

Squeak Notebook 4/15/05

Squeak Guide Introduction

This is a notebook about Squeak: an object-oriented programming language. The purpose of this notebook is to explain the tools, techniques and fundamentals of eToys/Squeak. Section I is an overview that includes two beginner projects designed to help you get started.

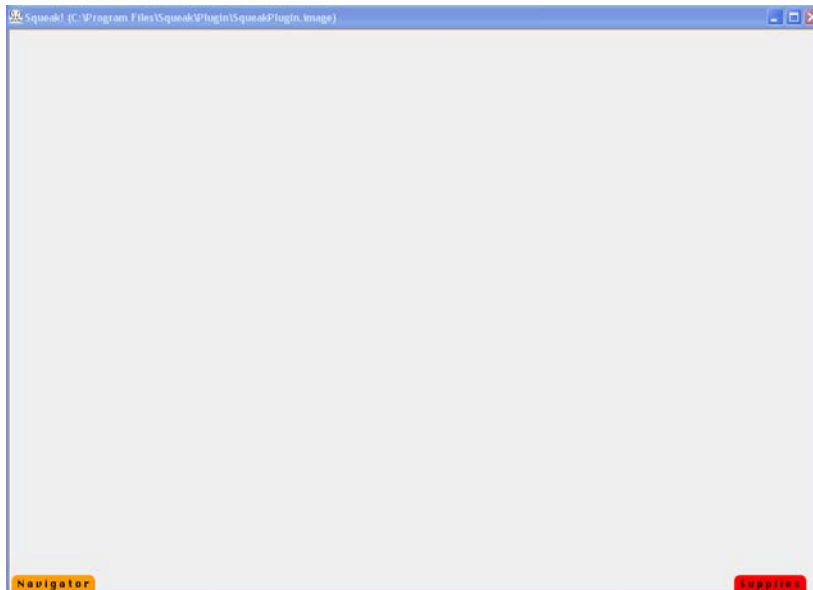
Section II is a lexicon of Squeak; a comprehensive and systematic survey of the tools and how they can be used and combined. The topics are alphabetized to make it easy for you to find out more about anything in Squeak. Email squeakcmi@uiuc.edu to request a copy of Section II

Section III contains example projects in alphabetical order by topic or technique. So, if you wonder what a 'scale factor' is you can look up information about it in the Section II of the notebook called 'Geometry' and then find examples in Section III of projects that use of scale factors. Email squeakcmi@uiuc.edu to request a copy of Section III

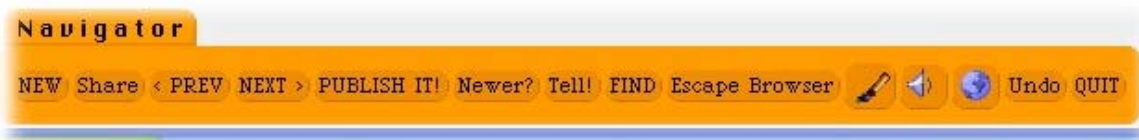
Section I

Navigator Flap

The first screen in Squeak looks like this. It is showing an object called 'world'. There is much more information about the 'world' in Section II but for now look at the two flaps showing in the world. Orange is **Navigator** and red is **Supplies**.



Navigator Flap click on the flap and drag it up to see many buttons



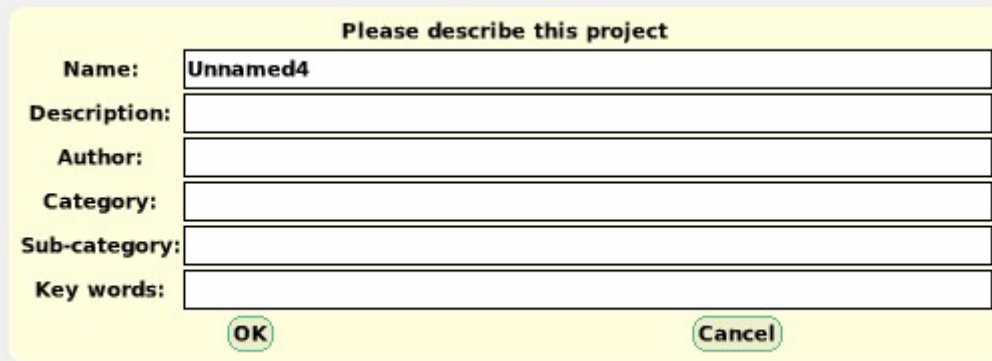
New opens a new work space called >world=

Share this project with people on other computers anywhere

Previous the project you were working on before opening a new one

Next move from one project to another

Publish It opens choices about how and where to store, save, a project



The image shows a dialog box titled "Please describe this project". It contains six text input fields, each with a label to its left: "Name:", "Description:", "Author:", "Category:", "Sub-category:", and "Key words:". The "Name" field contains the text "Unnamed4". At the bottom of the dialog box, there are two buttons: "OK" on the left and "Cancel" on the right.

Name give it a meaningful name so it can be found again.

Description

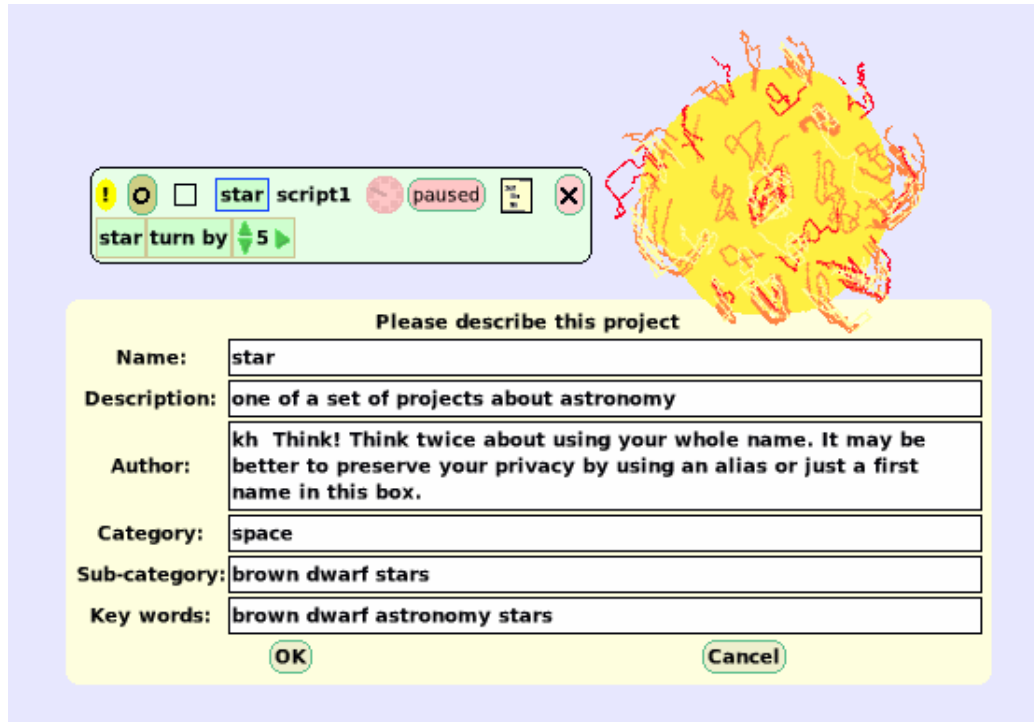
Author

Category

Sub-category

Key words

Here is an example of the form filled out. The reason for all the information is because when you 'search' for a project that is stored on a swiki you can use these words as searchable categories of data. You might have dozens of projects about various aspects of astronomy. Or a teacher might want to have class projects stored so they could be viewed by class period or lesson topic.

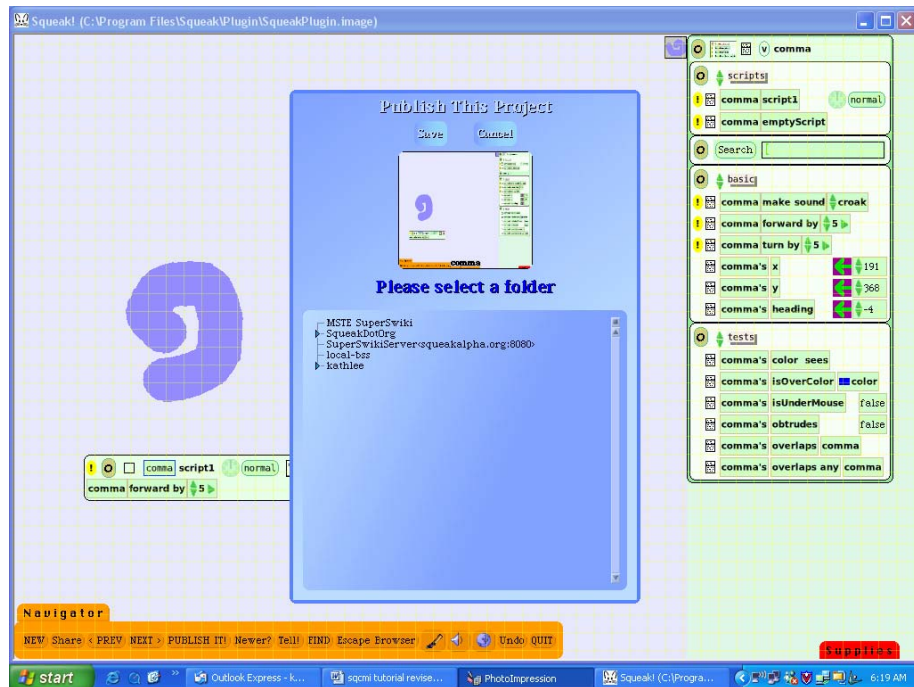


Please think about the fact that a project stored on a Swiki is on the internet and is in public place. Remember that you are known by your work and also by the computer location you store projects from.

You are not anonymous. On the other hand, do not reveal personal or private information in this panel.

The Squeak community has shown great kindness, a helping hand, and a gentle face. But that may not be true for all times, so err on the side of caution in releasing information into a space you do not control.

Please select a folder is asking where to store this project.



SqueakCMI-BSS saves it on computer at the Office for
 Mathematics, Science and Technology Education at the
 University of Illinois
SqueakDotOrg
SuperSwikiServersqueakalpha.org:8080 a swiki
 maintained by Squeakland.org
Local-bss
Kathlee saves it on *my* computer

Click on the name of the place you to choose to store the project and then click on the word 'Save'. If a choice is not available, that is, you click on 'local-bss' and nothing happens, then choose a different folder.

If your computer is not connected to the internet at the time you are trying to 'Publish it' the distant computers are not available to you as a choice. Your project can be saved on your computer only.

Later, when an internet connection is in use, the project can be saved to a distant computer too. The advantage of saving on a swiki is that the project can be accessed from any computer, any where, any time.

A project can be saved on your computer and on a swiki too. To do

this:

Left click on '**Publish it**' and hold down to open other choices.



Publish store it in the place selected

Publish As a way to give this project a new name and store the newly named version

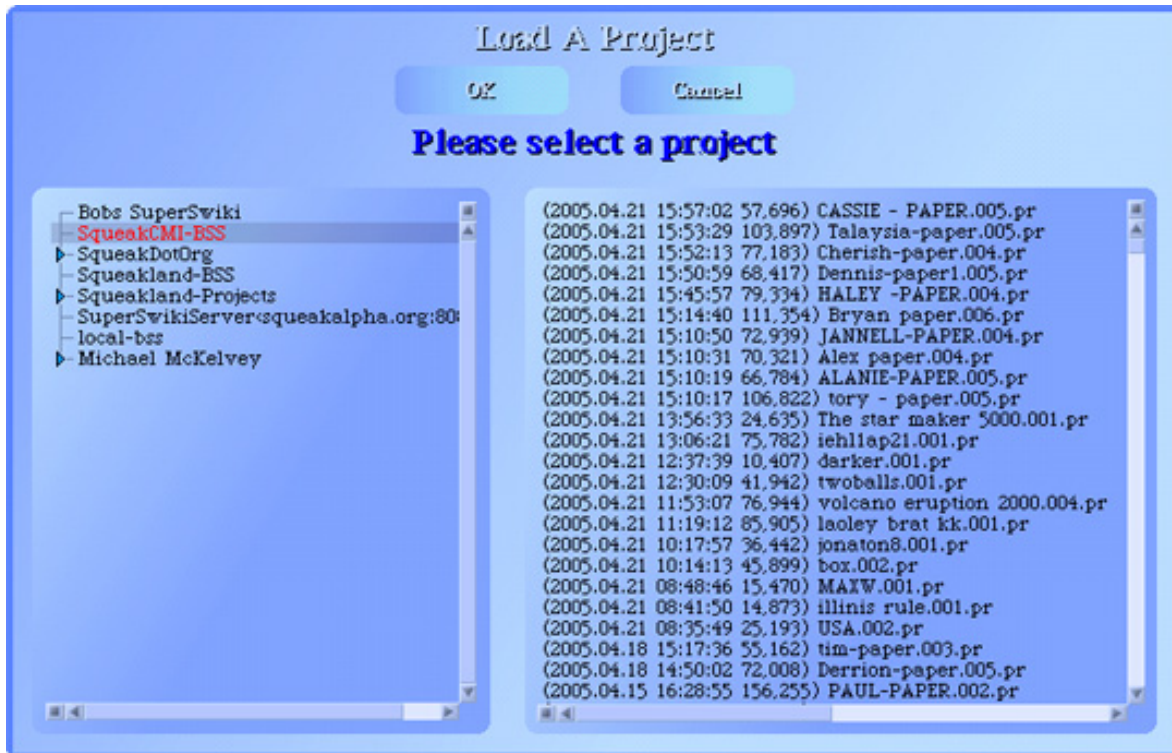
Publish to Different Server move a project from a local file to one stored in a swiki

edit project info especially useful if you now have two or more projects called 'unnamed1'



Newer if there are several versions of a project, find the newer one

Tell a communication tool for shared projects using an internet connection



Find a project already >published=. When 'find' is clicked on in the navigator tab this blue screen appears. If you are connected to the internet the browser inside of Squeak will open automatically. If you have a phone modem connect first, then choose 'find'.

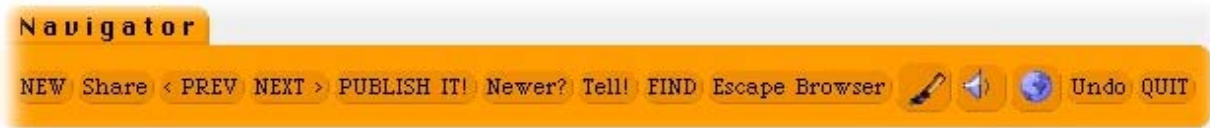
It is important to remember which file you chose to store a project. A project that is stored in SqueakDotOrg will not appear if you choose Squeakland-BSS. Each of these is just the name of folder, a place you can select to store your project. In this example, MSTE SuperSwiki was clicked on and it shows a dark highlight.

After choosing a folder name from the left side of the panel, then click on the name of the project you wish to open on your computer. For example, click on 'starfornotebook' and it will show a dark line of color. Then click on the word 'OK' at the top of the panel. The project you have selected will open on your computer.

Notice the projects are filed by date and time. This can help you find a project you did last summer which you don't recall the name for but you do remember it was summer when you did the project.

As you see, many people are storing projects in the same folders on the internet. You can look at other projects to learn from them but it would not be appropriate to change someone's project without their permission or approval. The community of Squeakcmi is just that, a community, and good manners will matter to the other people who share these spaces.


Escape Browser leaves only Squeak on the screen and gives more space to the project. To get back the parts of the screen that were taken away when 'escape browser' was clicked, just click on 'Browser reentry'.



Before using the paint brush you should understand that each object in a project should be draw by itself and kept so that each object can have a script for it only.

Do not draw a boat sailing on the lake with birds flying overhead all in one use of the paint brush. Squeak will treat the whole scene as one object and when you write a script to make the birds move, the whole scene, boat, lake, and birds will move.

In Squeak, everything is an object and everything can have a script but only it you remember to plan it that way from the beginning.

paint brush  click on the brush to open the pallet of painting tools



color

the brush:

size: select one of the six blue circles that will draw a line that big
color: the pink/black rectangle opens into a whole rainbow of colors as the paintbrush (or paint bucket) icon goes across and into it
the paint bucket: the paint bucket floods any chosen space with

the color chooser: the eyedropper selects a color for the brush or paint bucket.


the eraser: the eraser's size changes from large to small by selecting a blue circle the size you want the eraser to be. (Undo, clear and toss also erase)

the buttons: there are four ovals They are all useful actions but **Keep** is the most important.

If you have not clicked on **Keep** you are only painting and will not be able to use the programming tools.

Click on **Keep** when you are finished drawing an object. You will be able to make changes to the object after you **Keep** it through another mechanism.

Undo: this will undo only the last brush stroke or paint bucket fill of a space.

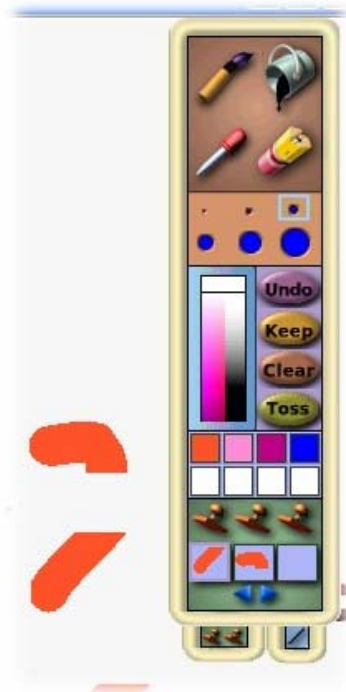
Keep:  clicking this ends the use of the paint mode of working and allows writing scripts to make the drawing/object do something.

Clear: erases all the paint on the screen, all the paint.

Toss: throws away the painting, leaves the paint mode, and returns to the scripting choices screen.

The custom pallet: eight white squares fill with the color choices you make using the color chooser tool. Then these eight colors can be used by just clicking on the paint brush or the paint bucket and then clicking in the color's box.

The rubber stamp icon: makes many copies of a drawing while still in the paint mode.



The tools: five shapes to use that will draw straight lines for a variety of geometric shapes. To find these tools, pull down on the white loop at the bottom right edge of the paint pallet. The thickness of the line depends on choosing one of the six circles above the 'undo' button.



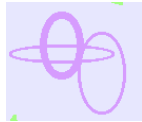
Line: draws straight lines at any angle.



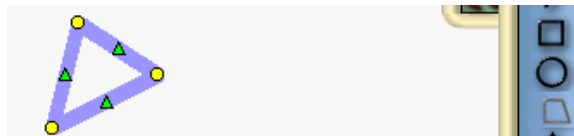
Quadrilateral: draws squares and rectangles.



Circle: draws circles and ovals.

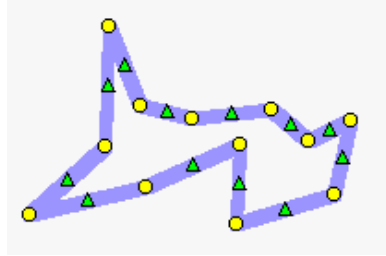


Polygon: the (irregular) polygon has special features that permit



changing the shape of the polygon from the triangle that first appears into a many sided-polygon.

Use the 'yellow' handles to change the size, use the 'green' handles to change the shape. Every click on a green or yellow handle adds additional yellow and green handles. Using these two handles can make a very intricate geometric shape.



Star: a shape ready to use.



The last four options in the Navigator Flap are:



Speaker cone controls dynamics by moving the slider higher (louder) or lower

Earth: choose the language you prefer: Deutsch, English, and Español.

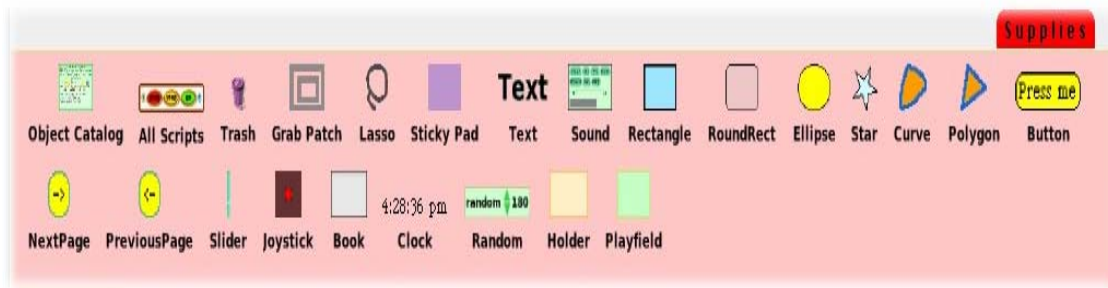
Other languages are available. Contact www.squeakland.org

Undo affects the last mouse click action only.

Quit closes Squeak completely not just part of the project you are working on.

Supplies Flap

The Supplies Flap contains many ready-to-use objects. There is an endless supply of these objects and each time one is dragged out, the supply is replenished. To use an object from the Supplies flap click on it and drag it out of the flap and click to drop it on the screen.



The supplies flap can also be used to store an object you know you want to use in more than one project. For example if you have made a really intricate pattern and it has taken an hour or so to make, save the object by dragging it down into the open Supplies flap and a small copy of it will be stored there for use in other projects.

It is also possible to create a whole new flap that will only appear in your Squeak projects with a supply of objects you prefer to use. There is more information about flaps in Section II of the notebook.

Here is a brief description of the items in the Supplies Flap. You can find out more about each by looking in Section II, the Squeak Lexicon, of this notebook. Each of the supply objects is also used in a project in Section III of the notebook.

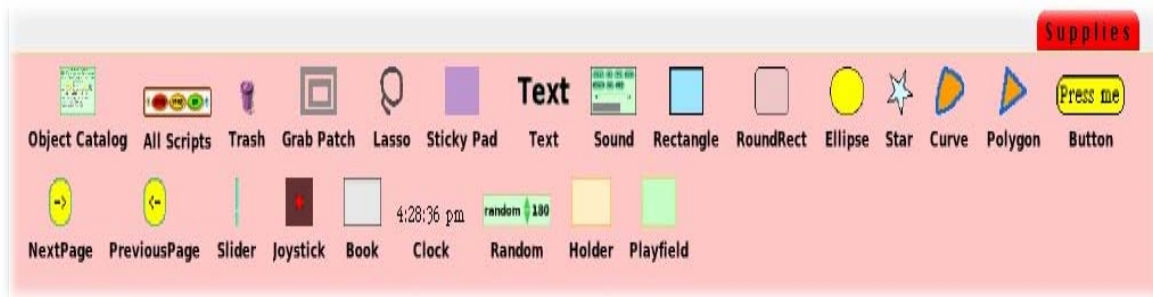
Object Catalog a huge assortment of tools ready to use if you know how.

All Scripts a stop-step-go button that acts on all scripts at the same time.

Trash drag one onto the screen, drag unwanted objects into it.

Grab Patch when you drag it out of supplies it turns into a copying tool that will copy anything within the border it draws.

Lasso a copying tool for tracing the outline of an object or a part of one.



Sticky Pad a supply of pastel, translucent, borderless rectangles

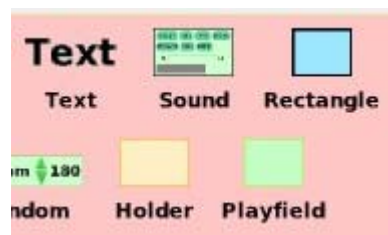
Text drag out the word 'text', highlight it and type new text. Use the halo handle (yellow dot) to make the size of the text box fit the text you wish to include. There are other ways to include text. Fonts, sizes and colors can be modified.

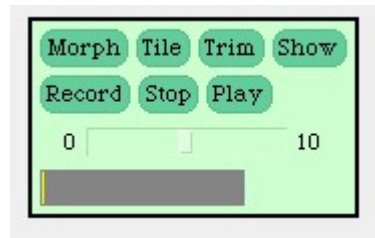
Holder is a place to assemble animations. A holder's halo of handles includes an additional handle for a large menu of options for the holder. There are additional viewer panes for holders: collections, input, pen trails, playfield, stack navigation. These give more scripting options for holders than are available for other kinds of objects.

Sound a recording device for music, speech or noises

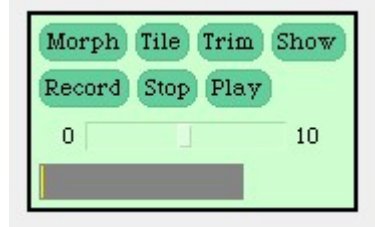
How to use the sound recorder

1. Click on the green object called 'Sound' in the supplies flap and drag a copy of it out onto the screen.





2. Click on 'record' and then speak, or sing into a microphone connected to the computer. It is also possible to play and record music on a midi synthesizer.



3. Click on 'stop' to stop recording a sound
4. Click on 'play' to hear the recorded sound
5. 'Morph' clicking on this button makes a thin tile to be dropped into a slot in a wave editor.
6. 'Tile' is used to add the new sound to the list of choices already available. Click on 'tile and a box will open asking for a name for the sound, name it something meaningful then accept or cancel it.

In the basic script find 'sketch make sound croak' Click on 'croak' to open a list and the new sound's name will appear in the list. Click on it to choose it or scroll through list with the up and down green arrows.

7. 'Trim' opens the wave editor and all its function.
8. 'Show' opens a wave editor. A new sound morph can be modified using this editor.

The next six shapes in the supplies tab are all already equipped with special **color and border** scripting/viewer options that are not available if the shape is drawn using the 'paint brush' from the Navigator flap.



Rectangle is a supply of bordered, rectangular shapes. They can be resized larger and smaller, or reshaped to become a square or long like a line. A rectangle from supplies has extra script/viewer options called 'color and border'.

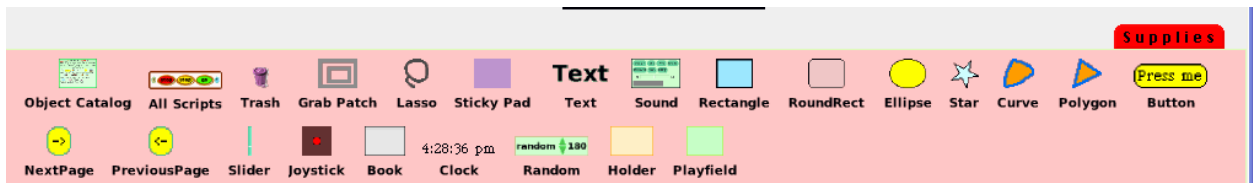
Round Rectangle is a translucent rectangular shape with rounded corners. The translucent characteristic allows tiles colors to react with other tiles. Like mixing red paint and yellow paint will result in an orange hue.

Ellipse is a shape that can be modified by dragging it to become long and narrow or round.

Star is a shape that can be modified and comes with special color and border option

Curve is a shape that can be modified and comes with special color and border option

Polygon is a triangular shape that can be modified large and small, thin or wide but still always a triangle. It comes with special color and border options in the script/viewer panel



Button ‘Press Me’ it can be used to start a script or by changing its label to stop a script. The script it runs must be defined in the project and a connection made between the script and the button.

NextPage is a button to use in a book that will turn to the next page in the book if there is already another page in the book.

PreviousPage is a button to use in a book that will turn back to an earlier page in the book.

Slider a tool equipped with special viewer script tiles. Drag out a slider, get the halo, click on the ‘open viewer’ aqua dot, click and hold down the word ‘basic’ in the viewer to open the list of script categories and find one at the bottom of the list called ‘slider’ Choose that and open a new viewer pane that contains many ways to use and control the slider.

Joystick Drag out a joystick, get the halo, click on the ‘open view’ aqua dot, click and hold down the word ‘basic’ in the viewer to open the list of script categories and find one at the bottom of the list called ‘joystick.’ Click on that to open a set of commands that make the joystick control forward and/or turn scripts. The joystick color and shape are variable that can be changed so that the joystick is customized. Make it easier to use or more difficult.

Book is a set of pages that can be written on and drawn on and scripted. Pages in Squeak book can include animations, digital images, and text. Text from other documents can be included in a book.

Clock is a digital clock showing the current time in hours, minutes and seconds. Note that if more than one is on the screen they do not all show the same time and sometimes differ by a second or more.

Random is a tile containing a random number range. This range can be changed, for example, if the number 180 is highlighted and the number 10 is typed and entered. The random numbers used in the script will range from 1 through 10.

Holder is a place for storing each stage of an animation. There is an additional dot in the halo that surrounds a holder that opens many menu commands. This additional dot is 'to open a viewing menu'. Click on it and a long list of viewing options is available.

Playfield is a place for assembling parts for projects or for staging animations. There is an additional handle in the playfield's halo that opens a menu called 'viewing options for the halo' that provides 29 more ways to use and change the playfield and the objects in it.

This section of information is a description of more tools and options that are part of Squeak. This information continues on from the point at which you have opened the paint pallet, drawn an object and clicked on the 'keep' button in the paint pallet. A haze disappears from the screen that was there while you were painting and now if you touch your object with the tip of the cursor a halo of dots called handles appears.

There are three ways to get the halo of handles to appear.


1. Right click on the object
2. Alt/apple left click on the object
3. Let the cursor arrow hover over the object's color and a halo will appear. Hover is the slowest way.


Halo a set of 'handles' appear around an object.





The whole screen in Squeak is called ‘world’ and it has a halo too. Every thing is an object in an object-oriented programming language. Every thing.


Each of the handles has a different use. Most *objects* have 11 halo handles. *Playfield* and **holders** have an extra handle (light green).


Tan  collapses the object into a small easy to re-open box in the upper left corner of the screen. Click on it to make the object re-appear.


Pink  throws the object away.

Red  opens a menu for the object.

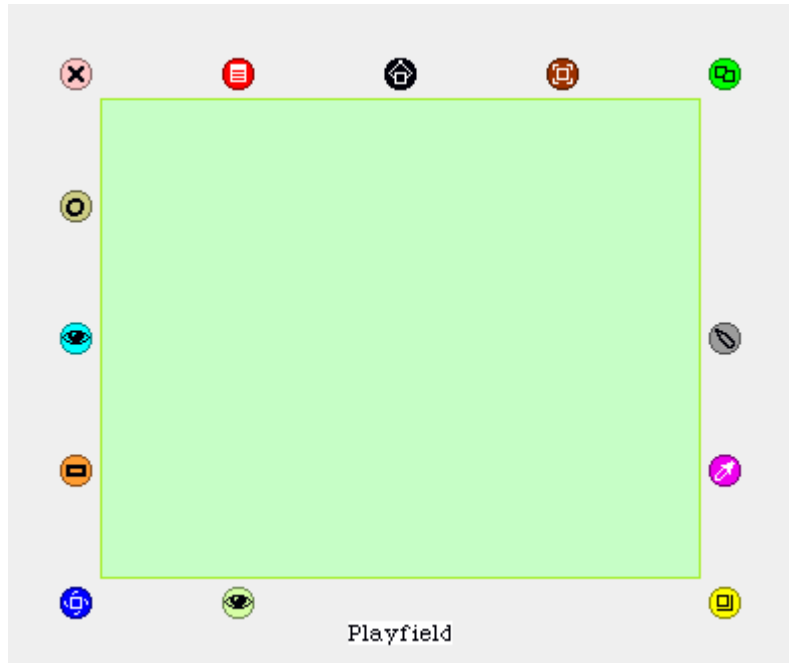
Black  tongs pick up the object in the same way that clicking with the left mouse button will pick up an object.


Brown  handles move the object so that if it is on a playfield or holder the object can be hidden, as though off-stage, inside the playfield or holder.


Green  duplicates the object as many duplicates wanted. Each can have a script of its own or one the same as the script made for the object before the duplicate was created.


Gray  repaint the object with the paint brush assigned to that object


This halo shows around a playfield or around a holder.
Notice there are two additional handles: one is magenta and the other is pastel green with an eye icon in it.





Magenta  opens a pallet of colors and color effects. These changes include corners, sticky, lock, fill, gradient fill, border, color, style and width, drop shadow


Yellow  changes the scale of the object. Click and drag toward the center of the object and it will become smaller, drag away from the center and it grows larger. The proportions can change also from fat to thin.

Light green  opens special menu of options for playfield and holders. The viewing options for playfields and holders are the same but there are different options checked that make the differences in a holder and a playfield that you draw out of the Supplies Flap, A holder can become more like a playfield and a playfield can be modified to be more like a holder.

Blue  handles turn the object's heading orientation

Orange  makes a tile to represent the object which can then be dropped into a script written for a different object. If you have written a script you wish to use for other objects this makes it easy to do.

Cyan  opens a **viewer** of scripts for the object. These scripts contain phrase tiles that are assembled by you to make your object be and do what you wish.

 The halo also has a green arrow in a red-crossed blue circle in its center. This arrow can be dragged to point in a different direction than the one showing.

The direction it is pointing is the default heading of every object drawn. It shows a positive direction on the 'y' axis.

The place where the two thin red lines cross is the center of rotation for the object. The location of the center of rotation can be changed. Section II of the notebook has a complete explanation of these changes and use.

Viewer

Click on the cyan halo handle.

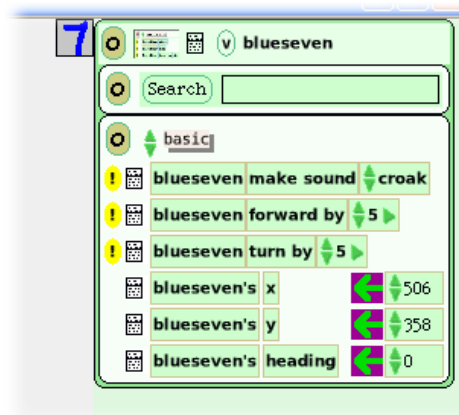


A pane of scripts opens along the right side of the screen.


This panel contains the many script commands that will be used to make your object do what you want it to do.


What you want the object to do must be clear in your mind and in a logical order that is then matched with commands selected from the phrase tiles available. This is a large subject and the rest of this notebook is made of examples of commands and how, by combining them in different ways, the objects work to demonstrate the action of your ideas.


The viewer panes provide an endless supply of phrase tiles that are dragged out of the supply and dropped onto the screen where they turn into scripts that can be run.




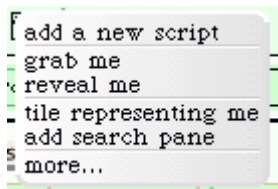
The top line of the Viewer pane has many important features accessed by clicking on the icon.

A **Tab**  icon on the edge of the script viewer shows a thumbnail drawing of the object for that tab and scripts. Click on that tab to open and close the script viewer.

Tan oval with black O  collapses the viewer. This clears the screen. If you want the viewer to return, you must alt-click on the object again, get its halo and select the cyan handle.

Big rectangle  adds a script category pane of scripts onto the last pane showing

Small rectangle  opens more menu options. This small rectangle and another that appears in the pane near a script tile, look the same but open to different sets of tools. The one on the top, next to the 'v' opens to a list six items.



1. **add a new script** puts an empty script box on the screen ready to be filled with new commands.
2. **grab me** is useful for finding an object you have made but can not see. If you click on 'grab me' the object will stick itself to the tip of the cursor.
3. **reveal me** will just flash and show you where the object is but will not bring it out of the place it is in at that time
4. **tile representing me** means make a tile that can be put into script for another object.


5. **add search pane** adds another way to look for a particular tile for a particular purpose.
6. **more . . .** Clicking here adds much, much, much more.


‘More’ means there are many other options available.
Click on ‘more’ to see a list of menus.

Each list is a menu containing many lists and items.

The last word in some lists is the word ‘more’.

‘More’ leads deeper and deeper into the Squeak/Smalltalk programming language and further and further away from the eToys/Squeak language.

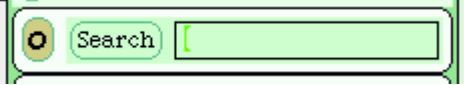
‘v = ’ adds a variable. This allows you to change a behavior of an object by controlling one aspect of its behavior. An example would be to make a variable called ‘speed’ and assign it a number to control the speed of an object moving on the screen. Variables can include random numbers.

Name the object  highlight the word *sketch*, type a name for this object, click enter/return.

Name the object something meaningful about what it represents or what it will do. This is an important step as projects become more complex.

It is bad to have three or four objects and all of them named ‘sketch’. This is certain to be confusing.

It is good to name objects at the same time that you make them.

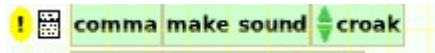
Search  is used to find a script tile quickly without opening additional category panes. For example, type ‘forward’ and the phrase tile to make an object move forward will appear in the pane.

Viewer Panes: There are many sets of script commands and they are grouped into different panes because they share common characteristics or purposes. There are also many extra scripting options that can be accessed by clicking on the shapes listed below.



The list of all the panes of scripts available for an object can be seen by clicking on the word 'basic'. A drop down menu will appear. Or use the tiny green up/down arrows to scroll through the category list.

Clicking on the tan oval with the O inside will close that pane of script phrases.

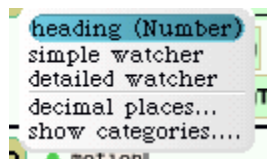


Click on the exclamation point in the yellow oval to run a script one time. Hold it down to see the action over and over again. Click on the round clock face at the top of the script.



This small rectangle opens a menu of options. These options vary depending on what script phrase tile they are next to.

So, for example, the one in front of the phrase tile 'sketch's heading' will show the following list. These menus are different from the ones that open when a similar shape at the very top of the viewer is clicked on.



heading (number) a number is a value, some scripts are systemScripts
simple watcher click on this to see a number showing the heading. This number can be dropped on the screen so the heading can be observed even though the viewer pane is closed.
detailed watcher click on this to see a number

showing the heading. This number can be dropped on the screen so the heading can be observed even though the viewer pane is closed. The detailed watch is in an easy to see box.

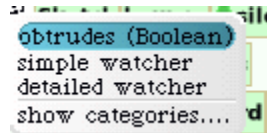
decimal places allows setting the level of precision
show categories this opens a list of places where this particular phrase tile can be found.

Another example is found by clicking on the small rectangle in front of the tile 'forward by'.



Basic and motion are on the menu by the tile 'forward by 5' and tell the category panes where that phrase can be found.

This is a final example of the variety of information that is shown when a small rectangle in front of a phrase tile is clicked on.



'Obtrudes' menu rectangle opens to show that obtrudes is (Boolean) and simple watcher and detailed watcher are available. Click on the last phrase in the list, 'show categories', and another list opens. It is a list of script panes that have this phrase tile.

The phrase tile 'sketch's obtrudes' is followed by a word false.

It reads false if the object's boundary does not obtrude. (Obtrude means to go out of a boundary.)

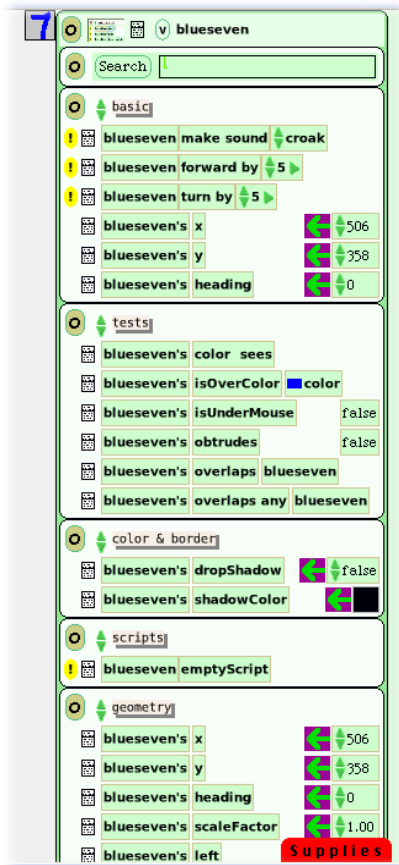
It reads true if the object's edge goes past the edge of the world screen, playfield, or holder.

When an object's halo cyan color handle  has been clicked on, the script

panes open to provide the phrases to write scripts of actions and states of being.

There are dozens of phrase tiles and combinations of them that can affect an object. A script can change what an object looks like, how it acts and when and where.

(Each pane and every tile in it is explained in Section II of this note book

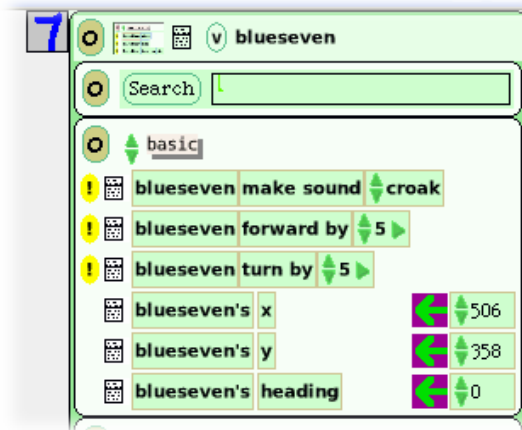



Look at the pane. Click and hold down on the word 'basic' and a list appears. The list includes:


- basic
- scripts
- color and border
- geometry
- motion
- pen use


tests
drag and drop
scripting
observation
miscellaneous
graphics

There are four more controls that need to be explained so they can be used in your first project.



1. Tiny green up/down arrows  are used to scroll through script and number choices. It is also possible to change a number by highlighting it and typing in the new number. Highlight and change is much easier than clicking 500 times on the arrow.

2. Green horizontal arrow pointing right  opens math operations: add, subtract, multiply, divide, minimum, maximum, remainder when divided by, divide and truncate.

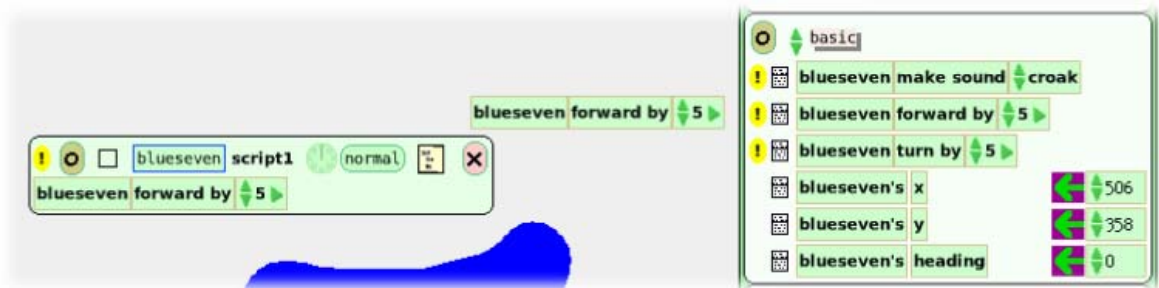
3. Green horizontal arrow pointing left in purple square  drag from the purple box to obtain an assignment phrase for a script.

4. Exclamation point in yellow oval  clicking on this runs a script once.

How to write a script for an object that has been drawn. 'keep' has been clicked.




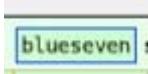
Get the halo of handles and click on the cyan eye to open a pane of script tiles.

Click on the tile 'sketch forward by 5' a copy of the phrase is made and sticks to the point of the cursor.

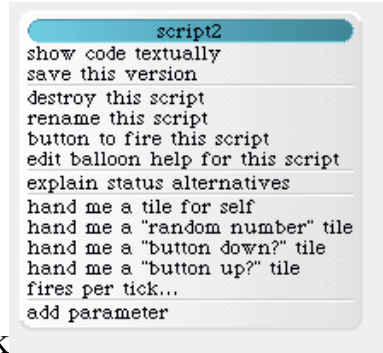


This copy is a phrase tile and should be dropped in an empty area of the screen. When the tile is down on the screen a script box will form around the tile.

There are nine icons across the top of a script.


1. the exclamation point  runs a script one time.
2. the tan oval with the 0 in it  closes and removes that script for the screen. It can be opened again from the list of scripts in the viewer pane on the left of the screen.
3. Click in the small empty square  near the name of the script and the script will be presented as textual code rather than tiles. It is possible to type code in this box. But once there is new typing in it, it is not permitted to return to a tile form of script-building. There are commands in the textual code version that do not have equivalent phrase tiles.
4. Clicking on the phrase 'blueseven'  or whatever you

have named your object will open this menu shown below. Read



more in Section II of this notebook

5. This helps keep track of each script **script2** for an object. Objects can have many scripts. It is useful to name a script for what it does or what it is. The name can be changed by highlighting the word script1 or script2 and typing in a new name.

6. A button  to start and stop scripts. Click on the circle and hold down to change the number of ticks per second. That is, every tick is once through the script. There are set options and also one which can be set at any number you think your computer will do.

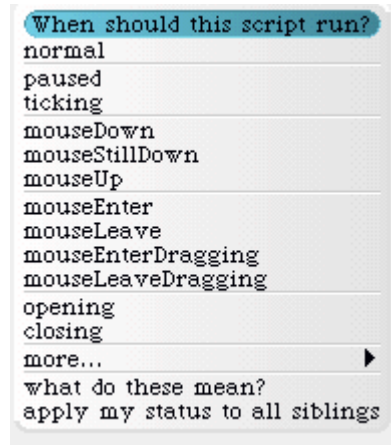
Please note that big, really big, numbers will cause your computer to appear to freeze. This is because you may have asked for something that will take years to finish. Close Squeak and start again with a more realistic view of the power of your computer.


In the menu above, note the phrase near the bottom of the list 'fires per tick' Clicking on this will permit changes in the number of times a script will fire per tick. There are many combinations of these two time controls. Combinations of these two timers are an interesting area to explore in depth. Section II of the notebook outlines a few possible uses.

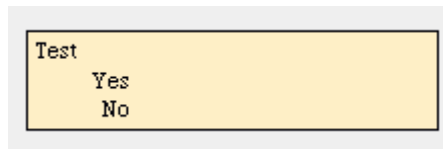
7. When a script is first produced the tile **normal** will read 'normal' As soon as the clock is started, the tile will read 'ticking' and when the clock is clicked on again the tile will


read 'paused'

Click on the phrase 'normal' and hold down and a menu of choices will appear. Each is discussed in Section II of this notebook.



8. Click on this small rectangle  and a 'test' form will be put on the tip of the cursor. This 'test' form is dropped into a script so that a yes/no test can be devised.

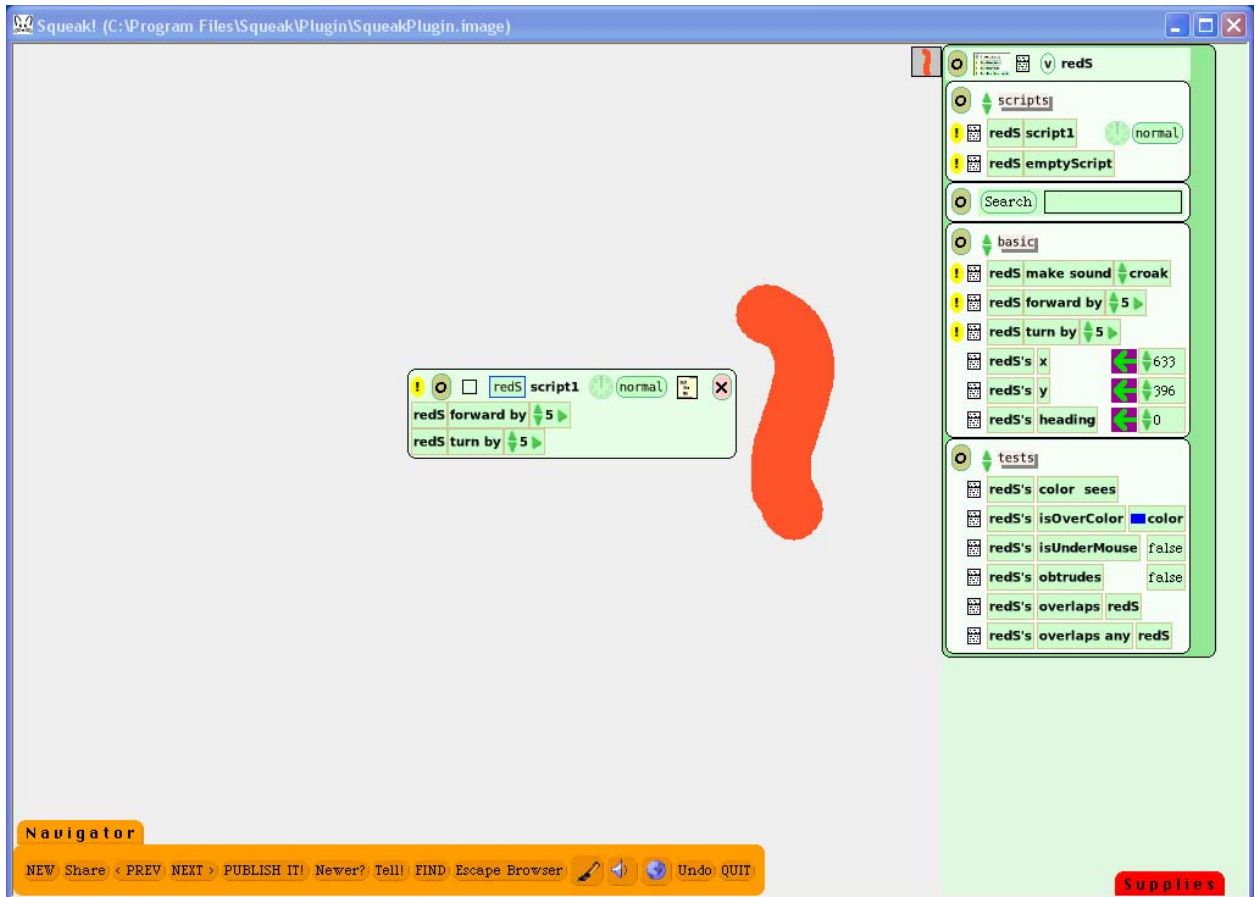


9. Click on this red oval with a black X  to destroy a script.

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Forward and Turn: Step by Step Project 1

In this project you will write a script that makes an object move and turn.



Using a Paint brush

Click on Navigator flap, the tab moves up to show contents

Click on the paint brush and the paint pallet opens

In the paint pallet, click on brush size; choose the large one.

Click on a paint color in the pink area, the whole range of colors appear.

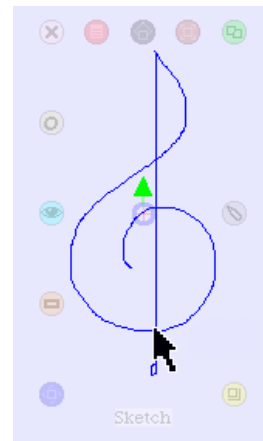
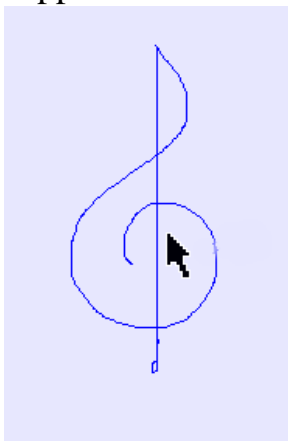
Choose a color by clicking in it.

Draw an object shape such as an "S"

Click the word 'keep' in paint box to save your object to the work screen

Scripting objects: drawn with a brush (or an object from the supplies flap)

Get the 'halo' for the object by moving the cursor so the tip touches the object. If you have drawn an object made of fine lines it is more difficult to put the tip of the cursor on the object. The tip must touch the object for the halo to appear.



There are three ways to get the halo of handles to appear.

Right click on the object

Alt/apple left click on the object

Let the cursor arrow hover over the object's color and a halo will appear. Hover is the slowest way.

Click on the cyan eye (handle) and a script panel appears on the right of the screen.

Give the object a meaningful name by clicking on the word "Sketch" in the top line of the script panel. E.g. highlight the word 'sketch' and give the object a descriptive or distinctive name. Red S for example.

In the basic category of scripts, click and drag the phrase tile 'red S forward by 5'.

Drop it on the open area of the screen away from the scripts panel.

This is now a scripted command of action for the 'red S'.

Click on the timer/clock face in the top of red S 'script 1' to start action.

Notice that the box next to the clock says 'normal'.



Click on the clock and that word changes to 'ticking'.



Stop the clock the word changes to 'paused'.



Clicking on the same timer/clock is one way to start and stop a script.

Click and drag the phrase tile 'red S turn by 5' into the same script.

Drop it on the bright green area that appears inside the script box.

This bright green target area acts like a magnet to draw a script tile into the proper location.

If no green box appears, it may be because the cursor's tip is outside the script box target. So, even though most of the tile is inside the script box, the cursor tip is not inside and the script box does not recognize it is being accessed.

Or, it may not drop into place in a script because the combination of tiles breaks rules of programming.

Click on the clock/timer to run the new script.

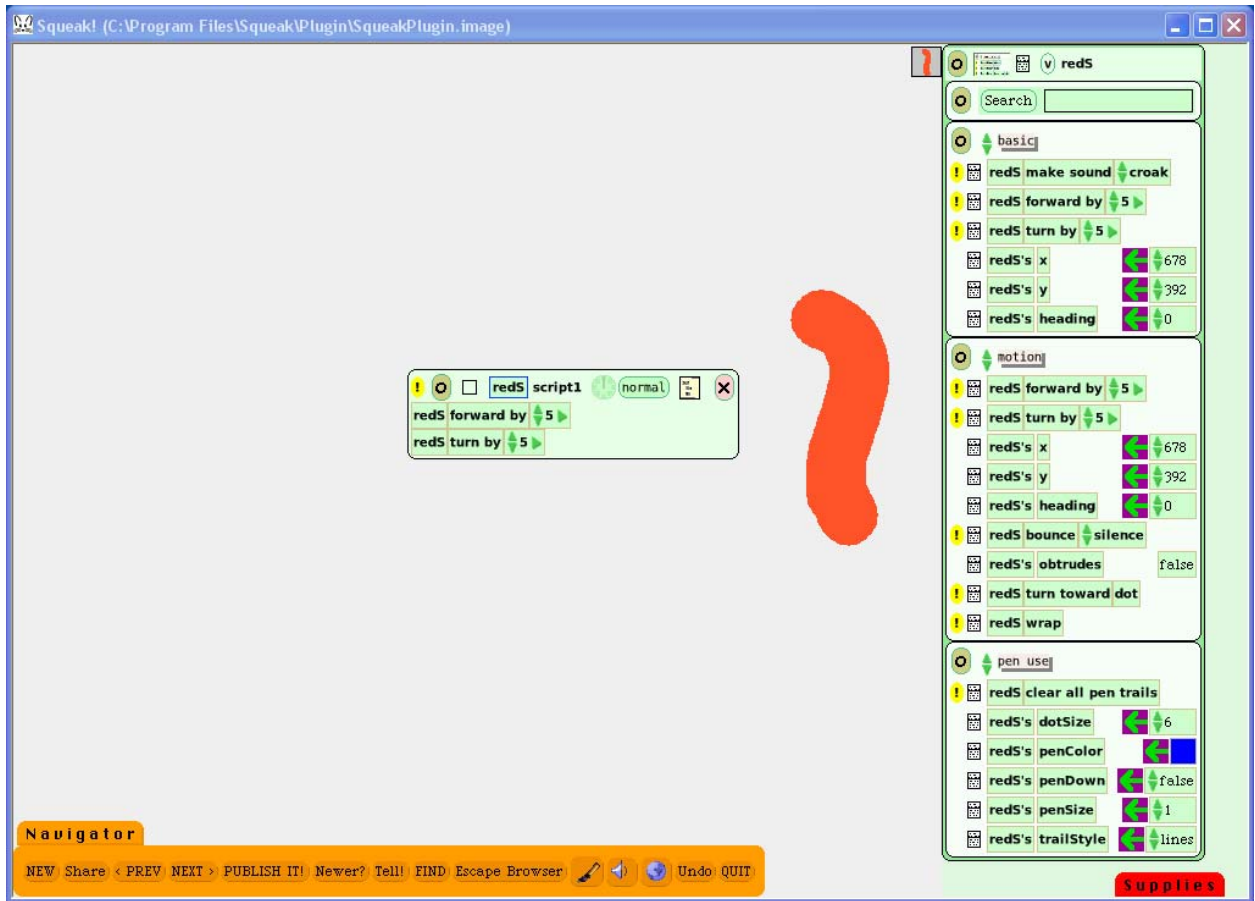
Experiment with these two script tiles. Start one and then the other. Change the forward and turn number values by using the little green arrows next to them. Or, highlight the number in the script and type in a new number. After typing in a number press the word 'enter' or 'return' on your keyboard to make the change effective. If you do not press on enter or return the new number value is not recognized by the script and no change will occur.

Change the '5' in the forward script to a new number '20'. Try steering your object around the outer edge of the screen. Notice the numbers in the viewer pane for 'x' and 'y' and 'heading'.

Run the script. Play, play, play.

Motion and Pen Use: Step by Step Project 2

In this project, write a script that makes an object move and leave a pen trail of the path it has traveled.



Motion

Make a script with forward and turn.

Change the forward number to 30. Leave the turn number at 5.

Click on the word 'basic' in the script panel and a list of script panels appears.

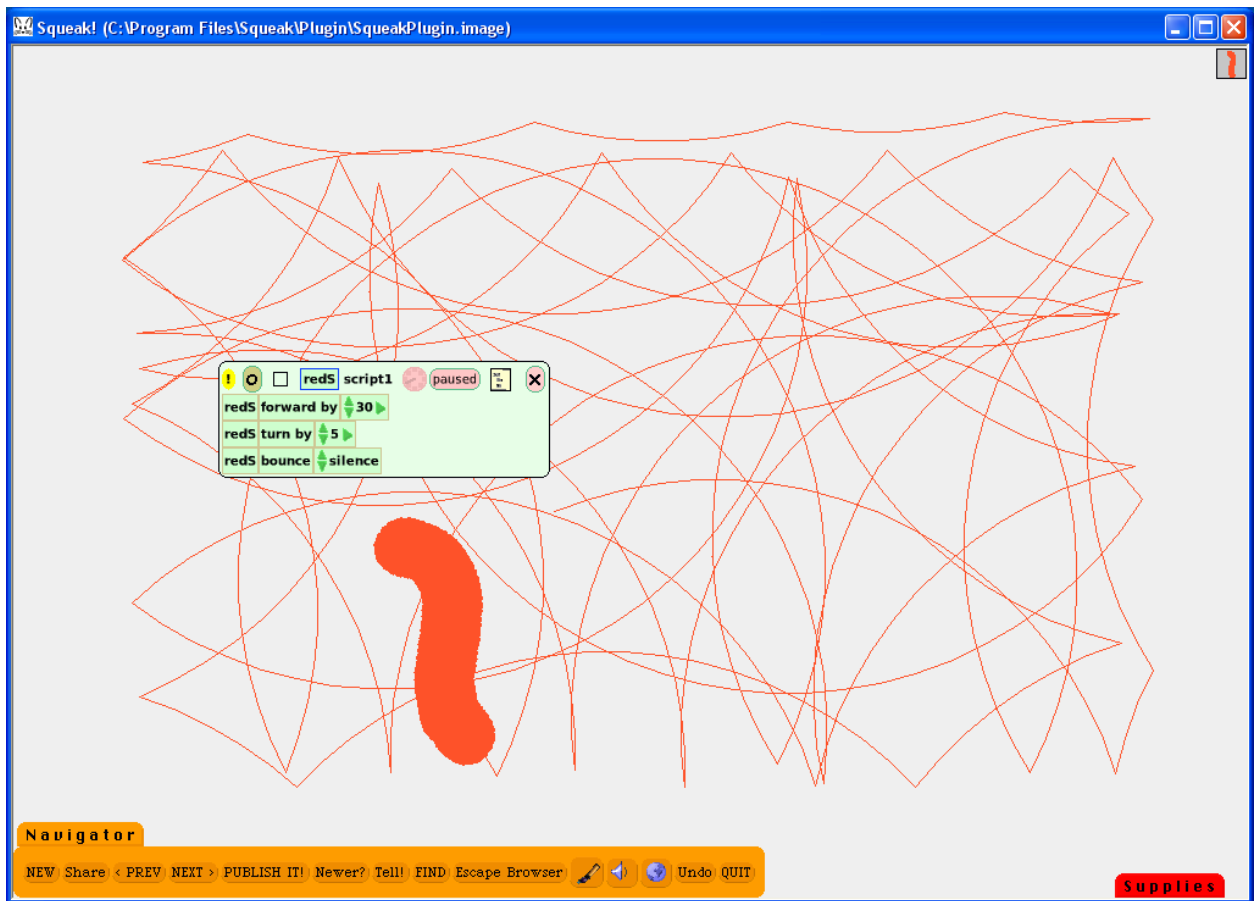
Choose 'motion' and this will open a different panel of scripts.

Click and drag the phrase tile 'red S bounce silence' into the script and drop

it onto the bright green area that appears inside the script box. Adding bounce to a script will make the object bounce back into the middle of the screen. A script with forward will go up on the 'y' axis and bump, bump, bump when it gets to the top edge of the screen. The effect is different when bounce is added. A script moving up on the 'y' axis will bounce and move down on the 'y' axis to the place where it began and then it will continue going down until it gets to the bottom edge of the screen where it will bounce up again. If the object's script has a forward and a turn phrase tile in the script then the bounce is an angle.

Click and hold on the word 'silence' and a list of sounds appears. Choose one.

Pen Use



Click on 'basic' in the script panel, a list appears. Choose 'Pen Use'.

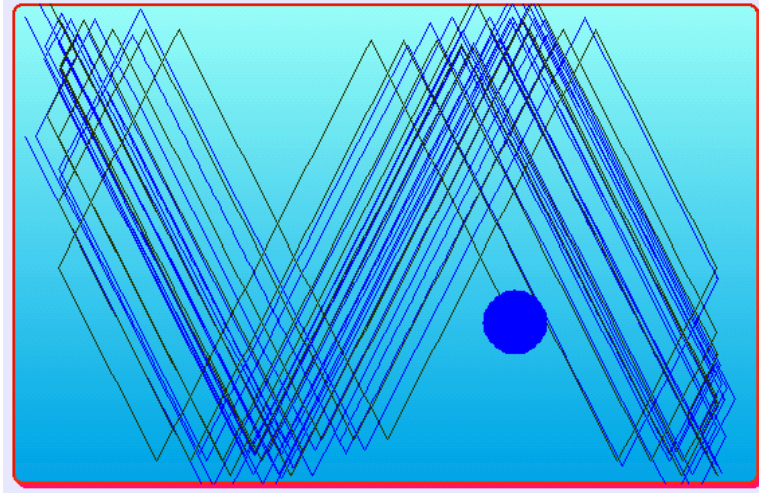
Click the tiny green up/down arrow in the tile 'red S' penDown to change the 'false' to 'true'.

Click the tiny green up/down arrow in the tile 'red S' penSize to change from 1 to 2 or 3 or 4.

Click the blue square next to the tile 'red S' penColor to open a paint pallet and select the color of the pen trail for this object.

Start the script and notice the pattern the pen trails make. Change the trails.

The Squeakcmi community can answer questions, share ideas, and schedule workshops.



Email: squeakcmi@uiuc.edu

Web site: www.squeakcmi.org

Squeakcmi Swiki: <http://squeakcmi.org:8080/super/gallery>



www.squeakland.org is the original source for Squeak.

www.squeak.org has technical information about Squeak.