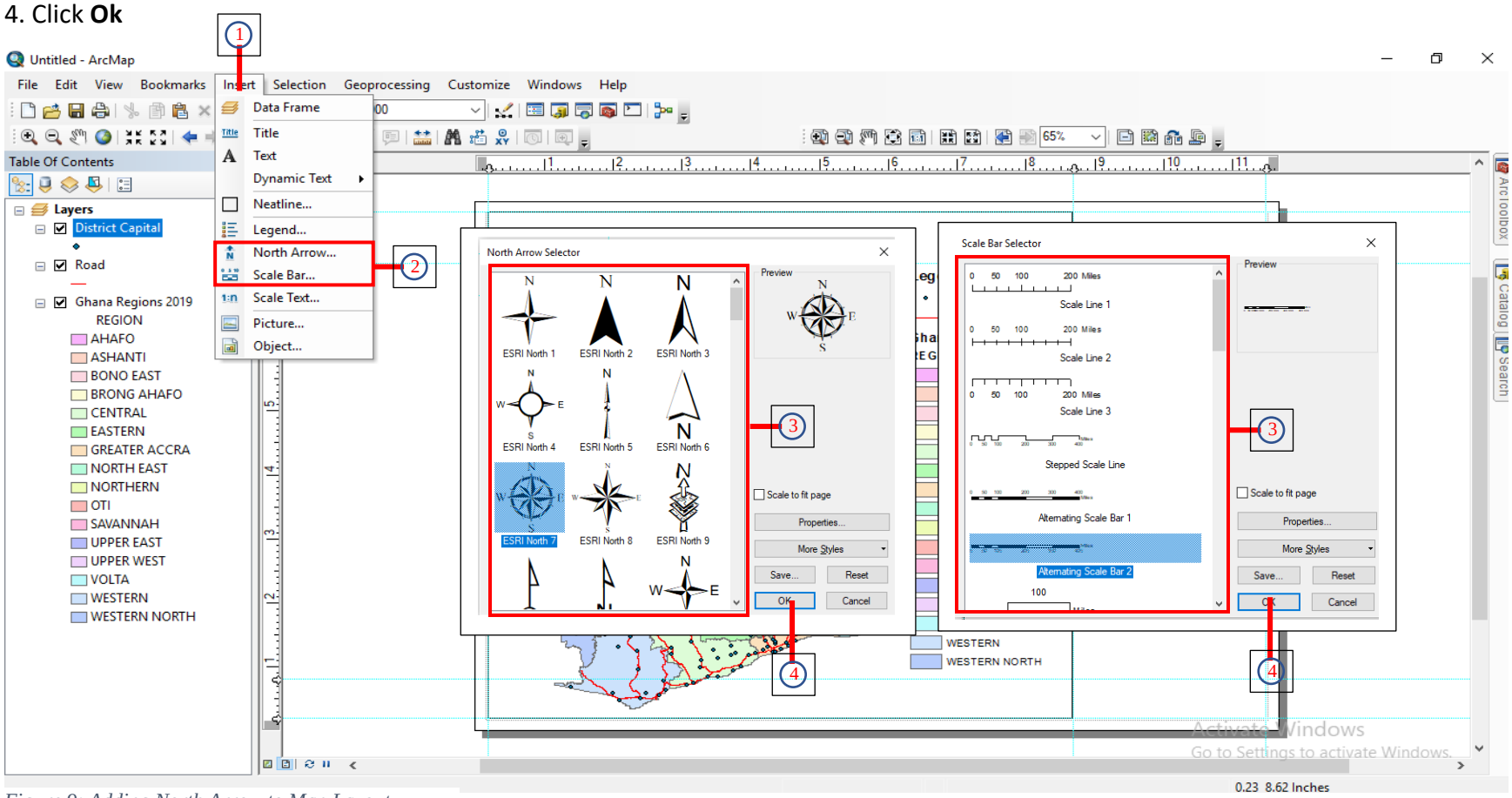


*Figure 9: Adding North Arrow to Map Layout*

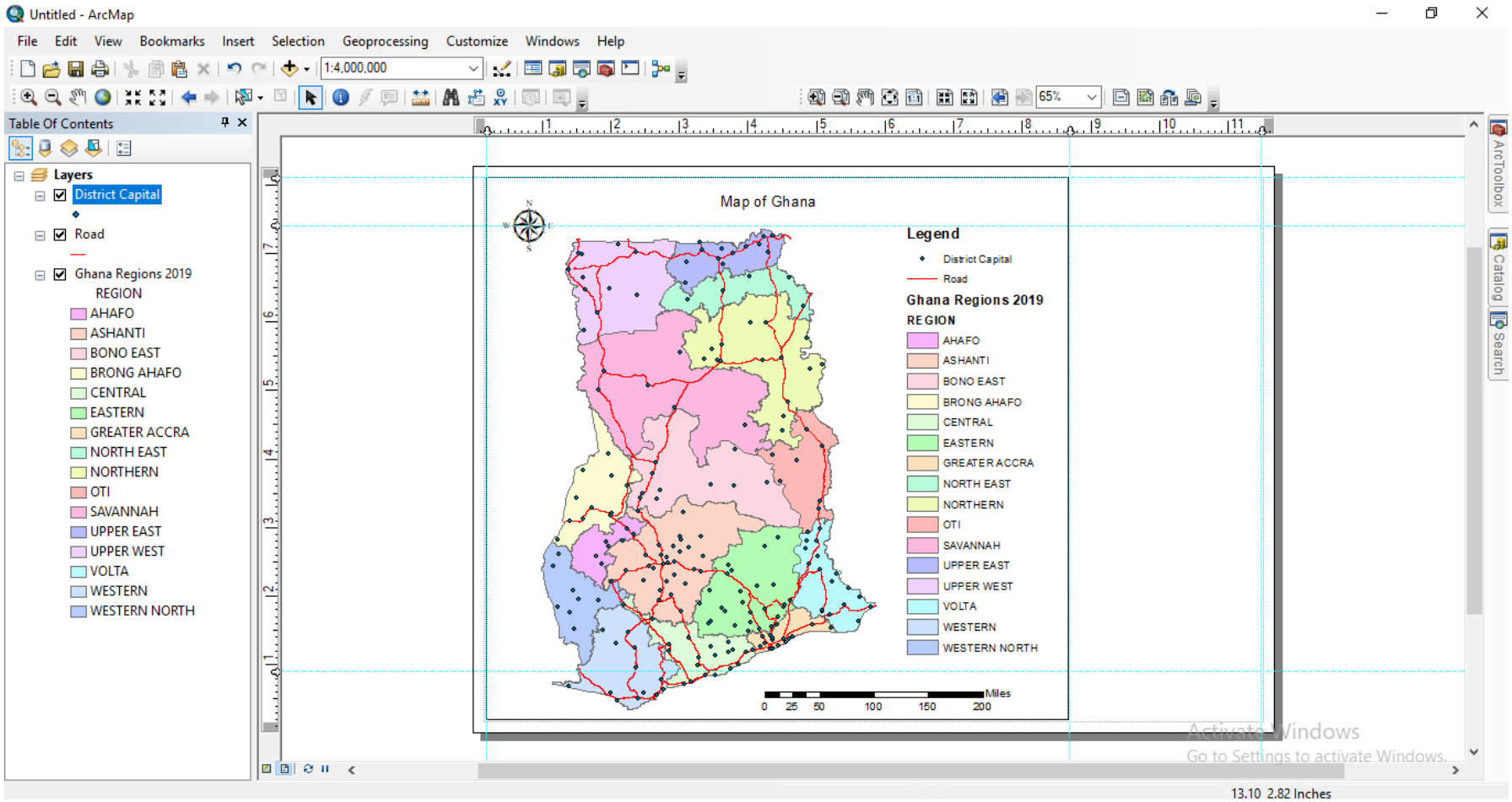


*Figure 10: Map Layout with North arrow*

## Adding Grid/Reference

Grids are applied to the Data Frame under which all data opened are placed. thus, all data under the same data frame in the table of content, use the same grid. To apply grids to the map, go to:

1. The **Table of Content** and go to the **properties** of the **data frame (Layers)**

2. Select **Grid**

3. Click on **New Grid**, to create a New Grid.

4. Select the type of Grid you will like to Create. And click **next**

- **Graticules:** this grid system uses meridians and parallels (longitudes and latitudes) as indicators of location.
- **Measured Grids:** divides the screen based on projected coordinate systems, grids are measured using map units specific projected coordinate system. Each Projected Coordinate System used will have different map units, though they cover the same area.
- **Reference Grid:** divides the map using index, the map is annotated with Numbers and Alphabets. This system doesn't use geographic coordinate systems, but uses reference location on the map based on Rows and Columns (Alphabet and Number e.g. B2).

5. Select the line appearance, and set the line intervals, then click on **next**.

6. Set the Axes thickness and label style the Click on **next**

7. Click on **finish** to create the new grid.

8. Click on **Ok** to apply the grids to the map layout.

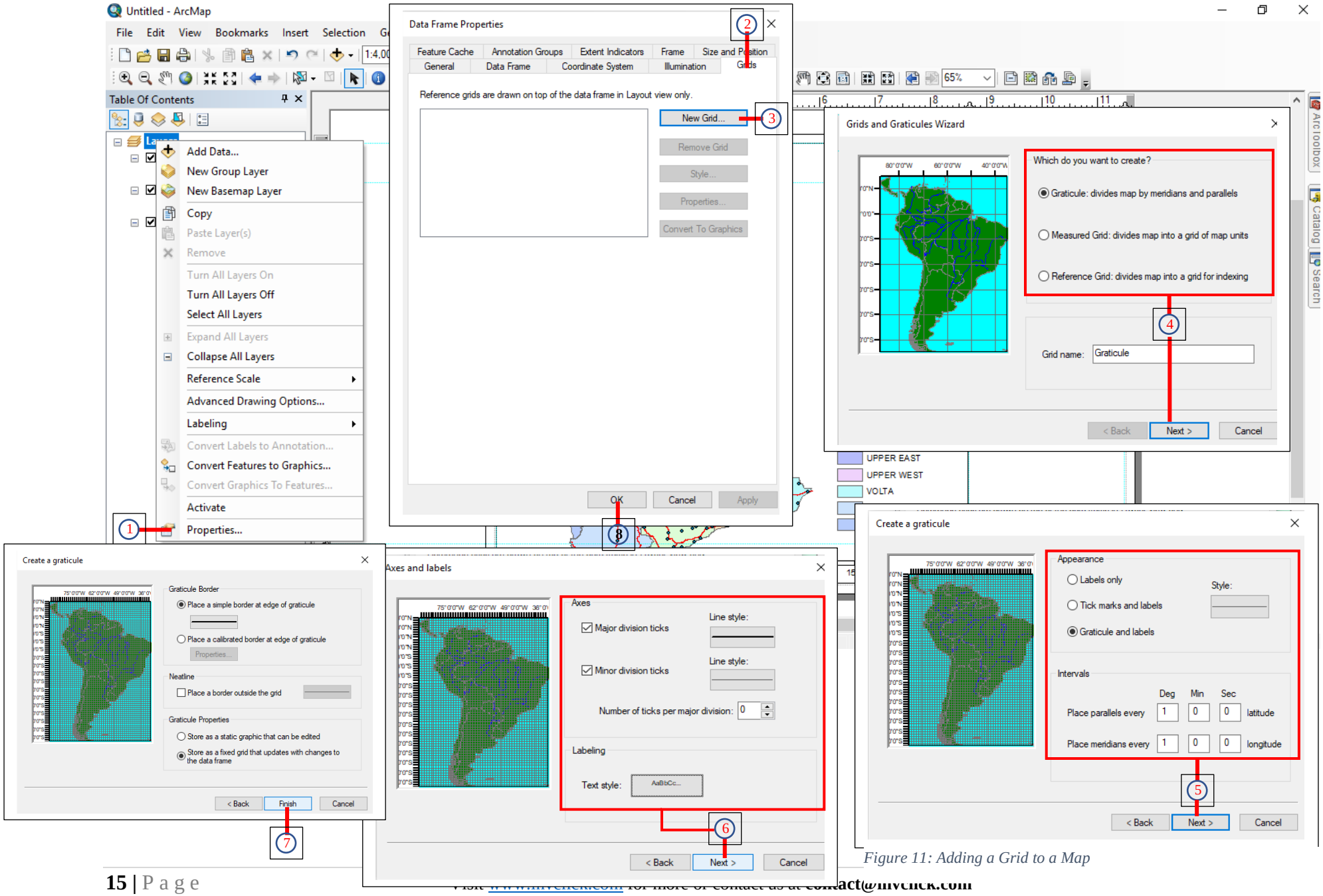


*Figure 11: Adding a Grid to a Map*

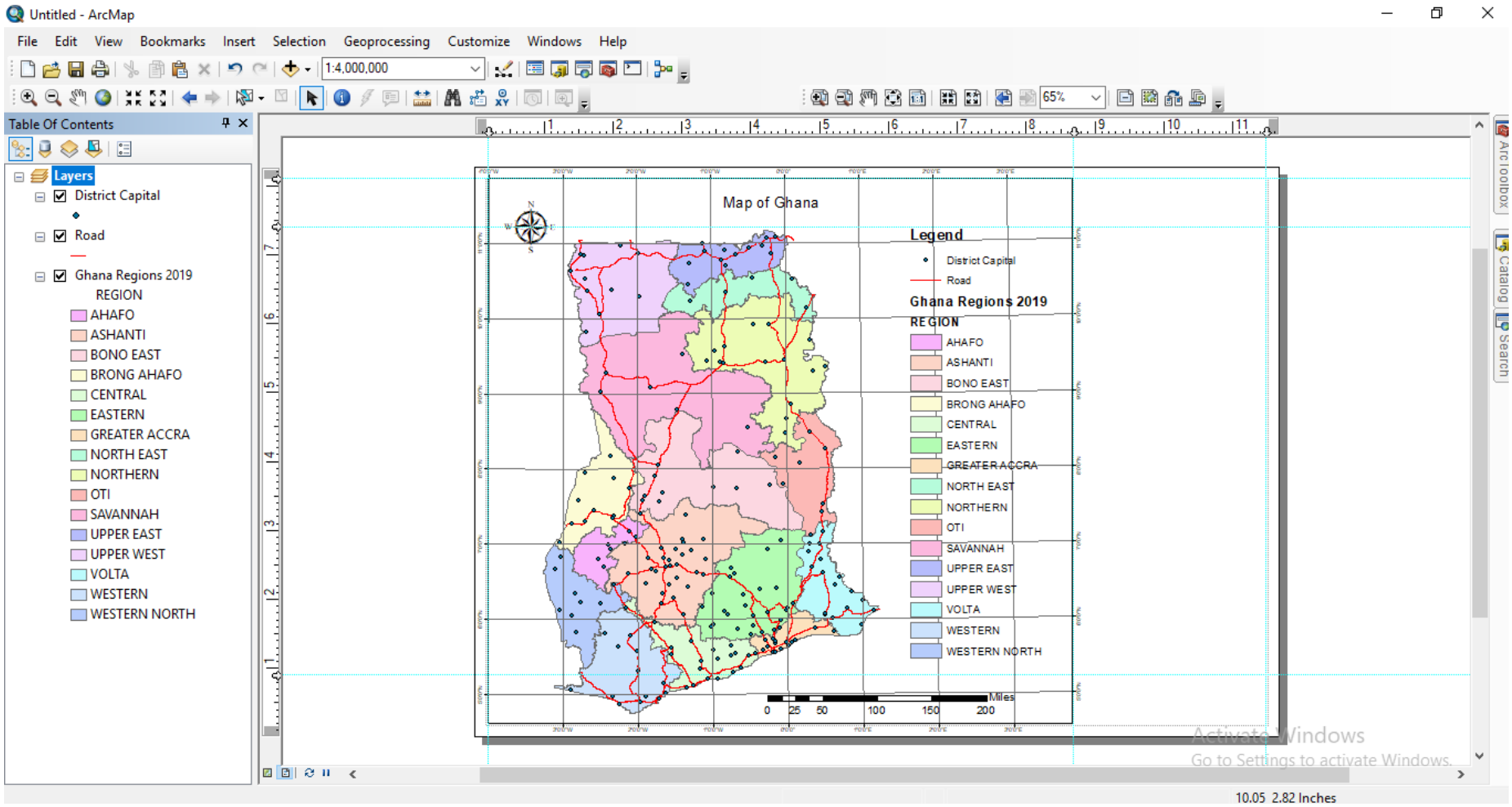


*Figure 12: Map with a Grid*

The image above depicts a map with all the basic map elements, i.e. title, legend, scale, north arrow, and grid lines. Extra elements (such as images and other dynamic texts) can be added by going to insert and selecting the desired element to be added. As seen above, a section of the layout has not been used, thus extra elements can be added to make use of that space.

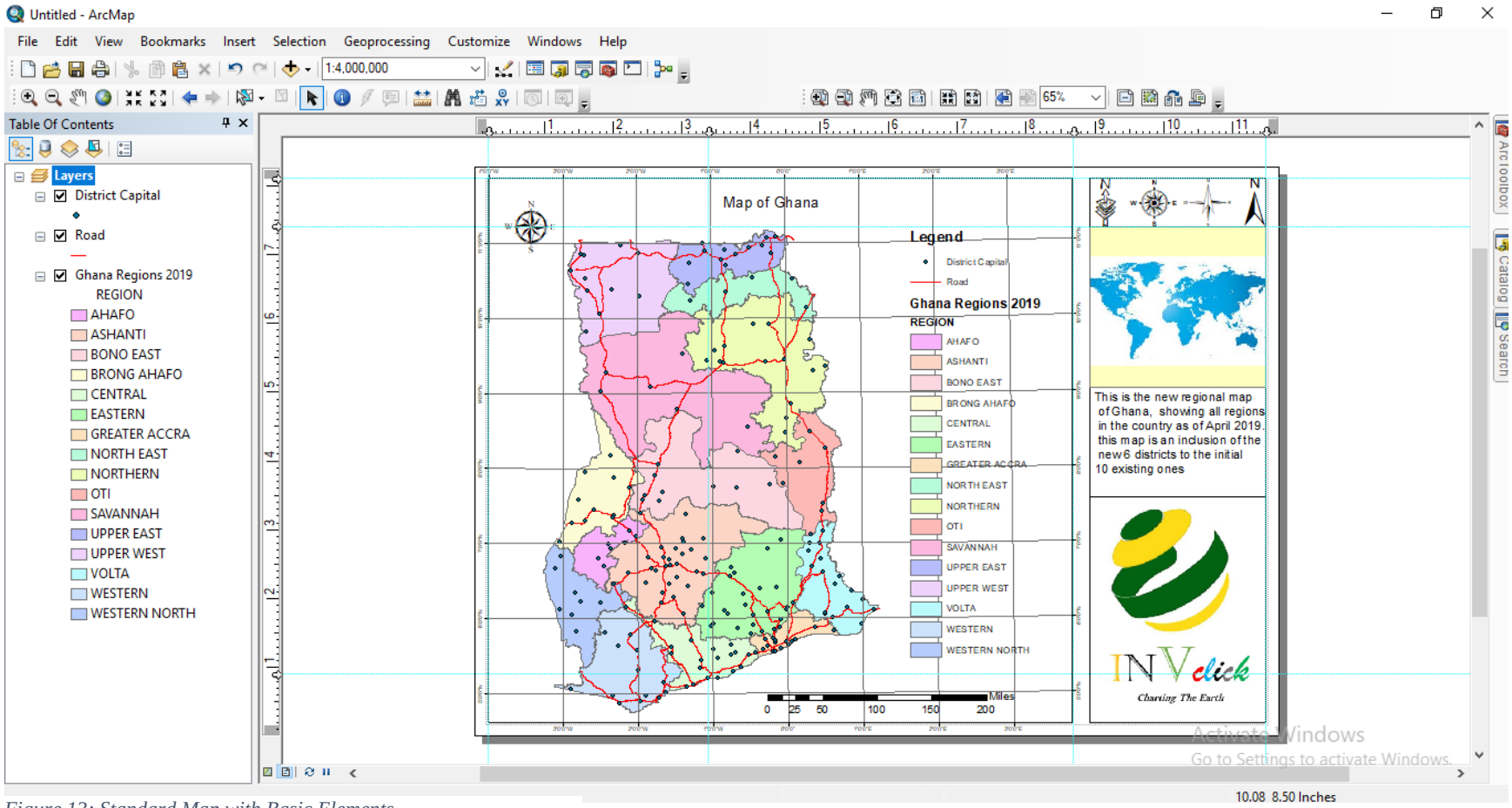


*Figure 13: Standard Map with Basic Elements*

After placing all elements, and aligning everything to satisfaction, the image can be exported and saved as a image, independent of the use of ArcMap. These images can be shared or printed. To save the layout as an image, Go to:

1. **File** in the menu bar.

2. Select **Export Map**

3. Browse for a folder to save the map in.

4. Select as save format **(Save as type)**, and specify the name **(file name)** the map should be saved in.

5. click on **save**.

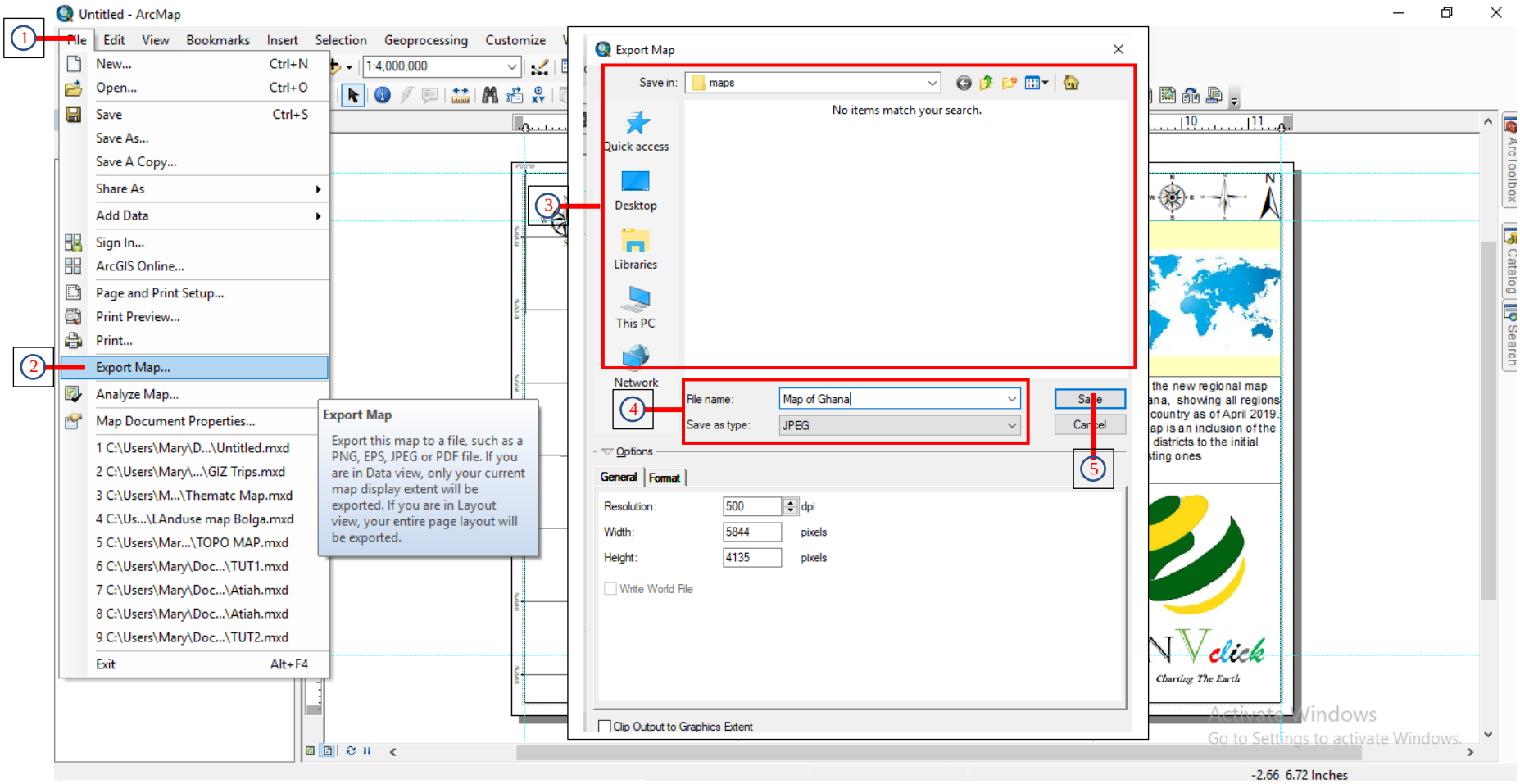


*Figure 14: Exporting a Map Layout*

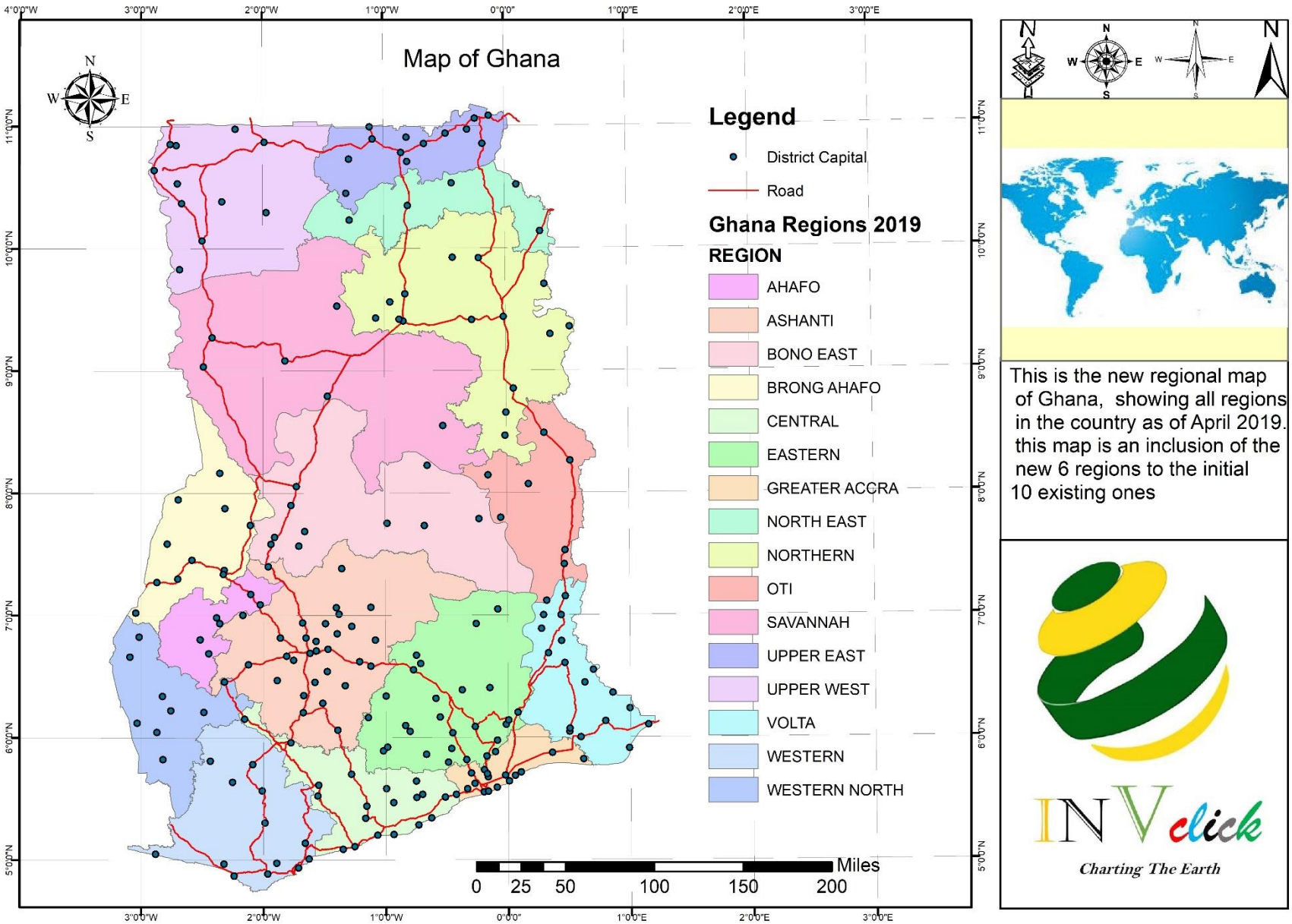


*Figure 15: Exported Map Layout*

The final map is saved in the specified directory (the folder that was chosen when saved). Locate that folder on your computer to find the saved map.

## Creating Multiple Maps in a Layout

I guess you have seen map layouts with multiple maps on the same sheet of paper and wondered how that was done. Data that is displayed on a map layout is dependent on the data frame and the number of data frames within the project. The example above ***(figure 15)*** featured a map layout with one data frame, and all the content within that frame. But to create another map besides (either for comparison or reference) that map will have to be displayed in another data frame.

The image below is an example of multiple (two) maps of the same layout.

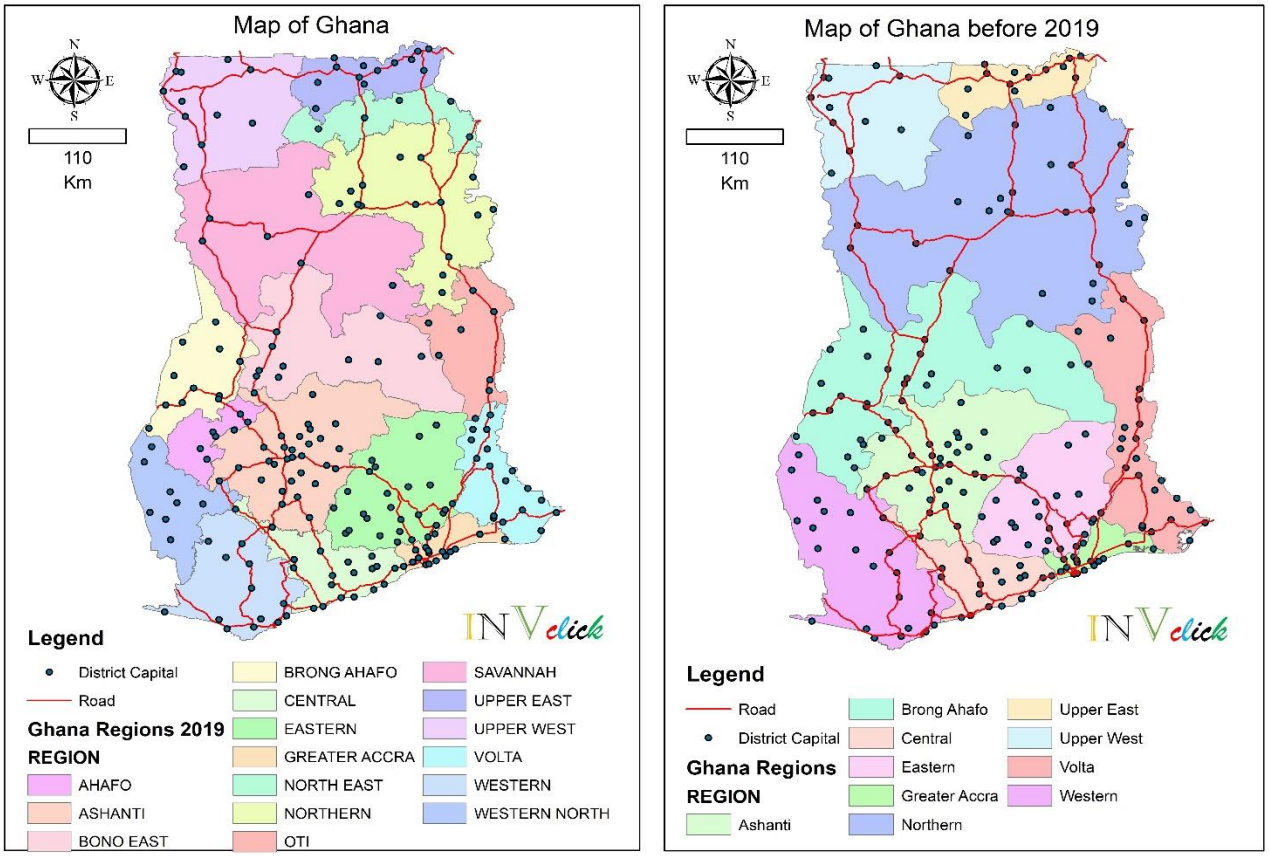


*Figure 16: Multiple Maps on a Layout*

NB: trying to display a map with the same extent/area within the same data frame will simple overlay the maps. E.g. If we wanted to compare the old regional map of Ghana, with the new

regional map of Ghana and opened both datasets within the same data frame, they would have overlain. Thus, to create a map with both maps on the same layout, each dataset (old regional map and new regional map) will have to be opened in different data frames.

To create/add a new data frame Go to:

1. **Insert**

2. Select **Data Frame** to add a new data frame. *(check table of content for all new data frames)*

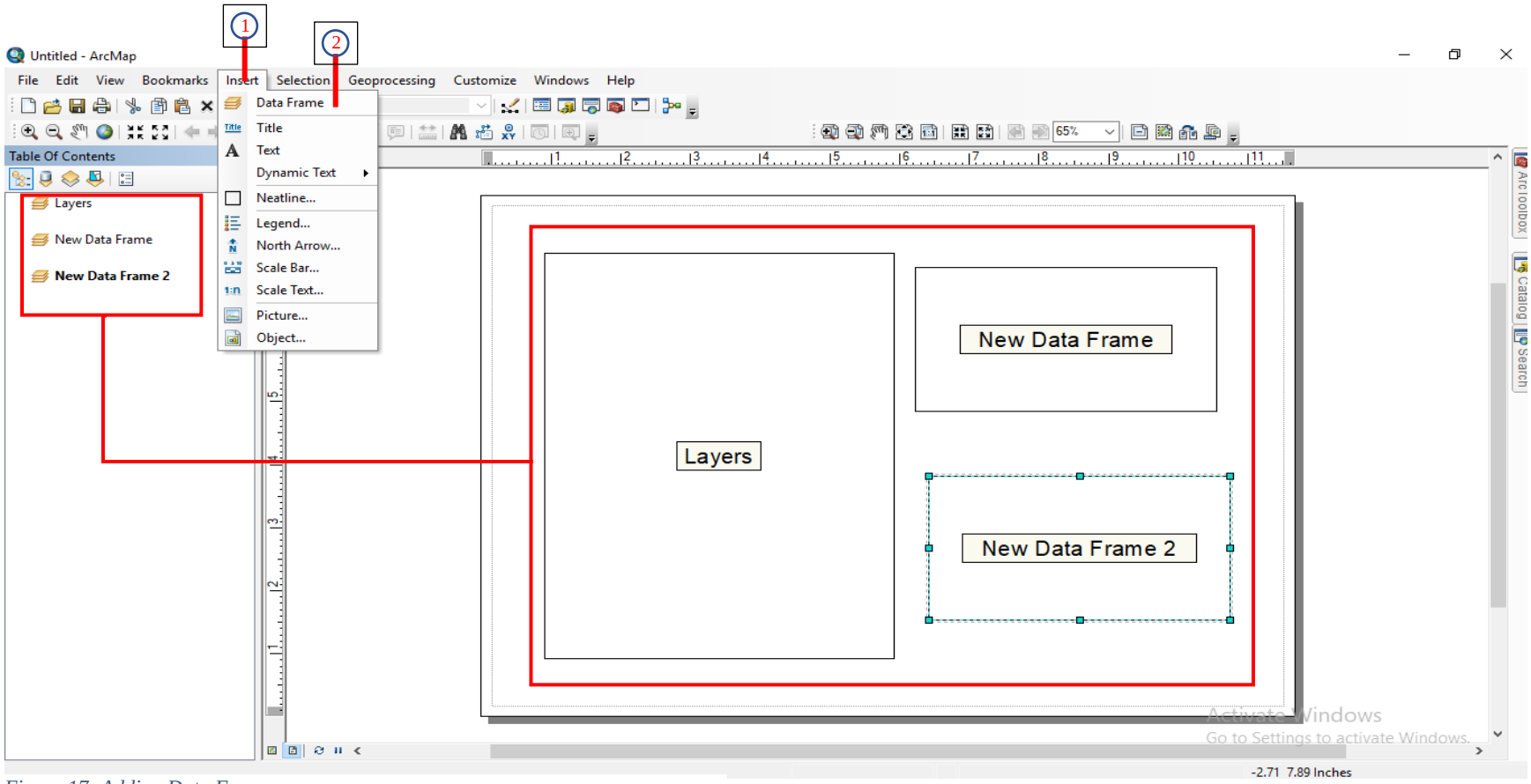


*Figure 17: Adding Data Frames*

In the layout there a three different data frames, each representing a data frame in the table of content. To work within a data frame (one's data frames are added you can work with one at a time in the data view),

1. right click on the **data frame** in the table of content and select **activate**.

Or switch to **layout view**, click on the **data frame**, and switch back to **data view**.

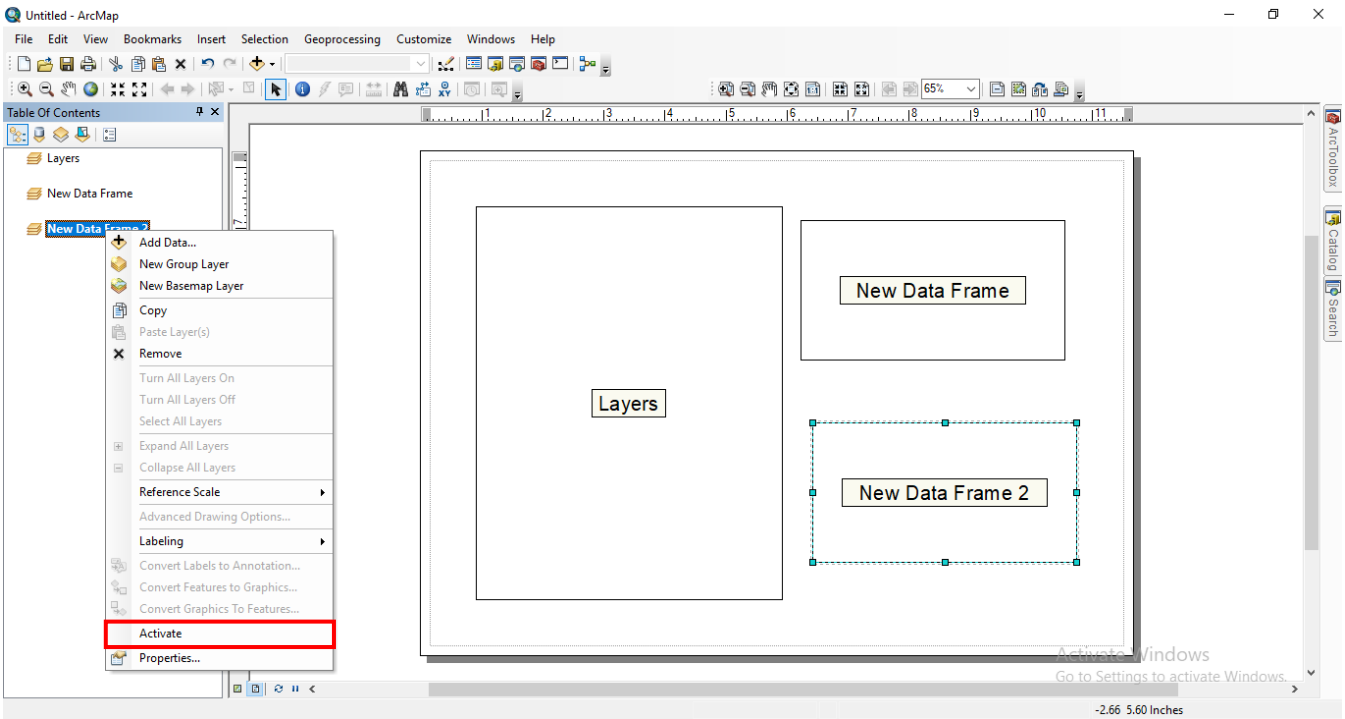


*Figure 18: Activating a Data Frame*

The boldened data frame in the table of content is usually the active one, and in the layout view, the blue highlighted frame is the active frame.

Therefore, to create a map layout with multiple maps on it, open the data in different data frames, and symbolize and label each of them as desired in their respective view, before moving to the layout view to arrange each data frame on the map layout.

As seen in *figure 19* below, each data frame has its own set of data represented in the map layout, as symbolized in their individual data frames.

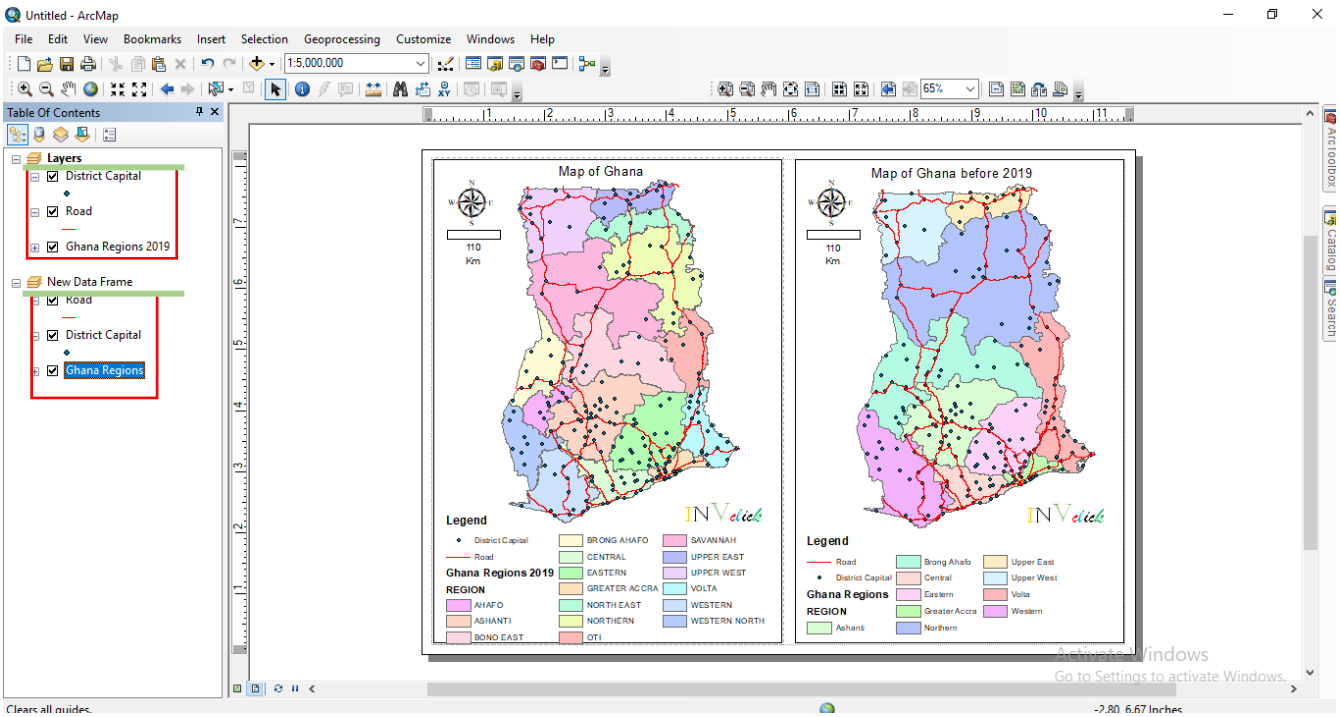


*Figure 19: Working with Multiple Data Frames*

*There are no strict guidelines or procedures to designing a map layout. Final designs should be based on basic visual art principles such as balance (symmetrical/asymmetrical), harmony, variety, proportion etc., to ensure that the map layout is clear, clean and easy to read and understand.*

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