# QGIS USEFUL TIPS 💡

The purpose of this worksheet is to give you some useful QGIS tips in relation to writing expressions, labelling, using geometry generators, and a few design elements. The idea is that if you know just a little bit more about these things you'll be able to do much more with QGIS, and make better looking maps.

EXPRESSIONS

You'll find that you can write expressions in all sorts of places within QGIS – e.g. when you're filtering a layer, when you want to create a custom label, and in lots of other places. When you see either of the symbols to the right, you'll be able to enter an expression in QGIS. An example of an expression in QGIS would be something like this: `"country_name" IN ('England','Scotland')` where we are filtering a UK countries layer (via a right-click then **Filter…**) to only show those features where England or Scotland are in the **country_name** column in our attribute table.

We can also use expressions for labelling, for example when we want to wrap longer labels over two lines – like in the example below where we are telling QGIS to use **constituency_name** as the label and to wrap it over two lines if there are 14 or more characters in it. Expressions can get a lot more complex, but if you start with the basics you'll soon be writing much fancier expressions. Then you'll be able to work much more efficiently in QGIS and make it do just about anything – change colours, change font sizes, select features, hide features, edit place names, and so much more. Look up **format_number** too – so useful!
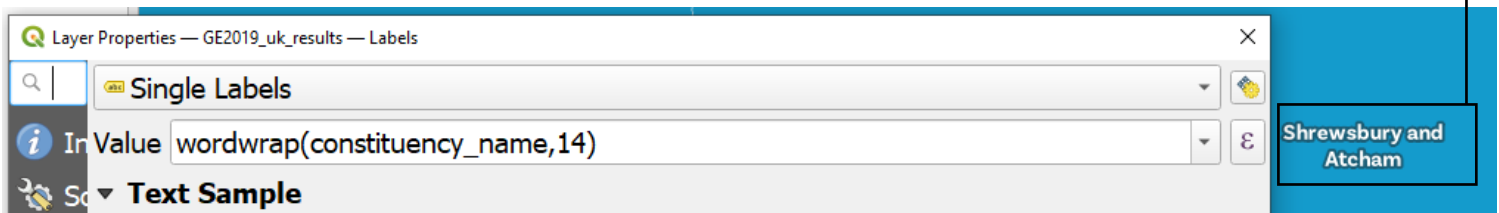

LABELLING

Labelling is part science, part art – and you can spend a LOT of time on it. First of all, we should be aware of the **Label Toolbar** in QGIS (shown to the right). In particular, pay attention to the icon with the arrow because this allows us to move labels manually, which is often really useful. Most of the time we edit labels via the **Labels** section of **Layer Properties** in QGIS, and there are an almost unlimited range of options here. For example, we could use the **upper** function to show label names in all CAPS, or the **lower** function to show labels in all lower-case text.
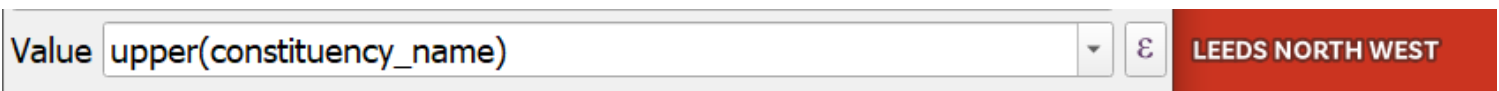

We can have labels with curved callouts, background boxes with rounded corners, and all sorts of other nice design elements. If we have an area that we want to change the name of (e.g. 'Hull' instead of 'Kingston upon Hull, City of') we could use this expression: `CASE WHEN "LAD21NM" = 'Kingston upon Hull, City of' THEN 'Hull' ELSE "LAD21NM" END` – where **"LAD21NM"** is the column with the area name. This expression can be used in the **Value** box (as above) within the **Labels** section of **Layer Properties** in QGIS. Finally, make sure you check out the **Placement** section of the Labelling options!
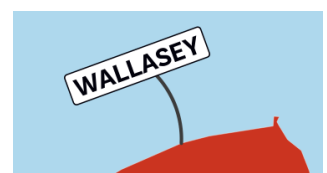
GEOMETRY GENERATOR

The geometry generator options in QGIS are fantastic but they can be a bit difficult to figure out initially. Put simply, using a geometry generator in QGIS allows you to modify the geometry of a layer – e.g. to turn a polygon into a line, smooth a polygon, create bounding boxes, centroids and much more. But here's the great thing about it: you do it *without* creating a new layer – it's all done via the **Symbology** section of **Layer Properties**. So, with a polygon layer in QGIS, we'd click **Simple Fill** (or Simple Marker or Simple Line for points/lines) and then change the **Symbol layer type** to **Geometry Generator**, as shown below.
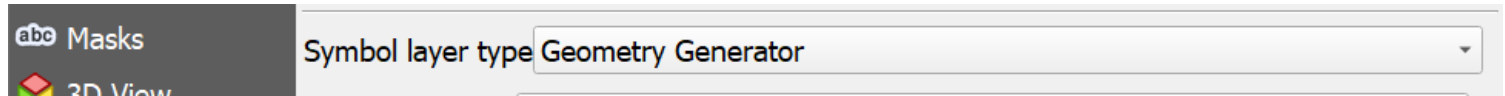
We enter expressions to make the geometry generator work. So with a US states layer, we can use **Geometry Generator** as the **Symbol layer type** and then `buffer($geometry,-15000)` to create a negative buffer around state borders like in the example below – where 15000 is the buffer distance in metres. We can write geometry generator expressions by using the **Expression dialog** in QGIS.

Try the following expression on a polygon layer and see what it does: `minimal_circle($geometry)`. Just be sure when using **Geometry Generator** that the **Geometry type** (e.g. Polygon) matches what you're trying to display, otherwise you may not see anything! This often catches people out, but it's easy to fix.
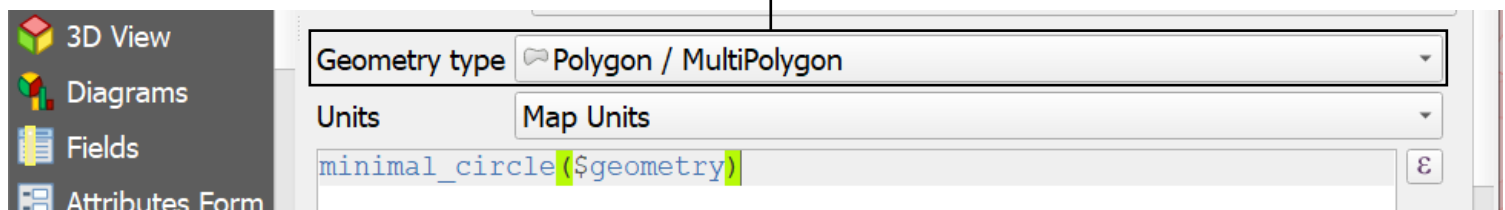
DESIGN

We can make beautiful maps in QGIS quickly and efficiently, but it takes time to get better at design. So we end this worksheet with a brief look at some design elements. First up, line width and colour. In the example below we see US congressional districts displayed in stark colours and thick outlines in the west, and simply and cleanly in the east. We'd recommend the approach taken on the right in nearly all cases.

When you have lots of lines close together, a narrower line width (e.g. 0.1) will often look better. Outline colours that are a slightly darker shade than the **Fill** colour often work well. Using a very dark shade of grey (e.g. HTML #222222, RGB **34, 34, 34**) often looks better than pure black. Having some kind of visual hierarchy for place labelling (see below) is also a good idea. Choosing 'good' map colours? Well, it's all subjective but we suggest doing an image search for e.g. 'New York Times maps' – or BBC, or FT, or similar.