

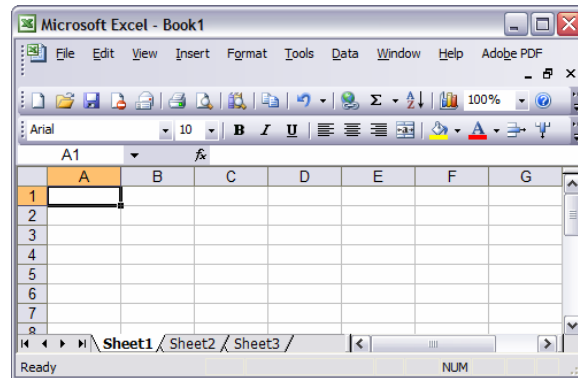
# Graphing Exponential Functions using Excel

## Step One

Open **Excel**.

Open a New Document.

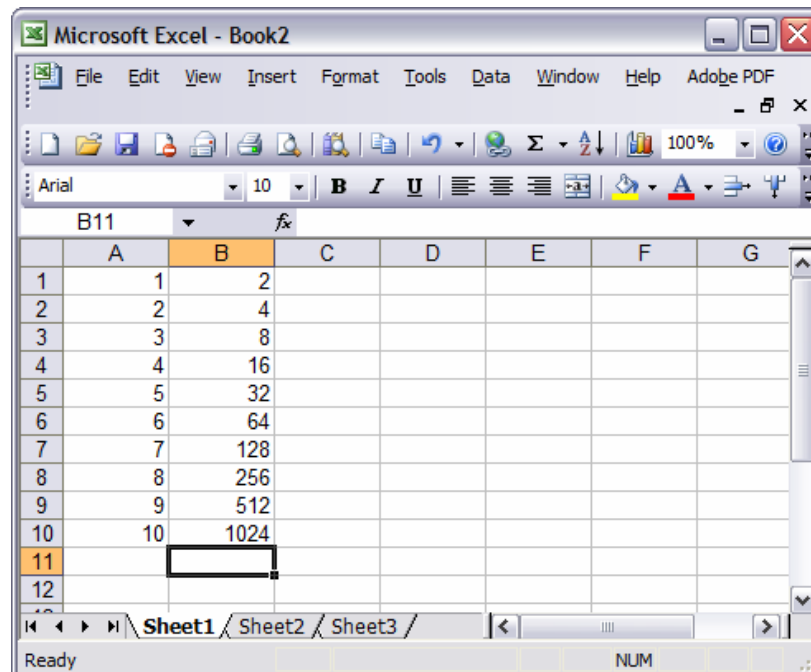
Your screen should appear:



## Step Two

In **column A** type the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

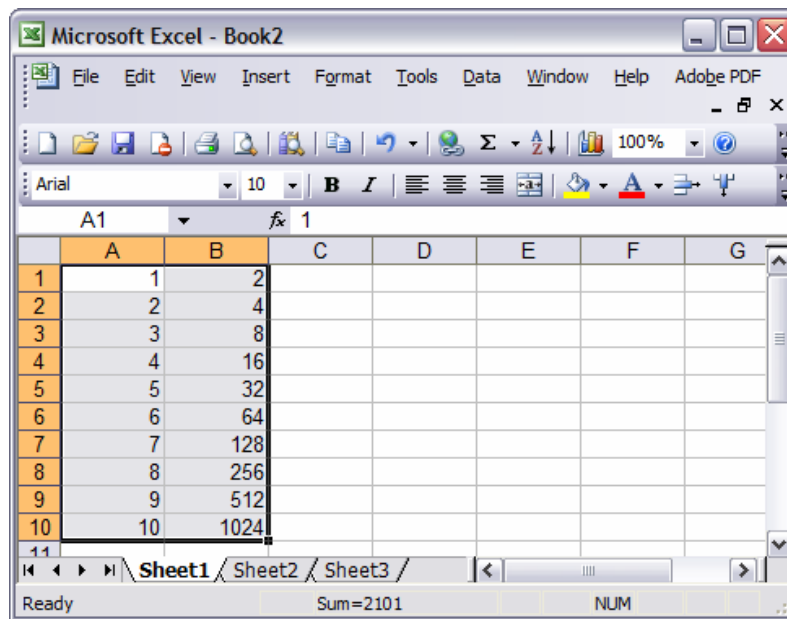
In **column B** type the numbers 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024



**NOTE:** This is a good place to remind students that the numbers in Column A are values for  $x$  and the numbers in Column B are values for  $f(x)$ . In this example  $f(x) = 2^x$  or  $f(x) = 2^{\wedge}x$ . The numbers in Column A and the numbers in Column B can be changed to fit whatever exponential function your students are investigating.

### Step Three

Starting in **cell A1** select all the cells that have numbers so that they are highlighted.

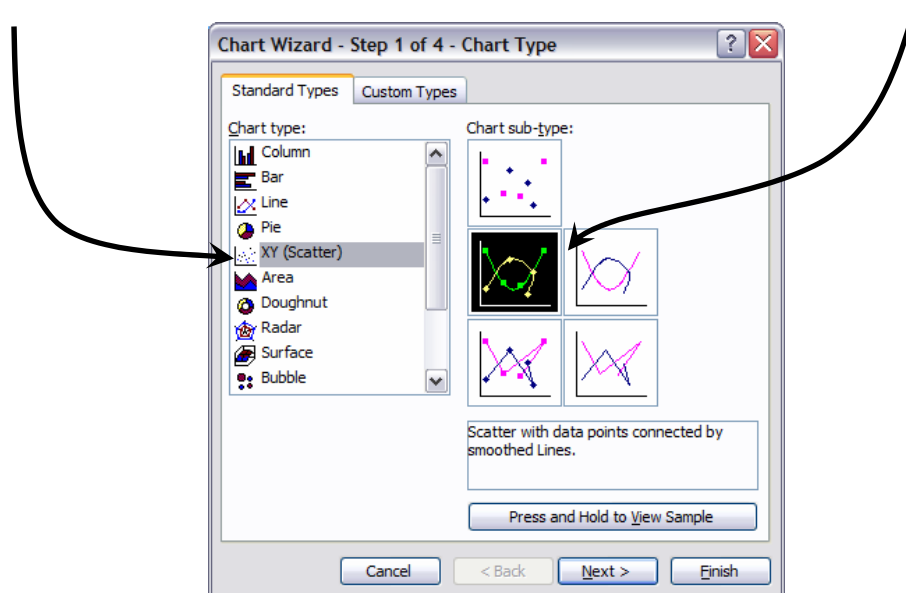


### Step Four

Go to **INSERT** and select **CHART...**

A Chart Wizard window will appear.

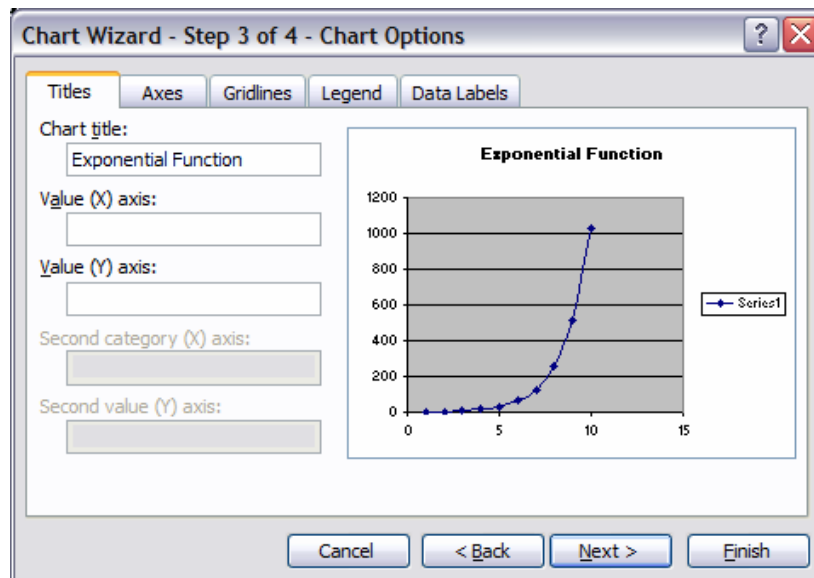
Select **XY (Scatter)** as the type of graph you wish to use and then select the **second sub-type** on the right side of the window, Click Next.



## Step Five

Step 2 in the Chart Wizard should remain the same, so click Next to move on to Step 3.

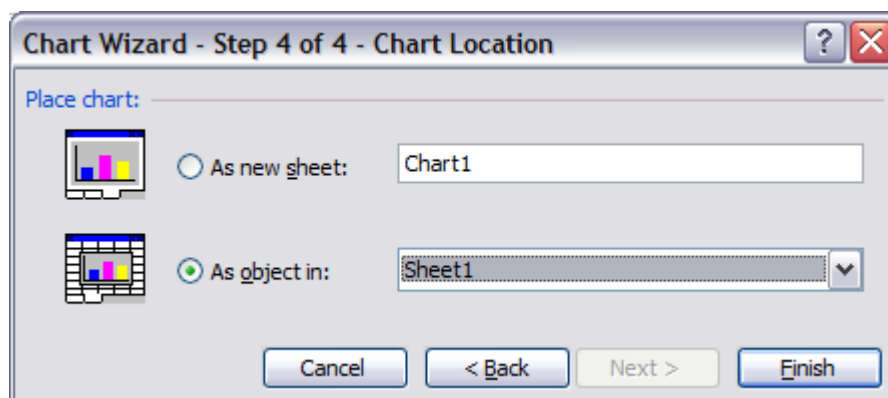
In Step 3, give your chart a title. The title in the example below is: **Exponential Function**. Axes can also be labeled in this window, if the graph requires it.



The legend feature can be turned off from the tabbed section of the window titled “Legend”. Just remove the tick mark from the box labeled “Show Legend” if you wish to remove it.

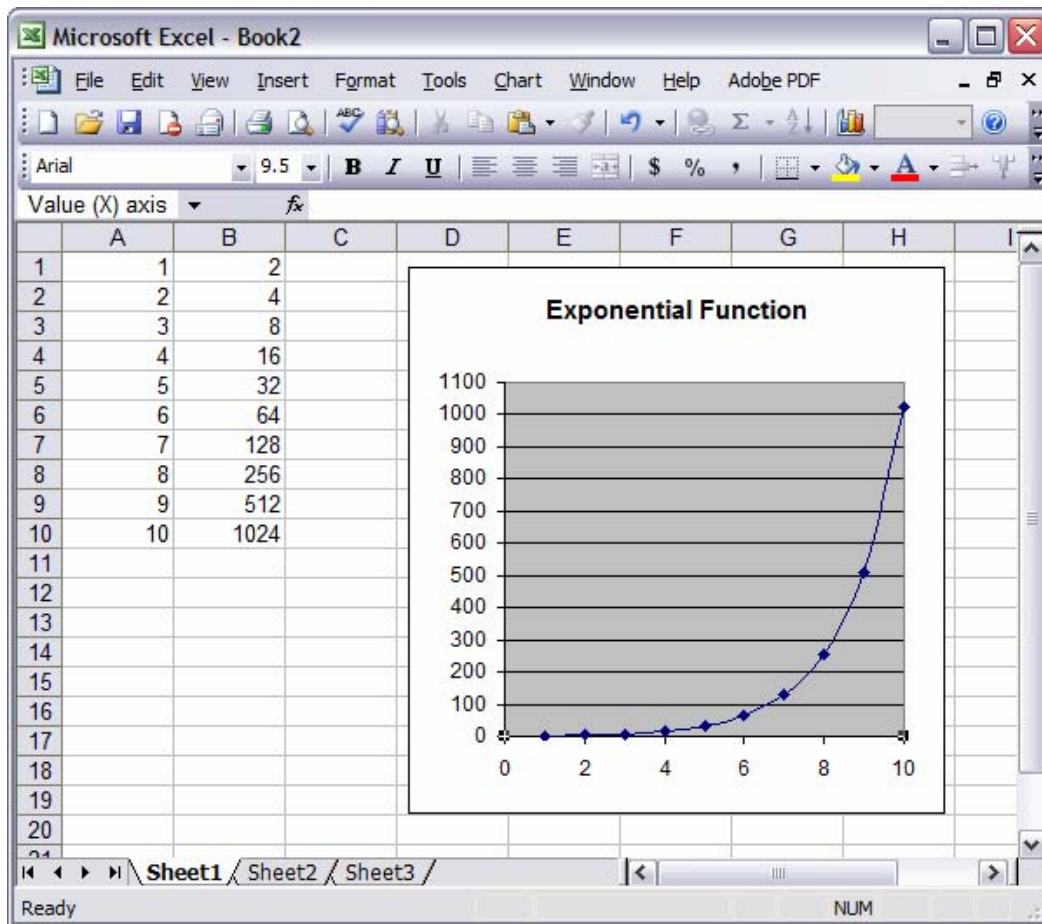
## Step Six

The final part of the Chart Wizard gives you the option to put your chart in a new sheet of the document, or add it to the same sheet beside the data. Usually, the second option is the best choice, so the data and the chart can be seen at once. Select **Finish** to create your chart.



## Step Seven

Your graph will appear on the screen.



You can change the maximum and minimum values for each axis by double-clicking on the numbers of the appropriate axis.

Clicking on other areas of the chart will give you other options for customizing the appearance of the chart.

Students should then:

- Copy their graph.
- Open a new Word document.
- Paste the graph.
- Write a description of what they did and what the graph represents.

The 'Format Axis' dialog box is shown with the 'Scale' tab selected. The 'Value (X) axis scale' section is configured as follows:

- ☒ Auto
- ☒ Minimum: 0
- ☐ Maximum: 10
- ☐ Major unit: 2
- ☒ Minor unit: 0.4
- ☒ Value (Y) axis crosses at: 0

The 'Display units' section is set to 'None' and 'Show display units label on chart' is checked.

At the bottom, there are 'OK' and 'Cancel' buttons.

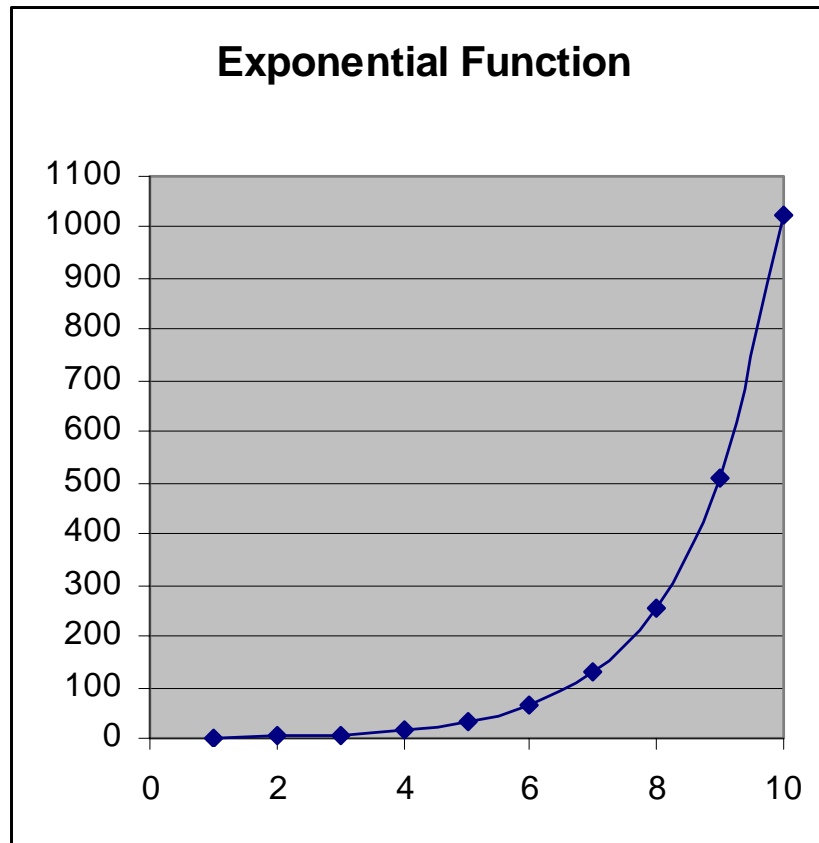
## Example of student work

Student Name

Date

Period

### Graphing the Function $f(x) = 2^x$



I plotted 10 different points that satisfied the equation  $f(x) = 2^x$  starting with 1 as the value of  $x$ .

The curved line would cross the  $x$ -axis at the point  $(0, 1)$  but this curved line segment does not show that because the first value of  $x$  that I plotted was 1. The curved line would not cross the  $y$ -axis because 2 to the power of 0 is 1 and you cannot get a value of 0 for  $y$  using this equation. You could see this better if the scale on the  $y$ -axis were smaller. I used a scale of 100 and this makes the beginning part of the line segment really hard see. Maybe I could choose a different scale next time.

The values for  $f(x)$  start off increasing slowly but get large quite quickly.