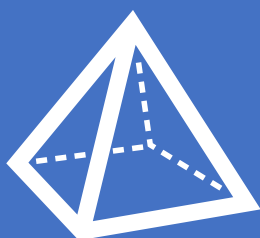


# ***Creating Math and Science Testing Materials***

## ***With Microsoft Word***





# ***Creating Math and Science Testing Materials with Microsoft Word***

***by Matthew Catalano***

***UMass Amherst Professional and Technical Writing***

***2023***

# *Acknowledgements*

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I would like to thank Professor Solberg for her clear instructions and expectations for this manual. Her consistent and helpful feedback provided throughout the entire process of creating this manual was also very much appreciated.

I would also like to thank Ben Weber and Julia Dunoyer for being willing test subjects and giving their time and energy towards improving this manual.

I'd lastly like to express my gratitude towards my fellow PWTC classmates and collaborators who critiqued this manual each and every step of the way to make it as polished as possible.

All graphics and screenshots were either taken or created by me or are part of Word's stock image library.

Thank you for reading,

Matthew Catalano

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# Introduction

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## What is this?

Welcome to *Creating Math and Science Testing Materials with Microsoft Word!*

This manual aims to teach and improve the reader's skills with the features of Word that are most relevant to creating testing materials. This includes text boxes, equations, the SmartArt feature, formatting, and more.

## Who is this guide for?

This guide has been specifically written for 6-12<sup>th</sup> grade educators in math and science related fields, after conducting interviews and research to determine what guidance educators need most to best create testing materials in Word.

Although information in this guide may be found useful to others outside of this scope, the guide will always be tailored to, and speaking as though communicating with this target audience.

Additionally, this guide assumes that the user holds at least a beginner-level knowledge of Word and general Mac computer functions. Such skills include saving documents, opening documents, changing fonts and font sizes, and navigating the file browser. It is not expected that the user has any experience with the features that will be addressed in the guide.

Lastly, this guide has been written specifically for MacOS users and the Mac version of Word.

## Using the guide

Most of the modules found in this guide can be read in any order. Feel free to skip around using the table of contents to whichever module may be most useful to you!

The exception to this rule is the two modules labeled as "Tutorials." These will each require you to have read and completed parts of a previous module to be completed.

Finally, *Notes*, highlighted via italicization, provide helpful tips that aren't necessarily vital or needed to complete the given task at hand. It is not recommended to skip these notes! Common questions or concerns may be addressed here, or you may find useful hints about why you may want to use certain features or how.

# ***Chapter 1: Textual Elements***

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**1.1: Creating Headers\_\_\_\_\_4**

**1.2: Inserting Text Boxes\_\_\_\_\_5**

**1.3 Creating Multiple-Choice Questions with Multilevel Lists\_6**

**1.4: Inserting Equations\_\_\_\_\_7**

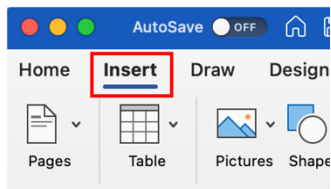
**1.5: Equations Tutorial\_\_\_\_\_8**

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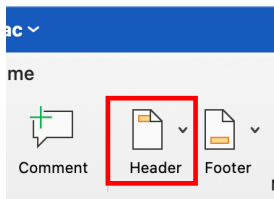
## 1.1: Creating Headers

Headers allow for writing within the top margins of a document and are a fantastic way to carve out a space for students to write their name, date, and class number (or any other needed information) at the top of a test or quiz.

1. Click on the **Insert** tab found on the ribbon.

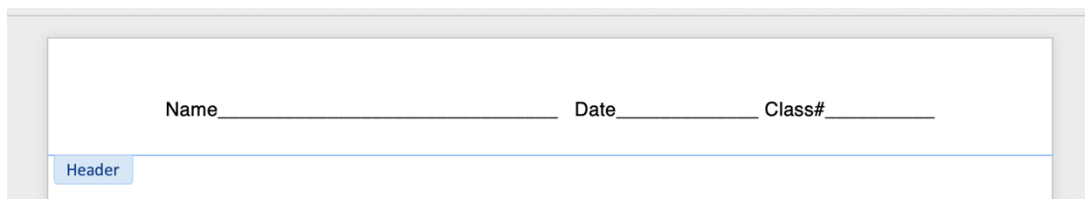


2. Click on the **Header** button. A drop-down menu appears.



3. Select either a preset header from the drop-down, or simply click on the **Edit Header** button found at the bottom of the drop-down. A partition appears on your document indicating the area allocated for your header.

*Note: The **Blank (Three Columns)** preset header is ideal for creating Name/Date/Class# style headers.*



*A successfully created header in a document.*

4. Edit the content of your header. Once you have completed your header, double click anywhere outside of your header to return to editing your document.

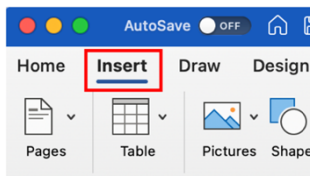
*Note: Double click anywhere on your header to easily return to editing it.*



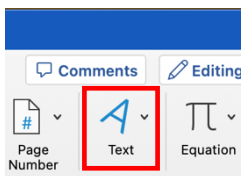
## 1.2: Inserting Text Boxes

Text boxes, which allow for a movable, modular piece of writing, are an excellent way to format your questions and text in tests and quizzes. This is particularly true if the text/question will be followed by or sit next to a graphic or large blank space intended for student handwriting.

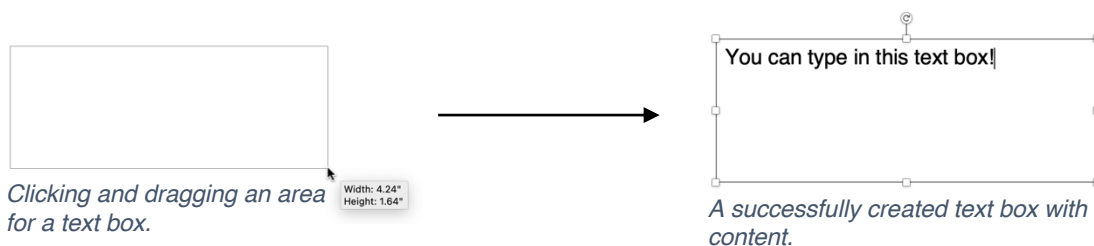
1. Click on the **Insert** tab found on the ribbon.



2. Click on the **Text** button. A drop-down menu appears.



3. From this drop-down, click on **Text Box**. Another drop-down menu appears with two options, **Draw Text Box** and **Draw Vertical Text Box**.
4. Select the type of text box you want to create. Your cursor turns into a “+” symbol, indicating that you are ready to create your text box.
5. Click, hold, drag, and release your cursor anywhere on your document to create your text box. The size of the area covered by your cursor is the size of the created text box.



6. Edit the contents of your text box. You can learn more about formatting text boxes in section **3.1 Formatting Text Boxes**, found on page **18**.

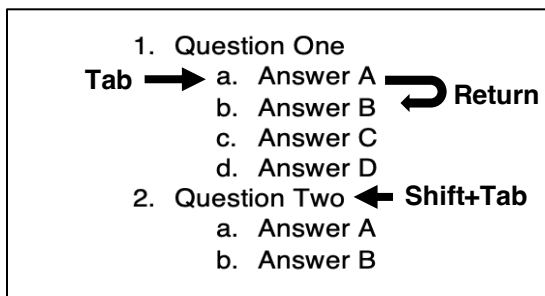
*Note: To quickly return to editing the contents of your text box, double click within the text boxes' confines.*

## 1.3: Creating Multiple-Choice Questions with Multilevel Lists

Word's built-in feature for creating numbered and lettered multilevel lists is a great and easy way to create multiple-choice questions for your tests and quizzes.

1. Type the number "1" followed by either a period, closed parenthesis, or both. Afterwards, press the **Spacebar** key to cause Word to immediately format this first number as a list item.
2. Edit the content of your *numbered* list item. This is your first multiple choice question. Afterwards, press the **Return** key to create a second numbered list item.
3. Press the **Tab** key to indent your second *numbered* list item and turn it into a *lettered* list item.
4. Edit the content of your *lettered* list item. This is your first question's first multiple-choice answer.
5. Press the **Return** key to create a second *lettered* multiple-choice answer, "B". Edit the content for this item. Repeat this process for as many answers as you need.
6. Press the **Return** key once your final multiple-choice answer has been created. This creates yet another *lettered* list item.
7. Press and hold down the **Shift** key, and while doing so press the **Tab** key to turn the final *lettered* list item into your next *numbered* list item. This item serves as your second multiple choice question.
8. Repeat steps 2-7 as many times as needed to create your quiz or test.

*Note: Create your lists within a text box for added modularity.*

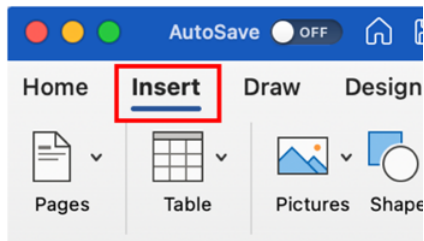


*Example of multiple-choice questions with necessary keystrokes.*

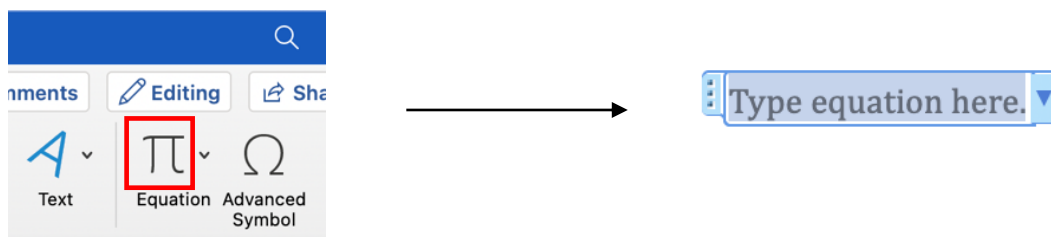
## 1.4: Inserting Equations

Word's Equation feature is a useful tool (particularly for math educators) that allows for the seamless writing, inserting, and formatting of complex mathematical equations and functions within Word for use when creating tests and quizzes.

1. Click on the **Insert** tab found on the ribbon.

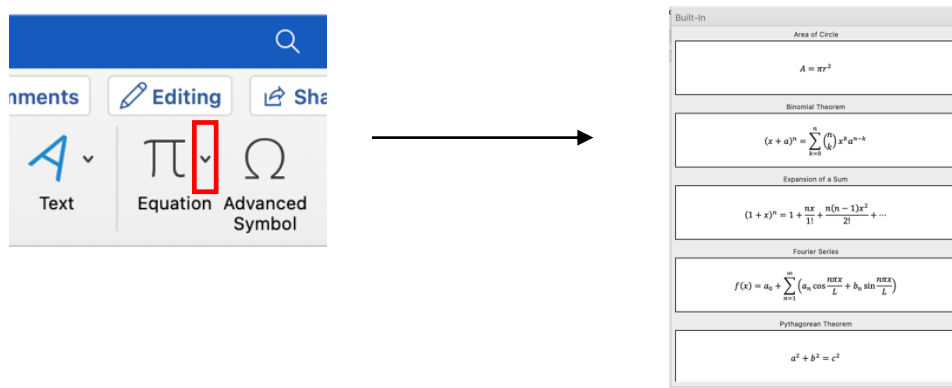


2. Click on the **Equation (Fig. 1.2)** button. A new menu appears at the top of your window, and a blue-bordered area appears on your document.



3. Edit the contents of your equation within the blue-bordered area. Refer to module **1.5: Equations Tutorial** on page 8 to further learn how to use the equation function.

*Note: Click the small arrow next to the **Equation** button to display a drop-down menu containing some commonly used preset equations that are included with Word.*

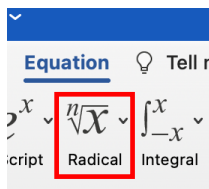


## 1.5: Equations Tutorial

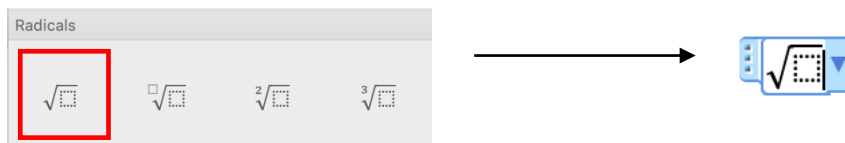
In this tutorial, you'll be taught how to create a simple equation using Word's Equation feature. By following this tutorial, the basic skills and knowledge needed to create a wide variety of different equations will be learned. The following will teach you how to create the following equation:  $\sqrt{x} \div \pi = \frac{y}{8}$

1. Follow steps **1 and 2** from Part 1 of module **1.4: Inserting Equations**, found on page **7**. The **Equation** tab opens.

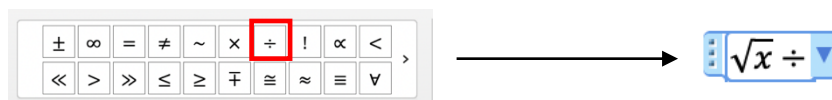
2. Click the **Radical** button. A drop-down menu appears.



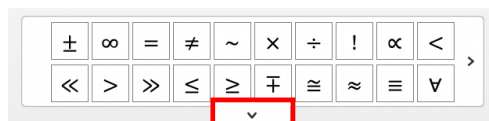
3. From the drop-down menu, select the first option, **Square Root**. A square root symbol appears within your equation.



4. Click on the small box with a dotted border within the square root and type the letter "x" within it.
5. Press the **right arrow** key on your keyboard to move your cursor to the right and stop typing within the highlighted area underneath the square root.
6. Click on the **Division** symbol found within the provided library under the **Equations** tab. The symbol appears within your equation.



7. Hover over the symbols library to reveal a small down arrow. Click on this small arrow to expand the symbols library and view all symbols.

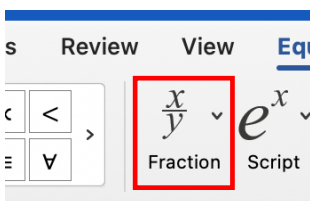


8. Click on the **Pi** symbol. The symbol appears within your equation.

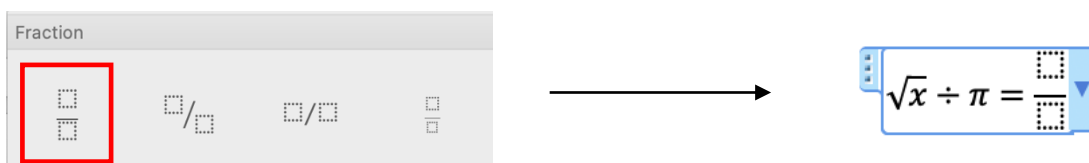


9. Type an “=” symbol. Alternatively, you can insert it from the symbol library.

10. Click the **Fraction** button. A drop-down menu appears.



11. From the drop-down menu, select the first option, **Stacked Fraction**. A blank fraction appears within your equation.



12. Click the small box with a dotted border on the top half of the fraction. Type the letter “y” within it.

13. Click the small box with a dotted border on the bottom half of the fraction. Type the number “9” within it.

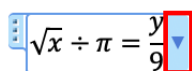
Congratulations, your equation is now complete! Compare it with the below reference to ensure that you’ve correctly created your equation.

The final completed equation in the editor is  $\sqrt{x} \div \pi = \frac{y}{9}$ .

## 1.6: Saving Equations

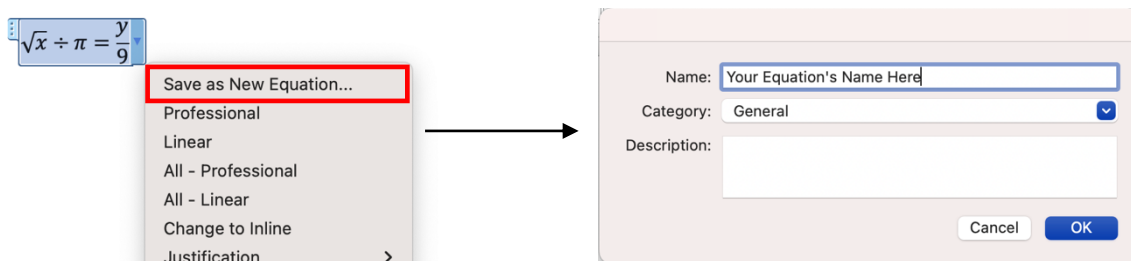
Word's Equation feature allows users to save commonly used equations to be easily accessed later without needing to retype the entire equation. Educators repeatedly teaching the same mathematical concepts and equations may find this feature useful.

1. Click the small blue arrow found within the blue border surrounding your equation. A drop-down menu appears.



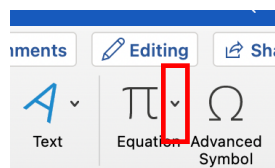
The image shows a blue-bordered equation box containing the equation  $\sqrt{x} \div \pi = \frac{y}{9}$ . A small blue downward-pointing arrow is located in the bottom right corner of the box, which is highlighted by a red rectangle.

2. Click on **Save as New Equation** from the drop-down menu. A new window appears.



3. In this new window, enter the name you'd like your equation to be saved as and a description, if needed. Click **OK** to save your equation.
4. Click the small arrow next to the **Equation** button under the **Insert** tab to view your saved equations. A drop-down menu appears, including a selection of preset, commonly used equations alongside your saved equations.

*Note: You will need to scroll down past Word's included saved equations before finding your own saved equations.*



5. Click on your desired equation to quickly insert it into your document.

# ***Chapter 2: Visual Elements***

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**2.1: Inserting Saved Images\_\_\_\_\_12**

**2.2: Inserting SmartArt Figures\_13**

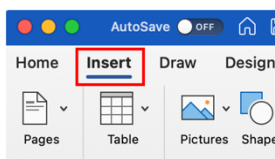
**2.3: SmartArt Tutorial\_\_\_\_\_14**

**2.4 Inserting Stock Images  
and Icons\_\_\_\_\_16**

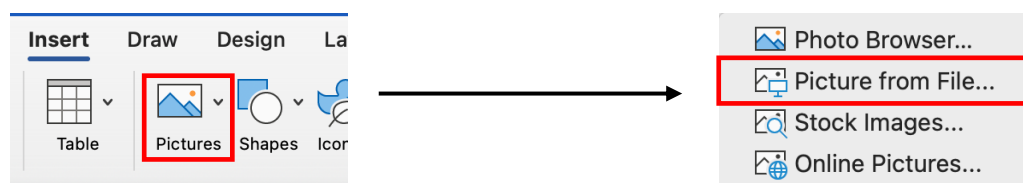
## 2.1: Inserting Saved Images

Beyond its library of stock images and icons, Word allows you to insert any image previously saved on your computer into your document. This is useful in a wide variety of scenarios, such as If you have external images of pre-made charts or figures, or perhaps a photograph you've taken yourself that you'd like to include on your tests/quizzes.

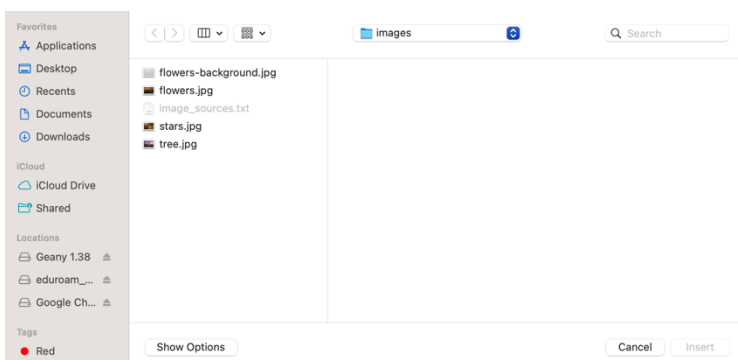
1. Click on the **Insert** tab found on the ribbon.



2. Click on the **Pictures** button. A drop-down menu appears.



3. Click on the **Picture from File** button in the drop-down menu (shown above). A new file browser window opens, as shown below.



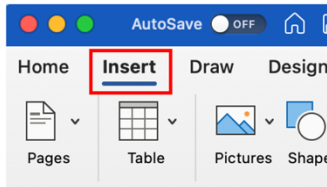
4. In the file browser, navigate to the image file you'd like to insert and select it by clicking.
5. Click the **Insert** button at the bottom right-hand side of your file browser window. The file browser window closes, and your selected image is inserted into your document.



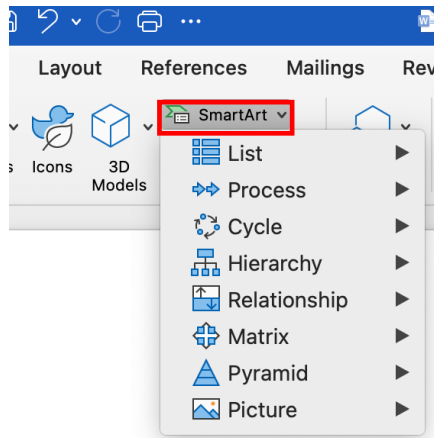
## 2.2: Inserting SmartArt Figures

Word's SmartArt feature allows you to insert and customize a wide variety of premade diagrams, charts, and informational structures for your tests and quizzes. You may find SmartArt useful for easily creating and presenting visual displays of information.

1. Click on the **Insert** tab found on the ribbon.



2. Click on the **SmartArt** button. A drop-down menu appears.

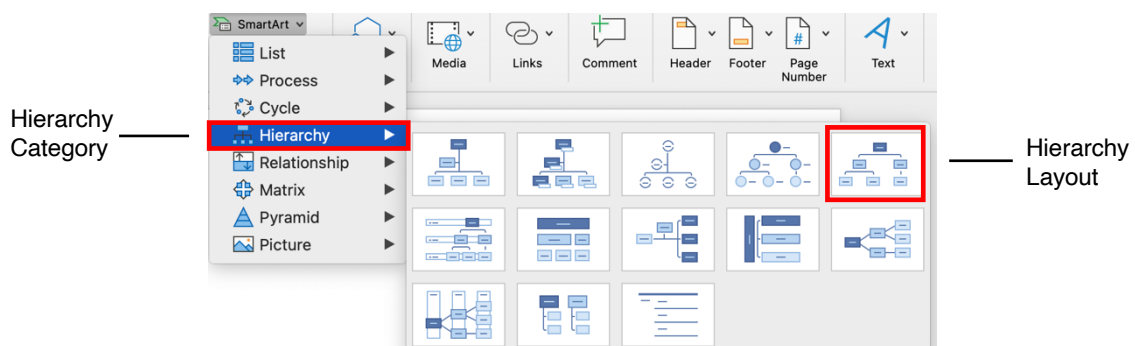


3. From the drop-down menu, hover over the category of SmartArt figure you'd like to insert. A flyout menu appears displaying various SmartArt layouts.
4. Select your desired SmartArt layout. A new tab labeled **SmartArt Design** appears at the top of your window. Your selected figure appears within your document.
5. Edit your SmartArt figure as desired. Refer to module **2.2: SmartArt Tutorial - Hierarchy** on page **14** for an in-depth tutorial to guide you through some of the SmartArt's most valuable features.

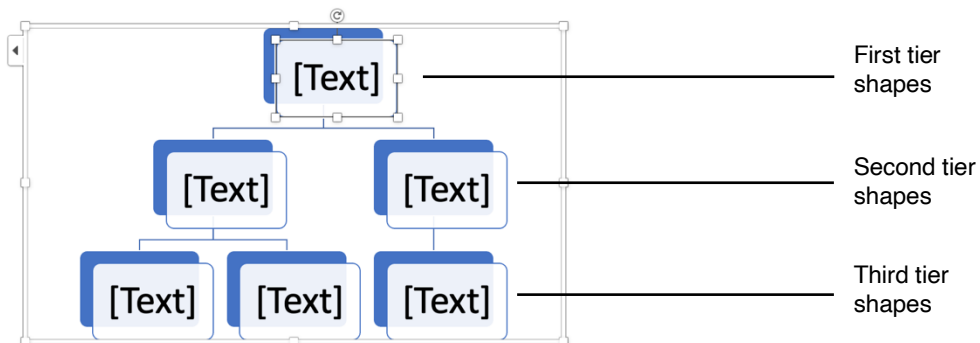
## 2.3: SmartArt Tutorial

In this tutorial, you will be taught how to make a simple evolutionary diagram using the SmartArt feature. By following this tutorial, the basic skills and knowledge needed to create a wide variety of SmartArt figures, such as adding, removing, and editing shapes, will be learned.

1. Follow steps **1 and 2** from module **2.2: Inserting SmartArt Figures**, found on page **13**.
2. Hover your cursor over the **Hierarchy** category in the drop-down menu.



3. From the fly-out menu that appears, select the **Hierarchy** layout, found in the top row, fifth from left. A blank hierarchy figure appears in your document, as shown below.

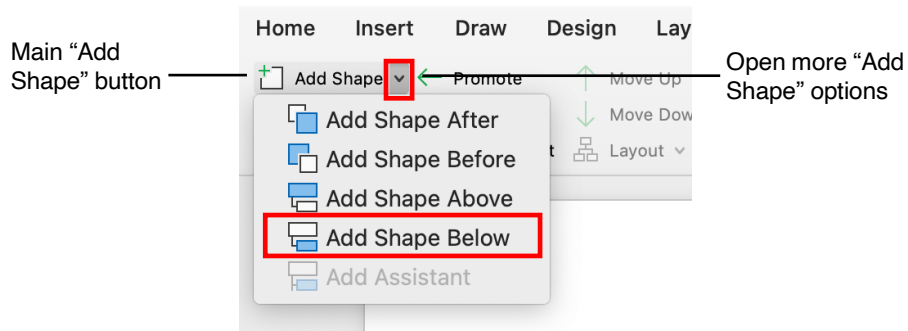


4. Click within the first-tiered shape of the hierarchy to begin editing its text. For the purposes of this tutorial, write “Vertebrae.”

*Note: Word automatically resizes text written within SmartArt shapes to fit the size of the shape.*

5. Click within the left-side shape of the second tier. Write “Bony Skeleton.” Then, click within the right-side shape of the second tier and write “Sharks.”

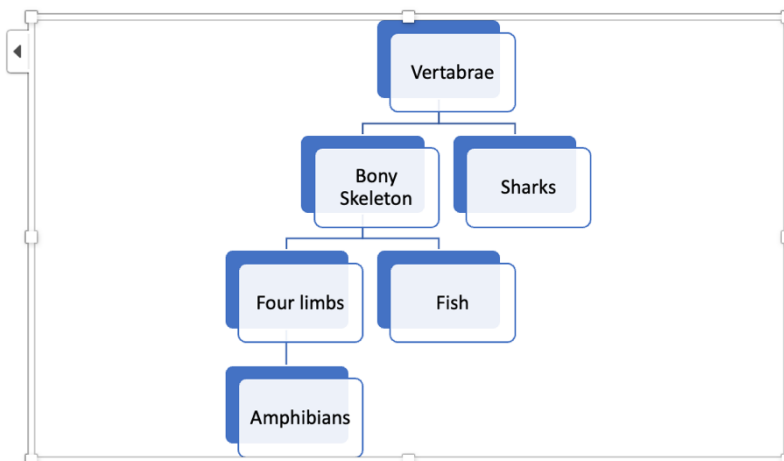
6. Click on the *border* of the third-tiered shape below “Sharks” to select the entire shape. Press the **Delete** key to remove it from your hierarchy.
7. Click within the leftmost shape in the third tier and write “Four limbs.” Then, click within the remaining third-tier shape and write “Fish.”
8. Click on the *border* of the “Four limbs” shape to select the entire shape
9. Click on the small arrow next to the **Add Shape** button, found under the **SmartArt Design** tab. A drop-down menu appears containing more options for adding shapes.



*Note: Clicking on the main “Add Shape” button always defaults to the “Add Shape After” option.*

10. Click on **Add Shape Below** from the drop-down menu. A new, blank shape appears below the “Four limbs” shape which was selected.
11. Click within this newly made, fourth-tier shape and write “Amphibians.”

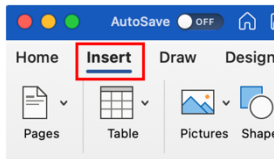
Congratulations, your hierarchy is now complete! Compare it with the below reference to ensure that you’ve correctly created your hierarchy.



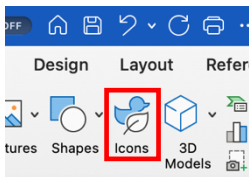
## 2.4: Inserting Stock Images and Icons

Word comes with a large library of stock images and basic icons to pick from that can serve as eye-catching and fun adornments for tests and quizzes. Teachers of younger students may especially find these features useful for creating engaging material.

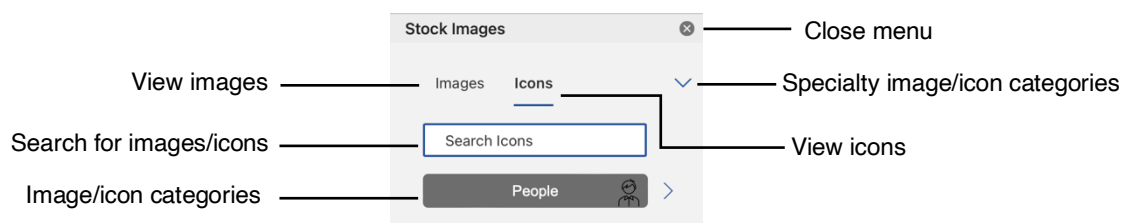
1. Click on the **Insert** tab found on the ribbon.



2. Click on the **Icons** button. A new menu labeled **Stock Images** appears on the right side of your window. Refer to the figure below for help in navigating the “Stock Images” menu.

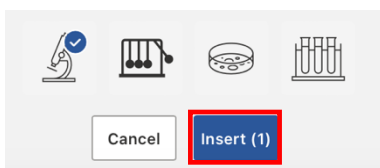


3. Navigate to the image(s) or icon(s) you'd like to insert and click to select it. Refer to the figure below for help in navigating the **Stock Images** menu.



*Note: You may select more than one image/icon to insert at once.*

4. Click the highlighted **Insert** button at the bottom of the menu to insert your selected icon(s) or image(s) into your document.



# ***Chapter 3: Formatting***

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## **3.1: Formatting Text Boxes\_\_\_\_\_18**

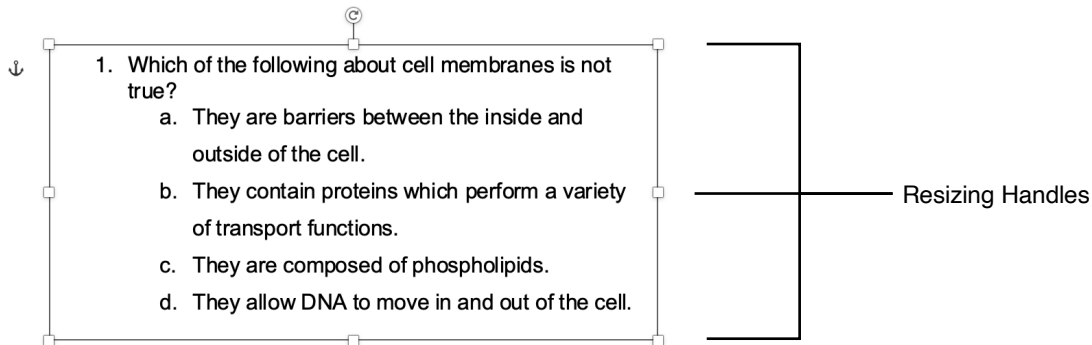
## **3.2: Formatting Visuals with Wrap Text\_\_\_\_\_20**

## 3.1: Formatting Text Boxes

The main advantages of utilizing text boxes over simply typing text directly into a document is the modularity and customizability that text boxes allow. This module will teach you how to both resize your text boxes and remove their borders. Refer to module **1.2: Inserting Text Boxes** on page 5 for guidance on creating text boxes.

### Part 1: Resizing Text Boxes

1. Click on your text box to select it. Your text box's borders appear.



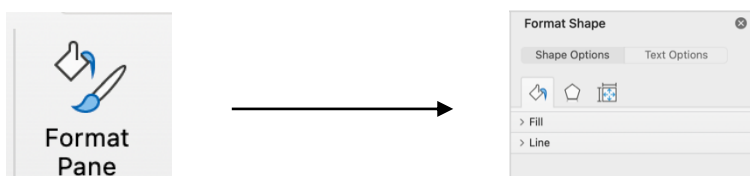
2. Click and hold on any of the small white boxes (the **Resizing Handles**) on the border of your text box. While clicking and holding, drag your mouse cursor to resize your text box.

*Note: Word will attempt to rearrange text to fit within a resized text box but won't alter font size to do so. If the text won't fit within the text box, it will be cut off by the edges of the text box.*

### Part 2: Removing Text Box Borders

*Note: By default, Word creates your text boxes with a thin black border surrounding them.*

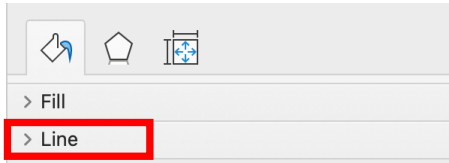
1. Click on your text box to select it. A new tab titled **Shape Format** appears and is automatically selected in the ribbon.
2. Within the **Shape Format** tab, click on the **Format Pane** button. A new menu, the **Format Pane**, appears on the right-hand side of your window.



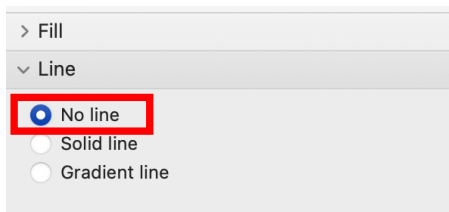
3. Within the **Format Pane**, click **Shape Options**.



4. Click **Line** underneath **Shape Options**. A drop-down menu appears.



5. Click on **No Line**. Your text box's border disappears.

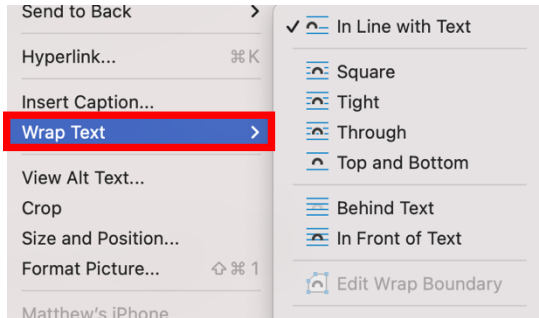


*Note: Be sure to deselect your text box to ensure that the border has been removed. Selected text boxes always display a border.*

## 3.2: Formatting Visuals with Text Wrap

Visual elements such as images and SmartArt figures may initially seem unwieldy and uncooperative when being inserted into a document with text or other visual elements already in place. Oftentimes, the solution to unruly visual elements lies within applying the correct text wrapping option.

1. Right click on your visual element. A new menu appears where you right clicked.
2. In the menu that appears, hover over the **Wrap Text** option. A flyout menu appears containing a variety of options.



3. Click to select your preferred text wrapping option. Refer to the following list for a description and example of each of these options.

### In Line with Text:

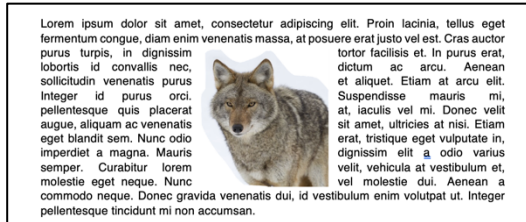
- Formats the element as though it were a paragraph. You may position the element as you would a paragraph. (right, left centrally aligned)



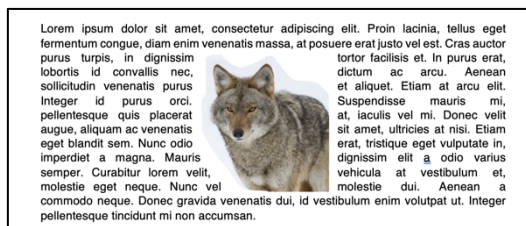


**Square:**

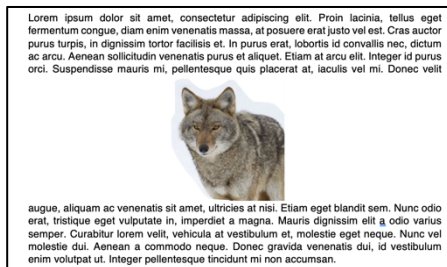
- Wraps text around the element in a square/rectangular shape, ignoring the shape of the element if it is not square/rectangular.

**Tight/Through:**

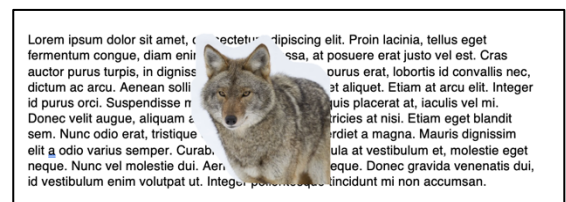
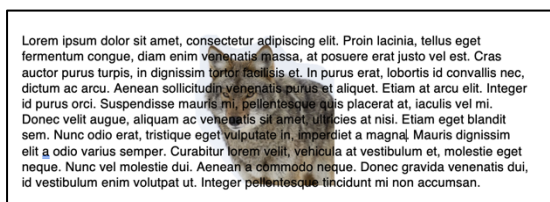
- Wraps text around the element, taking into account the element's actual shape. **Through** allows for text to pass through any gaps in the element's shape, while **Tight** will not.

**Top and Bottom:**

- Wraps text completely above and below the element.

**Behind Text/In Front of Text:**

- Fully places the element behind/in front of the text.



## ***Colophon***

This manual was written and assembled entirely using Microsoft Word for Mac. (even the cover!) The only typeface used throughout this manual is Helvetica. It was printed and bound at Amherst Copy & Designworks in Hadley, Massachusetts.