Adobe Illustrator
This packet will serve as a basic introduction to Adobe Illustrator and some of the more basic tools it has to offer. This is not a comprehensive introduction to Illustrator, these are just a few basic tools to get you started. It is recommended that anyone looking to become more familiar with the program go to the HELPFUL LINKS page on the Digital Fabrication Lab website found on the facilities page of the Fine and Performing Arts website. Here one can follow along with some of the more in-depth tutorials on how to use Adobe Illustrator. As with any software there is a learning curve to this program. Once you understand a few of the basics, which this packet will provide, the learning curve levels out quite a bit. As anyone who is proficient with this program can tell you, it just takes practice.

Getting Started:
To begin you are going to want to open Adobe Illustrator, then go to the upper left hand corner and go to FILE > NEW. From there the menu below will appear. This is where you will define the settings for your document. These settings will depend on the requirements of your project, so it is good to have the final output of this file in mind prior to setting up your file.

Always NAME your project file. It should be specific to you and the project you are working on.

PROFILES define presets for your file depending on what the final output may be. In our case we will use a RGB profile.

An ARTBOARD is a printable workspace within a Illustrator file. Think of them as a page in a sketchbook.

WIDTH and HEIGHT are the dimensions of your artboard or work area. UNITS can vary: cm, mm, pixels. In our case we will be using inches.

COLOR MODE is similar to profiles, this will alter a number of presets within your file depending on the final output. Be it large format printing or the laser cutter, it is good to be aware of the output prior to setting up your file. RASTER EFFECTS will effect the DPI or resolution of any bitmap images that are rasterized within your file.

Once you have your file set up correctly, click OK to begin.

If at any point you feel the need to change your Artboard settings, go to FILE > DOCUMENT SETUP and from that menu select EDIT ARTBOARDS. This will allow you change the size and orientation of your artboard.
Once you have hit OK your new document will appear and should look something like this. At left you will see two tool bars identified as LEFT and RIGHT as well as a CONTROL PANEL. Tool bars, the control panel, and drop down menus are where you will find all of the functions in Illustrator. If you hover your cursor over any one of the icons it will reveal a description of what that tool is. Also, if you get stuck, or can't find a function you can use the search menu in the upper right corner of your Illustrator window. This will bring you to an online help forum with some helpful tips. Before we go to far into the tool bars and drop down menus, a quick not on rulers will help you with the initial setup of your file.

**Rulers and Grid:**
Before one gets started there are a few settings that will make working with Illustrator a lot easier. Under VIEW in the top menu, half way down, one will find a few helpful work-flow options. All of these are a matter of preference, but in the beginning, they can be very useful tools.

**RULERS:**
When shown, the rulers can be seen running up the left side and top of the illustrator window. These are very helpful for keeping track of your layout scale. Also, using the SELECT TOOL, if you CLICK in one of the rulers and DRAG, you will bring out a guide. By holding SHIFT while doing so, the guide will SNAP to the increments on the ruler.

**GUIDES:**
Guides help greatly with object and text alignment. Once dragged from the ruler they appear as a teal line running either vertically or horizontally (top ruler = horizontal guide, left ruler = vertical guide). One can also hide guides from the same guides menu. Guides can also be deleted. Go to guides, make sure the guides are NOT LOCKED from there just click and delete.

**GRID:**
The grid is just that, a grid. One can turn it on and off while working. The units of the grid can be changed under EDIT > PREFERENCES > GUIDES & GRID. When using the grid it is helpful at time to have SNAP TO GRID turned on. This will help align objects and text to the grid as you are moving them around.

**SMART GUIDES:**
Smart Guides are temporary snap-to guides that appear when you create or manipulate objects. They help you move, align, edit, and transform objects relative to other objects by snap-aligning (automatically) as well as displaying X / Y coordinates.

Notice here, when I try to move one square in relation to the other, there is no information about their relation to each other.

Where as here, with SMART GUIDES on, I get X / Y coordinates as well as an indication that the objects are aligned horizontally.

**Control Panel:**
The control panel offers easy access to options for customization pertaining to the tool or object you have selected. For example, when you select a text object, the control panel displays text formatting options in addition to options for changing the color, placement, and dimensions of the object.
Shown below is the control panel when **TEXT** is selected.

Options for **STROKE WIDTH/ COLOR** as well as **FILL COLOR** will always appear in the control panel.

We have text selected so the control panel lists a number of different **TEXT OPTIONS**.

You can see here the **SCALE** and **X / Y PLACEMENT** options of your text.

This is the control panel when an **OBJECT** is selected.

**STROKE WIDTH/ COLOR**

**FILL COLOR**

You also have appearance options for **BRUSH DEFINITION** and **LINE WIDTH PROFILES**.

**SCALE** and **X / Y PLACEMENT** options.

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**Drop Down Menus:**

Above the **CONTROL PANEL** you will also find some very useful **DROP DOWN MENUS**. These menus are where you will find a number of tools and functions which may not appear in the control panels. A number of the functions in these drop down menus will be covered in this packet.

**OBJECT MENU:**

- **TRANSFORM** has many functions which allows one to **MOVE**, **ROTATE**, **REFLECT**, or **SCALE** an object.
- **ARRANGE** allows one to alter where an object lies in the stacking order of objects. One can bring an object all the way to the front, or send it back behind another object. This tool becomes very useful in the **PATHFINDER** functions.
- **GROUP** combines several objects into a group so that the objects are treated as a single unit.
- Applying **EXPAND** to objects enables you to divide a single object or text into multiple objects that make up its appearance. You can see here how expand has given both the stroke and fill solid dimensions which can be separated and altered.
- **RASTERIZING** converts vector data to pixel data. When placing jpeg or bitmap images into Illustrator, it is recommended that you rasterize them in order to embed them into your Illustrator file.

**EDIT MENU:**

- **EDIT** is where you will find **UNDO**, **REDO**, **CUT**, **COPY**, **PASTE**.

**TYPE MENU:**

- **This** is where you will find font type and size options.
RIGHT CLICK:
When you have an OBJECT or TEXT selected and you RIGHT CLICK on the selected element a drop down menu with many of the tools just described on the previous page will appear. This allows for easy manipulation of objects and text without having to reference the drop down menu every time.

ESC:
It may seem simple, but escape is a very useful for moving around Illustrator easily. When one is done with an action, say editing text or making a shape to leave that current tool HIT ESC. Illustrator will give you the SELECT TOOL automatically. If ESC does not exit the tool, which for a few it may not, hit V, the shortcut for the SELECT TOOL.

SELECT MENU:
The SELECT menu is where you will find options like SELECT ALL, SELECT INVERSE, SELECT SAME.

Select same is very useful for selecting multiple objects that have similar characteristics such as same FILL COLOR, same STROKE COLOR, or same STROKE WEIGHT.

WINDOW MENU:
The WINDOW drop down menu is where to will find many of the tool functions which also appear in your tool bars. If for some reason you cannot find a tool, this is a good place to find it.

The VIEW menu, as stated earlier, holds many of the functions pertaining to rulers, guides, and the grid.

HELP MENU:
The help menu will link you to the AI online help forums for questions pertaining to Illustrator.
**Left Tool Bar:**
The left tool bar is the primary tool bar for most of the functions in Illustrator. I will be highlighting a number of these tools in this packet, but as always, go through this tool bar and experiment.

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**SELECT TOOL:**
The select tool is the black arrow at the top of the tool bar. Using the select tool you can either click on any part of an object or drag a marque around it to select the whole thing. Select will not allow you to select individual points on an object.

**NOTE:** When you have an object selected you can alter the **SCALE** of that object by dragging any one of the corners in or out. To constrain the proportions while scaling (IE: ensure everything is scaled equally) **HOLD SHIFT** while dragging.

**DIRECT SELECT TOOL:**
The direct select tool allows you to select Individual anchor points or path segments by clicking on them, Similar to the select tool you can also use the direct select tool to drag a marque around the whole shape to make a selection.

**NOTE:** When using the direct select tool you can select one point of an object with the cursor but in order to select multiple points on the object you must **HOLD SHIFT** while clicking the control point.

**PEN TOOL:**
The pen tool allows one to draw a free-form array of points (control points) connected by line segments. This tool can be used to construct shapes as well as trace bitmap images. While it is a free form tool, by holding **SHIFT** while drawing one can constrain the pen movements to multiples of 45° (see fig. 1). One can also add or subtract anchor points to or from line segments using the **ADD** or **DELETE** anchor point tool from the pen menu. Click on the **LINE** segment where you want to add an anchor point with the **ADD ANCHOR POINT TOOL**, or click the **POINT** you want to remove with the **DELETE ANCHOR POINT TOOL**.

When drawing with the pen, in order to create a **CLOSED SHAPE** one must return to the **ORIGIN POINT** (first point) on the drawing and hover the pen icon over that point. From there a little circle will appear with the pen icon. Click that first point and the shape will become closed. (see fig. 2)
When using the pen tool one can also use the **CONVERT ANCHOR POINT** tool. This will allow an individual to alter the contour of line segments attached to that control point. You can convert curved lines to corners by clicking once on the point with the convert anchor point tool. By clicking and dragging one will get handles which will allow them to alter the contours of the line from that control point (see fig. 3).

**TEXT TOOL:**
The text tool allows one to embed text into one’s illustration. To use the text tool one simply draws a marquee where they would like the text. From there a cursor will appear and one can type within the box they just created. The control panel will allow you to change font, type size, alignment, etc. At any point one can change the scale of the text area by using select tool to grab one of the 8 white points and drag it to scale the text window (again, **HOLD SHIFT** to constrain the proportions of the text box when scaling).

**LINE TOOL:**
There are two ways to draw a line with this tool. One, **CLICK** where you want the line to begin, and **DRAG** to where you want the line to end and release the mouse. The other is by clicking where you want the line to begin, and specify the length and angle of the line within the menu that appears.

**SHAPE BUILDER:**
The shape builder tool allows you to draw objects in a fashion similar to the line tool. One way is to **CLICK** where you would like the shape to start and **DRAG** to where you would like the object to end and then release the mouse.

The second way is to click where you would like the shape to start, a menu for that shape will appear. From here input the desired dimensions and attributes of your object into the menu that appears and click **OK**.

**NOTE:** Holding **SHIFT** while creating a shape will constrain the proportions (IE: ensure that the x to y ratios are equivalent)

**MEASURE TOOL:**
The measure tool, found under the eye dropper icon allows one to measure between two points. Simply open the tool, use the cross-hairs to click between two points and the distance will appear in the information menu.
ROTATE:
The rotate tool is very useful for manipulating shapes. By selecting the rotate tool one can click on ANY part of an object to create the axis of rotation (the point on which the object will turn). Once one has clicked the shape and created their anchor point you can then click and drag the shape to rotate it. Similar to MANY tools in Illustrator, holding SHIFT while rotating will limit the axis of rotation to multiples of 45°.

A cross-hair will appear once you have chosen your axis of rotation.

From there CLICK and DRAG your shape to rotate.

SCALE:
The scale tool operates similar to the rotate tool. One can click ANY point on a shape and the will become the point from which the object is scaled.

A cross-hair will appear once you have chosen the point from which to scale your object.

From there CLICK within the shape and DRAG the cursor until you reach your desired scale and release.

SCALE & ROTATE:
Two other options for scale and rotation can be found under OBJECT > TRANSFORM > SCALE or ROTATE. These menus allow you to scale an object by a percentage value or rotate by a degree value offering a bit more control than the other methods. Also, DO NOT FORGET that the SIZE of an object can be changed with the CONTROL PANEL. After selecting an object or body of text, in the upper right of the control panel there will be HEIGHT and WIDTH dimensions which you can change.

Another option to bear in mind is the SCALE and ROTATION adjustments can be done using the SELECT TOOL. Once you have selected an object you will see a BOUNDING BOX, a blue rectangle with 8 white points on it will appear around the object. One can click on any one of these points and drag to alter the shape. In addition to this if one hovers the cursor over one of the 8 points, a SCALE cursor (diagonal arrow) will appear allowing you to re-size the shape. If you hover just off the point, a ROTATE icon will appear (curved arrow). This will allow one to rotate the selected object.
HAND TOOL:
The hand tool allows one to CLICK and DRAG their artboard around within the visible Illustrator window. It is useful for moving between different parts of one's illustration without zooming in and out.

ZOOM TOOL:
This tool allows one to zoom in and out within their illustration. By selecting the zoom tool you will be in ZOOM IN mode by default. If you hold ALT and click you will be ZOOMING OUT.

STROKE AND FILL:
A FILL is a color, pattern, or gradient inside an object. A STROKE is the visible outline of an object or path. To change the fill color or stroke color / width use the select tool to highlight the entire object. From there using the CONTROL PANEL or the color options in the bottom of the LEFT TOOL BAR, one will be able to alter the fill or stroke color.

STROKE and FILL will appear in the top left corner of the control panel. By clicking either of the drop down arrows next to each, one is able to choose from preset colors as seen below.

STROKE WEIGHT is found next to stroke and fill color in the control panel. This is where you adjust the LINE WEIGHT (outline) of an object or text.

These are the STROKE and FILL options as they appear in the left tool bar. The solid square is fill. The square with the hole in it represents the stroke. By double clicking on either the stroke or the fill boxes in the left tool bar, the color picker menu seen below will appear. This will allow you to choose custom colors or enter RGB / CMYK values.

CLICK and DRAG within the gradient map and slider to choose custom color. OR, enter custom RGB or CMYK values here.

NOTE: In either the CONTROL PANEL or the LEFT TOOL BAR:

This symbol means there is NO STROKE for that selected shape or body of text. This symbol means there is NO FILL for that selected shape or body of text.

That covers some of the basic tools that can be found in the left toolbar. As I have said, there are many tools held here and it is advised to go through and have fun experimenting with them. From here we are going to move on to a few very useful tools in the Right toolbar.
Right Toolbar:

**LAYERS:**
The layers panel provides an easy way to select, hide, lock, and change the appearance of selected portions of your artwork. Layers are a very useful way to organize and arrange artwork in more complex illustrations. Think of layers as transparent pages in a sketchbook. While you can see everything, portions of your work can live on different “pages” or layers making the editing process far simpler.

You can make layers **VISIBLE** or **INVISIBLE** by clicking the **EYE** icon. When the eye is visible so is that layer and vice versa.

The **LOCK** indicates that a layer is locked and cannot be edited until unlocked.

One major aspect to keep in mind is that layer visibility is dictated by the order in the layers menu. For instance images on **LAYER ONE** will cover those on **LAYER TWO**, and so on. If you want to change the visibility of an image you can either copy and paste that image to a more dominant layer in the menu (say from layer 2 to layer 1) or change the layer order by clicking and dragging that images layer higher up the list. Organized layers is one of the **KEY ELEMENTS** of Illustrator. It cannot be stressed enough how much easier work becomes if you separate different elements of your illustration onto different layers. Keep this in mind and practice using this tool.

**ALIGN & DISTRIBUTE:**
The align function can be used to align selected objects to each other, to a specific object, or to the artboard as a whole. Under the same menu you can find distribute. This tool allows you to distribute selected objects in relation to each other, selected objects, as well as the artboard. This is a powerful function of Illustrator and does take some trial and error. This is the full align and distribute menu which can be found in the right tool bar. Many of these functions will also appear in the control panel when you have one or more objects selected.

This is where you will choose the desired alignment type. Be it to a selection, key object or the artboard.
ALIGN & DISTRIBUTE TO ARTBOARD:
Align to artboard works in a very similar fashion as align to key object. One starts by going to ALIGN TO > ALIGN TO ARTBOARD. From there one simply selects the objects they would like to align to the art board and then SHIFT-CLICK within the desired artboard to align to (the selected artboard will receive a black outline) With the objects selected choose the desired alignment type and the action will occur.

Here we have three circles selected and as well as the artboard to which we would like to align (as can be seen by the this black line around the border)

Using the Horizontally Align Center tool the three circles are now aligned to the center of the artboard.

You can also DISTRIBUTE OBJECTS within an artboard in a very similar way. Select the objects you would like to distribute and SHIFT-CLICK within the art board you would like to distribute them. From there, similar to the alignment tool, select the distribution type and the objects will distribute accordingly within your chosen artboard.

DISTRIBUTE TO SELECTION:
Distribute will evenly distribute a group of selected objects within the bounding box for that selected group. Using the select tool one simply uses shift-click or a marquee to select the shapes they would like to distribute and then applies the desired distribution function. It is recommended that one aligns the objects they are looking to distribute prior to the distribution process.

So here I have selected three circles spread randomly. Once selected I applied VERTICALLY ALIGN CENTER. The three aligned circles are then selected again. From here, using HORIZONTALLY DISTRIBUTE CENTER the three circles have now been distributed evenly in relation to each other.

DISTRIBUTE TO KEY OBJECT:
Distribute to key object, similar to the align function, allows one to distribute a group of objects in relation to a selected key object. To begin select your group of objects and with all of them selected click on the object (without holding shift) which you would like to be your key object. By doing this ALIGN TO will automatically default to ALIGN TO KEY OBJECT. From here with your objects and your key object selected, enter your distribution spacing as well as distribution type and you will be all set.

The three objects here were selected and VERTICALLY ALIGNED CENTER. From there the objects were selected again and the key object defined. Once you have clicked the key object, the path of the object will become blue. With both of these selections made ALIGN TO has defaulted to ALIGN TO KEY OBJECT. From there choose your distribution spacing and alignment type, in this case a .5", horizontally distributed center (meaning the edge of every object lies .5" the other and they spaced out horizontally)
Keep in mind that **HORIZONTAL ALIGN CENTER** will **MOVE** the center of the selected objects on a **HORIZONTAL AXIS** (a line running left to right) across your artboard until the objects are aligned **VERTICALLY**. **VERTICAL ALIGN CENTER** will **MOVE** the center of the selected objects along a **VERTICAL AXIS** (a line running top to bottom) through your artboard until the objects are aligned **HORIZONTALLY**. The phrasing is a bit confusing at first so I wanted to point that out. The rest of the commands, left, right, top and bottom are a bit more self explanatory.

**ALIGN TO SELECTION:**
Align to selection will align any number of objects within the same selection (bounding box). This option is found in **ALIGN TO > ALIGN TO SELECTION**. Below there are three objects selected, if an alignment function is applied, it will only apply to those objects and nothing else. If **HORIZONTALLY ALIGN LEFT** is applied to these objects, it will align all of them to the center of the object furthest to the left. When you choose **VERTICAL ALIGN TOP**, it will align all of the objects to the center of the **HIGHEST OBJECT** in the selection. This principle translates to all of the align to selection tools, note the examples below.

![Alignment Examples](attachment:image.png)

**ALIGN TO KEY OBJECT:**
In order to use this function one must first select **ALIGN TO KEY OBJECT** from the **ALIGNMENT TYPE** menu. From there one will select the objects they want to align using **SHIFT-CLICK** or by dragging a marquee around them. The **LAST** object to be selected is the one to which the other objects will align, in this case the square around our circles. So, I have selected all three circles and **THEN** the square around them. You do not have to hold shift while selecting the key object, just click on it and the blue highlight will appear. From here choose your alignment type and you will be all set. This principle applies to aligning any group of objects to a secondary object or path.

![Alignment Examples](attachment:image.png)
There is a lot of information here on the align and distribute function, so don’t be overwhelmed, it takes a lot of trial and error to become accustomed to these tools. In the beginning the most useful tools will most likely be Vertical/Horizontal Align Center, Distribute to Selection, and Distribute to Key Object. Practice with those and once you have a solid understanding, move forward to using some of the other tools.

**PATHFINDER TOOL:**
The Pathfinder tool, also found in the right tool bar allows the individual to combine and crop vector objects in a variety of different ways. This is a very useful tool but similar to the align tool it does take some getting used to so be patient.

<table>
<thead>
<tr>
<th>UNITE</th>
<th>EXCLUDE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINUS FRONT</td>
<td>INTERSECT</td>
</tr>
<tr>
<td>DIVIDE</td>
<td>OUTLINE</td>
</tr>
</tbody>
</table>

**EXPAND:**
Expanding divides a single object or text into multiple objects enabling editing. Illustrator, when it executes one of these pathfinder functions will automatically expand the shapes created. This option will remain blacked out due to this default setting.

**NOTE:**
Many of these pathfinder functions depend greatly upon which object is on top, so using **ARRANGE** from either **OBJECT > ARRANGE** or **RIGHT CLICKING** and selecting arrange, you can bring objects forward, or send them backward, depending on what you are looking to accomplish.

**UNITE:**
Combines all the selected objects and merges them into a single shape. If the objects are different colors, the merged shape takes on the attributes of the top-most object.

**MINUS FRONT:**
Uses the top object(s) as a sort of "cookie cutter" to subtract their shapes from the bottom object.

**INTERSECT:**
Deletes everything that does not overlap, and combines the rest into a single shape.

**EXCLUDE:**
The opposite of Intersect. Instead of getting rid of everything that isn't overlapping, it gets rid of everything that does overlap. The resulting shapes become a compound path.

**DIVIDE:**
Probably the most often used, divide cuts the artwork into separate pieces wherever shapes overlap. The color of the original shapes are not changed. After dividing, you can use the Direct Selection or Group Selection tool to move the resulting pieces independently. You can also un-group the shapes and move them with the Selection tool.

**OUTLINE:**
Similar to the divide function, outline separates the overlapping shapes into separate, editable elements but instead of shapes the result is individual line segments. After outlining, you can use the Direct Selection tool to move the resulting pieces independently. You can also un-group the shapes and move them with the Selection tool. **NOTE:** if you use the outline function, you must go to the **CONTROL PANEL** and apply a **STROKE** to the line.
That is the pathfinder tool. There are a few functions that we did not cover, but if you reference the DFL website's **HELPFUL LINKS PAGE** there is a great link which offers a bit more insight into the pathfinder tool. As with the Align/ Distribute function, there is **A LOT** to learn about these functions, so **DO NOT BE DISCOURAGED** if you don't get it at first.

So for now, those are the basics. There is a lot more to learn but this will definitely get you started. As with any tool or craft, Illustrator takes a great deal of time to become proficient with, do not become discouraged if you don't understand it the first day, none of us did. Take your time, practice, make some mistakes and have some fun.

**Keyboard Commands:**

There are some keyboard commands in Illustrator that will save a lot of time in the long run. NOTE: the Command key is the Ctrl key when working on a Mac.

- Ctrl + C = Copy
- Ctrl + V = Paste
- Ctrl + Shift + V = Paste in place
- Ctrl + Z = Undo
- Shift + Ctrl + Z = Redo
- Ctrl + G = Group
- Shift + Ctrl + G = Un-group
- Ctrl + A = Select all
- Shift + Ctrl + A = De-select all
- Ctrl + J = Join
- Z = zoom
- A = Direct select
- V = Select
- H = Hand tool
- P = Pen tool

**CLASS NOTES:**