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!
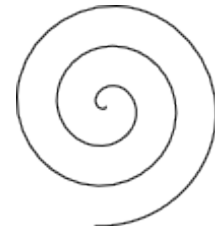
**SQUARE**           **RECTANGLE**           **CIRCLE**           **SPIRAL**

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:
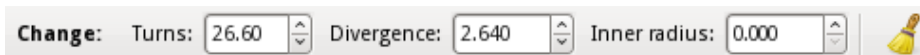
### Square toolbar:

Change:   W: 97.000   H: 97.000   Rx: 17.800   Ry: 0.000   px

### Circle toolbar:

Change:   Start: 28.000   End: 330.000

### Spiral Toolbar:

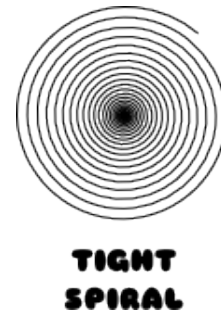Change:   Turns: 26.60   Divergence: 2.640   Inner radius: 0.000

**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 | PIE-SLICE CIRCLE | TIGHT SPIRAL |
|---|---|---|
| **Rx:** 18 | **Start:** 28<br>**End:** 330<br>**Mode:** Segment | **Turns:** 26.6<br>**Divergence:** 2.64<br>**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:

POLYGON MODE    STAR MODE    NUMBER OF CORNERS

New:  [⬠] [⭐]   Corners: [5 ⬍]
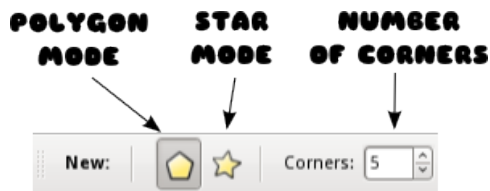
You can also control the number of corners your star or polygon shape has by typing a different number into the 'Corners' box on the star/polygon toolbar.

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

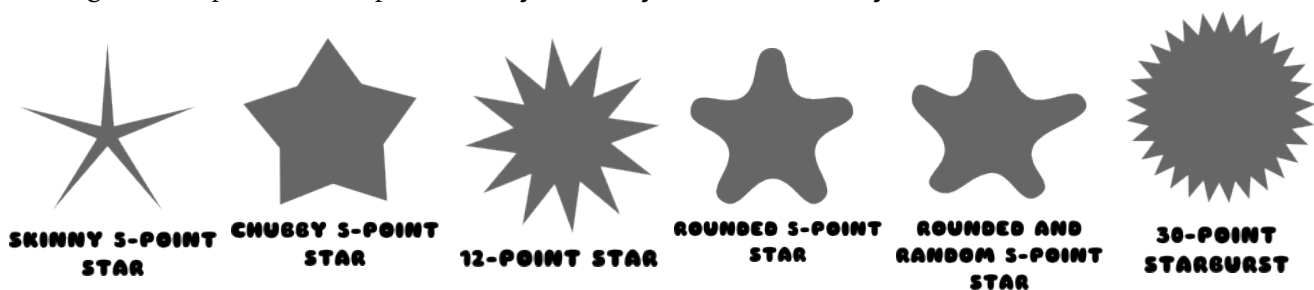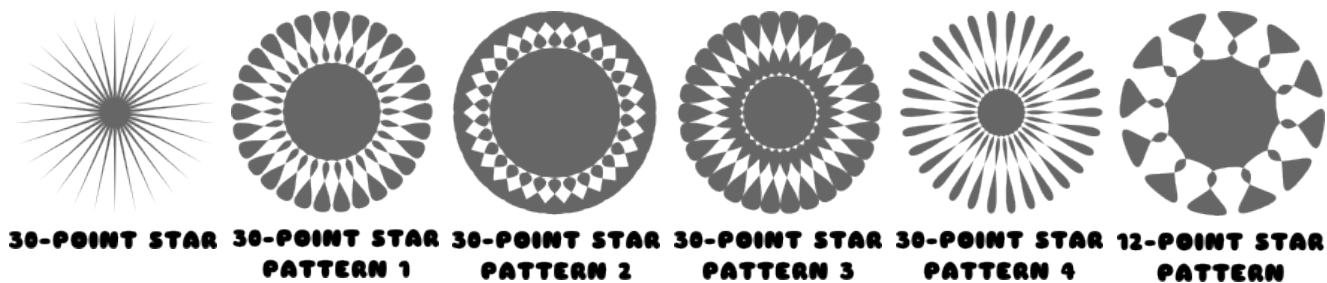| TRIANGLE | 5-POINT STAR | PENTAGON |
|---|---|---|
| **Mode:** Polygon<br>**Corners:** 3 | **Mode:** Star<br>**Corners:** 5<br>**Spoke Ratio:** 0.5 | **Mode:** Polygon<br>**Corners:** 5 |

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 | CHUBBY 5-POINT STAR | 12-POINT STAR | ROUNDED 5-POINT STAR | ROUNDED AND RANDOM 5-POINT STAR | 30-POINT STARBURST |
|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mode: | Star | Mode: | Star | Mode: | Star | Mode: | Star | Mode: | Star | Mode: | Star |
| Corners: | 5 | Corners: | 5 | Corners: | 12 | Corners: | 5 | Corners: | 5 | Corners: | 30 |
| Spoke Ratio: | 0.12 | Spoke Ratio: | 0.6 | Spoke Ratio: | 0.5 | Spoke Ratio: | 0.544 | Spoke Ratio: | 0.544 | Spoke Ratio: | 0.78 |
| | | | | | | Rounded: | 0.41 | Rounded: | 0.41 | | |
| | | | | | | | | Random: | -0.113 | | |

| 30-POINT STAR | 30-POINT STAR PATTERN 1 | 30-POINT STAR PATTERN 2 | 30-POINT STAR PATTERN 3 | 30-POINT STAR PATTERN 4 | 12-POINT STAR PATTERN |
|---|---|---|---|---|---|

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mode: | Star | Mode: | Star | Mode: | Star | Mode: | Star | Mode: | Star | Mode: | Star |
| Corners: | 30 | Corners: | 30 | Corners: | 30 | Corners: | 30 | Corners: | 30 | Corners: | 12 |
| Spoke Ratio: | 0.144 | Spoke Ratio: | 0.48 | Spoke Ratio: | 0.637 | Spoke Ratio: | 0.358 | Spoke Ratio: | 0.23 | Spoke Ratio: | 0.53 |
| | | Rounded: | 0.53 | Rounded: | 1.16 | Rounded: | 0.5 | Rounded: | 0.19 | 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:

← SELECTION POINTER
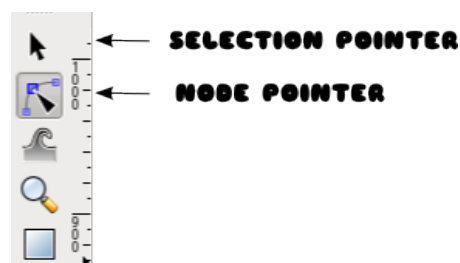
← NODE POINTER

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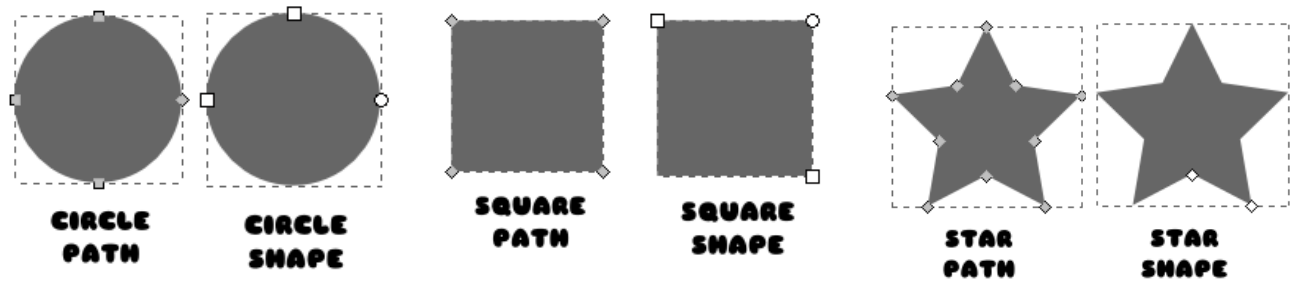


Look around the edges of each path or shape. The grey diamonds around the paths are called "nodes". You can select one or more (hold down "shift" to select more than one at a time, or lasso using the node pointer) by clicking on them using the node pointer. You can move them around using your mouse or 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 | DIVISION |
|---|---|---|---|---|
| | | | (Front path cuts the bottom path) | (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:
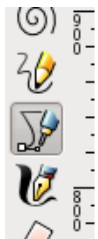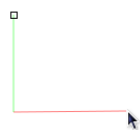
← PEN TOOL

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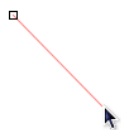
When you first click on the canvas with the pen tool, you'll see a little square. Move the mouse and you'll see a red line is following it. Let's draw the left side of the square first. Move your mouse so you have a straight vertical red line, and click the canvas again.

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.
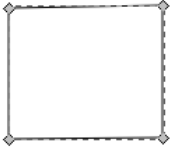
You now have a square path!

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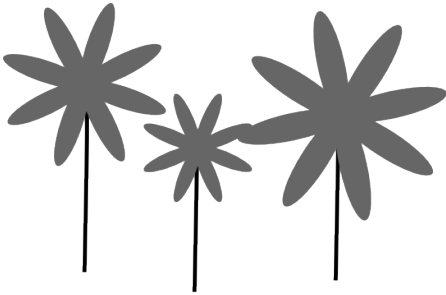
You can also use the pen tool to create lines. These don't need to be closed. You can simply double-click when you are ready to stop drawing a line.

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

## 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.
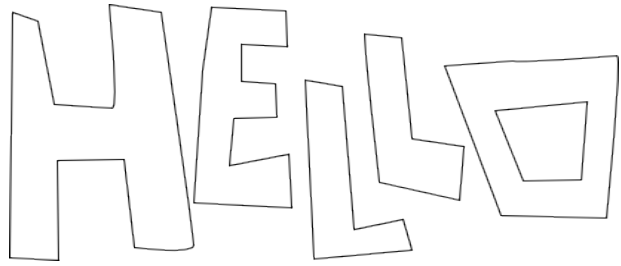- The flower stems are made using the path tool.

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: