

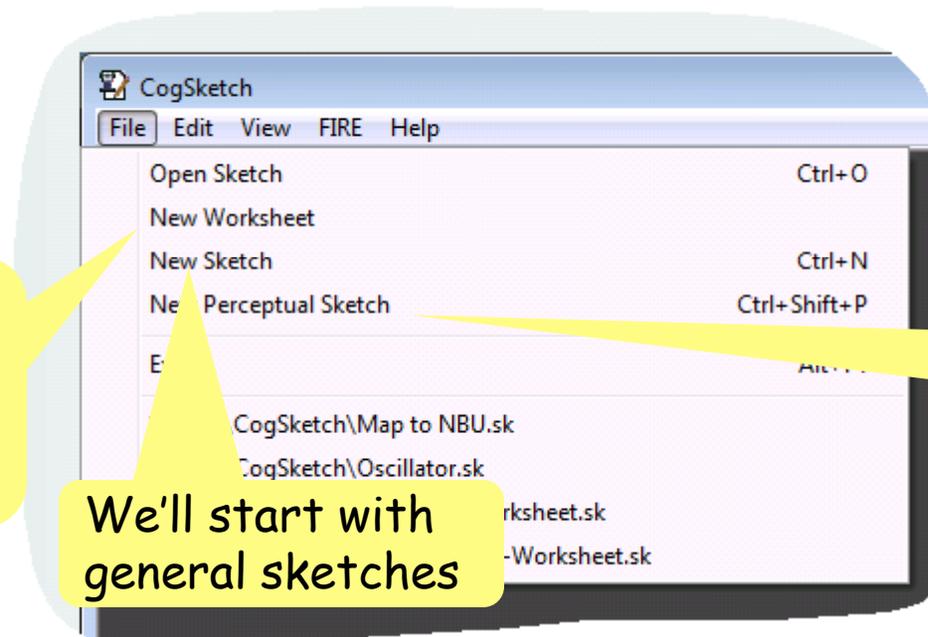
CogSketch Basic Operations

This Section

- Starting a sketch
- Drawing glyphs
 - Inking
 - Conceptual labeling
- Layers
- Subsketches & the metalayer
- Saving sketches

Creating a Sketch in CogSketch

- There are three types of sketches

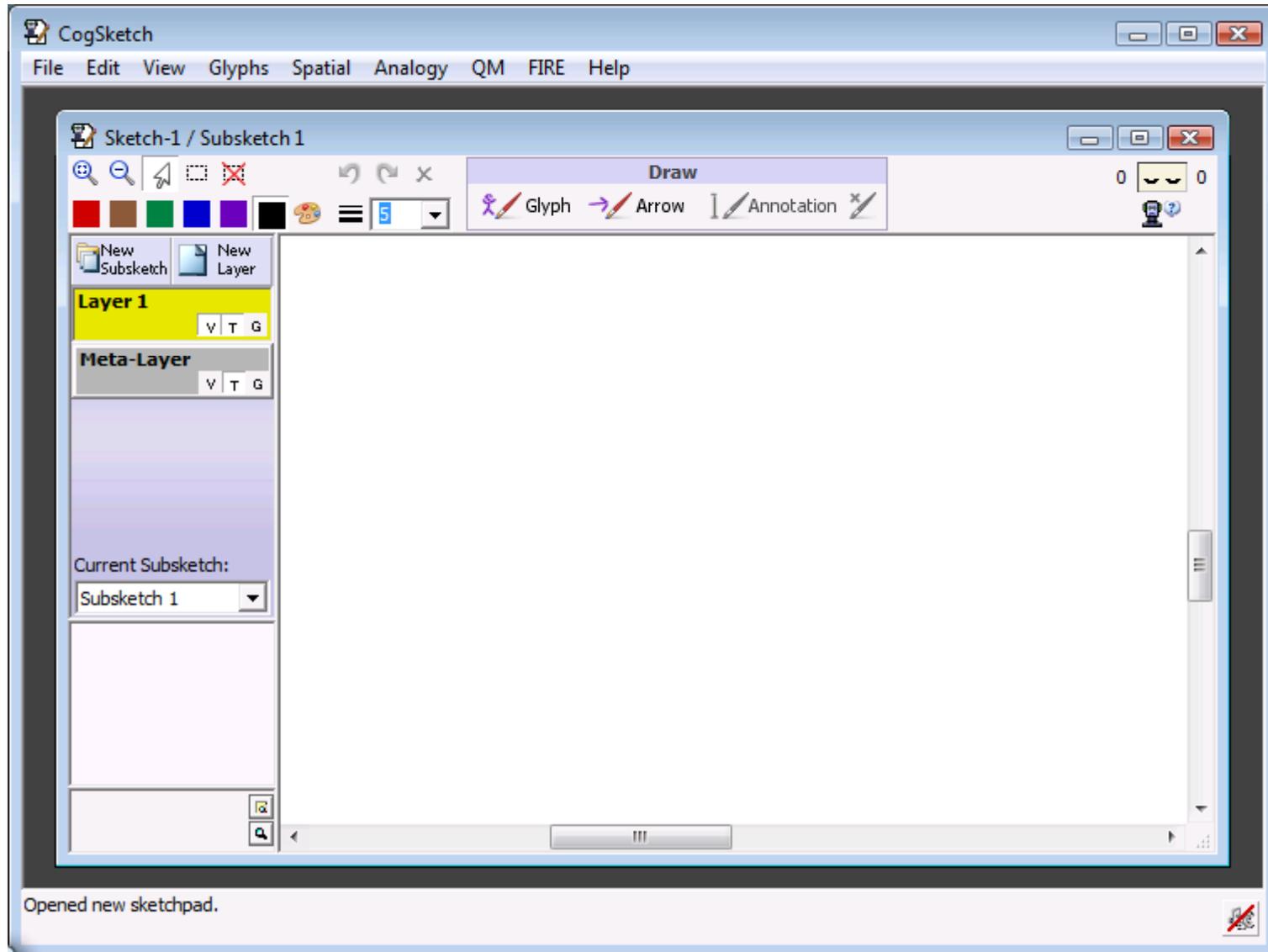


Worksheet authoring will be discussed later

We'll start with general sketches

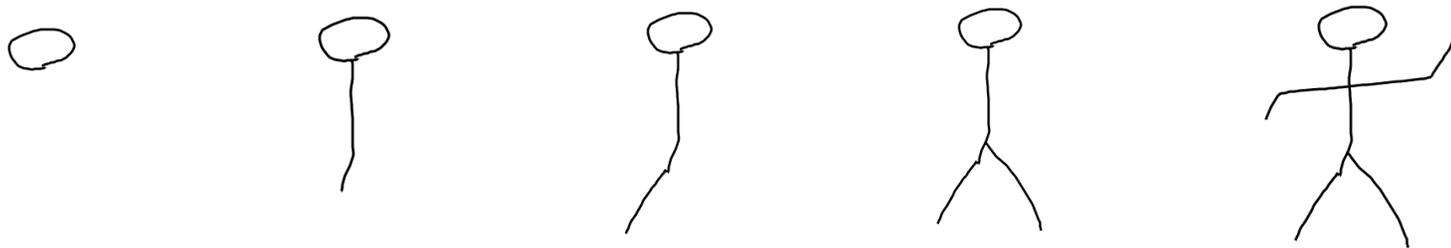
Perceptual Sketchpad will be discussed later

What you should see



Two Core Problems of Sketch Understanding

- Segmentation: How to break up ink into pieces corresponding to depicted entities?



- Interpretation: What is being depicted?

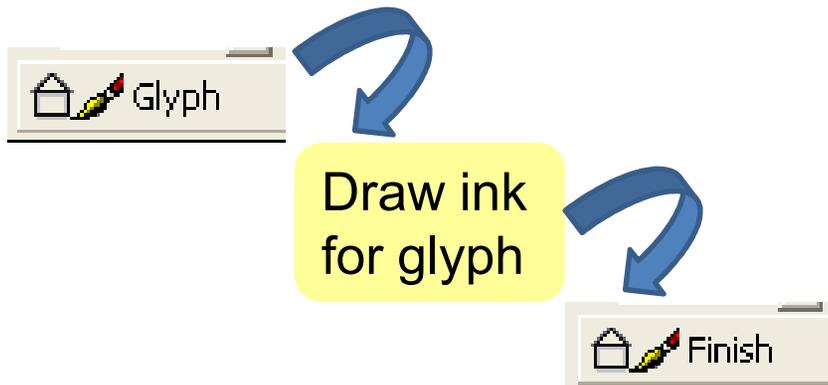


Traditional Solutions

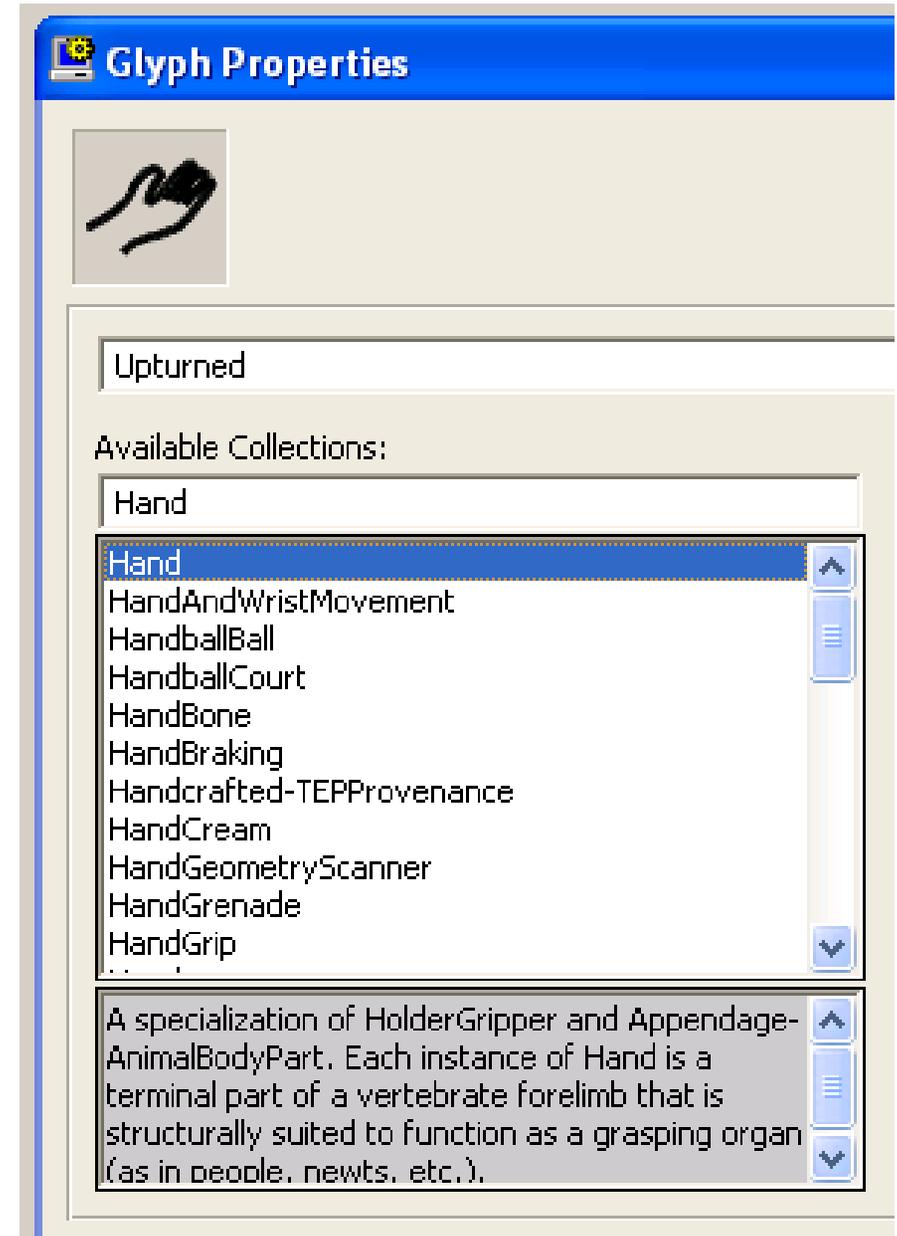
- Segmentation: Heuristics
 - Pen up, long pauses taken as evidence for segmentation
 - Overlapping speech
- Interpretation: *Which-of-N* recognition
 - Fixed vocabulary of entities (10-100)
 - Train system on each user individually
 - Train users via feedback

Open-Domain Sketch Understanding

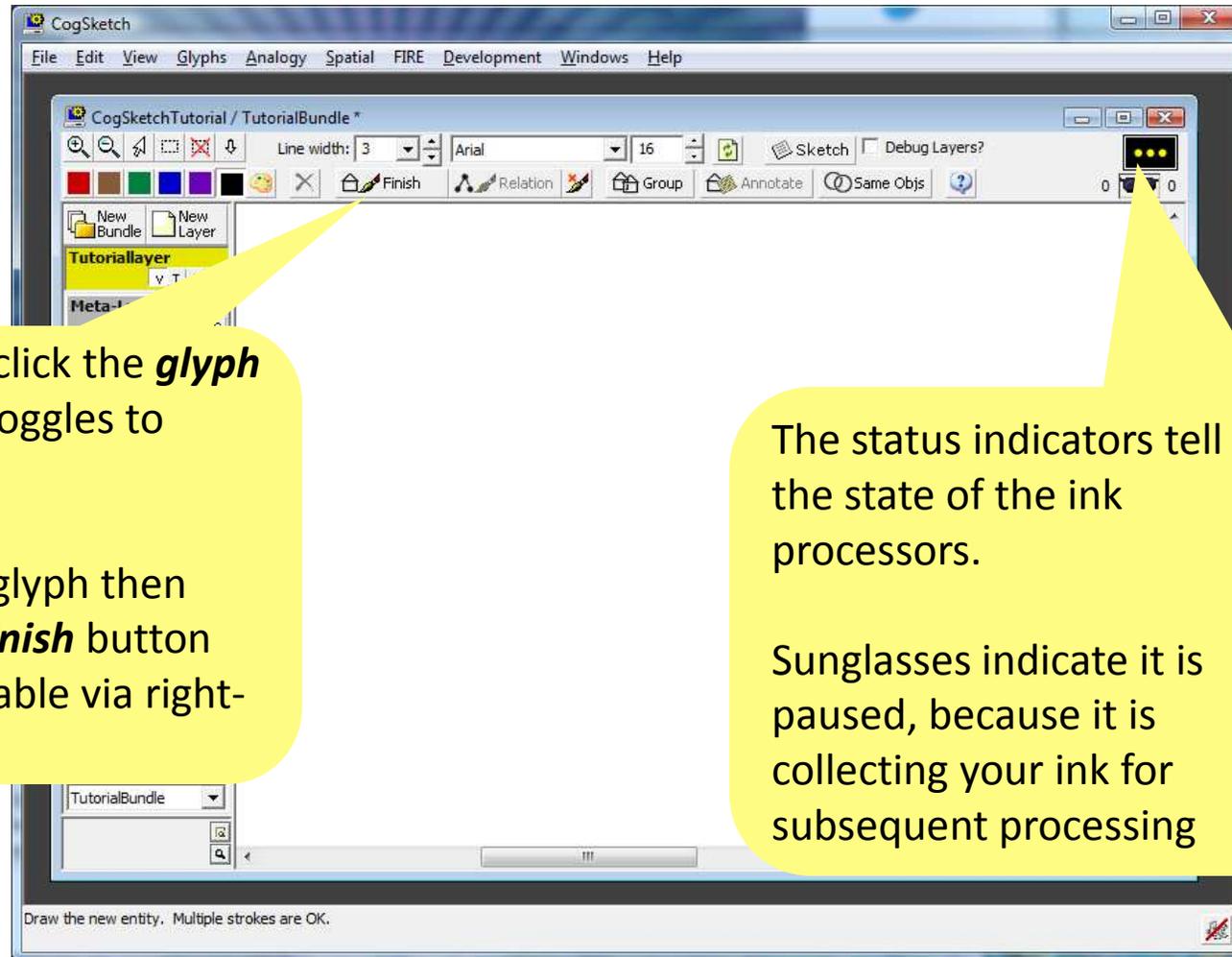
- Segmentation: User signals via a button



- Interpretation: User specifies via selection from large (58,782 as of 8/30/08) set of concepts



Creating a New Sketch - Glyphs



After you click the **glyph** button it toggles to **finish**

Draw the glyph then click the **finish** button (also available via right-click)

The status indicators tell you the state of the ink processors.

Sunglasses indicate it is paused, because it is collecting your ink for subsequent processing

Status Indicators

Status of drawing interaction understanding



Idle



Processing



Understood



Confused:
Rarely happens



Idle



Waiting. You get smoother inking if it doesn't try to process while you are drawing



Both processors running

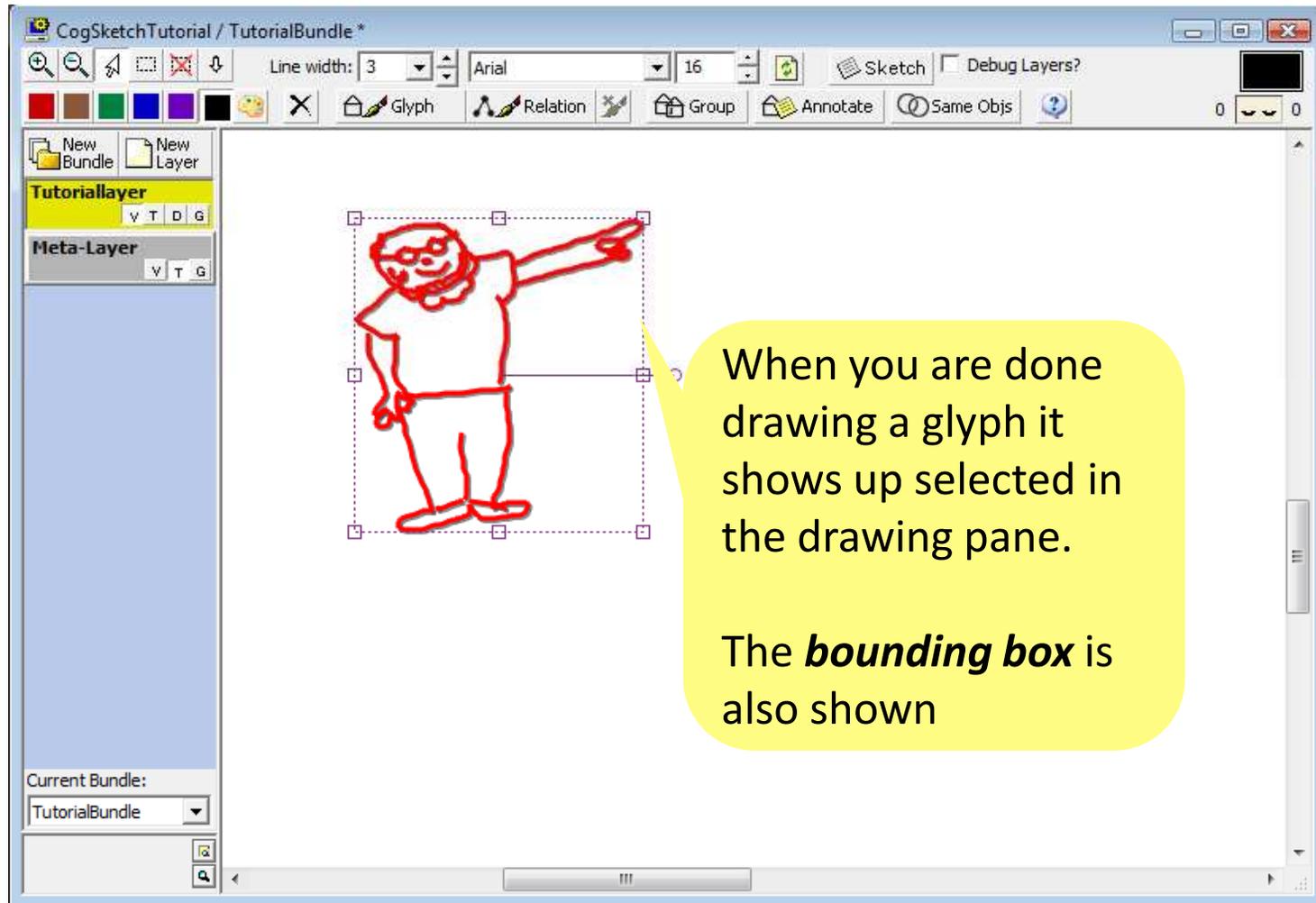


Slacking. If you aren't drawing and queues are non-empty, touch to awaken



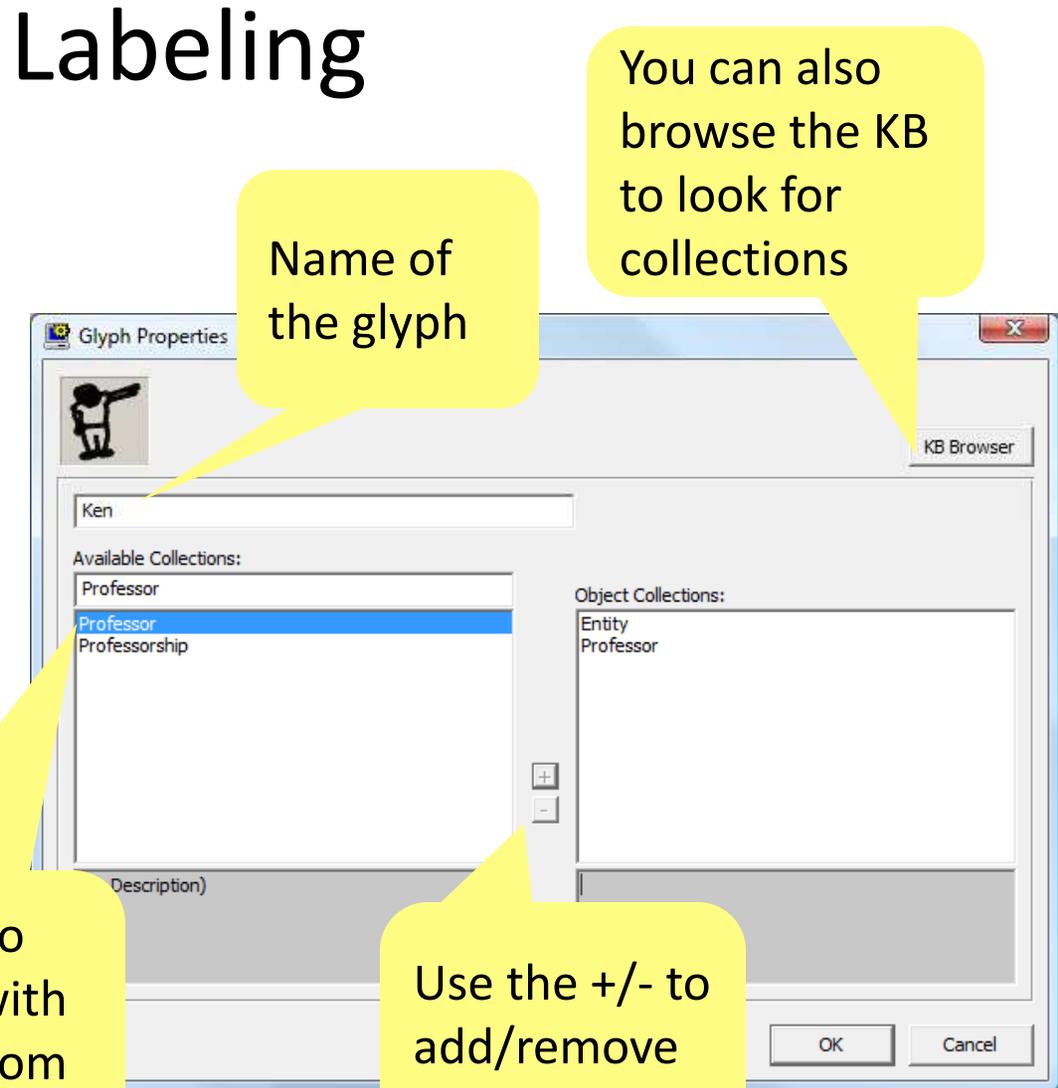
Crashed. (Very rare) Touch to restart

Creating a New Sketch - Glyphs



Creating a New Glyph – Conceptual Labeling

- The name is a string used to refer to the glyph in reasoning
- You can also conceptually label the glyph with concept(s) from the OpenCyc KB



Name of the glyph

You can also browse the KB to look for collections

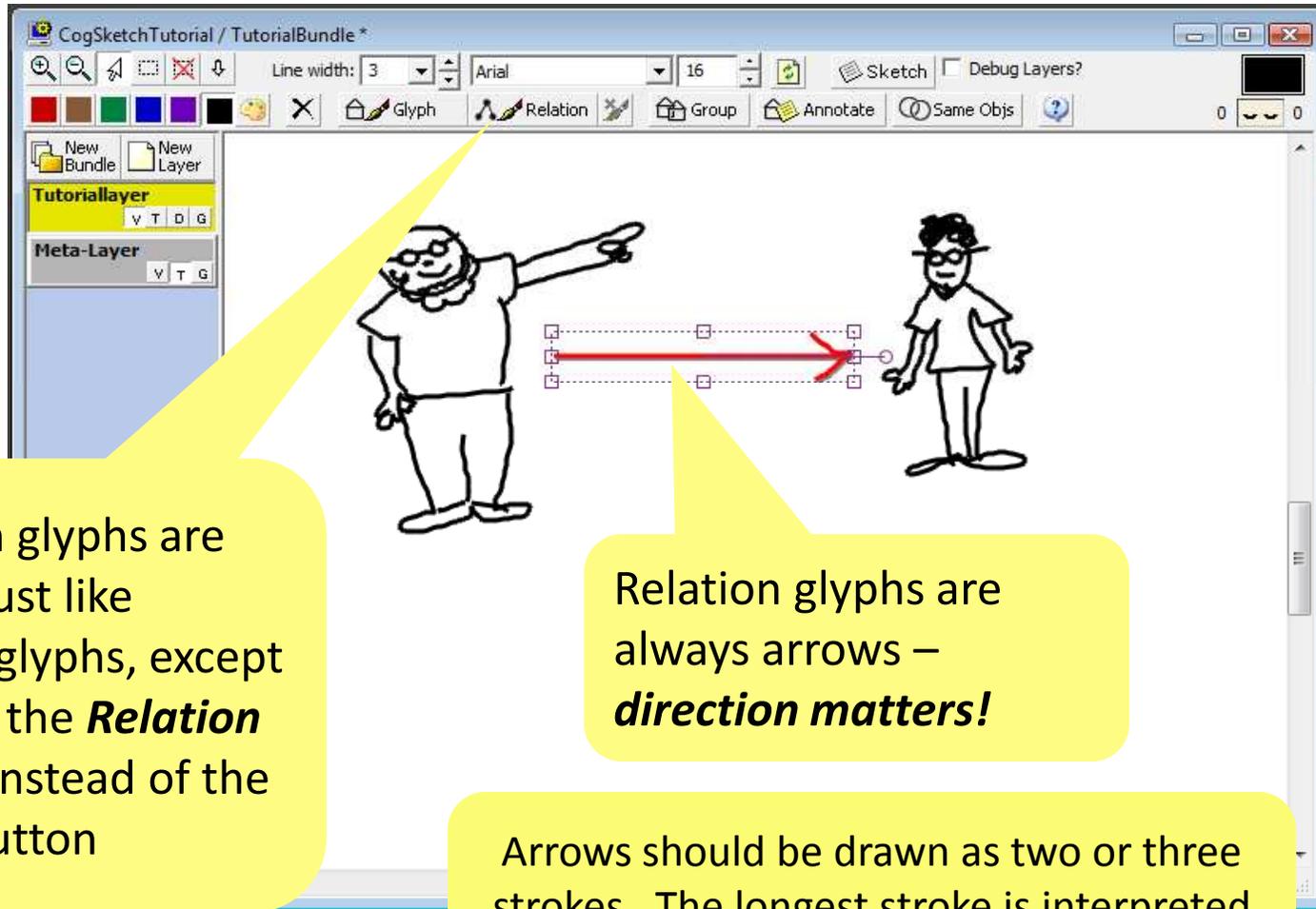
CogSketch will try to symbol-complete with collection names from the KB as you type

Use the +/- to add/remove collections

Types of Glyphs

- There are three types of glyphs that you can use in CogSketch
 - **Glyphs:** Standard glyphs, used to represent entities in a sketch
 - **Relations:** Represent binary relationships between other entities in the sketch
 - **Annotations:** Used to assign a quantitative or qualitative value to another glyph

Relation Glyphs

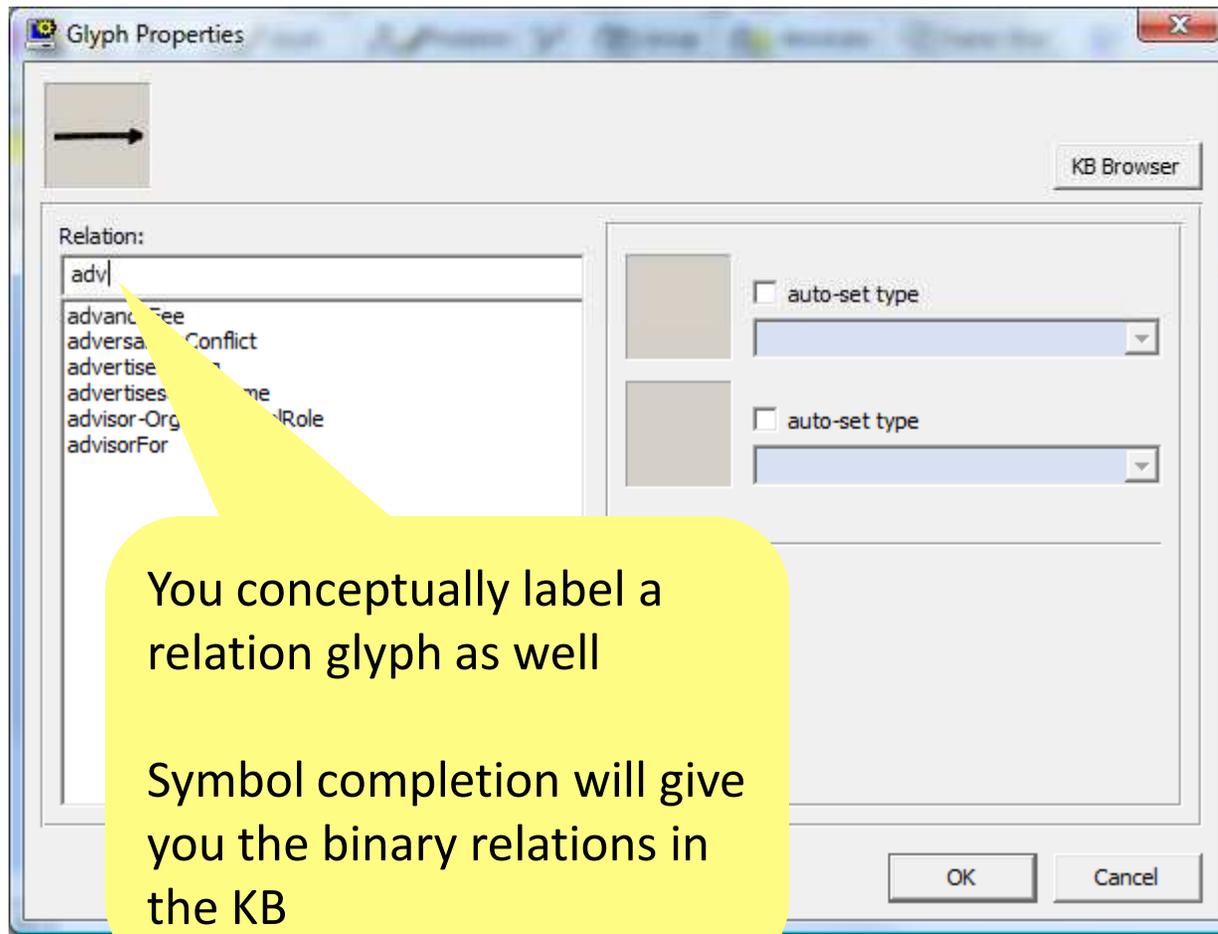


Relation glyphs are drawn just like regular glyphs, except you use the **Relation** button instead of the glyph button

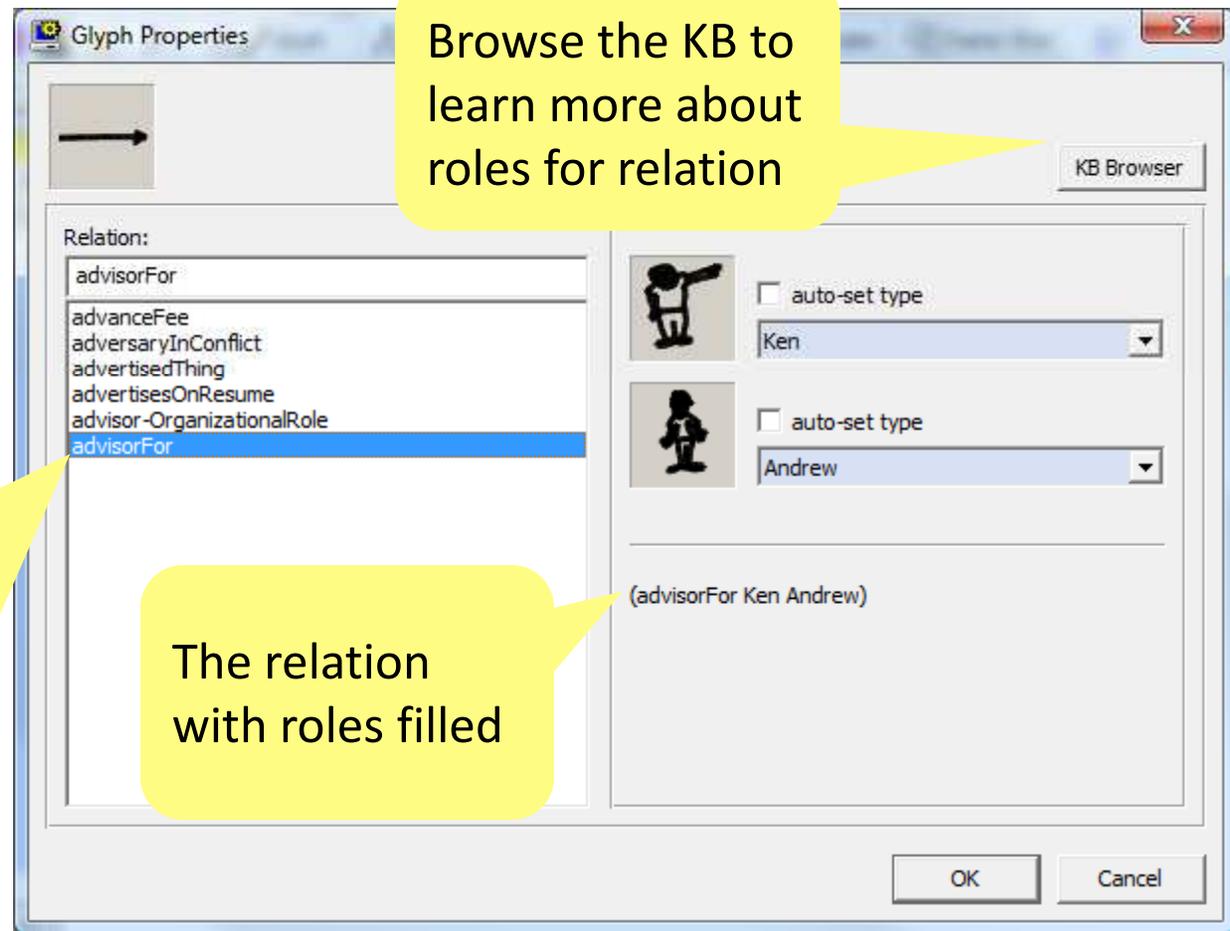
Relation glyphs are always arrows – **direction matters!**

Arrows should be drawn as two or three strokes. The longest stroke is interpreted as the shaft of the arrow.

Relation Glyphs



Relation Glyphs



Browse the KB to learn more about roles for relation

When you select a relation, the roles are auto-filled with glyphs near the tail and head of the arrow

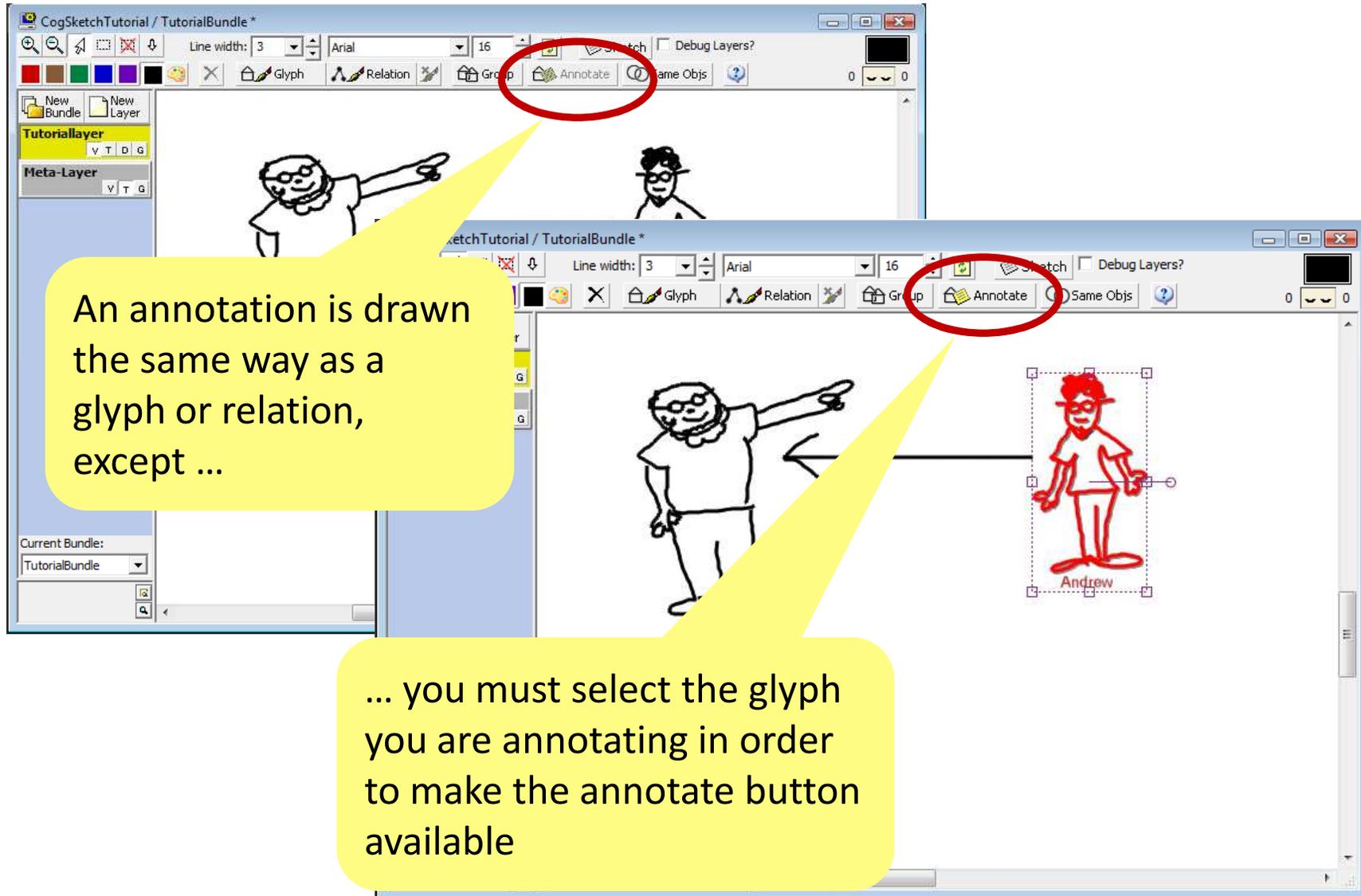
The relation with roles filled

Relation Glyphs

The screenshot shows an Internet Explorer window titled 'KB Browser - Internet Explorer provided by Dell'. The address bar contains 'http://localhost/rbrowse/kbb-frameset.html?kb=1'. The browser's toolbar includes a search box with 'KB Browser' and a 'search' button. Below the toolbar, there is a search input field containing 'advisorFor' and a 'search' button. The main content area displays the results for 'advisorFor'. On the left, there is a sidebar with the heading 'advisorFor:' and a list of links: 'all genIPreds', 'all specPreds', and 'all references'. The main content area has the heading 'advisorFor [type = Relation:]' and contains the following text: 'comment: (advisorFor AGT1 AGT2) means that IntelligentAgent AGT2 is an advisor for AGT1.', 'isa: CoexistingObjectsPredicate , OrganizationalRolePredicate , OrgRoleReplacement , PeopleRelatedToOrganizations-Organization-Topic , PersonalAssociationPredicate , PersonalAssociationPredReplacement , RelationalNounSlot', 'arity: 2', 'arg1isa: IntelligentAgent', 'arg2isa: IntelligentAgent', 'genIPreds: advisorFor , affiliatedWith', and 'specPreds: advisor-OrganizationalRole'. At the bottom of the page, the text 'Knowledge-Base: c:\qrg\plan\bkbs\opencyc-kb\OpenCyc KB' is visible on the left, and the date '8/29/2008' is on the right. A yellow callout bubble with a tail pointing to the 'comment' line contains the text 'Oops! Our arrow is backwards!'.

Oops! Our arrow is backwards!

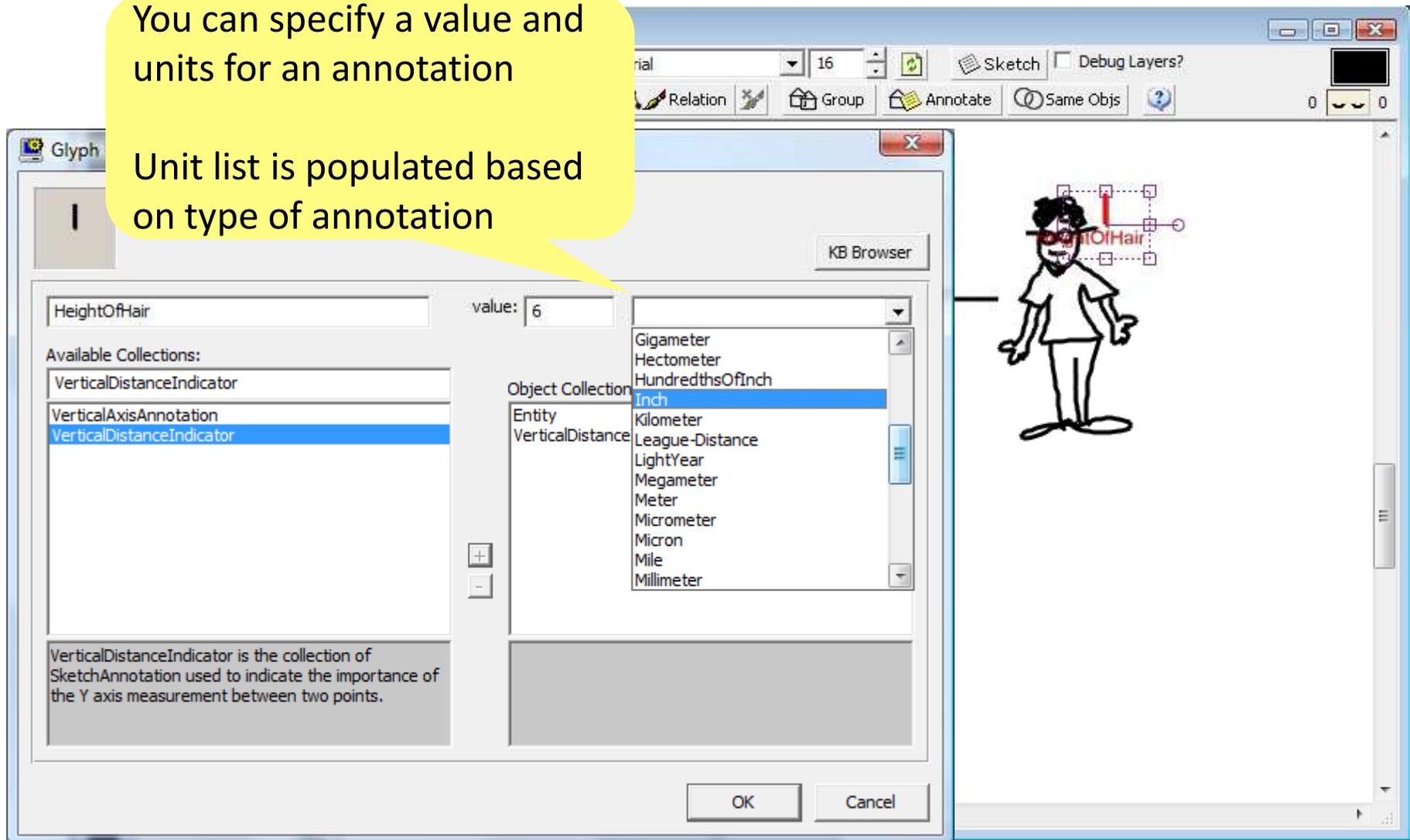
Annotation Glyphs



Annotation Glyphs

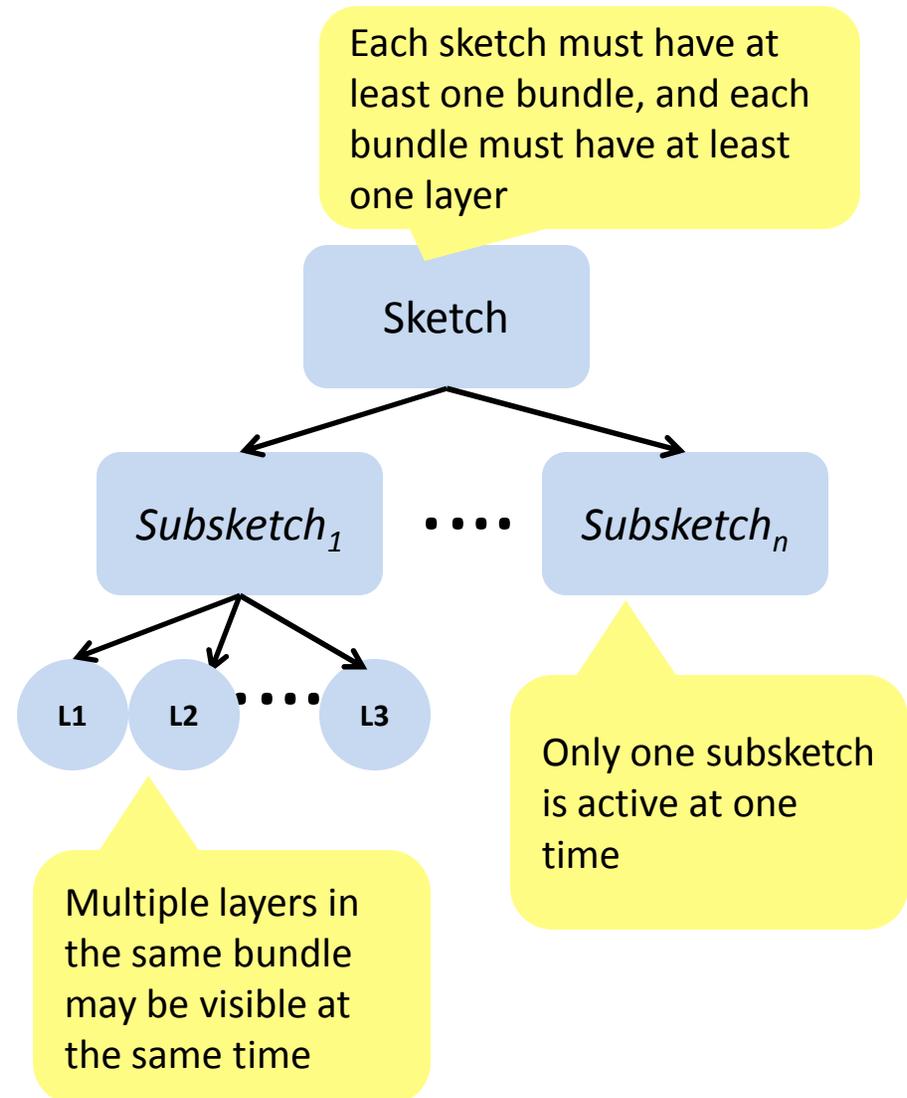
You can specify a value and units for an annotation

Unit list is populated based on type of annotation



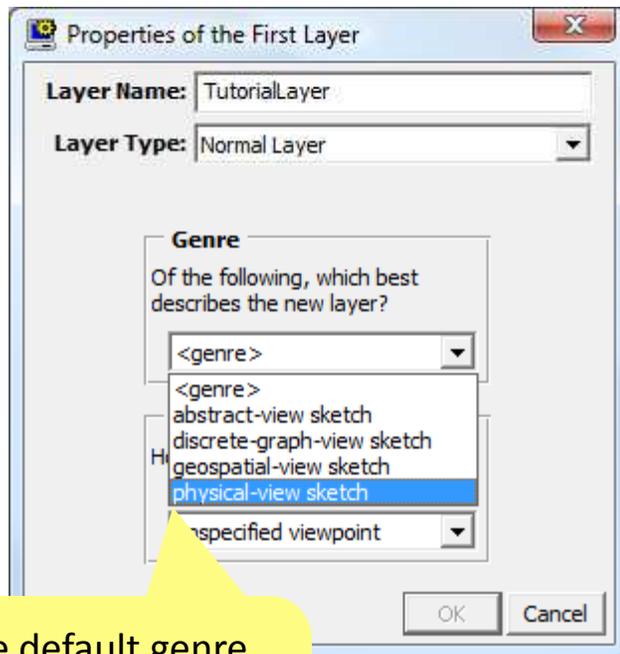
The structure of sketches

- Think of layers as transparent sheets stacked on top of each other
 - Multiple layers in the same bundle can be visible at the same time
 - Spatial relationships will only be computed between objects on the same layer



Interpreting Layers

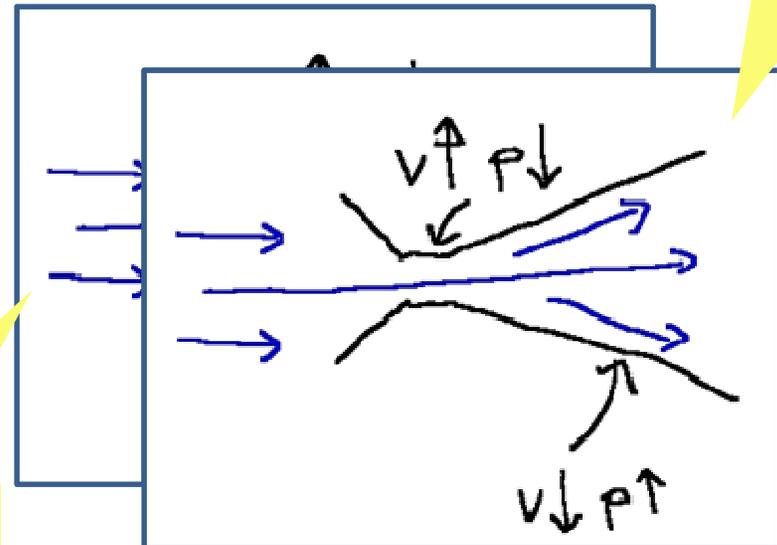
- For every layer you specify a *genre*



The default genre is physical view. This is a sticky default

- Abstract-view
- Discrete-graph-view
- Geospatial-view
- Physical-view

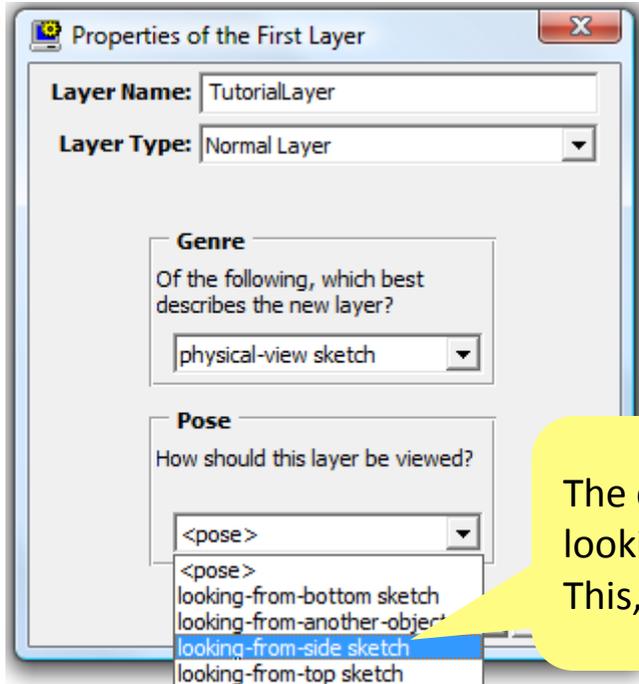
Visual reference frame



Spatial reference frame

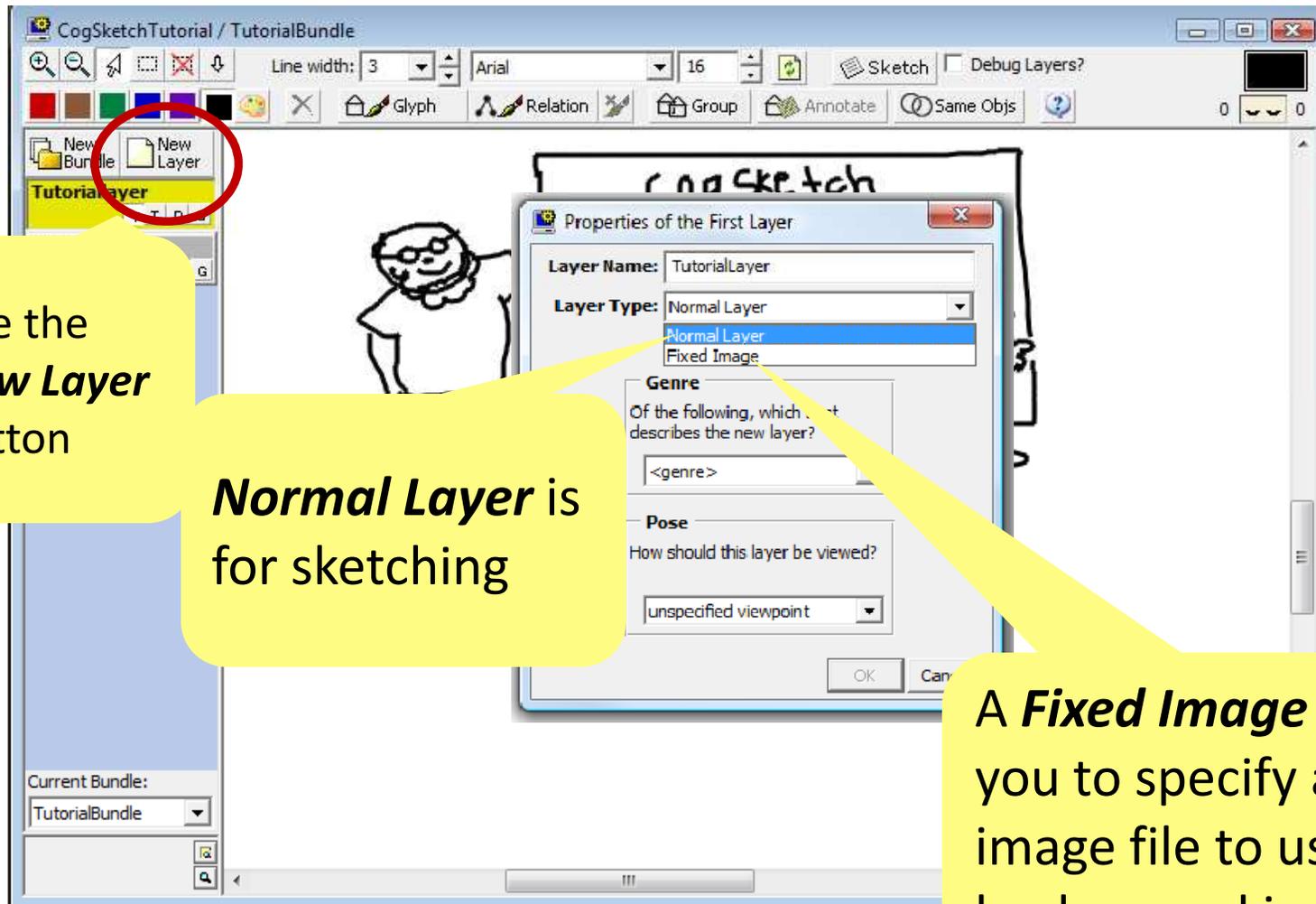
Interpreting Layers: Pose

- For physical-view and geospatial-view genres you will also be asked to select a *pose*
- Pose describes the frame of reference from which the sketch is made
- Determines how visual directions map into spatial directions
 - E.g., up in visual reference frame = up in spatial reference frame if looking from the side



The default is looking-from-side. This, too, is sticky

Adding a Layer

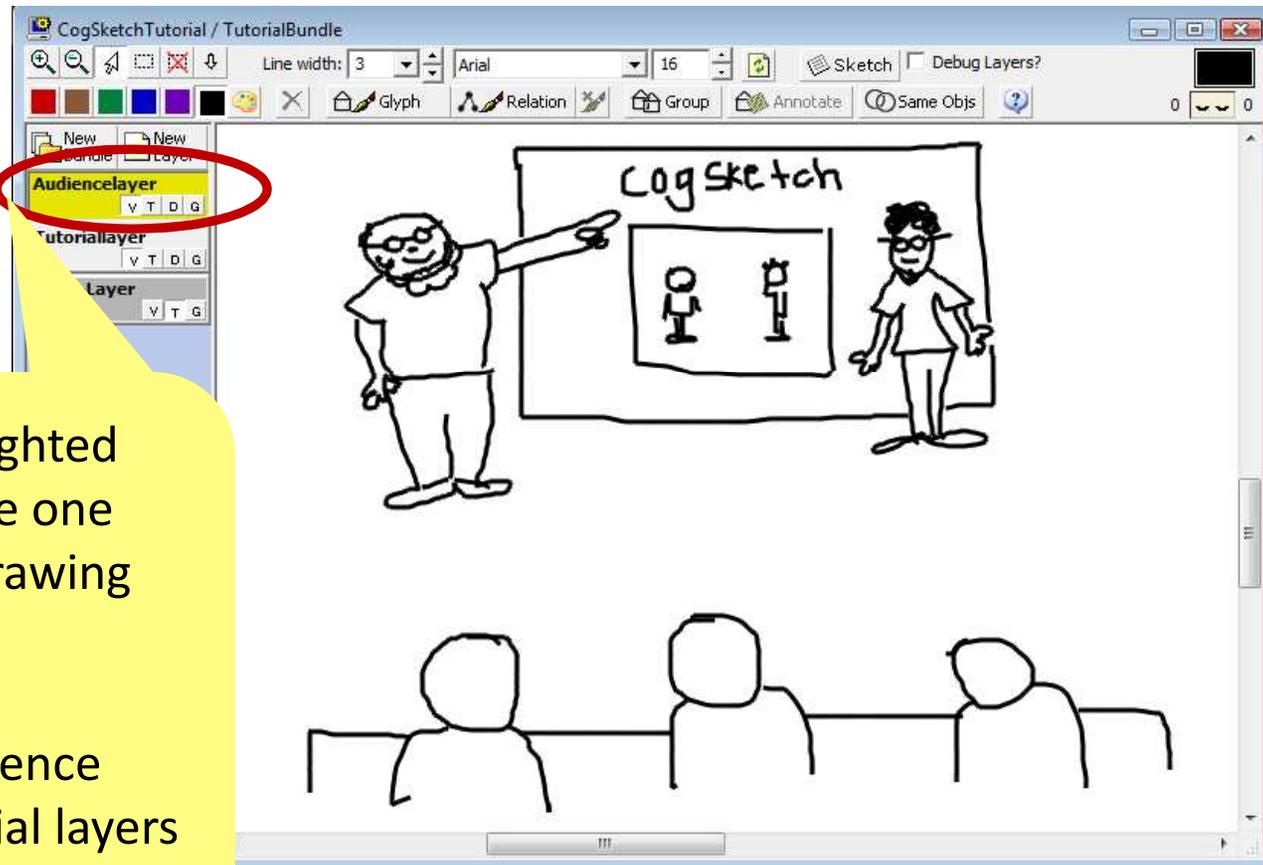


Use the ***New Layer*** button

Normal Layer is for sketching

A ***Fixed Image*** allows you to specify an image file to use as a background image

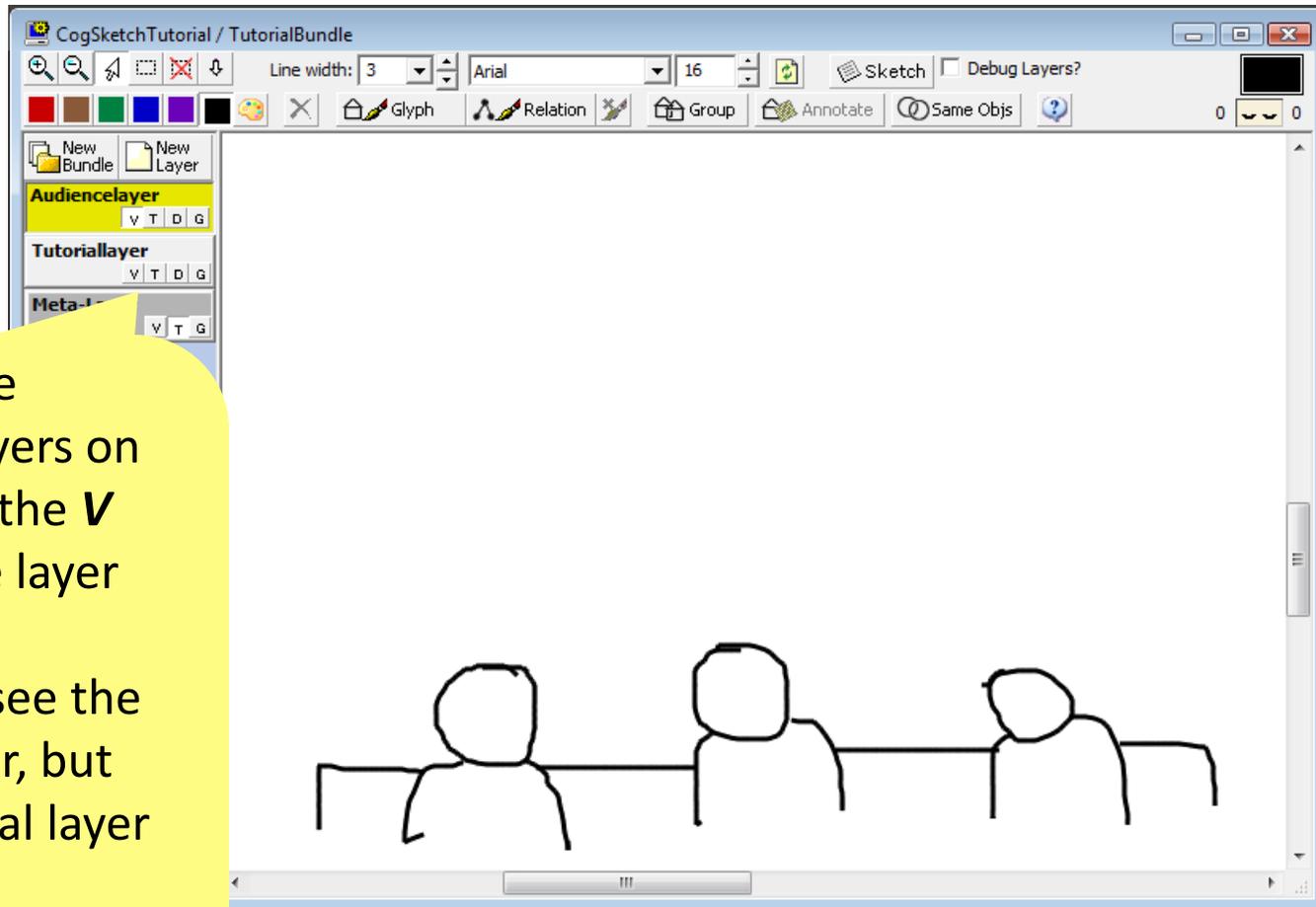
Adding a Layer



The highlighted layer is the one you are drawing on

Both Audience and Tutorial layers are visible

Adding a Layer

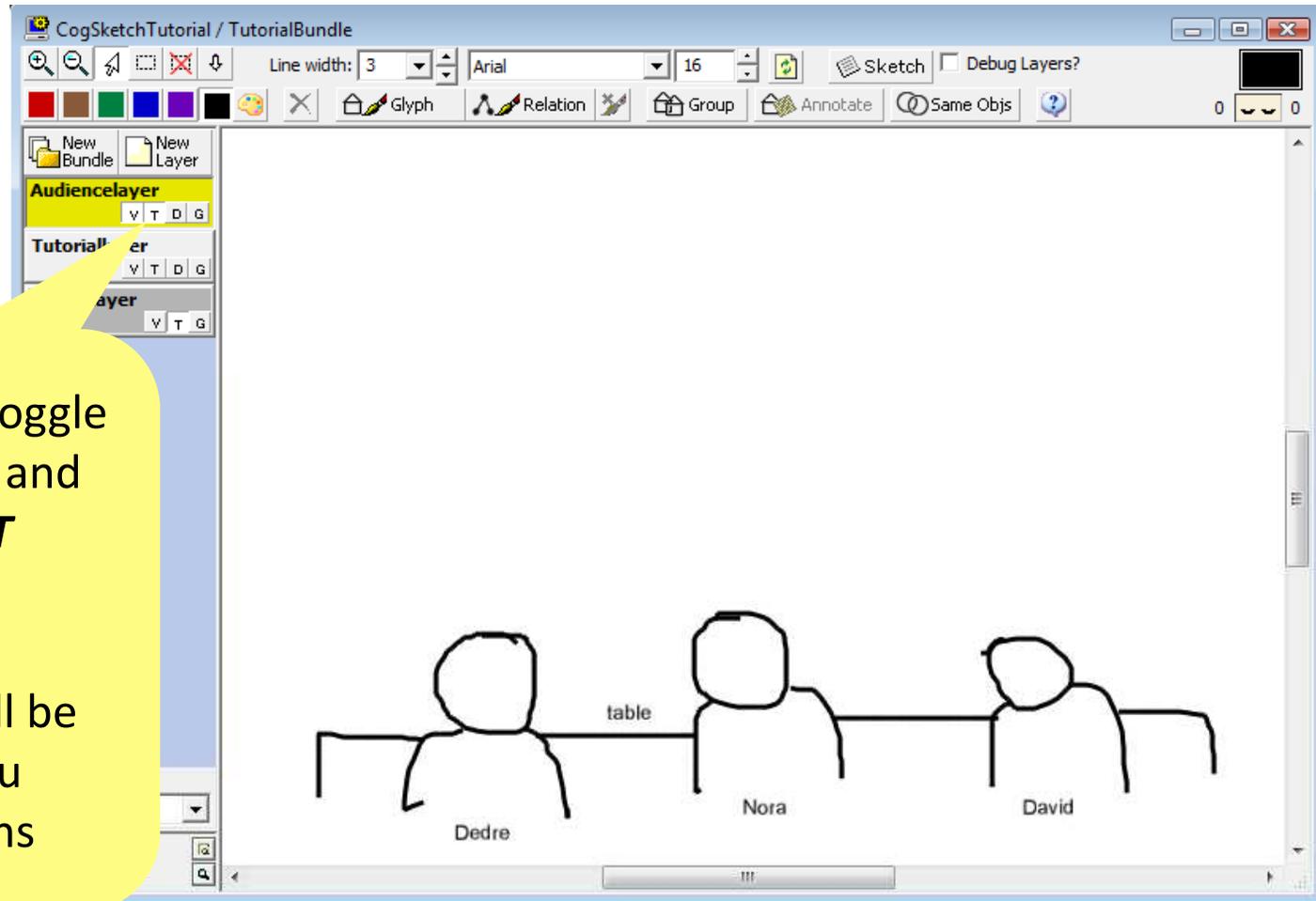


You can toggle visibility of layers on and off using the **V** button on the layer

Here we can see the audience layer, but not the tutorial layer

The selected layer is always visible

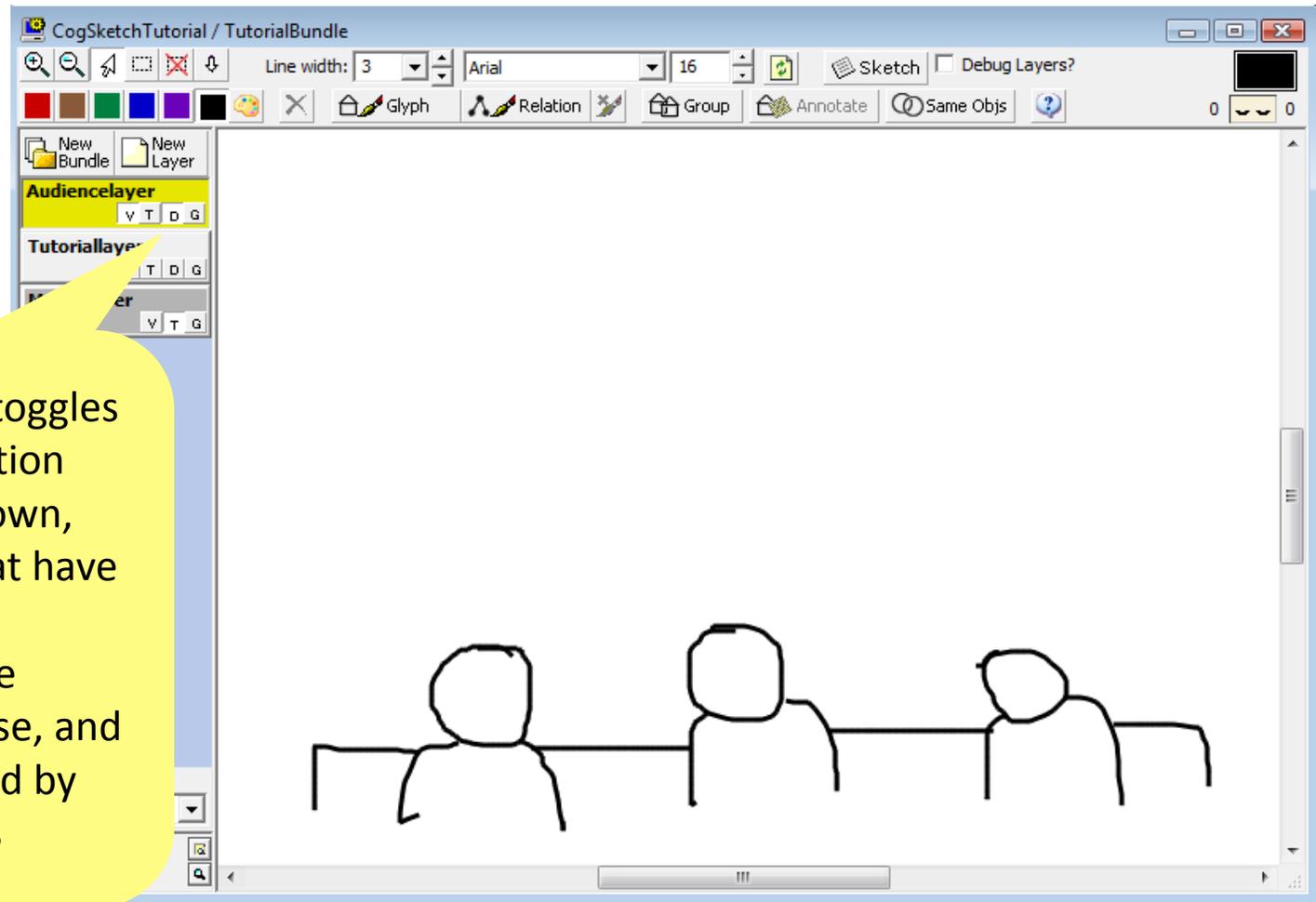
Adding a Layer



You can also toggle text labels on and off using the *T* button

Text labels will be the names you gave the glyphs

Adding a Layer



The **D** button toggles whether direction arrows are shown, for entities that have them. This is specified in the knowledge base, and can be changed by experimenters

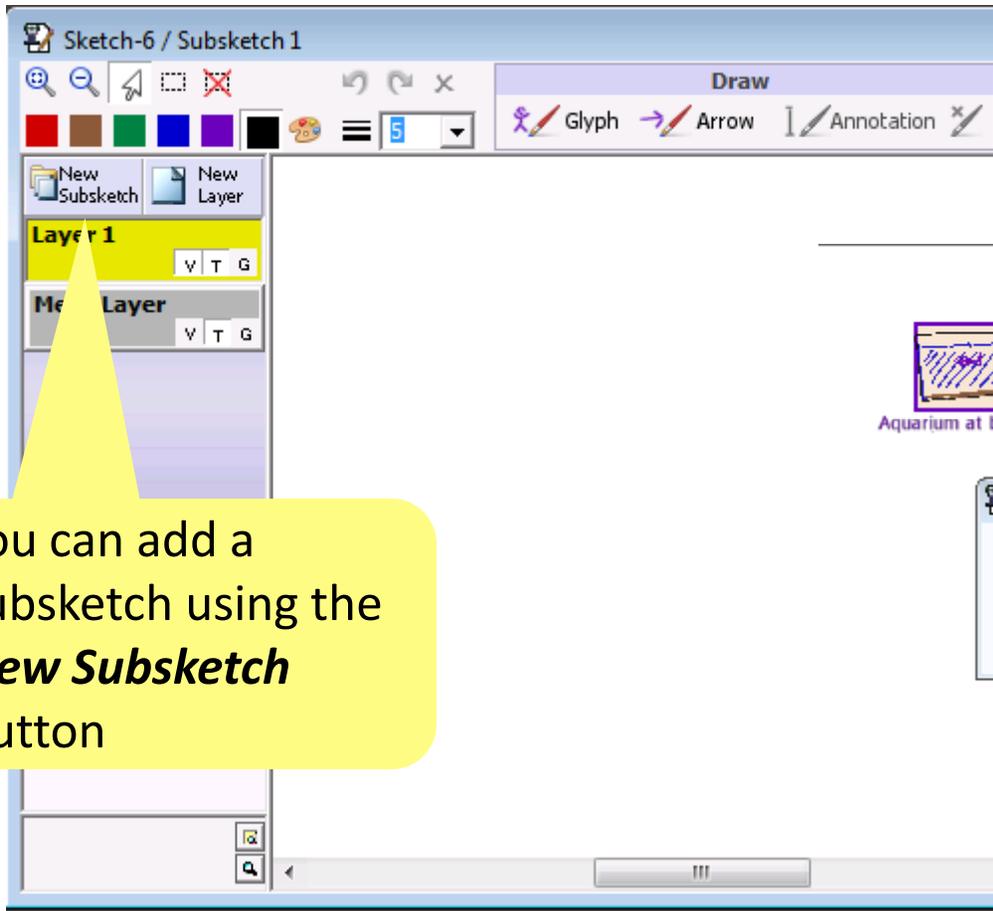
Adding a Layer



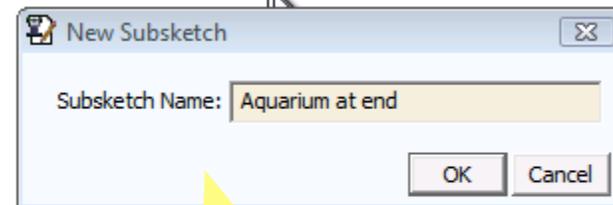
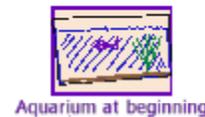
The **G** button displays a given layer grayed out

(here the audience layer is grayed out)

Adding a Subsketch

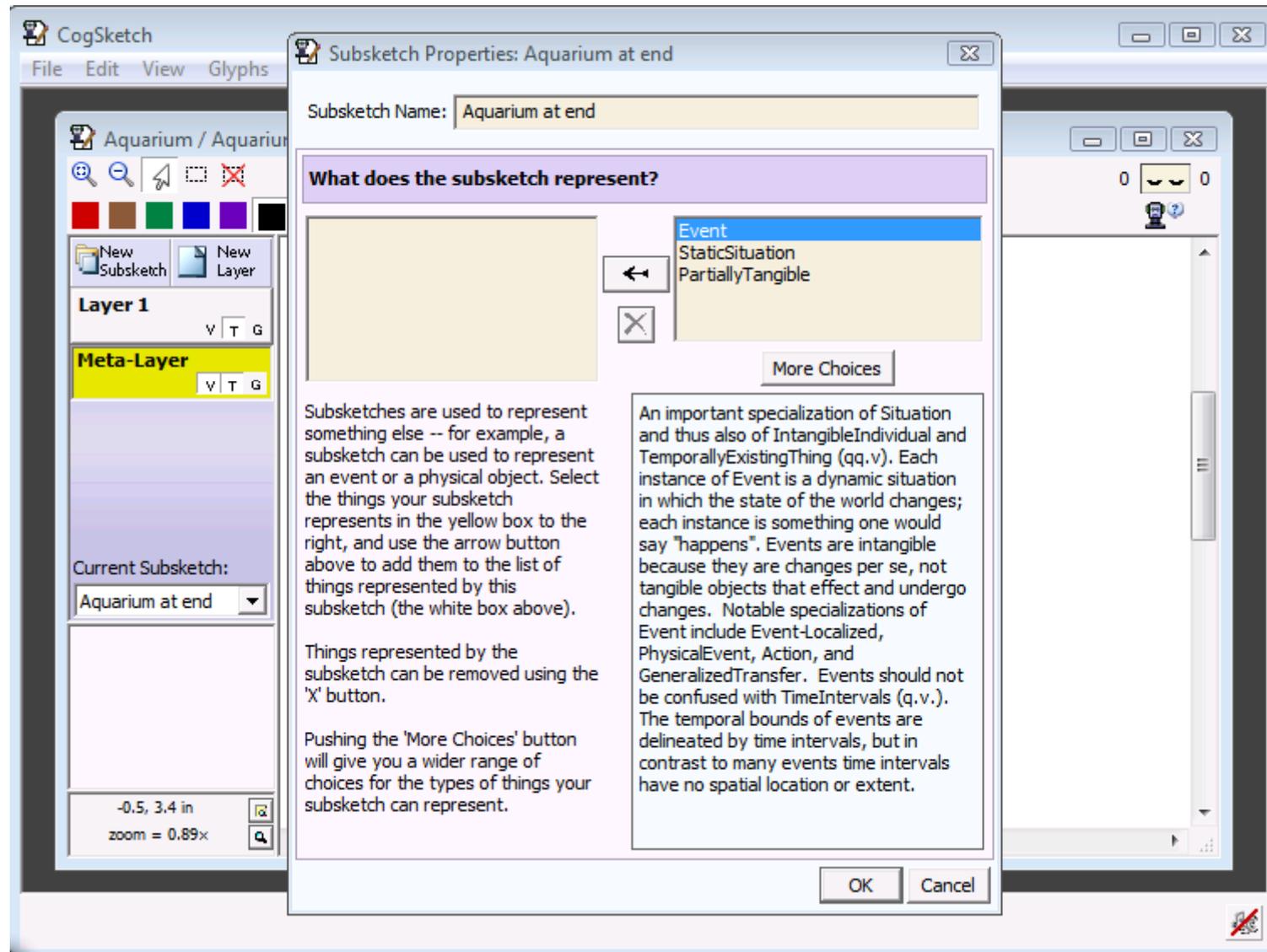


You can add a subsketch using the ***New Subsketch*** button

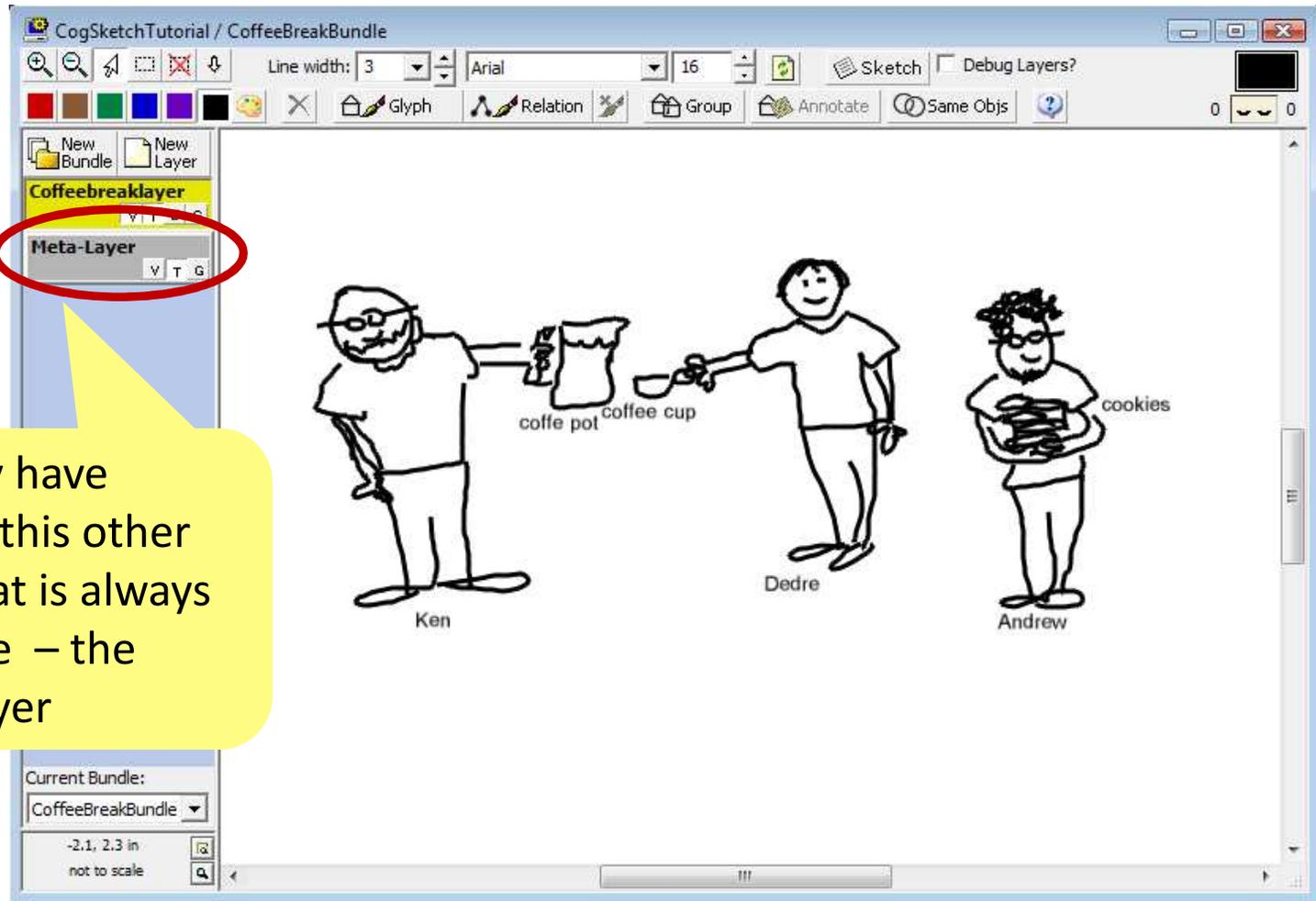


Or by using the clone right-click operation on the subsketch in the metalayer

Conceptually Labeling a Subsketch

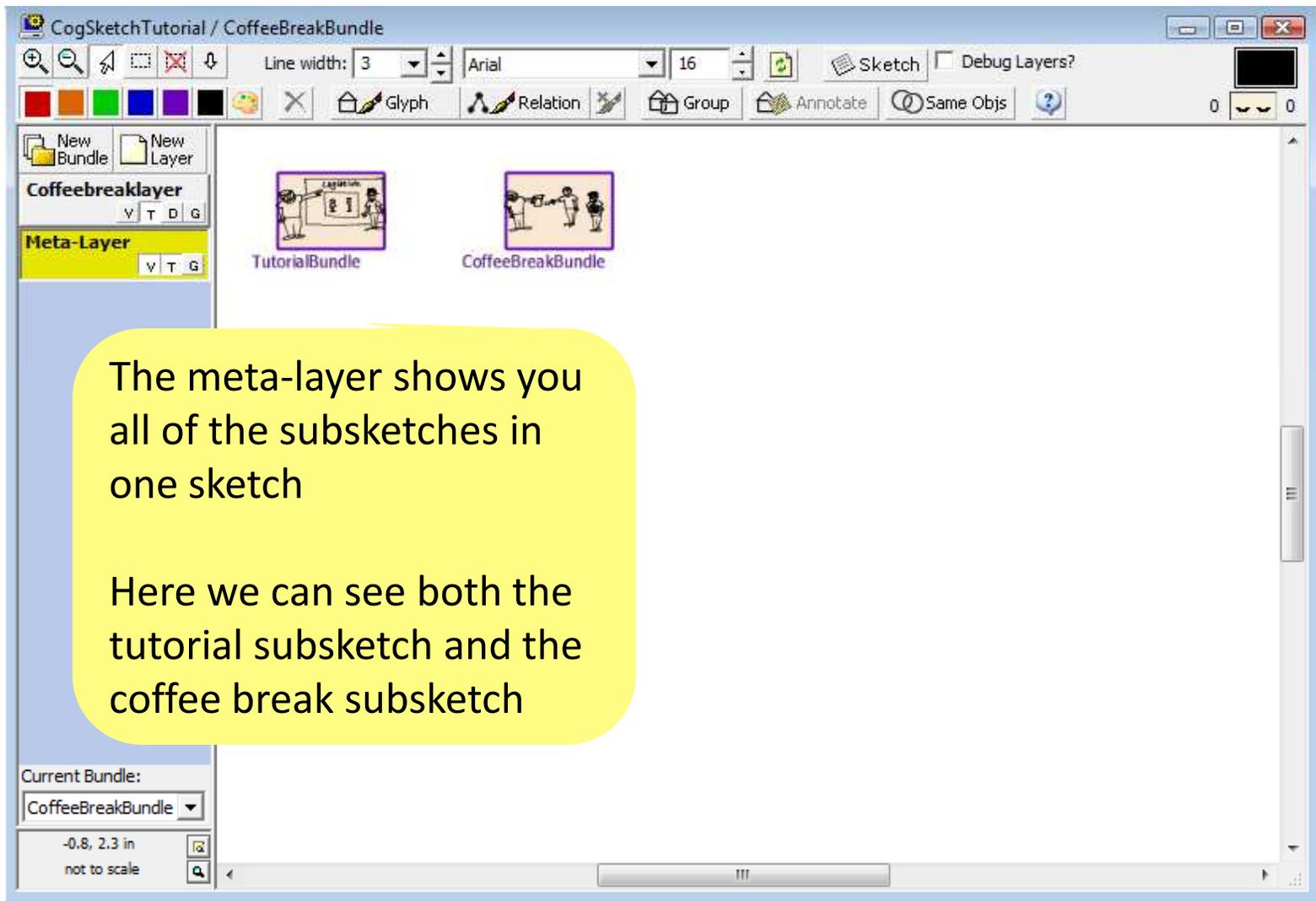


The Meta-layer

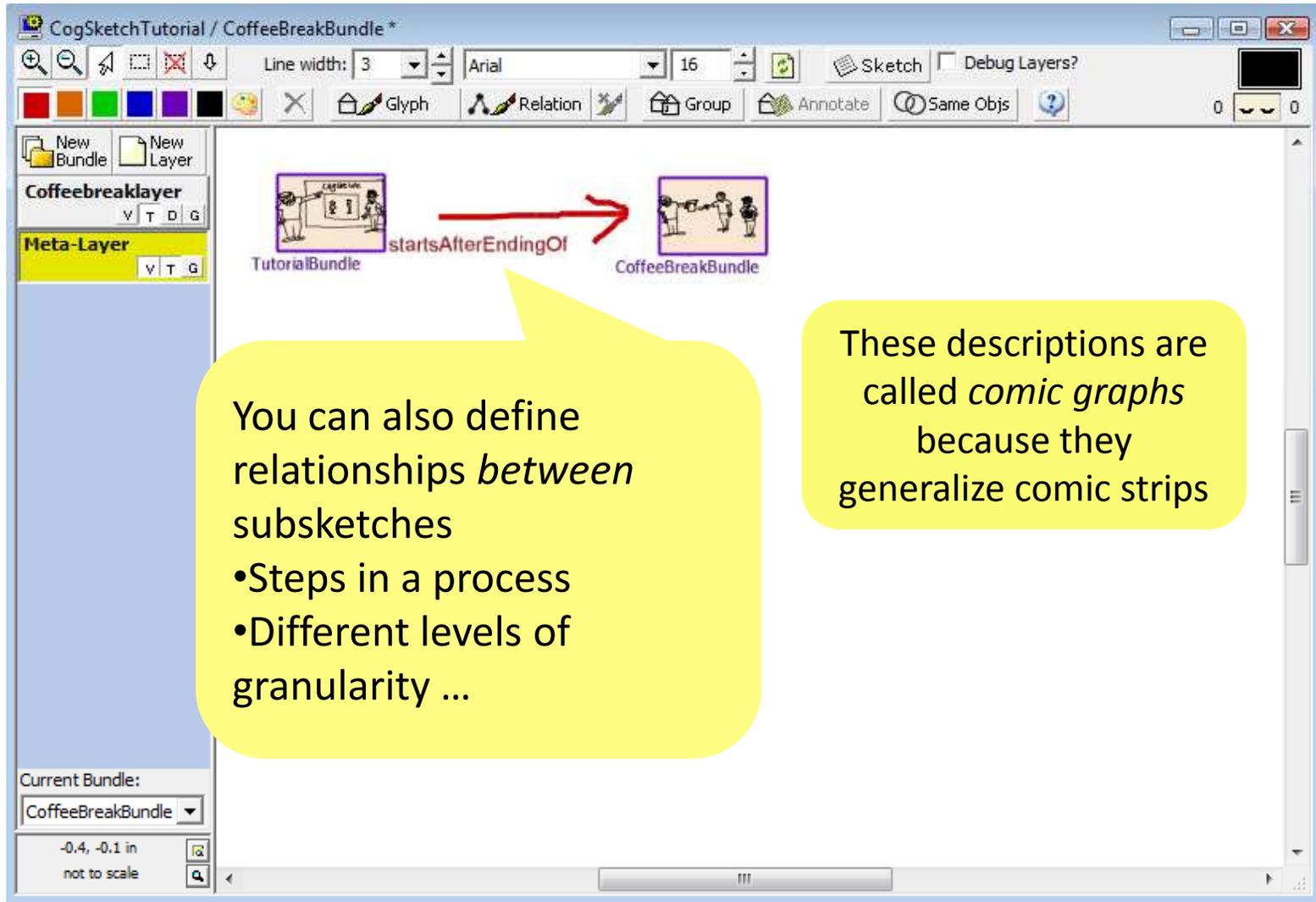


You may have noticed this other layer that is always available – the meta-layer

The Meta-layer



The Meta-Layer



The screenshot shows the CogSketchTutorial interface. The main workspace displays two comic strip bundles: 'TutorialBundle' on the left and 'CoffeeBreakBundle' on the right. A red arrow points from 'TutorialBundle' to 'CoffeeBreakBundle' with the label 'startsAfterEndingOf' below it. The left sidebar shows a tree view with 'Coffeebreaklayer' and 'Meta-Layer' selected. The bottom status bar shows 'Current Bundle: CoffeeBreakBundle' and coordinates '-0.4, -0.1 in not to scale'.

You can also define relationships *between* subsketches

- Steps in a process
- Different levels of granularity ...

These descriptions are called *comic graphs* because they generalize comic strips

What you have seen

- How to draw glyphs
- Types of glyphs: Objects, relationships, annotations
- Structure of sketches
 - Layers, subsketches, and the metalayer