INTRODUCTION TO
INKSCAPE

LESSON 1: BASICS BOOTCAMP

Find out what Inkscape is, how to run it, and all the Inkscape essentials you'll need to know to get started creating your own awesome artwork!

WHAT IS INKSCAPE?

Inkscape is a software program that allows you to create artwork of all kinds – illustrations, logos, icons, business cards, webpage banners, posters, CD and DVD labels, T-shirt artwork – your imagination and creativity are the limit!

There's two things you should know about Inkscape:

1. Inkscape is free. You can download Inkscape and share it with your friends – no problem. You can always download a copy of the latest Inkscape at inkscape.org.

2. Inkscape is a vector graphics program. This mean, practically, any artwork you create in Inkscape can be sized up to be infinitely large without any loss of quality. We'll talk more about this later.

INKSCAPE BASICS BOOTCAMP

We're going to get started in Inkscape right away. We're going to run through some of the basics very quickly. Give them a shot, and please refer back to this instruction sheet as you work with Inkscape if you need to remember how to do something. Open up Inkscape and get ready!

1. **Pan the Inkscape canvas**
   - Grab the vertical scrollbar at the right of the screen and scroll up and down.
   - Try the same with the horiztonal scrollbar at the bottom of the screen – scroll left and right.
   - Hold down the 'Ctrl' key on your keyboard. While keeping it held down, press the up, down, left, and right arrow keys one-by-one on the keyboard and move around the canvas.
   - Lost? Can't find your canvas anymore? Not to worry – hit the '5' key on your keyboard to get back to your canvas.

2. **Zoom, zoom, zoom.**
   - Go to View > Zoom in the toolbar. Zoom far into the canvas. Then zoom back out. (Lost? Hit the '1' key to get back to 100% zoom.)
   - Now try zooming using the zoom tool. Click on the magnifying glass tool in the left – click on the canvas to zoom in. Hold down the 'Shift' key, then click on the canvas again to zoom out.
   - Now try zooming using the keyboard shortcuts. Hit '+' 3 times to zoom in. Now hit '-' 3 times to zoom out.
   - Now try zooming using the zoom toolbar entry in the lower right. You can click the little arrows or type the zoom percentage you'd like.

3. **Pick and choose – selecting objects**
    - Select the circle, square, or star tool from the toolbar on the left and draw a bunch of shapes on the canvas.
    - Select one of the shapes you just drew. Simply click on it. Click on empty canvas to reset your selection.
    - Select two of the shapes you just drew at the same time – hold down the 'Shift' key, and click on the two shapes you'd like to select. Drag them with the mouse, and move them using the arrow keys. Click on empty canvas to reset your selection.
    - Select three of the shapes you just drew at the same time. Hold down the 'Shift' key, click on three shapes. Unselect one of them by Shift + clicking on it again. Click on empty canvas to reset your selection.
    - Now select all of the shapes you just drew. Do this by clicking and dragging a lasso around all the shapes. Click on empty canvas to reset your selection. Now try the same by holding down the 'Ctrl' key and hitting the 'A' key.

4. **You've got to move it, move it!**
    - Select one of your objects. Move it around – try dragging it with the mouse.
    - Now select another object, and use the arrow keys to move it around.
    - Hold down the 'Shift' key, and use the arrow keys to move the object around again. How does holding down the shift key change how moving it works?

5. **Copy / Paste / Delete / Duplicate**
    - Select all the objects on your canvas. Hit 'Ctrl' + 'C'.
    - Hit the 'Delete' key. They're all gone.
    - Hit 'Ctrl' + 'V'. They're back!
    - Hit 'Ctrl' + 'X'. They're gone again!
    - Hit 'Ctrl' + 'V' again. They're back again!
    - Hit 'Ctrl' + 'D'... looks normal... but hit the up key a few times on your keyboard. Wow!

6. **Supersize it! Rotate, and Flip too!**
    - Delete all the objects on your canvas except for one.
    - Select the object by clicking on it once. Look at the border around the object. What does it look like?
    - Click the object one more time. Look at the border now. How has it changed?
    - Click on the object so that the arrows on the borders are straight, and drag them out to scale the object bigger. Drag them in to scale it smaller. Hold down 'Shift' and scale up again. How does it scale differently?
    - Click on the object again so that the arrows on the borders are curved. Drag them to rotate the object. Hold down 'Shift' and rotate it again. How does it rotate differently? Hold down 'Ctrl' and rotate again. How does it rotate differently?
    - Select the object and hit the 'H' key. What happened? Try the 'V' key as well.

7. **Grouping and ungrouping**
    - Create two more objects.
    - Select two objects. Hit 'Ctrl' + 'G'. Click the objects, and click on them again. Move them around. What changed?
    - Select the group you just created and one additional object. Hit 'Ctrl' + 'G' – what happened?
    - Select your new group. Hit 'Ctrl' + 'Shift' + 'G'. What happened? Try it again.

8. **Two steps forward, two steps back – arranging**
    - Select one of your objects. Hit 'Pg Up'. Now hit 'Pg Down' – what happened?
    - Now try hit the 'Home'key with the object selected. Hit the 'End' key. What happened?

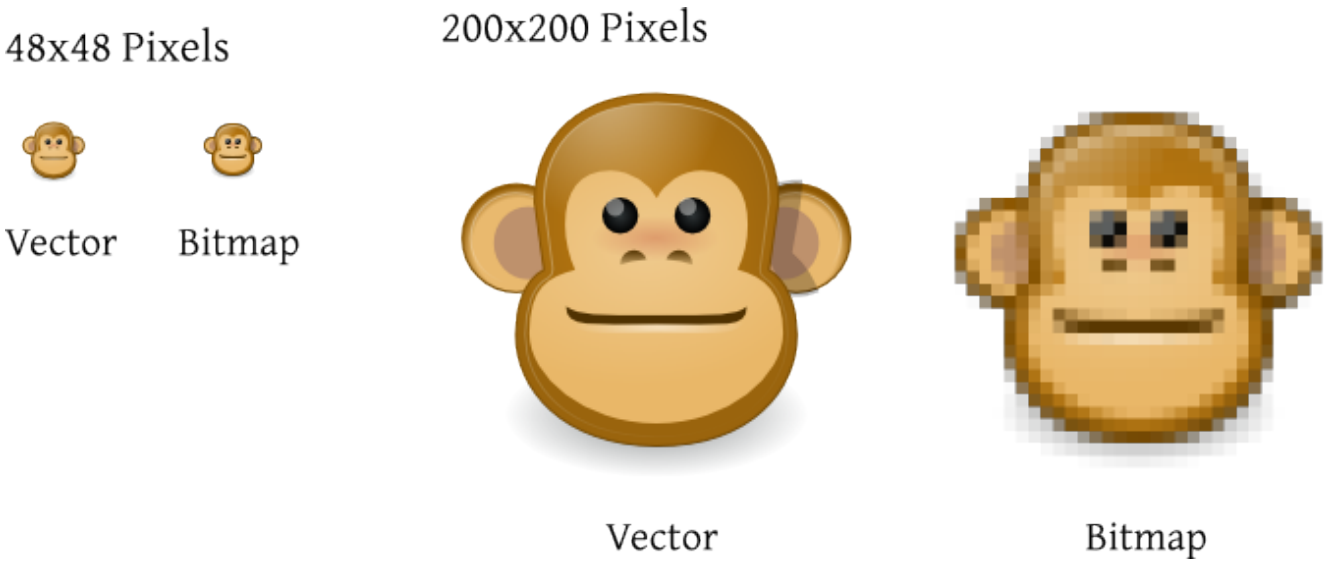
Save your file by going to File > Save As... and giving it a name. Note you are saving a file out as an SVG.

Bitmap vs. Vector

Now that you've had a chance to play around in Inkscape – here's a little bit more about what makes Inkscape and vector artwork cool.

Bitmap artwork involves storing different color values - "bits" - in a grid of pixels – a "map." This is how photos on a digital camera are stored. The camera stores different color and light values in a grid. Have you ever tried to scale a digital photo to a large size and find that it only gets more blurry as you scale it up? That's because photos are bitmapped.

Vector artwork involves storing color values, lines, shapes, and effects as mathematical values. This means when you scale vector artwork to be larger, it doesn't get blurry – the artwork maintains its quality.



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INKSCAPE

LESSON 1 EXERCISES

EXERCISES

Create a series of circles:

1. Make a circle that is a perfect circle. (Hint: There's a few ways to do this. Try using the lock icon in the top toolbar.)
2. Make a circle that is not a perfect circle – squish it!
3. Make 5 copies of your circle, and arrange them in a row horizontally.
4. Size your five circles so they grow from left to right - the one towards the left should be the smallest, and the one on the right should be the largest. You may scale down the first four, scale up the last four, or use any of the techniques you've been shown so far to accomplish this.

Create a series of rectangles:

1. Create a rectangle that is a perfect square.
2. Create a long rectangle that is not a perfect square.
3. Make 5 copies of your rectangle, all the same size.
4. Rotate each of the 5 copies of your rectangle circularly to make a start or flower out of your rectangles.
5. Group all of the rectangles of your flower together. Ungroup them and pull them apart. Undo and rebuild the flower. Group them again.

Save your file. Copy it onto the shared storage space on the school's server and share it with a classmate.

BONUS EXERCISES

Create a star:

1. Play around with the star object to create fun effects.
2. Try making a star with 20 points.
3. Try making a star with really rounded points.

APPLY THIS TO YOUR SCHOOLWORK

These simple shapes you've learned today are a great foundation for creating diagrams to explain how things work or illustrate a concept. The next time you need to write an essay or paper for a class, consider using Inkscape to create a diagram to help drive home your message.

INTRODUCTION TO
INKSCAPE

LESSON 2: SHAPES, PATHS, & PEN

Learn how to create shapes, paths and how to use the pen tool - these are the building blocks you'll need to create more complex drawings.

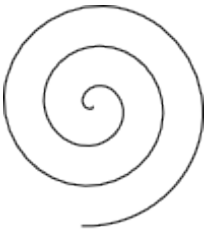
BASIC SHAPES

Inkscape makes it really easy to make several basic shapes with only a mouse click or two. You've probably already figured out how to draw these shapes during lesson 1. If you haven't tried one or more of these shapes yet, go ahead and try now!

SQUARE

RECTANGLE

CIRCLE



SPIRAL

Click and drag the square tool while holding down the Ctrl key.

Click and drag the square tool.

Click and drag the circle tool.

Click and drag the spiral tool.

You may have noticed that the toolbar at the top of your canvas changes when you have the square, circle, or spiral tools selected. The toolbar offers different properties you can change about the shape, so you can do things like create a rounded rectangle, a pie-slice circle, or a very tightly-wound spiral. Here's what some of these toolbars look like:

Square toolbar:

Circle toolbar:

Spiral Toolbar:

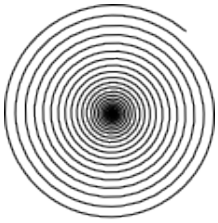
QUICK EXERCISE: Make each of the following shapes by changing the shape's properties using these shape-specific toolbars at the top of your canvas:

ROUNDED RECTANGLE

Rx: 18

PIE-SLICE CIRCLE

Start: 28
End: 330
Mode: Segment

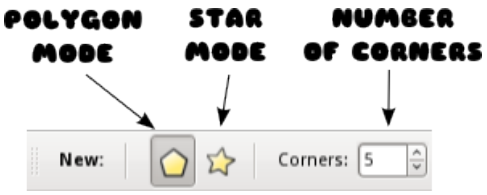


TIGHT SPIRAL

Turns: 26.6
Divergence: 2.64
Inner Radius: 0

BASIC STAR-BASED SHAPES

Have you explored the star & polygon shape tool yet? It's handy for creating evenly-formed shapes like triangle and pentagons. The tool has two modes – it can be in polygon mode, or star mode. When you click on the star/polygon tool in the Inkscape toolbar (it looks like this:), you'll see the star/polygon toolbar along the top of your canvas. You can switch between polygon mode and star mode by clicking the icons shown below in the star/polygon toolbar:



You can also control the number of corners your star or polygon shape has by typing a different number into the 'Corners' box on the star/polygon toolbar.

QUICK EXERCISE: Let's run through how you can create some more basic shapes using the polygon/star tool. Try these on your own!

TRIANGLE

Mode: Polygon
Corners: 3

5-POINT STAR

Mode: Star
Corners: 5
Spoke Ratio: 0.5

PENTAGON

Mode: Polygon
Corners: 5

Okay, so those are pretty basic, but there's an amazing variety of shapes you can create just by working with

this tool. Here's a small catalog of example shapes you can create just with star mode – the properties for creating each shape have been provided so you can try to make these on your own!

SKINNY 5-POINT STAR

Mode:	Star
Corners:	5
Spoke Ratio:	0.12

CHUBBY 5-POINT STAR

Mode:	Star
Corners:	5
Spoke Ratio:	0.6

12-POINT STAR

Mode:	Star
Corners:	12
Spoke Ratio:	0.5

ROUNDED 5-POINT STAR

Mode:	Star
Corners:	5
Spoke Ratio:	0.544
Rounded:	0.41

ROUNDED AND RANDOM 5-POINT STAR

Mode:	Star
Corners:	5
Spoke Ratio:	0.544
Rounded:	0.41
Random:	-0.113

30-POINT STARBURST

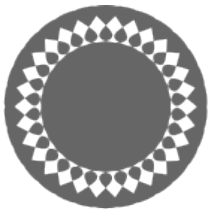
Mode:	Star
Corners:	30
Spoke Ratio:	0.78

30-POINT STAR

Mode:	Star
Corners:	30
Spoke Ratio:	0.144

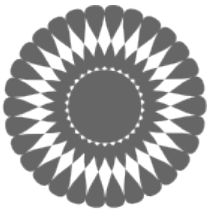
30-POINT STAR PATTERN 1

Mode:	Star
Corners:	30
Spoke Ratio:	0.48
Rounded:	0.53



30-POINT STAR PATTERN 2

Mode:	Star
Corners:	30
Spoke Ratio:	0.637
Rounded:	1.16



30-POINT STAR PATTERN 3

Mode:	Star
Corners:	30
Spoke Ratio:	0.358
Rounded:	0.5

30-POINT STAR PATTERN 4

Mode:	Star
Corners:	30
Spoke Ratio:	0.23
Rounded:	0.19

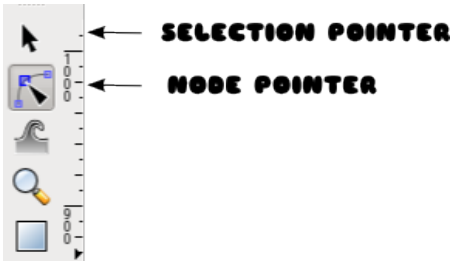
12-POINT STAR PATTERN

Mode:	Star
Corners:	12
Spoke Ratio:	0.53
Rounded:	1.21

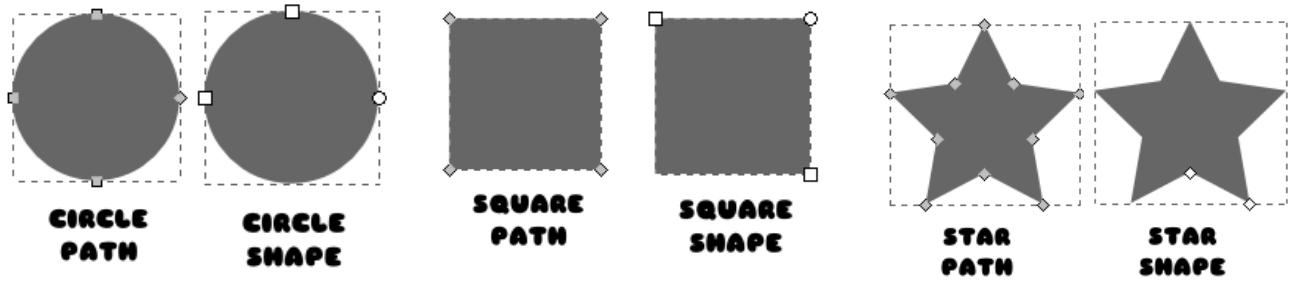
SHAPES VS. PATH

Everything we've drawn today so far is considered a 'shape' in Inkscape. If you click a star or polygon shape with the star/polygon tool, you get that special star/polygon toolbar that lets you change different properties about the shape – for example, how many corners your star has. Similarly, if you click a square you get the square toolbar; if you click a circle you get the circle toolbar – you get it, right?

There's another type of object in Inkscape called a path. Paths have nodes, which are intersection points that you can move around a lot more freely than you can in one of Inkscape's special shapes. One confusing thing is that, for example, a circle shape and a circle path look exactly the same. So how can you tell the difference? Use the node pointer (as opposed to the selection pointer you have been using) and click on the shape:



Here's some examples of what shapes look like compared to paths when you select them using the node pointer:



Look around the edges of each path or shape. The grey diamonds around the paths are called “nodes”. You can select one or more (hold down “shift” to select more than one at a time, or lasso using the node pointer) by clicking on them using the node pointer. You can move them around using your mouse or the arrow keys on the keyboard.

The white squares and circles around the shapes are control points. Depending on which one you click and drag with the node pointer, the shapes will be changed in different ways. Inkscape will give you little hints about what each control point does – look towards the bottom of the Inkscape screen to read the hint message. Here's what the hint message for the upper-right control point on the square shape looks like:

> Adjust the **vertical rounding** radius; with **Ctrl** to make the horizontal radius the same

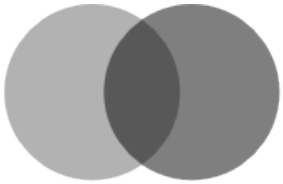
How does a shape become a path? Draw a shape, select it, then go to the “Path” menu at the top of your screen and select the “Object to Path” menu item. (You can also use Shift+Ctrl+C instead of selecting the menu item.) You can turn any shape you can draw into a path, but be careful. Once you have converted a shape to a path, you can't turn it back into a shape.

QUICK EXERCISE: Draw a circle shape using the circle tool. Make a duplicate of it (Ctrl+D), and convert that duplicate circle into a path. Use the node pointer on each – can you tell which is which?

PATH OPERATIONS

You can use one path to modify another path using path operations. Many path operations are available under the “Path” menu at the top of the screen in Inkscape. Here's a quick overview of some of the most useful ones:

If you start with the following two paths:



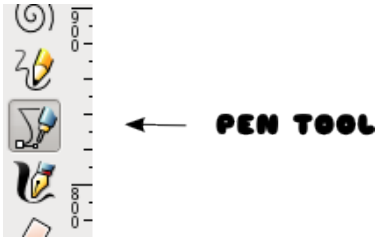
TWO CIRCLES
(The right circle is in front)

They will end up looking like the following using the path operations listed:

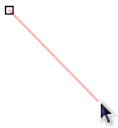
UNION	INTERSECTION	EXCLUSION	DIFFERENCE (Front path cuts the bottom path)	DIVISION (Front path cuts the bottom path)
The two paths are added together to make one big path.	Only the area where the two paths intersected remains (think of it as a donut hole.)	Only the area where the two paths did NOT intersect remains (think of it as the donut!)	The path in front is subtracted from the path in back.	The path in front is used to divide the path in back.

THE PEN TOOL

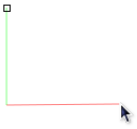
Here's one more way you can create paths – we'll go over it quickly today, and cover it in more depth next lesson. Here's what the pen tool looks like – go ahead and click on the pen tool icon to get started:



We're going to draw a simple square path using the pen tool:

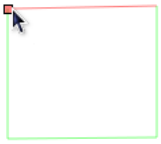


When you first click on the canvas with the pen tool, you'll see a little square. Move the mouse and you'll see a red line is following it. Let's draw the left side of the square first. Move your mouse so you have a straight vertical red line, and click the canvas again.

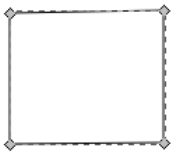


The line you just drew has turned green. Now when you move the mouse you have a new red line. Let's draw the bottom of the square now. Move the mouse to the left of the node you just created and click the canvas again.

Now the left side and the bottom of your square are green. (This means your path isn't closed yet, more on this later. Go ahead and create the right side of the square.



It's finally time to create the top of the square and finish the path. This time, when you click on the canvas, make sure to click on the empty white square in the upper left of your path. This will close your path.



You now have a square path!

You can draw as many lines in your path as you like – just make sure you close your path by making your last line connect to your first line by clicking on the empty white square at the path start.

You can also use the pen tool to create lines. These don't need to be closed. You can simply double-click when you are ready to stop drawing a line.

We'll learn more about the path tool in the next lesson!

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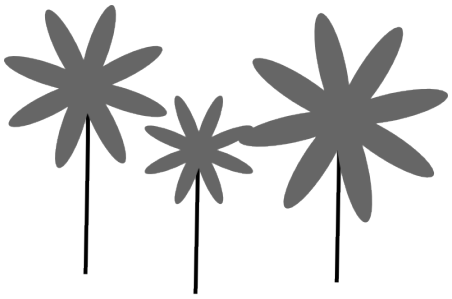
LESSON 2 EXERCISES

EXERCISES

1. Create this flowery scene using some of the techniques you learned today:



HINTS:

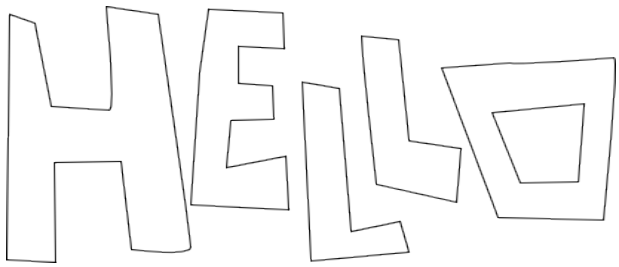
- The flowers are stretched circles that are rotated and added together using the union tool.
- The flower stems are made using the path tool.

2. Create this cloudy night sky scene using some of the techniques you learned today:

HINTS:

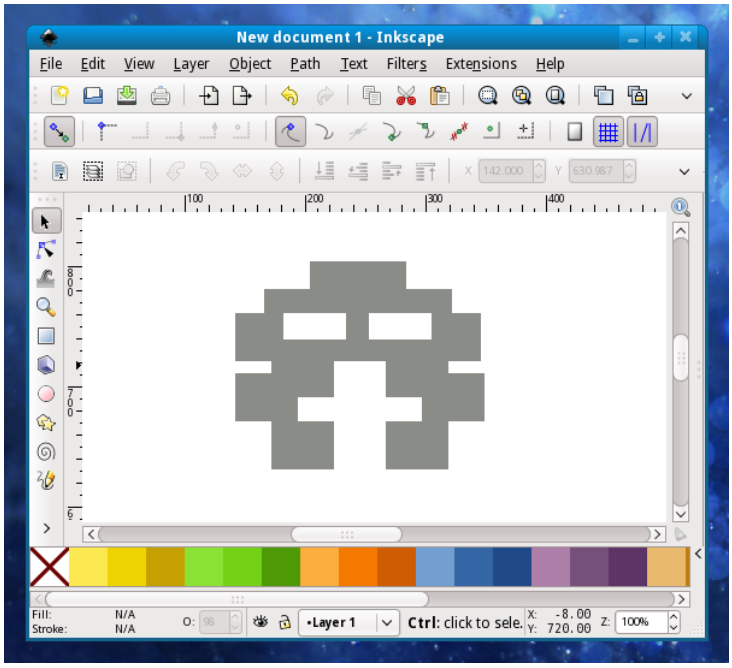
- The clouds use circle shapes and the union tool.
- The stars can be made using the star/polygon tool.
- The moon is made using two circles and the difference tool.

3. Use the pen tool to create letters. You can create your name or a short message:



BONUS EXERCISES

Create a space invader using only path arithmetic and squares:



COOL TRICK

Select a shape or path on the canvas. Hold down the spacebar and drag – you can 'paint' using any shape or path you can imagine as your brush!

APPLY THIS TO YOUR SCHOOLWORK

Many of the different types of polygons you can create with the star/polygon tool have or will be covered in your mathematics class when you learn about geometry. How many sides does a hexagon have? An octagon? How about a dodecagon? Can you draw these using Inkscape?

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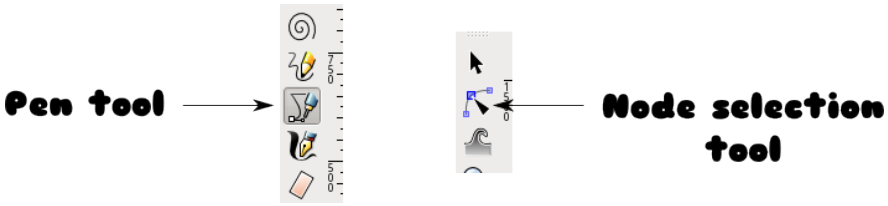
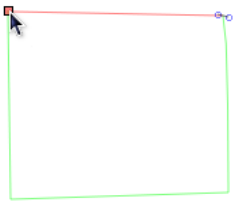
LESSON 3: MORE PATHS + TYPE

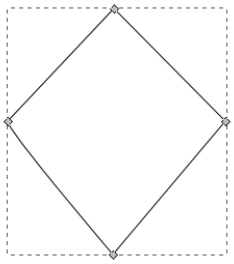
Learn more complex path techniques including curves, node manipulation, and path tweaking. Also learn about how you can use Inkscape to work with type!

QUICK REVIEW

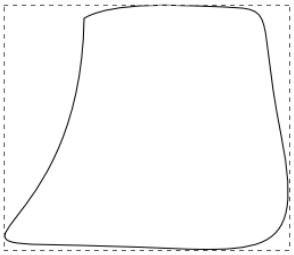


Let's do a quick review of what you learned about paths first! Draw a quick, sloppy rectangle using the pen tool, then use the node selection tool to turn it into the diamond shape shown below only by moving the nodes. Remember, you can move the nodes using click & drag with the mouse, or by selecting them and moving them with the keyboard. Do you remember how to select more than one node at a time?



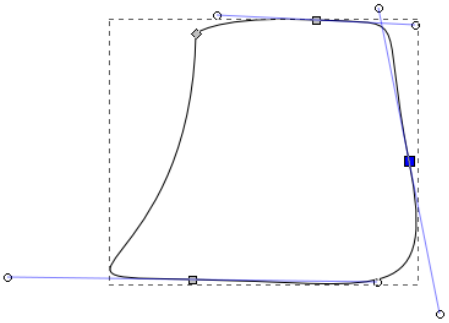


DRAWING CURVES WITH THE PEN



So the pen tool so far has been a nice tool to create paths with straight lines, but how about curves? Actually, the pen tool is great for making curved paths. Start to draw a rectangle using the pen tool again, but this time, don't let go of your mouse button right away when drawing each node. Hold down the mouse button and drag as you draw each point. You may come up with something that looks like a very strange rectangle indeed!

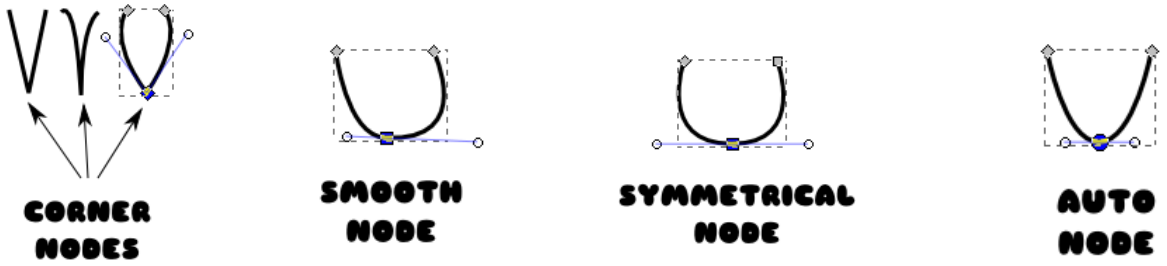
What's going on here? Well, there are different types of nodes in paths. With the pen tool, we've been working with corner nodes, which connect straight lines. There are other types of nodes, though, and they allow you to create and control curves. When a node controls a curve, it gains a special property – it gets one or two handles that allow you to adjust the curve based on the type of node you're working with and the position of the handle.



Click your strange rectangle using the node selector tool – now you can see its node handles. Click and drag the node handles - how does dragging the handles out longer or shorter affect the shape of the curve? Now try rotating the handles around the node!

TYPES OF NODES

Node handles affect curves differently depending on which type of node they are. Here are the three basic types of nodes:



Corner nodes are sometimes called cusp nodes. They are the only 'pointy' type of node – if you want a sharp point, use this type of node. Smooth notes are smooth but can be uneven as in the example above. Symmetrical nodes are also smooth, but their node handles are always exactly the same length and are always straight. Notice in the corner node example above, the node handles are not straight and are at completely different angles.

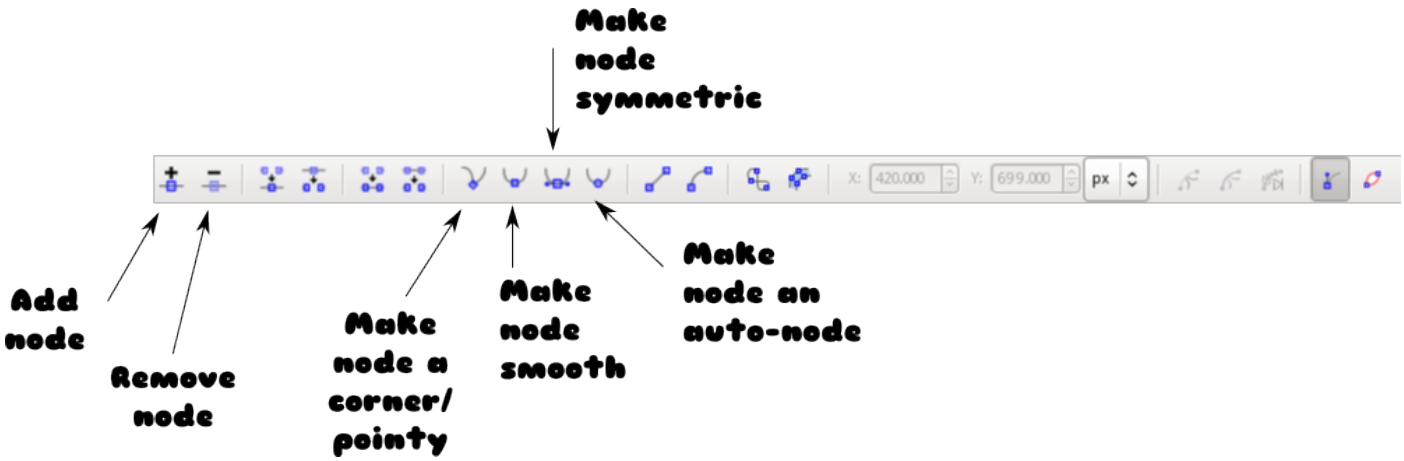
Auto-nodes are a special type of node – their handles automatically adjust to make the lines it controls as smooth as possible. If you try to adjust the handles of an auto-node, it will convert to a smooth node. You can move an auto-node as much as you like, just don't touch the handles if you want to keep it an auto-node!

You can tell quickly if a node is a corner node or one of the smooth kinds of nodes (smooth or symmetrical) by looking at the shape of the node. If the node is a blue or grey square, it's a smooth type of node. If it's a blue or grey diamond, it's a corner node. Auto-nodes are a blue or grey circle.

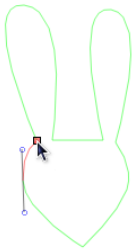
There are a few different ways to convert a node from one type to another. The quickest is to hold down the Ctrl button on your keyboard while clicking the node with the node selector. Keep clicking until the node turns into the type you want. Another way involves using the node toolbar.

THE NODE TOOLBAR

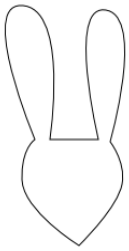
Just as the toolbar changed to accommodate the different shape tools we made last week, it also changes to accommodate working with paths and nodes if you're using the node selection tool. Take a look:



Pay particular attention to the 7th, 8th, 9th, and 10th buttons on the node toolbar. As labeled, they will enable you to convert a node between the different types we just discussed. You can convert multiple nodes at a time to a particular type by selecting them all with the node selector tool at the same time (using Shift + click or lassoing them) and then clicking the type of node you'd like to convert them to on the node toolbar.

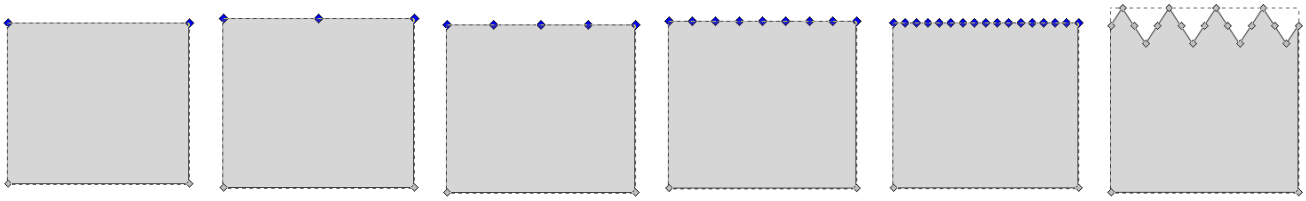


QUICK EXERCISE: Make this bunny using the pen tricks you learn above. Convert nodes between corner, smooth, symmetrical, and auto types as needed to give the bunny nice round ears, round cheeks, and a pointy chin!



Notice the 'Add node' and 'remove node' buttons labeled on the node toolbar on the last page. You can select any nodes you'd like to remove with the node selection tool, and either hit the 'Delete' key on your keyboard or click the 'Remove node' button shown above to remove them.

To add a node to a path, you need to select two nodes that are next to each other and click the 'Add node' button. The new node will appear exactly in the middle between the two nodes you selected. If you click the 'Add node' button again, two more new nodes will appear, at equal distances between the three nodes you started with. Keep clicking 'add node' and the nodes will keep getting added, equally divided along your selected area of the path!



First, select two consecutive nodes.

Click the 'add nodes' button once and you'll get one new node.

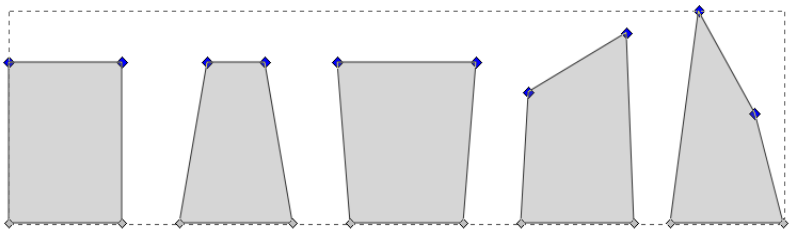
Click the 'add nodes' button twice and you'll get three new nodes!

Click the 'add nodes' button three times and things are starting to get interesting.

Four clicks of the 'add nodes' button and things are getting a little crazy!

Having equidistant nodes means you can make interesting regular shapes with a little bit of precise node movement using the keyboard arrows.

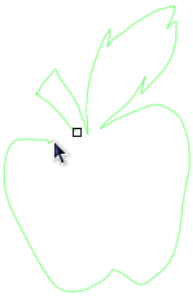
There are other cool ways you can work two selected and consecutive nodes besides adding nodes between them. If you select two consecutive nodes and hit the '<' and '>' keys, you can 'shrink' or 'grow' the space between the two nodes. If you select two consecutive nodes and hit the '[' and ']' keys, you can rotate the line between the two nodes as if you were moving a seesaw! See below for some examples:



So we've learned more about how to create paths with the pen and manipulate nodes using different techniques. Let's learn more ways to create paths.

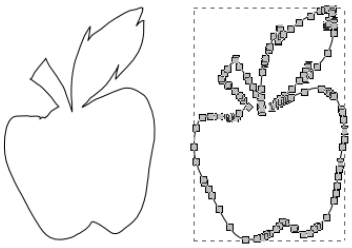
The pencil tool & simplify

The pencil tool is a pretty straightforward way to create a path, and it's a good tool to use with your tablet. You simply draw using a tablet, or hold down the mouse button and drag using the mouse. A small empty square will appear at the very beginning of where you started drawing – make sure you hit that empty square when you finish to close the path.

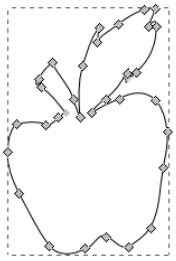


Like other tools, the pencil tool has a special toolbar that appears when you have it selected. If your hand is a little shaky when using your tablet or mouse, turn up the smoothing control and Inkscape will automatically make your lines nice and smooth.

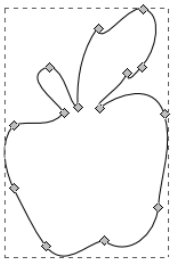
Once you've drawn a path using the pencil tool, you might notice that it has a lot of nodes. Simple shapes don't require that you have a lot of nodes – so try simplifying your path by selecting it and using Ctrl + L or the 'Simplify' menu item under the 'Path' menu. You simplify as many times as you like, but if you simplify too much it can change the shape of your path drastically:



Original path drawing using the pencil tool.

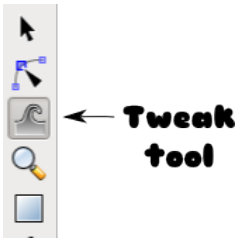


Path after one simplify.



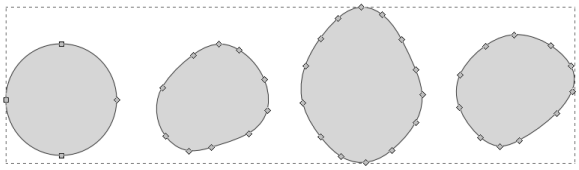
Path after seven simplifies – a little too much, perhaps?

The tweak tool

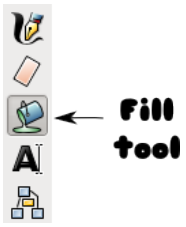


Using the tweak tool on existing paths is a really fun way to create new and interesting paths. Start out with any path at all – I've taken a circle shape below and converted it to a path – then use the tweak tool to drag, pinch, and pull the circle into any kind of shape you like! Of course, as always, you can manipulate the paths you come up with using all of the techniques we've gone over, converting smooth nodes to corner nodes, or simplifying, or adding and removing nodes!

Like many of the tools we've explored, the tweak tool has its own special toolbar that activates when you select it. We won't go into detail on all the ways you can configure the tweak tool using its toolbar, but please feel free to explore it on your own and see what cool kinds of paths you can come up with using it!



THE FILL TOOL



The fill tool fills in any area in between lines or paths or shapes on the Inkscape canvas and turns it into its own path. It's a great tool to use if you want to draw cartoons using the calligraphy pen and want to fill them in easily. See how in the dinosaur head below, the fills have been dragged out of the line artwork and are paths themselves?

Like many other tools, the fill tool has its own toolbar. Explore it on your own!

THE TYPE TOOL

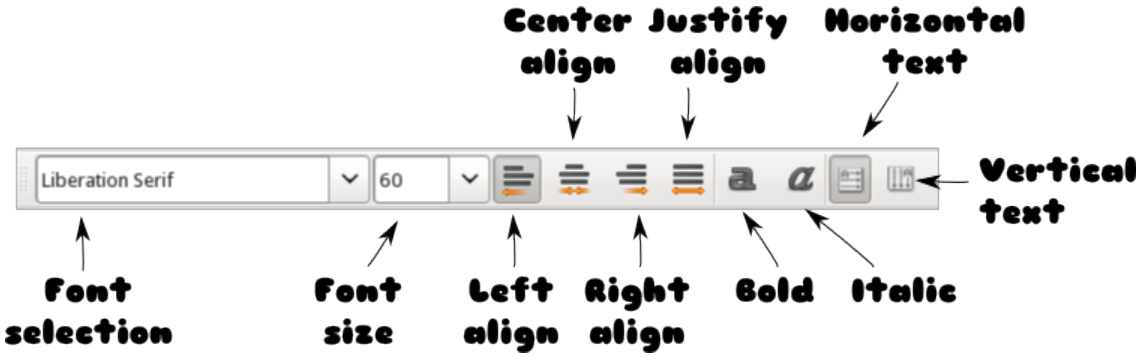
One more way to create a path that we'll talk about today is the type tool. You can use the type tool to create paths, the same way you use the shape tool to create paths – you select some type and select 'Object to Path' in the 'Path' menu. More on that later.

For now let's focus on some basic type creation. The first thing you want to do after clicking the type tool icon in the toolbar is to make sure that the 'lock' icon is locked on the type toolbar. If the lock icon is not locked, your type can get can squished or out of proportion when you try to scale it, which will make it look weird and possibly hard to read. So make sure your lock is always lock when creating type!

Now, click the type tool on the canvas and start typing away!

Change your mind about what you want to write? Double-click on the text using the type tool, and you can type new text or use backspace, delete, and the keyboard arrow keys to edit the text the same way you are used to in other programs.

Let's take a closer look at the type toolbar and see what else this tool will allow us to do:



The type toolbar will let you change the font you're using, the size of the font, the alignment of text, whether or not the font is bold or italic (or both!), and whether or not your text runs horizontally (which it will most of the time) or vertically.

The controls on the type toolbar are the controls you'll use the most when working with type. However, some additional control is available under the 'Text and Font' item in the 'Text' menu of Inkscape. Some type controls are not available from any of the menus! You need to know keyboard shortcuts to use them. We'll go over some of these next week.

For now, know that whenever you have a type object on your Inkscape canvas, you can go back and edit it anytime. Once you convert your type object to a path, you can no longer edit it using the type tool. So if you decide to name your band 'The Stony Brooks' and decide to rename it 'The Blanchards' (because that's a much cooler name), you can easily edit the text if it's a type object. If your text is a path, though, you'll have to create it from scratch using the type tool and converting it to paths.

QUICK EXERCISE: Type out a name you think you might like to use for your band and convert it to paths. Use all the techniques we've learned so far to manipulate the letters into a new design. Here's an example of the kinds of things you can do:

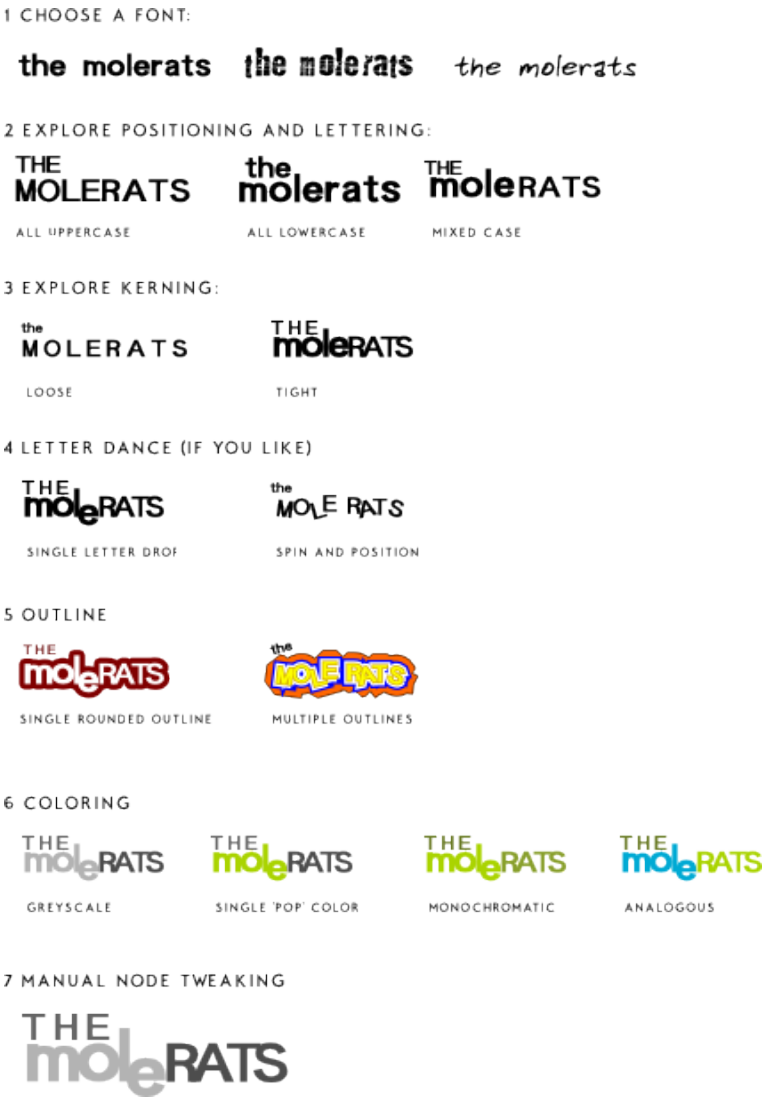
INTRODUCTION TO
INKSCAPE

LESSON 3 EXERCISES

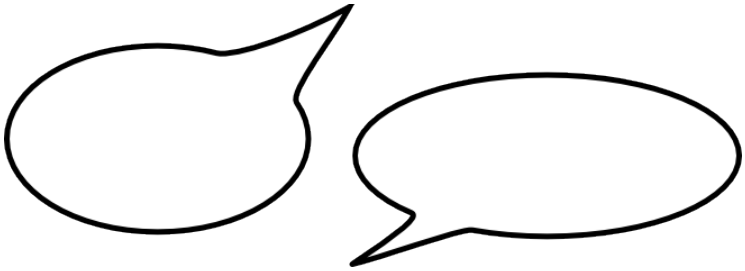
EXERCISES

1. Maybe you're already in a band, or have a favorite band, or have a cool name for one. What kind of music do they play? What instruments do they use? What are their songs about? Who's in the band? What kind of feel does the band's music have? (Loud, fast, slow, powerful, laid-back) Create a type composition that reflects your music group's musical style, personality, and message, and could serve as a logo for your T-shirt design.

   Here's some examples of potential logo type treatments for an imaginary band called 'The Mole Rats' to tickle your creativity. Feel free to draw custom lettering if you need to!



2. Using the 'Add node' tool you learned about today, make a comic-style speech bubble like these:



HINTS:

- Start with a circle shape and convert it to paths.
- Hitting the 'add node' button multiple times will come in handy here!
- You may need to convert the end point of the speech bubble's 'arrow' to a corner node to make it pointy.

BONUS EXERCISES

1. Create a type composition of your name that reflects your personality.
2. In an earlier lesson you learned about how to duplicate objects on the canvas using Ctrl+D or the 'Duplicate' item in Inkscape's 'Edit' menu. When you have many copies of the same object though, your drawing can look 'too' perfect or uniform. Create a composition with many repeated objects, then use the tweak tool to make the objects look less uniform and more random. Take a look at the field of dandelions below as an example:

Before tweaking

After tweaking

APPLY THIS TO YOUR SCHOOLWORK

Being able to work with type is a very useful skill. The next time you put together a story in your language arts class, consider creating an attractive title page using the type and path techniques you've learned today.

INTRODUCTION TO INKSCAPE

LESSON 4: MORE TYPE

Learn more about working with type in Inkscape!

QUICK REVIEW & LEARNING MORE

Let's do a quick recap of everything you've learned so far:

- Panning and zooming on the canvas
- Selecting objects, and moving them (hold down Shift to move faster, Alt to move slower)
- Copy (Ctrl+C), Paste (Ctrl+V), Duplicate (Ctrl+D), Delete (Ctrl+X or Delete key)
- Resizing, rotating, and flipping objects (H for horizontal flip, V for vertical flip)
- Grouping (Ctrl+G) and Ungrouping (Ctrl+Shift+G) selected objects
- Arranging objects in front and behind each other (PgUp to move an object to the front, PgDn to move it to the back)
- Working with shapes: Squares, Circles, Spirals, Stars, Pentagons, Triangles, Rosettes
- Converting shapes and text to paths
- Path manipulations: Union, Intersection, Exclusion, Difference, Divison
- Using the pen tool to draw straight paths and curved paths
- Working with path nodes
- Simplifying paths (Ctrl+L)
- Using the pencil tool, tweak tool, fill tool, and type tools to create paths

Wow, we've gone over a lot so far! Is there anything here you're not sure about or want to learn more about? You can always ask in class, but if you're on your own or working on Inkscape at home, there's a few ways you can learn more about this functionality and even more:

INKSCAPE MANUAL	If you select **Help** > **Inkscape Manual** in the Inkscape menus, your browser will open up to the full Inkscape software manual. It gives a good overview of all of Inkscape's features and how they work.
INKSCAPE TUTORIALS	If you select **Help > Tutorials** in the Inkscape menus, you'll find a handful of tutorials that will open right in Inkscape and go over some of the techniques we've covered in class so far – and some we haven't!

WORKING WITH TYPE: TEXT VS. PATHS

You may remember from last week that there are two main types of type in Inkscape:

- **Text Object:**
  You can change the font and the text in a text object, and do all of the cool things we're going to go over today – changing line spacing, letter spacing, and putting text on paths, for example. However, unless the person you are sending your file to has the same fonts that you do, they won't be able to see your type the same way!

- Path Object:
  If your type has been converted to paths, anyone who opens your file can see the type exactly as you designed it to look. However, you can't easily change its appearance – you can't change the font you are using and you can't change the letters in it.

Working with type that has been converted to paths is fine if you are sure about the name of your band! If you think you might change your mind, however, consider keeping your type as a text object until you are sure.

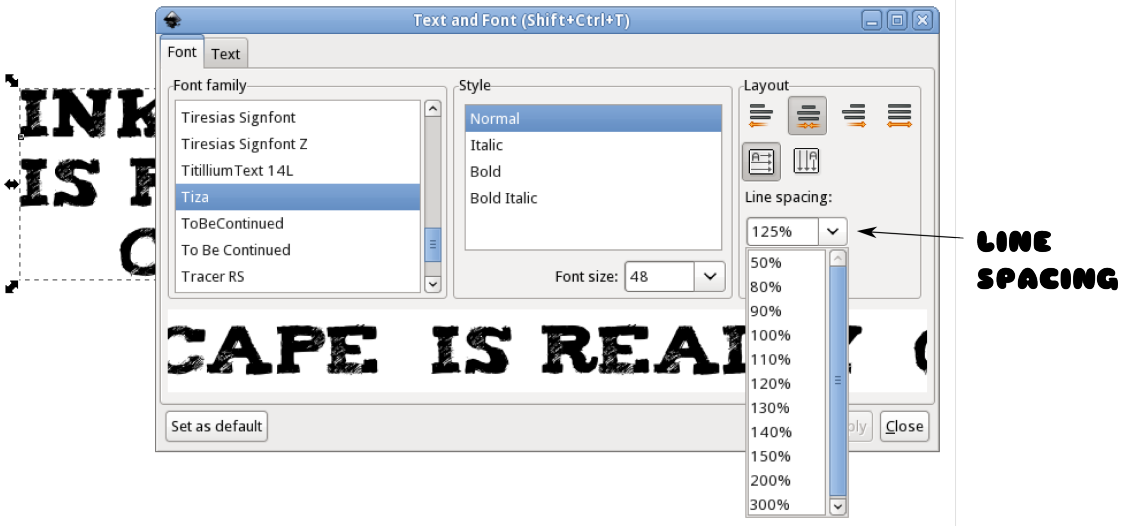
How can you tell if your type is text or path? Click on it using the text tool ( ):

Clicking and dragging on a text object using the text tool will highlight the letters and let you type over them to edit.

Clicking and dragging on a path object using the text tool will do nothing. If you click enough times, it may create a new blank text object!

LINE SPACING

One feature of text objects in Inkscape that is not available in the text toolbar is line spacing control. You can tell Inkscape to put more or less space between lines of text. To control line spacing, select the text you'd like to change using the selection arrow and go to the Text > Text and Font menu in Inkscape:



Changing the line spacing of text can change its personality a lot:

125% line spacing. Pretty normal.

80% line spacing – crowded and busy!

200% line spacing – wide and airy.

LETTER SPACING

You can control how much space is in between letters as well as in between lines in text objects. Select the text you'd like to adjust the letter spacing for by clicking and dragging over it using the text tool ( ). Then hold down the 'Alt' key on the keyboard and press the '<' key to tighten the text or '>' to loosen it!

Normal letterspacing, normal potato.

Loose letter spacing, lots of room for the potato to breathe!

Tight letter spacing, and this potato is gasping for more air!

KERNING

Kerning means controlling how individual letters are positioned with respect to each other:

- To kern horiztonally, select the letters or letters you'd like to kern by clicking and dragging over them using the text tool ( ). Then hold down the 'Alt' key on the keyboard and press the left or right arrows multiple times. You can hold down Shift + Alt + the arrow keys to kern faster. It will squish or loosen the letters from each other. Check out the example below:

Some letters are getting close while others are running away!

- To kern horiztonally, select the letters or letters you'd like to kern by clicking and dragging over them using the text tool ( ). Then hold down the 'Alt' key on the keyboard and press the up or down arrows multiple times. This will pull the letters up or down. This effect works much better if you choose only certain letters in your type, otherwise you'll move the entire word up or down which isn't very exciting!

“A” is up, “O” is down!

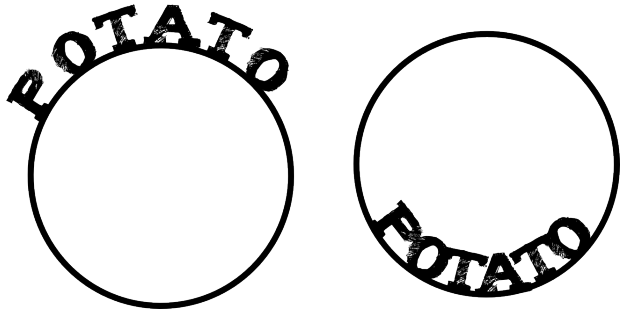
- You can also rotate individual letters! Select the letters or letters you'd like to kern by clicking and dragging over them using the text tool ( ). Then hold down the 'Alt' key on the keyboard and press the '[' or ']' keys.

Dancing potato?

- Of course you can combine all of these effects at the same time!

PUTTING TYPE ON PATHS

One last thing you'll want to know about text objects in Inkscape: you can align them to paths! This will let you align your text to circles, curves, or any types of shapes you can dream up!



To accomplish this, first create a path (if you use a shape object, convert it to paths.) Then create some text. Select both the text and path you'd like to use (Hold down shift and use the select arrow, or lasso both the text and path), then select the Text > Put on Path menu item.

If you put “Potato” on a circle as on the left above, it will run along the outside of the circle. If you would like the “Potato” to run along the inside of the circle, select the circle and select Path > Reverse **before** you put the text on the path.

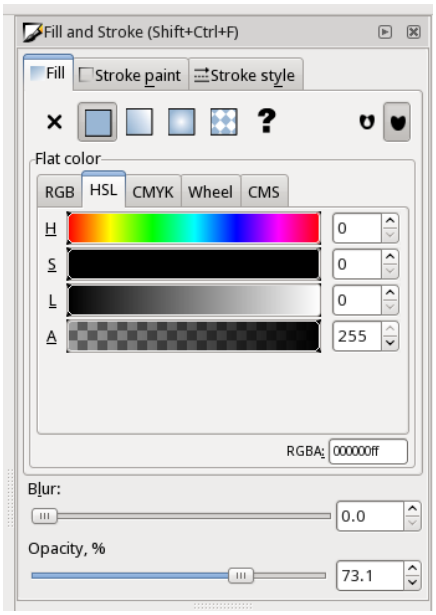
INTRODUCTION TO
INKSCAPE

LESSON 5: GRADIENTS & PATTERNS

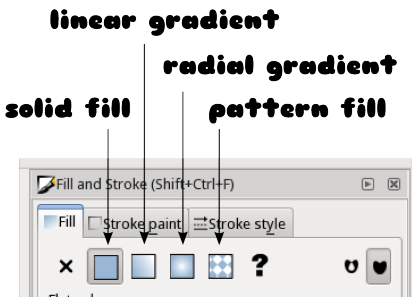
Find out how to make linear and radial gradients and use patterns to fill in your paths!

USING THE GRADIENT TOOL

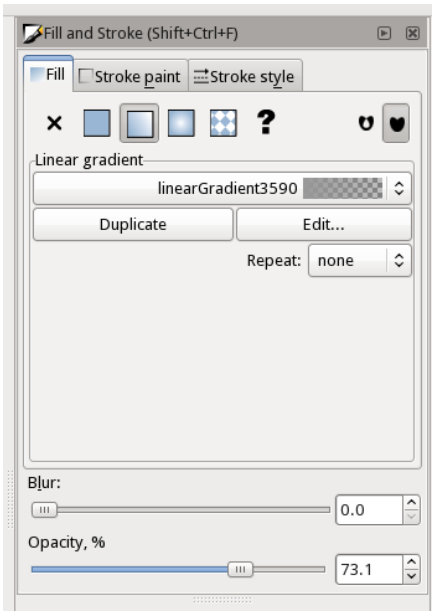
First, draw a shape or path on the canvas – let's draw a circle using the circle tool. Open up the 'Fill and Stroke' dialog by selecting the Objects > Fill and Stroke menu at the top of the screen or by hitting Ctrl + Shift + F. The 'Fill and Stroke' dialog will appear in a dock towards the right of your Inkscape window. With your circle selected, make sure you are on the 'Fill' tab of the dialog, then click on the 'linear gradient' button in the dialog.



Fill and Stroke dialog with a solid fill selected.

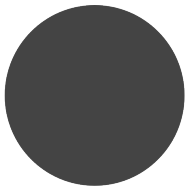


Fill type selector – the second from the left is for the linear gradient fill.

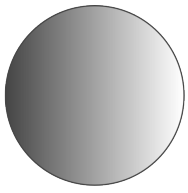


Fill and stroke dialog with linear gradient fill selected.

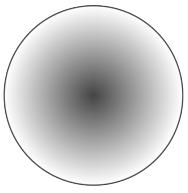
After clicking on the 'linear gradient' button, you should see your circle filled with a linear gradient. Go ahead and click on the 'radial gradient' button – you should now see your circle filled with a radial gradient. Finally, click on the 'pattern fill' button – and your circle should be filled with a pattern (usually stripes by default):



BEFORE GRADIENT



LINEAR GRADIENT

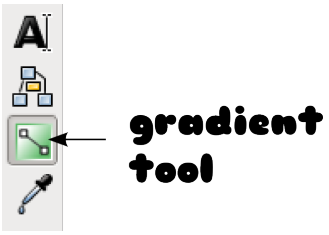


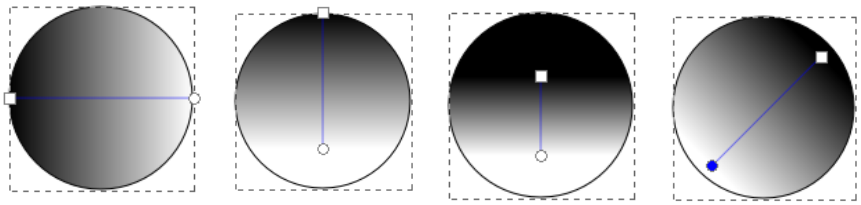
LINEAR GRADIENT

PATTERN FILL

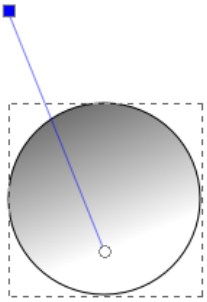
FINE-TUNING GRADIENT POSITION

Go ahead and click back on the 'linear gradient' button. We're going to work with a linear gradient on your circle for a while. First, select the 'gradient' tool from the left toolbar, then click on your circle. You'll see a bar representing the gradient. Click on that bar and drag it around – you can change how the gradient is aligned to the shape by dragging the points on the bar. You can hold down the 'Ctrl' key while dragging the bar to snap it to various angles:

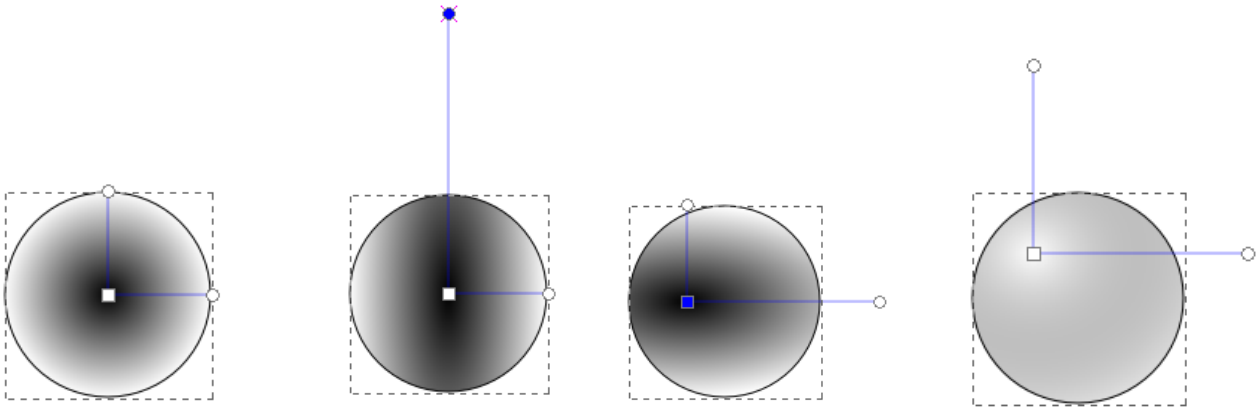




You can even drag the different ends of the bar so that they are outside of the shape:



You can similarly control the position, angle, and length of radial gradients. With your circle shape selected, go ahead and click on the 'radial gradient' button in the Fill & Stroke dialog, then click on the circle using the gradient tool. You'll see two handles rather than a single bar – and they control the gradient very similarly to the linear gradient bar. You can click on and drag the center point between the bars to change where the center of the gradient starts:



This is what a linear gradient looks like by default – a center node and two handle end nodes aligned to the edge of the shape.

The center node is in the center of the shape still, but the vertical handle has been dragged out to be longer.

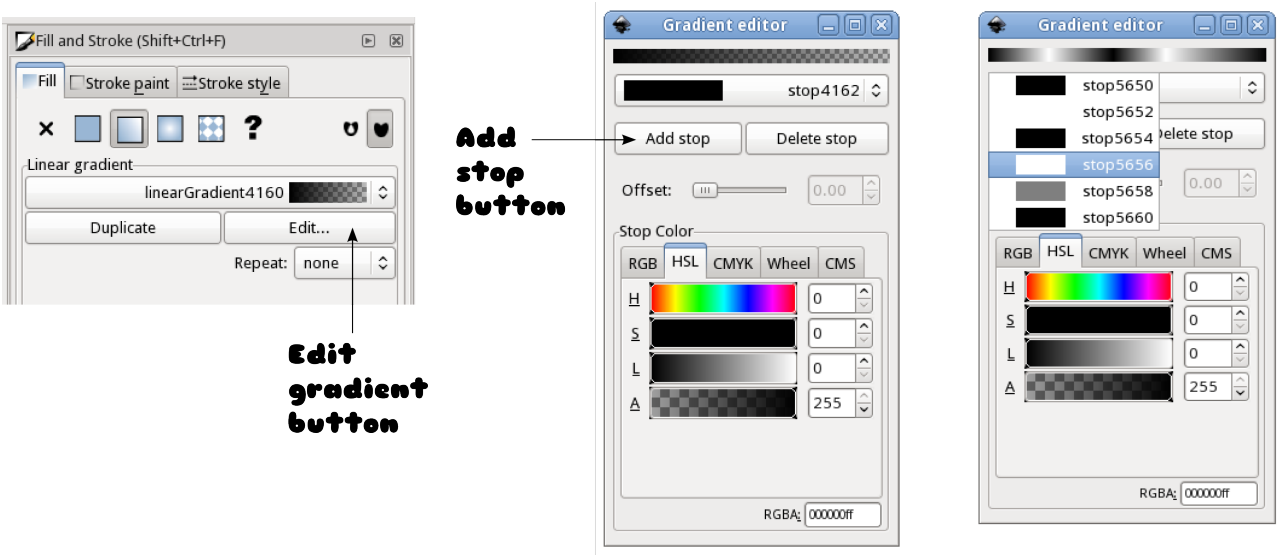
The center node has been dragged to the left of the center, and the horizontal handle has been dragged out.

The center node is now white, and it has been dragged to the upper right corner giving the circle a 3D look.

Adding more points to a gradient

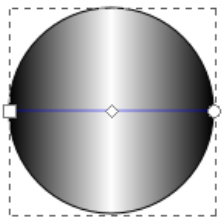
Go ahead and click back on the 'linear gradient' button. Click on your circle to make sure it's selected, then look carefully at the 'Fill and Stroke' dialog on the right. The dialog gives the gradient a name (in the screenshot below it's called 'linearGradient4160' but it probably has a different name on your computer.) Beneath and to the right of the gradient name, you'll see an 'Edit' button. Click on that button to open up the gradient editor dialog.

To add additional points, also called 'stops,' to your gradient, click the 'Add stop' button in the Gradient editor. Each stop will have a color associated with it. You can change the colors of each of the stops by selecting them in the stop dropdown and picking a color using the palette controls below.

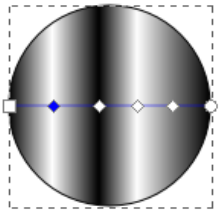


You can make rainbow gradients with multi-color stops! You can also make gradients that simulate the shininess of metal by mixing very dark, very light, and-medium shades of a color. By the way, you can also assign colors to the different stops of your gradient by clicking on a stop with the gradient tool, then selecting the color you'd like to assign it. This can be simpler and faster than working with the gradient editor dialog.

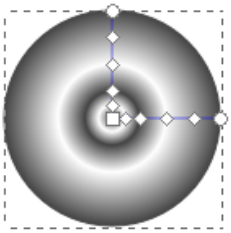
Of course, you can add multiple stops to radial gradients as well! You can also re-position the spaces between different stops along a gradient by clicking the stops with the gradient tool and dragging them around.



Here's a three-stop gradient. It looks a little metallic. The left-most and right-most stops are black, and the center stop is white.



Here's a six-stop gradient! The stop colors alternate between black and white, and there is also a grey stop thrown in there as well. It also has a metallic shine to it.



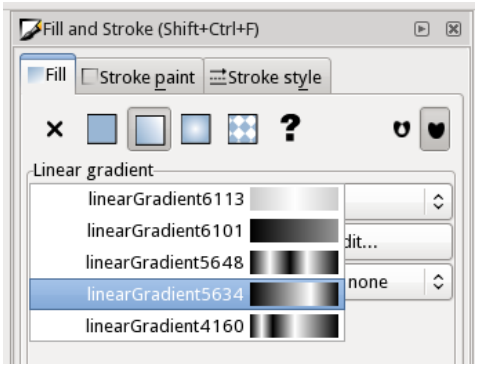
This is a six-stop radial gradient – it has an interesting 3D-beveled look to it.

INKSCAPE QUIRK: Sometimes when you select an object on the canvas that has a gradient, the Fill and Stroke dialog will go into solid fill mode, rather than show the name of your gradient. If this happens, simply click on the linear gradient or radial gradient (whichever the object you're working with has) button in the Fill and Stroke dialog to see the gradient information for the object.

SELECTING DIFFERENT GRADIENTS

Every time you set an object to have a gradient fill, Inkscape will automatically give that gradient a name and save it for you when you save your file. Unfortunately, you can't control what names Inkscape gives the gradients. Once you've created a number of gradients, though, you switch which gradient any object is filled with:

1) Select the object you'd like to fill with a gradient you've already created.
2) Open up the Fill and Stroke dialog by selection the Object > Fill and Stroke menu item in the top Inkscape menu, or by hitting Shift + Ctrl + F.
3) If the Fill and Stroke dialog is not already in linear gradient or radial gradient mode, click the linear or radial gradient button.
4) Click the drop down where the selected gradient is shown – you'll see a drop down menu of all the gradients available for you to choose from.

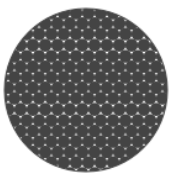


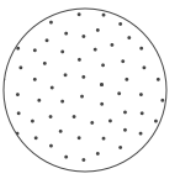
WORKING WITH PATTERNS

Filling an object with a pattern is as simple as selecting the object and clicking on the 'pattern' button in the Fill and Stroke dialog – we did this earlier and it filled our circle with stripes. Similar to the method we just went over for selecting different gradients, you can select different patterns to fill objects with by clicking on the drop down that displays the name of the current pattern. Inkscape comes with a bunch of pre-made patterns you can choose from:


STRIPES 1:1


CHECKERBOARD


PACKED CIRCLES


POLKA DOTS


SAND

By the way, you can create your own patterns! Make a drawing or create a shape that you'd like to make into a pattern, select it with the selection tool, then select the Objects > Pattern > Object to Pattern item in the main Inkscape menu. You should see your new pattern appear in the pattern selection drop down!

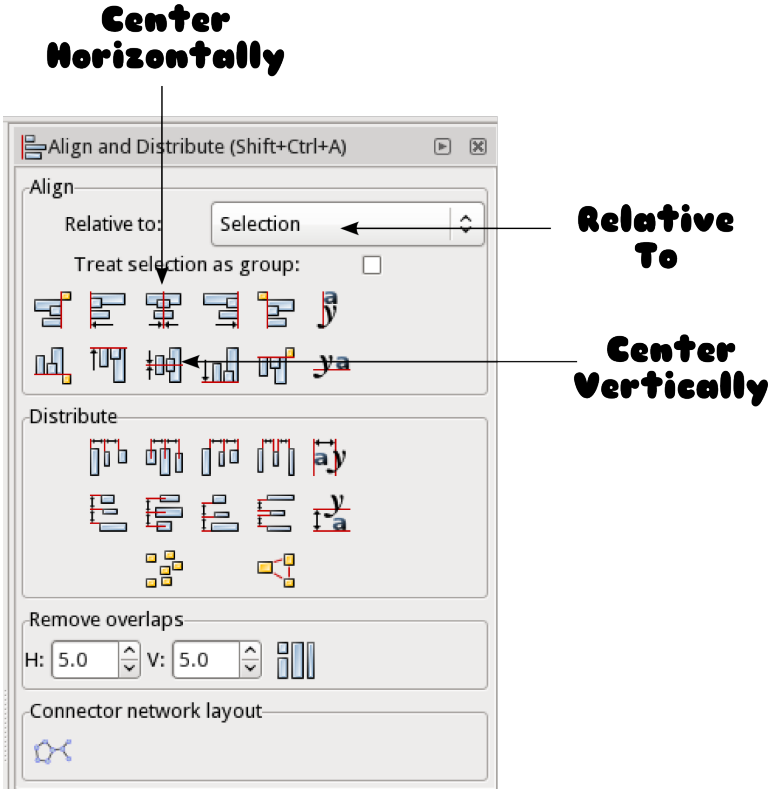
INTRODUCTION TO
INKSCAPE

LESSON 6: ALIGNING OBJECTS

Find out how to align and arrange objects to keep them tidy and neatly-arranged!

CENTERING OBJECTS

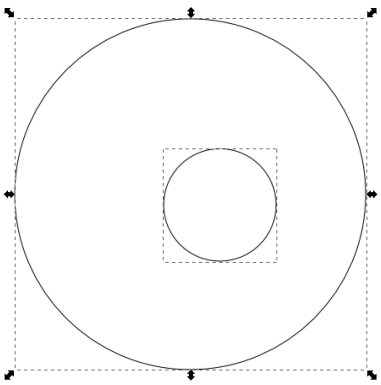
Let's say you're trying to draw a template for a CD design. The diameter of a CD is approximately 11.8 cm, and the center hole is approximately 3.8 cm. You need to draw two circles – an 11.8 cm circle, and a smaller 3.8 cm circle – in order to create a template for a disc design.



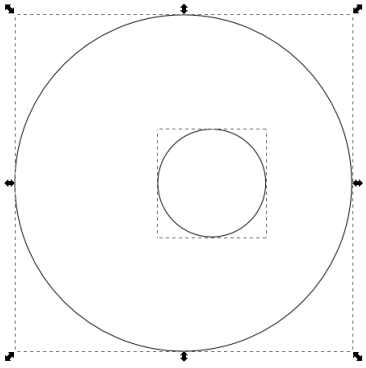
You don't want the hole in your template to be off-center though. How can you be sure it's perfectly aligned and centered, vertically and horizontally? Well, Inkscape has an alignment tool that can help!

Draw two circles, one larger and one bigger. Open up the Inkscape 'Align and Distribute' dialog by selecting the Object > Align and Distribute menu item or by hitting Shift + Ctrl + A. The dialog will dock to the right of your screen.

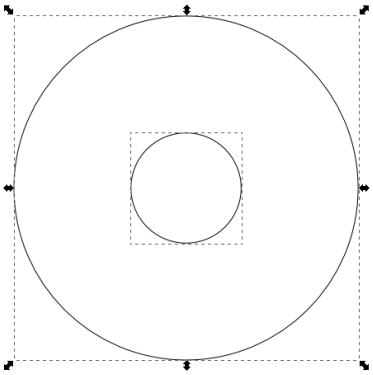
Select the two circles, then click the 'Center Vertically' button highlighted in the screenshot to the right. Next, keeping the two circles still selected, click on the 'Center Horizontally' button. The two circles should now be perfectly centered within each other.



Before



Vertically Centered



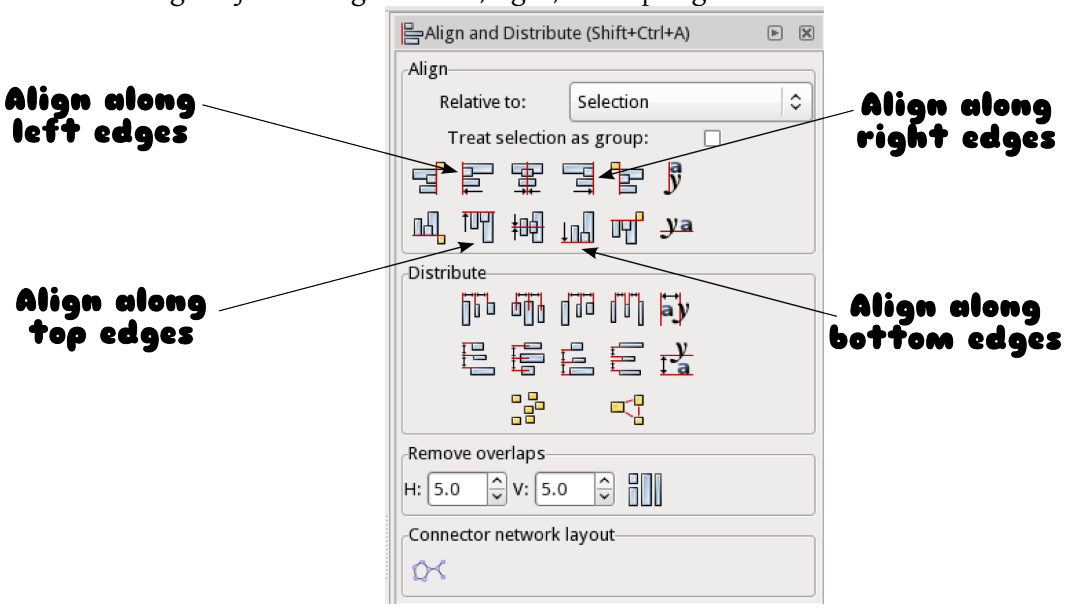
Vertically & Horizontally Centered

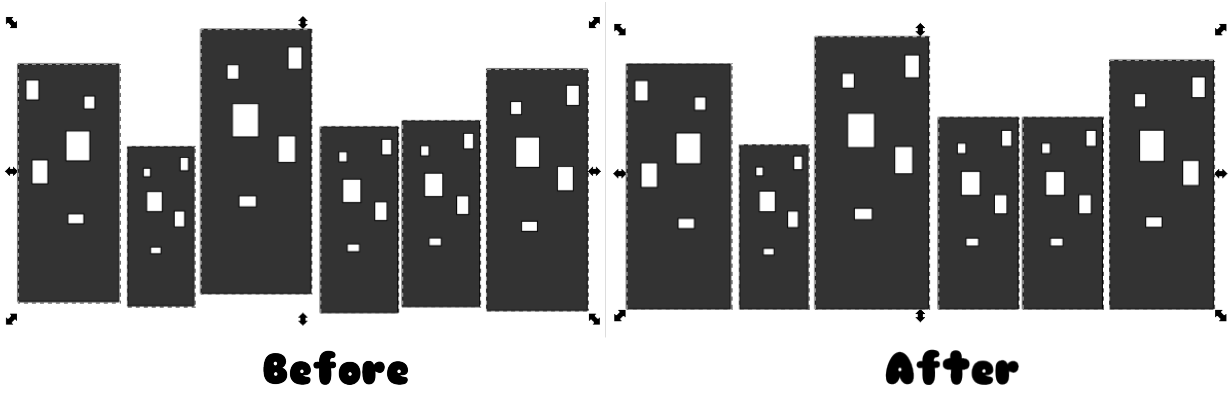
Well, now your two circles are centered with each other, but they are not centered within the canvas on your screen! What's going on? Well, take a look at the drop down box marked 'Relative to:' in the 'Align and Distribute' dialog. By default it will say, 'Relative to: Selection' which means any alignment you make will only apply within the area the objects you've selected take up. If you click on the 'Relative to:' drop down box, you'll find that you can align objects relative to other areas, such as 'Relative to: Page' which will allow you to center your CD template in the middle of your canvas!

Aligning objects along one side & distributing them evenly

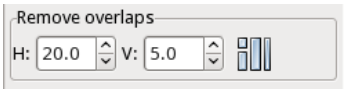
Now let's say you're trying to create a simple city scene. You've drawn a few city buildings, but you'd like to align them along their bottoms. Simply select them all, then click the 'Align bottom edges' button in the 'Align and Distribute' dialog, and they will be perfectly aligned along their bottom edges!

Similarly, you can also align objects along their left, right, and top edges.



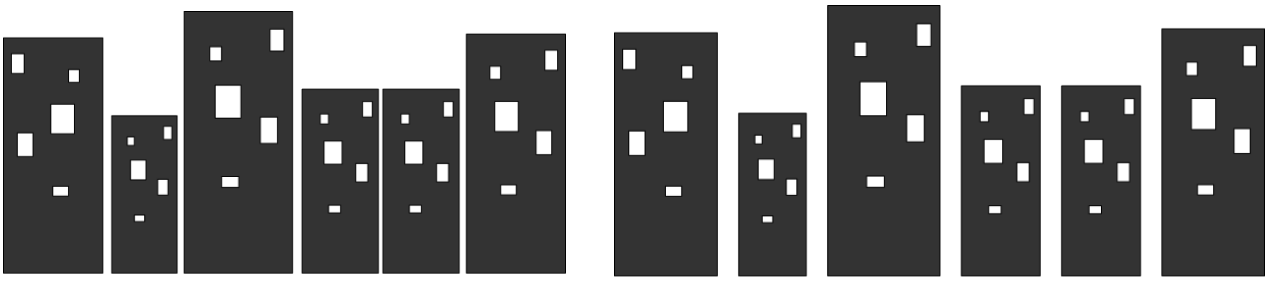


Look at the spaces between the buildings in the example pictures above. See how the spaces between the buildings are uneven? What if you'd like to have an even amount of space between each pair of buildings – let's say 20 pixels? The 'Align and Distribute' tool will let us do this too!



In the 'Remove Overlaps' section of the 'Align and Distribute' dialog, enter in '20' in the 'H' field ('H' is for horizontal, 'V' is for vertical.) We want 20 pixels of space between each building horizontally. It doesn't matter what value you have in the 'V' field right now. Later on, though, if you'd like to space out objects aligned vertically you can enter a value in there too.

Select your buildings and press the icon to the right of the 'Remove overlaps' dialog (it has blue rectangles on it.) You'll notice your buildings are now evenly spaced out, 20 pixels apart!

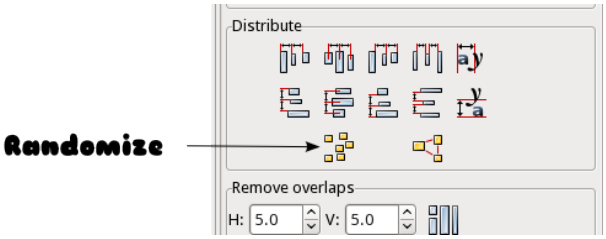


Before

After

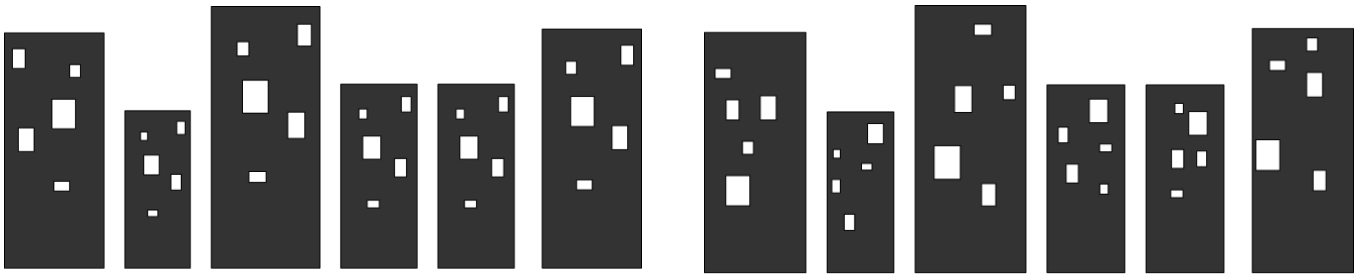
Randomizing object positions

There's a lot more to explore in the 'Align and Distribute' dialog – we're going to go over one more tip and let you explore the rest on your own.



If we continue to work on our cityscape, one thing that stands out as an area for improvement is the position of the 'lights' on the buildings. They look very regular and not at all realistic. We can randomize them using the randomize tool in the 'Align and Distribute' dialog.

Simply select the building lights of one of the buildings, and click the randomize button. You can click it as many times as you like until you're happy with the resulting position of the lights. You can also use the 'Remove overlaps' tool to adjust the spacing of the lights after randomization. Repeat this process for each of the buildings, selecting the lights and hitting the randomize button, until you've got a more random set of city lights!



Before

After

INTRODUCTION TO
INKSCAPE

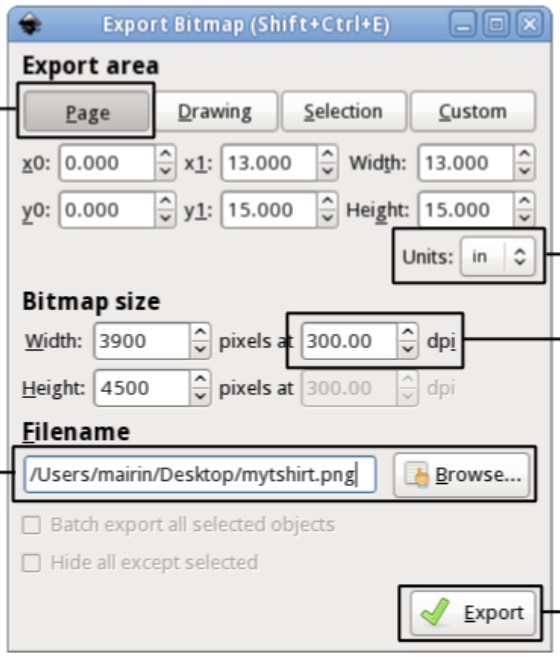
LESSON 7: EXPORTING ARTWORK

Find out how to export your artwork to bitmap format for printing and sharing on the web!

EXPORTING ARTWORK

When you're ready to export your artwork, select the File > Export Bitmap menu item (or hit Shift + Ctrl + E) and use the following settings. Note that we're using 300 dpi for your T-shirts, which means the file size is going to be quite large – the artwork is going to be higher quality too, because it means there are going to be more pixels for each area of the file. If you'd like to share your work on the web, 90 dpi is a better choice because it's a smaller file size – you don't need the same level of quality for the web.

This will export your artwork in PNG format, which is a great format for uploading to the web. (Get a parent's permission before you upload anything, though!)



#1
Make sure the 'Page' tab is selected - it will export your whole canvas.

#2
Make sure your file is in inches - and check that x1 is 13, y1 is 15.

#3
Change the dpi to 300 for high-quality! (90 is okay for web)

#4
Use the 'Browse' button to pick a folder, then type in a name for the file (should end in .png!)

#5
Finally, hit export - and check to make sure your png file is where you told Inkscape to put it!

INTRODUCTION TO
INKSCAPE

LESSON 8: CLIPART & BITMAP TRACING

Find out how you can use vector clip art in your Inkscape creations – and how to make your own from photos and other images!

ABOUT OPENCLIPART.ORG

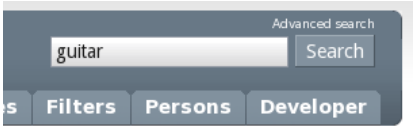
Openclipart.org is a website that provides images for free that you can download and use in your designs. Images on openclipart.org are in the public domain, meaning that no one owns copyright on them. You can use public domain artwork, you can modify it, and you can even sell it without having to pay anyone a fee.

Openclipart.org offers its images in vector format, meaning that unlike bitmap artwork (like photos), you can modify the paths and the fills in the artwork in Inkscape.

IMPORTING OPEN CLIP ART INTO INKSCAPE

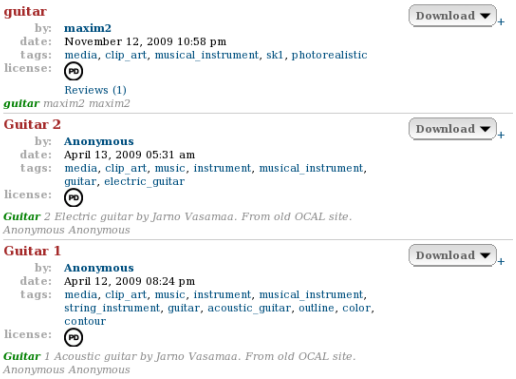
STEP 1

Visit openclipart.org in a web browser. In the upper right search box, search for the type of image you'd like to find. Here I've searched for "guitar."



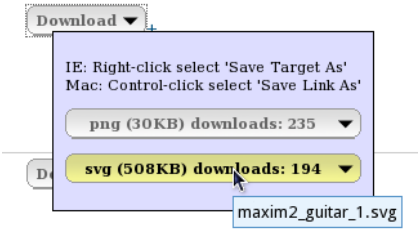
STEP 2

Openclip.art searches both users and artwork, and the search results list user name matches first. Scroll down past the user listings to see the artwork that matches your search.



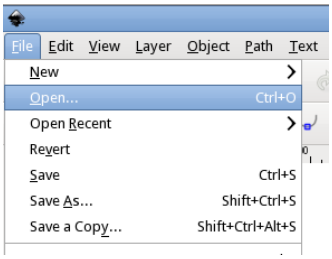
STEP 3

Click the 'download' button next to the artwork you would like to download. Follow the instructions on screen to download the SVG version of the file. This is the Inkscape-friendly vector version. Save this file to your documents folder.



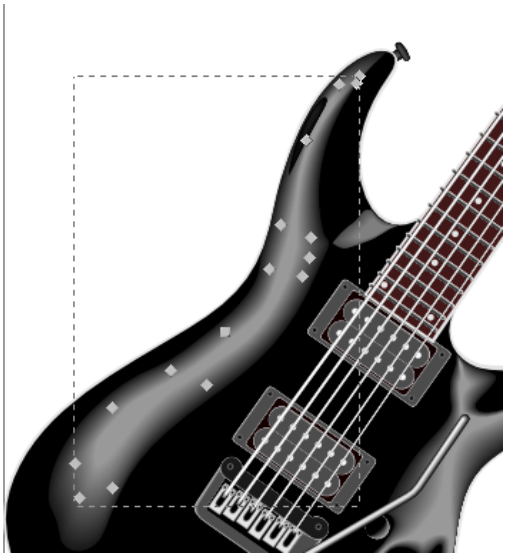
STEP 4

Open up Inkscape. Go to the File > Open menu item, and browse to your documents folder. Look for the SVG you just downloaded, and select it. It should appear on your canvas.



STEP 5

Once the artwork appears on the Inkscape canvas, you may need to hit Shift+Ctrl+G a few times to ungroup the artwork so you can break it into paths that you can modify.

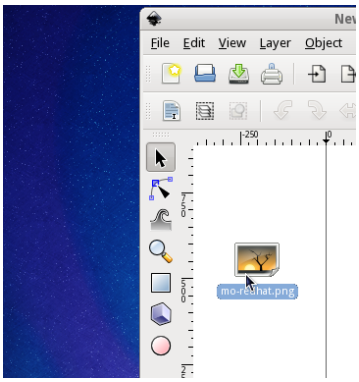


BITMAP TRACING

The bitmap tracing tool in Inkscape is a fun way to convert pixel-based artwork, including photos, into vector artwork you can manipulate using all the techniques you've learned in class! (Please be careful though, and only trace photos and other images that belong to you or that you've gotten permission to use!)

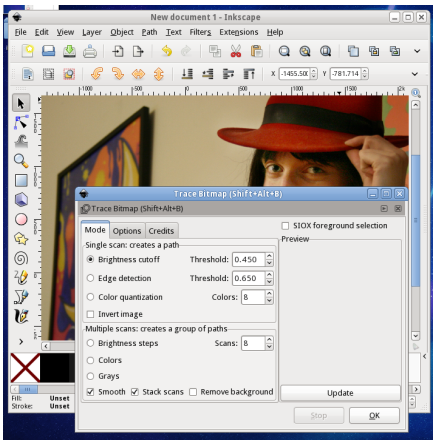
STEP 1

Find a photo or other image you would like to trace. Put it on your desktop. Then, drag the image into your Inkscape canvas from the desktop.



STEP 2

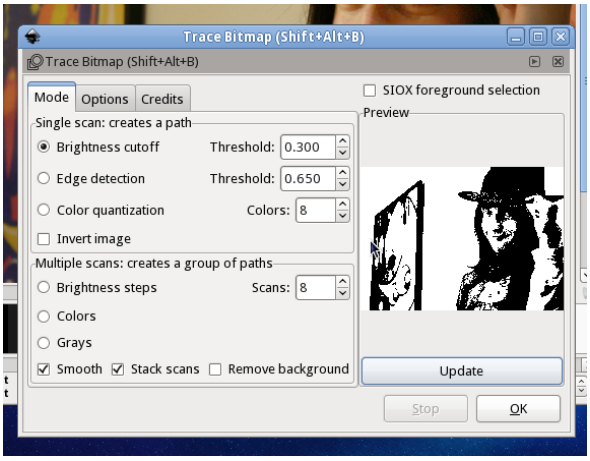
Once the image has loaded, select it by using the main pointer. While the image is still selected, select the Path > Trace Bitmap menu item.



STEP 3

You can adjust the settings in the 'Trace Bitmap' dialog, and hit 'Update' in the lower

right to get a preview of what the bitmap trace would look like. There are six main modes to the tool. Here I've selected 'Brightness cutoff' mode with a value of 0.30. When you are happy with the preview and ready to trace, hit the 'OK' button in the lower right. Close the 'Trace Bitmap' dialog.



STEP 4

You now have a bitmap trace! It will appear directly over your original image, so make sure you move the trace out of the way so you can see it.

THE END OF CLASS

This is the last Inkscape class! If you ever want to refer back to any of the sheets we've handed out, you can download them here:

http://linuxgrrl.com/learn/Introduction_To_Inkscape

Happy Inkscaping!