

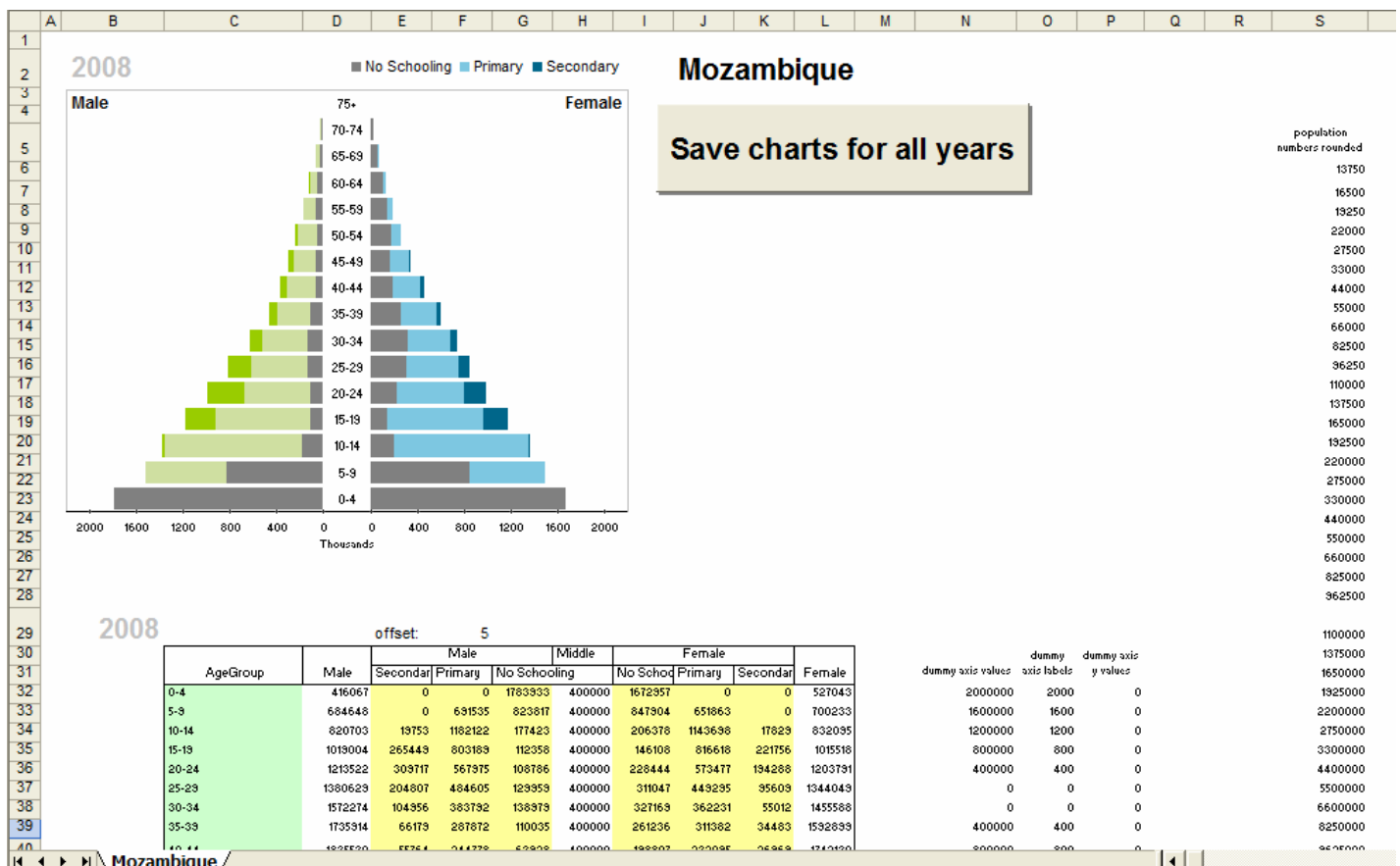
How to Make Animated GIFs

The EPDC has developed a variety of different animated charts in Excel, but these charts have their limitations. They require macros, which some people are not able to run, and they can't be used online. To get around this, we can create animated GIFs which can be used on a web page. This involves three steps:

1. Save a series of image files to be combined into one animation
2. Use Macromedia Fireworks to combine these images into an animated GIF
3. Create an HTML page that includes the GIF, a couple of buttons, and some simple Javascript that controls the image

Saving a series of image files

It would be helpful if you familiarize yourself with the tutorial on making animated graphs, because saving an image file for each year is a minor addition to the macro. The Excel file that accompanies this tutorial uses human capital pyramids rather than scatter charts, but the theory behind creating an animated chart is the same. The spreadsheet is set up as follows:



The chart is linked to dynamic, formatted data, which is visible in the screenshot above in cells C32:L47. The dynamic data consists of offset functions that depend on cell F29, which is the only cell controlled by the macro. When the macro is run, the value of F29 changes, going from 1 up to 26.

The unformatted data for all years is in cells C64:AH168.

	C	D	E	F	G	H	I	J	K	L	M
58											
59											
60											
61											
62											
63											
64	Population with No Schooling										
65	Male	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
66	0-4	1616036	1645737	1675030	1705378	1737015	1783933	1802820	1822080	1841643	1861460
67	5-9	784127	800720	814552	824804	832262	823817	848121	868317	884879	900388
68	10-14	178234	173690	173372	174841	176064	177423	178718	179061	178750	177691
69	15-19	113778	112431	110347	114724	115026	112358	108523	107264	106592	105976
70	20-24	123946	141278	137690	120045	114239	108786	107627	106219	103908	110270
71	25-29	147218	139468	136309	140169	134383	129959	134322	130971	114267	108817
72	30-34	118839	122209	126009	130225	134550	138979	131774	128899	132661	127293
73	35-39	70559	77420	84730	92475	100916	110035	113270	116917	120962	125131
74	40-44	71115	63525	67917	66294	64969	63928	70247	76991	84151	91967
75	45-49	65764	64141	62877	61953	61318	60959	59644	58354	57089	56127
76	50-54	87133	79743	72648	65837	59308	53047	51904	51045	50457	50100
77	55-59	77825	72284	68069	64992	62835	61472	59398	51003	46431	42245
78	60-64	71447	65600	60284	55447	51051	47052	44041	41795	40215	39181
79	65-69	71751	55858	45128	37975	33323	30367	27953	25912	24161	22659
80	70-74	48900	40689	33813	28083	23309	19347	15395	12712	10931	9801
81	75+	43769	21016	13767	9960	7752	6314	5273	4465	3817	3281
82	Female										
83	0-4	1596685	1621108	1627982	1637255	1648394	1672957	1675853	1695072	1714605	1734389
84	5-9	836297	841478	850096	855480	858334	847904	863692	861666	861454	865151
85	10-14	252448	231857	224999	218263	212105	206378	200799	194534	188168	181482

If you were making animated GIFs for multiple countries, you would import the data into these cells, but in this tutorial we're only going to use one country.

The macro is fairly simple. When the button is clicked, it calls `CommandButton4_Click()`. This function loops through all of the years, and for each year, it calls a second function: `SaveChart`. `SaveChart` takes three arguments. The first argument is the chart, which is identified by its chart number. The second argument is the path to the folder in which you want to save the images. And the final argument is the name that you want to give to the file.

```
Const DIR_LOCATION = "C:\Documents and Settings\soliver\Desktop\Charts\animHCP"

Private Sub CommandButton4_Click()

    Dim i As Integer
    i = 1

    Do While i <= 26 'there are 26 years to loop through (2003 to 2028)

        Sheet3.Cells.Range("F29").Value = i - 1 'sets the value of the offset cell
        'calls the function "SaveChart"
        SaveChart Sheet3.ChartObjects("Chart 284").Chart, DIR_LOCATION,
Sheet3.Cells.Range("J2").Value & CStr(i)
        i = i + 1
    Loop

End Sub

Private Sub SaveChart(CurChart As Chart, Path As String, FileName As String)

    Dim fs As New FileSystemObject

    'if the directory doesn't exist, creates a new folder
```

```

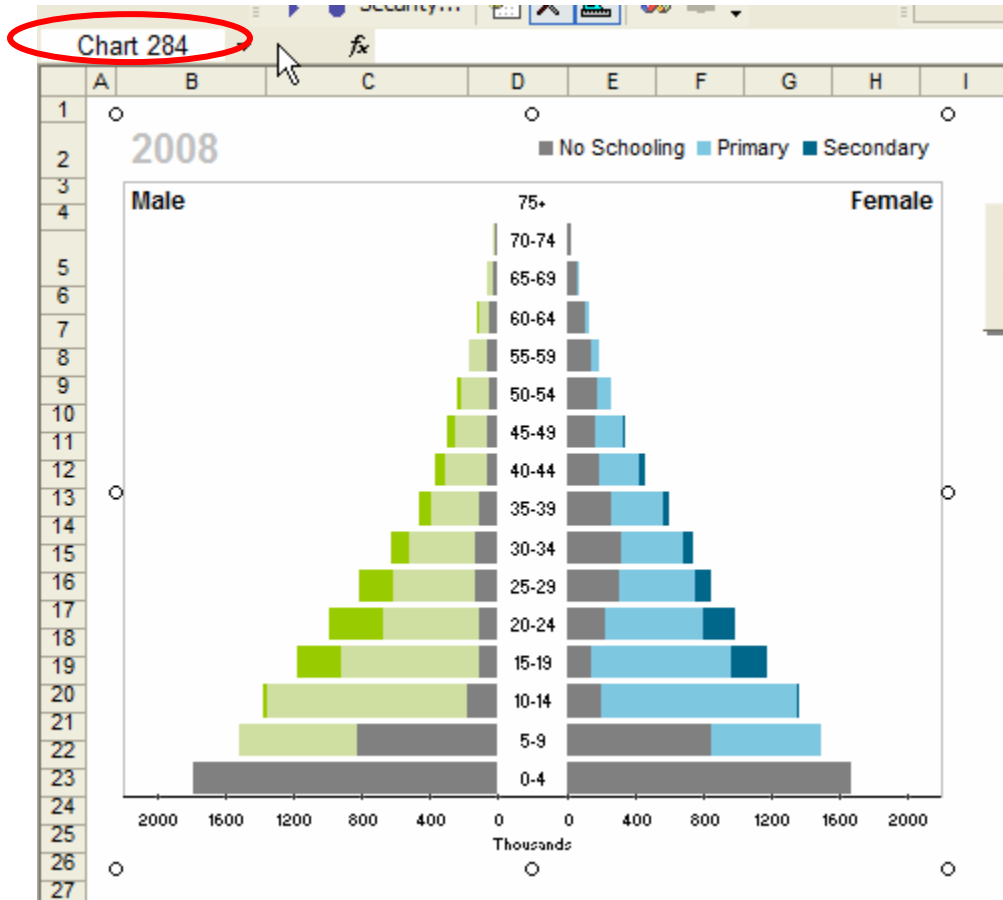
If Not fs.FolderExists(Path) Then
    fs.CreateFolder Path
End If

Set fs = Nothing
DoEvents
CurChart.Export FileName:=Path & "\" & FileName & ".png", FilterName:="PNG"

End Sub

```

Notice that the macro refers to Chart 284. You can determine the chart number as follows: click on any cell in the workbook. Hold down the shift key, and click on the chart. Release the mouse button and shift key, and move your mouse. The chart number will appear in the name field:



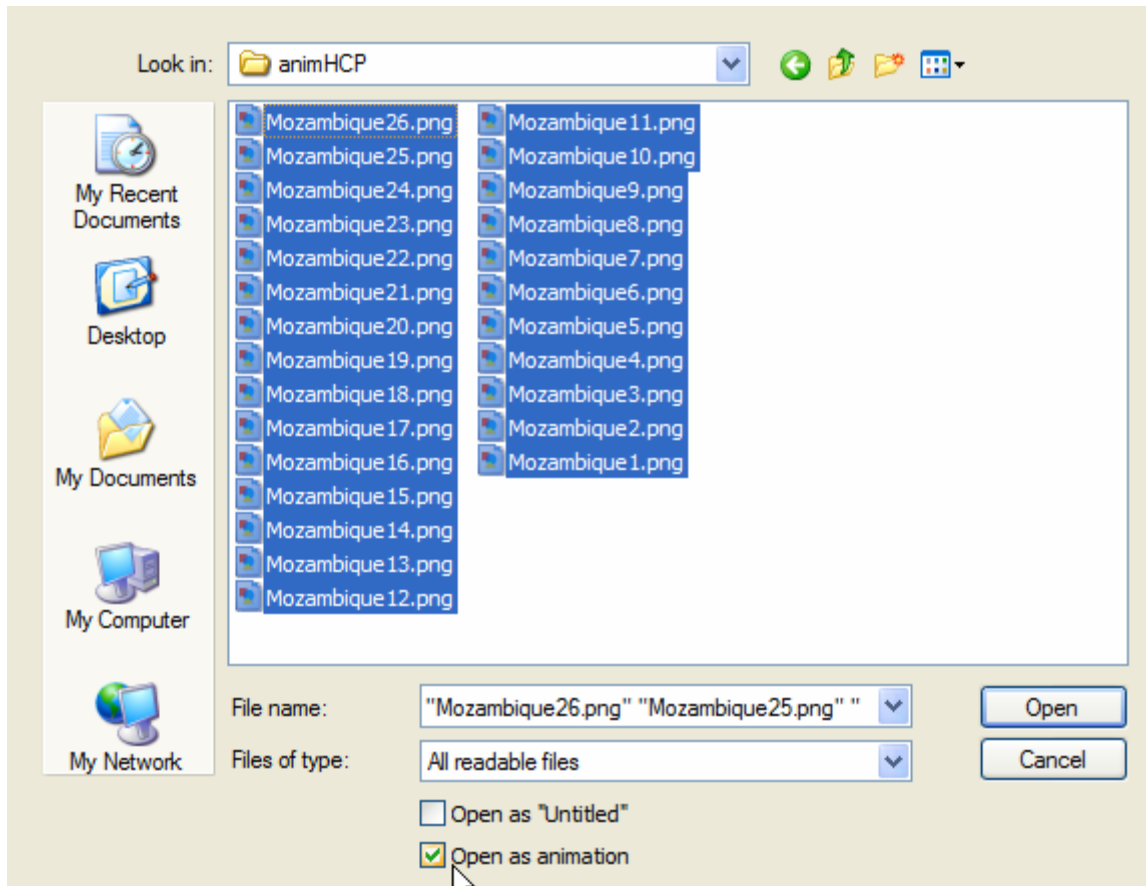
The file directory is defined in the first line of the macro. You'll need to change this to point to a file on your computer before running the macro. The name that we give to the image file is up to you, but in this case, we're naming it after the country (cell J2 contains the text, "Mozambique") and we're using the value of *i*, so we'll have a bunch of files named Mozambique1.png, Mozambique2.png, etc.

When saving charts as images, it's important to have the worksheet at 100% magnification. If it isn't, Excel will mess up the chart formatting. If you haven't already, change the file path in the first line of the macro, and click the button on the spreadsheet to create the charts.

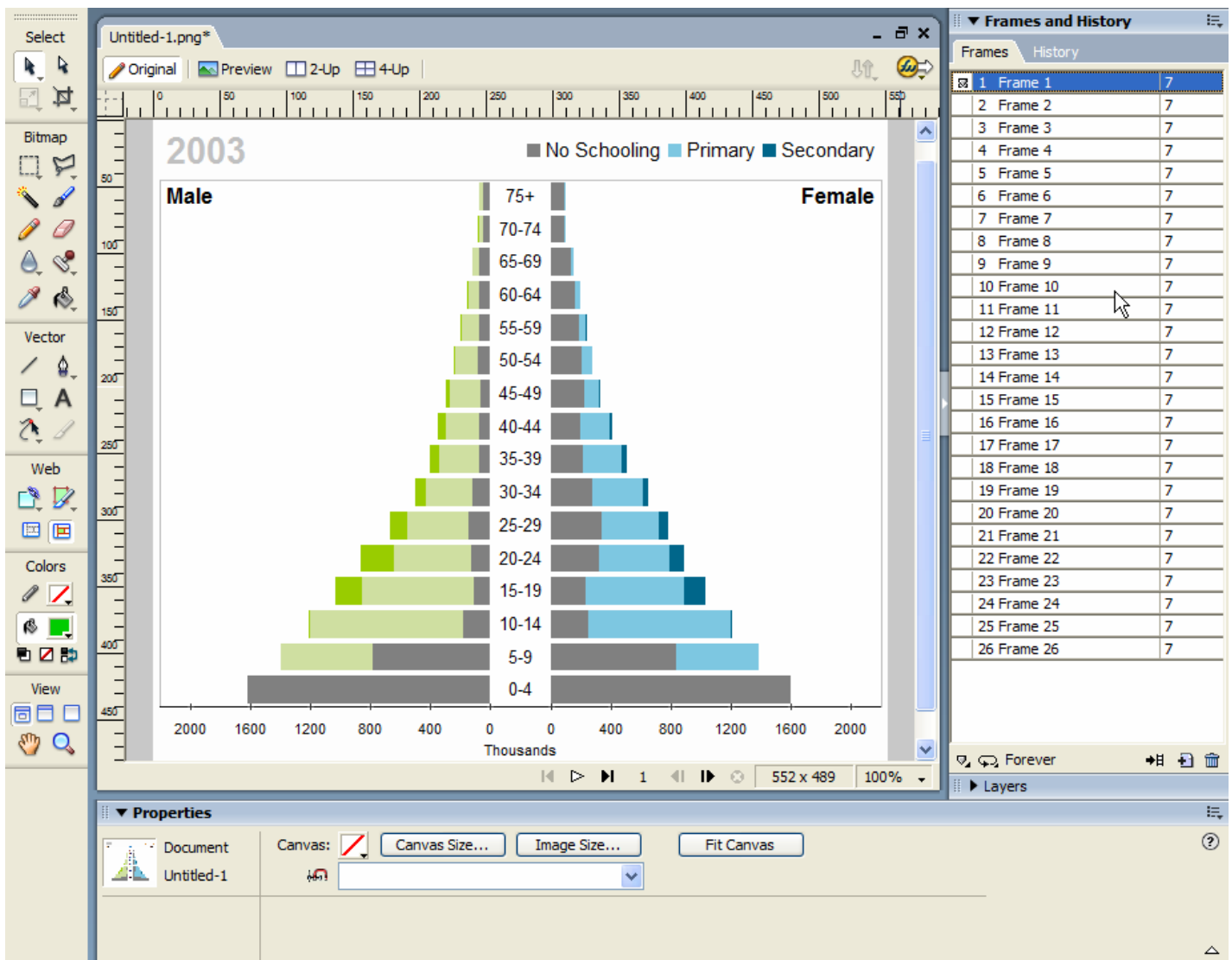
Using Fireworks to create an animated GIF

For this next step, you'll need to install Macromedia Fireworks on your computer. The software is in a black box labeled "Studio MX 2004."

Open Fireworks and go to *File* → *Open...* In the dialog that appears, navigate to the folder with your charts, and select them all. Check the "open as animation" option.



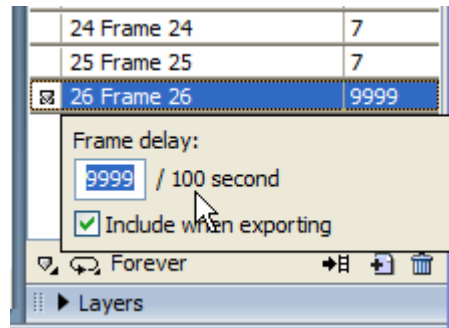
Click "Open." Fireworks will open all of the charts as frames in a single document. Go to *Window* → *Frames* if *Frames* is not already checked. There should now be a panel to the right of the pyramid chart, like the one below:



If you click on the different frames, the pyramid changes from one year to the next. As you look at the different frames, you'll notice that they are not quite in the right order. I don't know exactly why. You'll need to drag the frames around until they're in the right order, with the earliest year as Frame 1, and the final year as Frame 26.

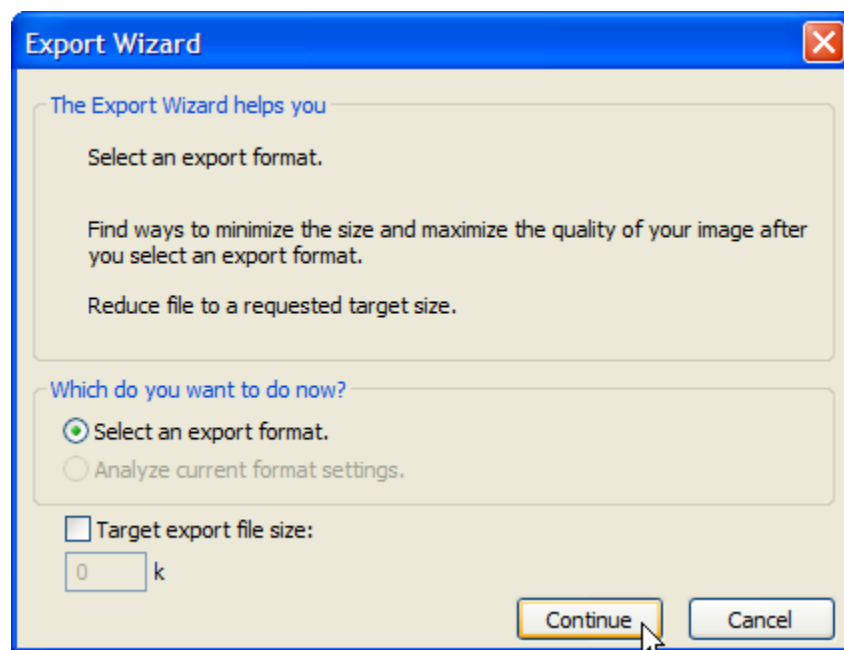
The "7" next to each frame indicates that the frame will be visible for 7/100 of a second.

A short digression into how animated GIFs work: You can create GIFs that run through a sequence of frames once and then stop, or you can have them loop endlessly. Usually when we create an animated graph, we want it to run once and then stop. Unfortunately, animated GIFs stop on the first frame of the animation rather than the last frame, so the pyramid would proceed from 2003 to 2028, jump back to 2003 immediately, and then stop. We can deal with this by setting the GIF to loop continuously, but have the duration of the final frame be very long (relative to the duration of the other frames). So we're going to change the duration of Frame 26 to be 9999/100 of a second, which is the maximum allowed by Fireworks. Double-click on the "7" next to Frame 26, and change the duration:

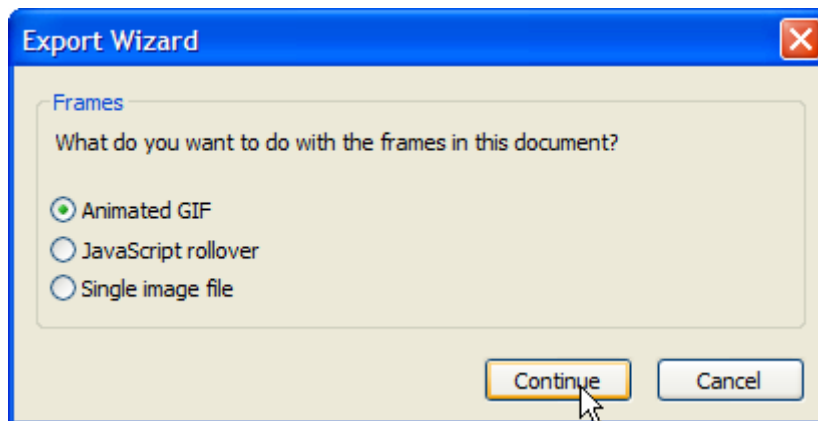


You should also change the duration of the rest of the frames, because 7/100 of a second is too short. Try 30/100 and adjust from there. You can change all of the frames at once (except Frame 26), by shift-clicking to select them all, and then double-clicking on one of the 7s.

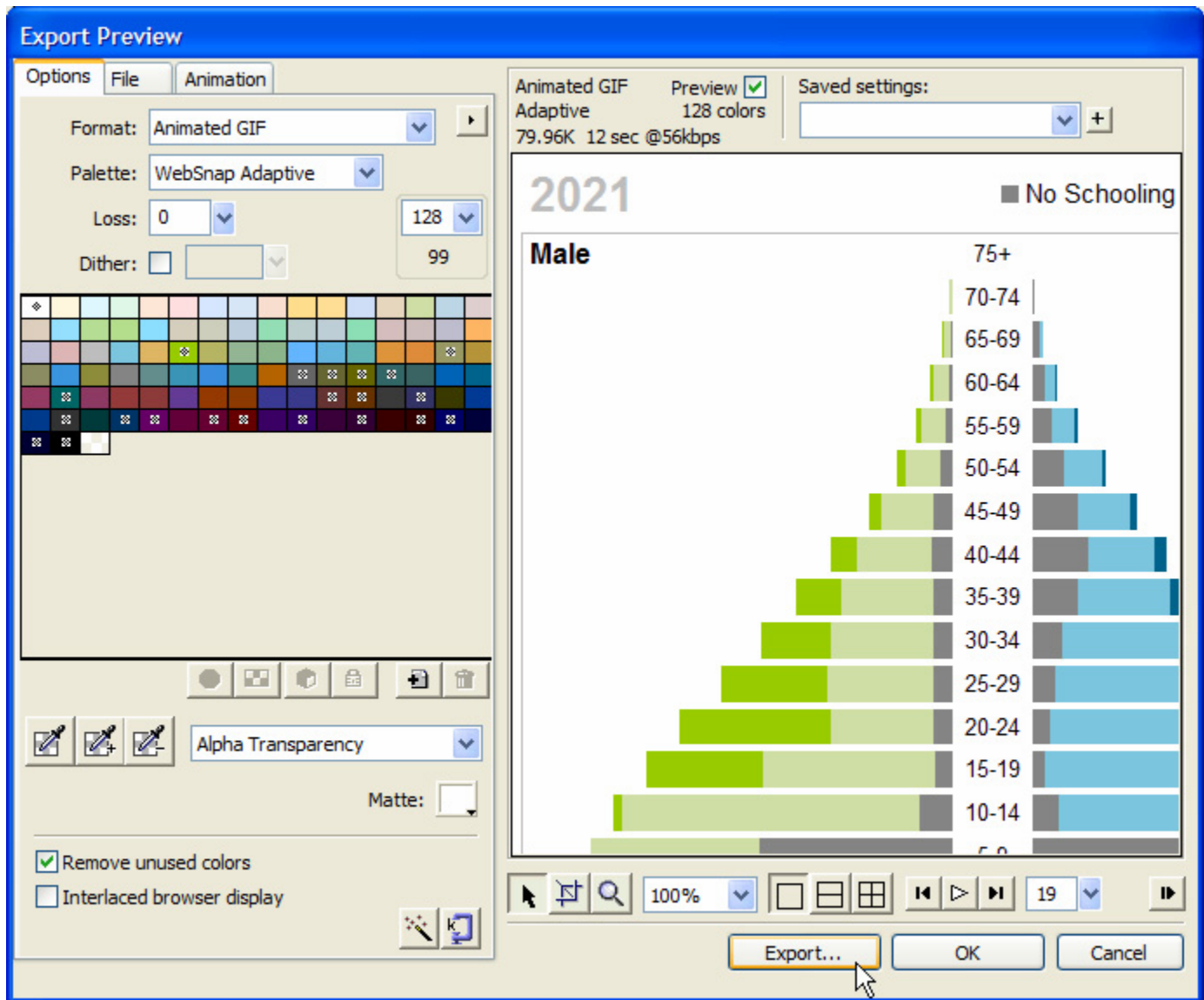
Now go to *File* → *Export Wizard...*



Click “Continue.”



Click “Continue” again. In the next window, you don’t need to change any settings, just click “Export...”



Choose a location in which to save your file and give it a name (I'd suggest Mozambique.gif), and then go and open it to see if it worked. If you just double-click on the file, it will probably open in Microsoft Photo Editor or some other program where the animation will not work properly. You'll need to open it in a browser in order to see the animation in action.

Congratulations—you've created an animated GIF. However, it's still a little deficient. The animation starts running as soon as you open the page, and to re-start the animation, you have to reload. It would be nice to at least provide the illusion of control.

Creating an HTML page to contain the GIF

Open a Notepad document, go to *File* → *Save As...*, change the document type to "All files" and save the file as Mozambique.html in the same folder that contains your animated GIF and all of the individual image files. If you save it in a different folder, you'll need to change the code below so that it's looking for the image files wherever they are.

This is not a tutorial on how to create web pages, so I'm just going to give you the code to copy, with a short explanation of how it works. Copy the following text into Mozambique.html:


```

<html>
  <head>
    <title>Mozambique</title>
  </head>
  <body>
    <h1>Mozambique</h1>
    
    <form>
      <input type="button" id="startButton" value='start'
onClick="PlayButtonClick()">
      <input type="button" id="resetButton" value='reset'
onClick="ResetButtonClick()">
    </form>
    <script type="text/javascript">
      //when the "Play" button is clicked, the source of the image is
changed to Mozambique.gif (the animated GIF)
      function PlayButtonClick() {
        document.getElementById('ImageLocation').src='Mozambique.gif';
      }
      //when the "Reset" button is clicked, the source of the image is
changed to Mozambique1.png (the static pyramid from 2003)
      function ResetButtonClick() {
        document.getElementById('ImageLocation').src='Mozambique1.png';
      }
    </script>
  </body>
</html>

```

An HTML document is just a series of nested elements. So within the HTML element (<html>) there is the <head> element, which contains the page title. The </head> tag marks the end of the <head> section. Within the <body> element, there is header text that says “Mozambique,” an image, and a form which contains two buttons. After the form element ends (</form>), there is a script section. When you view the page in a browser, the script section will not be visible—it’s the equivalent to a macro in an Excel document. In this case, the script section just contains two simple functions that are executed when the buttons in the form are clicked.

When the page is first loaded, the image that is shown is the static PNG for 2003. When the Start button is clicked, the image switches to the animated GIF, and as soon as the GIF is loaded, it runs from start to finish. Clicking on the Reset button changes the image back to the static PNG.

Save your changes to Mozambique.html and close it. If you double-click on Mozambique.html now, it should by default open in a web browser.

If you are creating animated charts for a client, you would need to give them Mozambique.html, Mozambique.gif, and Mozambique1.png, and let them know that all of the files need to be placed in the same directory.