SqueakCMI Notebook:
Projects, Tools, and Techniques

Introduction

Welcome to eToys/Squeak: an object-oriented programming language. This notebook was written to introduce Squeak to curious beginners with step-by-step descriptions of projects and how they were done.

Advice is freely given in the hope that the path you take to learning eToys/Squeak is quick and smooth. The Squeak community will be generous with their time, their knowledge, and their willingness to help newcomers. The Office for Mathematics, Science, and Technology Education at the University of Illinois Urbana-Champaign invites you to use these materials to the benefit of students everywhere.

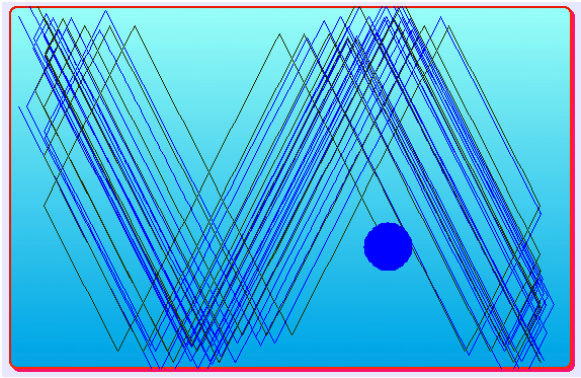
These projects can be explored on the computer by opening them from www.Squeakcmi.org. This dynamic experience of projects on the computer in conjunction with the written materials should give you a range of ideas and possibilities to combine in many ways and for many purposes.

Section I

This section contains two easy projects designed to help you get started with Squeak. They are followed by an extensive description of the rich resources, tools, icons, supplies, and conventions that make Squeak what it is.

Section II

This section explains more complicated projects. They are in alphabetical order by the name of a Squeak tool used predominantly in that project. The projects are not in sequential order by level of difficulty. The project's name can be used to locate that project atwww.Squeakcmi.org. So, if you wonder, "What is a scale factor and how could it be used in a Squeak project?" you can find out.



www.SqueakCMI.org
Resources, projects, tutorials, and standards-based lessons applying Squeak in math, science, language arts, social science, and art. Additional projects and essays can be found on the website. Tutorials developed by math specialists show the myriad ways Squeak enriches the study of geometry and trigonometry. The SqueakCMI community can answer questions, share ideas, and schedule workshops.

www.squeakland.org
The origin of Squeak: software, tutorials, and example projects. Get the most current versions of the software at Squeakland. The site includes interesting essays about the nature of learning, about programming and thinking.

www.squeak.org
Technical information for experienced programmers and developers

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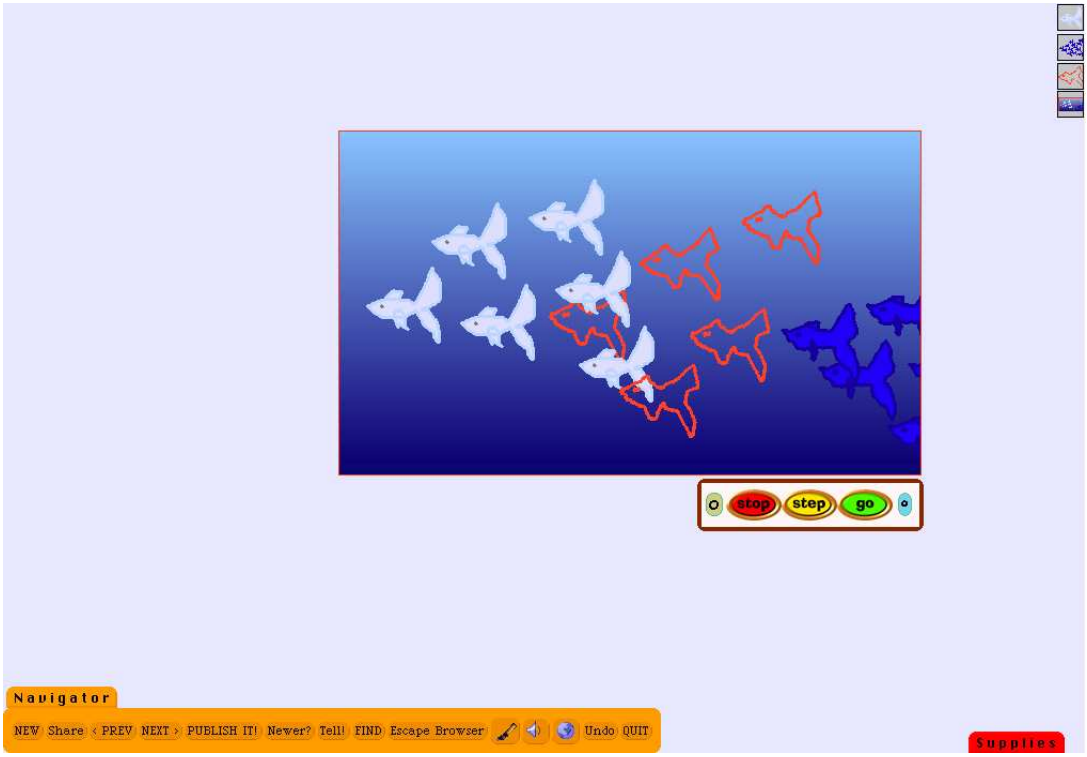
All Scripts2/stop-step-go: fishschoolsnb

This project uses an All Scripts button which starts and stops all of the scripts at the same time. The fish are on a playfield. Two schools of fish were created using the green halo handle and the other school used the stamp tool in the paint palette. There are more than a dozen fish but, there are only three scripts controlling them. The fourth script is for the playfield.



Draw a fish using the paint palette and keep it. Get the halo for the fish.

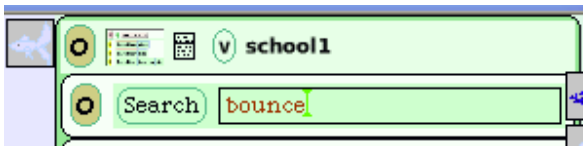
Click on the cyan handle  to open a viewer of script panels. Highlight the word sketch at the top of the panel and give the fish a meaningful name.

This fish drawing is about to become a school of fish so it is named school1.

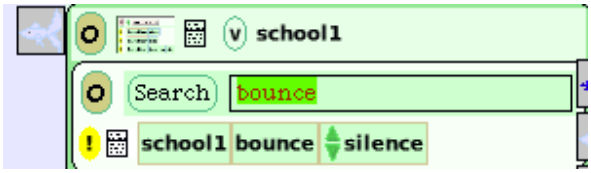
Please notice that the word sketch is at the very top of the viewer and it is that which must be chosen to change the name of the script and script tiles.

Just below the word sketch is the word Search which is followed by a temptingly empty box with a type-right-here kind of green cursor showing. The purpose of this box is to help you find a script tile that you want quickly.

Try it. Type the word bounce in the box by the word Search and press Enter on the keyboard.



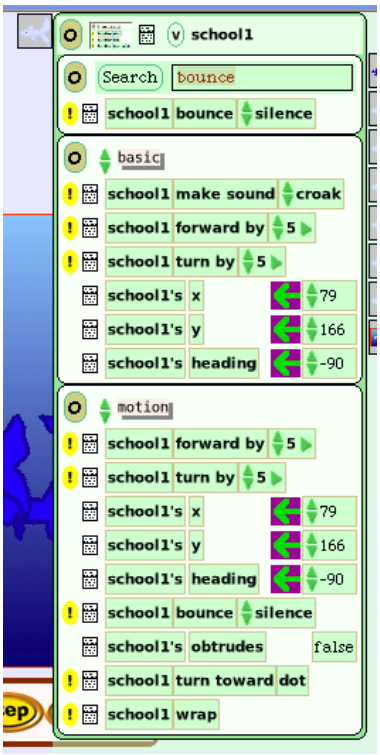
This opens a new category section and puts the script tile “school1bounce silence” there ready for you to click and drag it into a script.



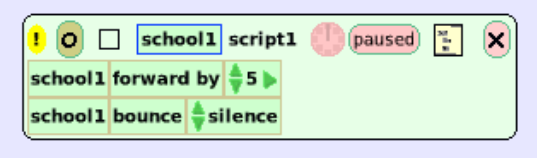
Bounce is found in the Pen Use category. You can always find it there too. The search feature is intended to make it quick and easy to find a tile that you already know the name of and you have a purpose for it.

This project will use bounce in the scripts so leave it there for now.

The script name has been changed to “school1” and all the tiles in the viewer panel show that name for the fish.



Click on the tile school1 forward by 5 and drag the copy of it out onto the screen and drop in an empty place away from the viewer panel of scripts. Then add the tile phrase school1 bounce silence to the script box. You can click on the tile underneath the word search and drag the tile’s copy into the script box. Or, you can click and hold down on the word basic and open a menu list which includes the motion category. You will find the same tile there.



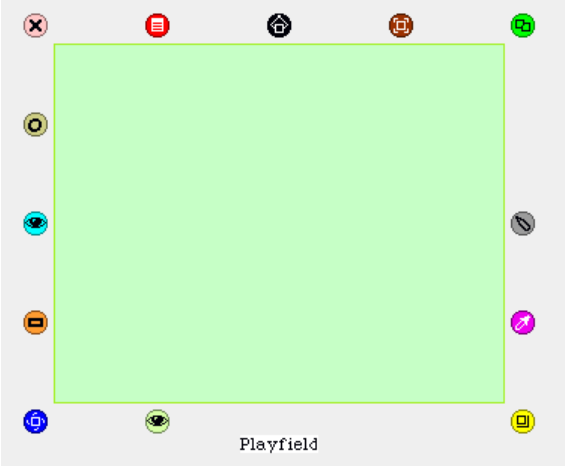
This is the script for the fish you have called school1 and now the fish can be copied and all the copies will follow the script you have written for the original fish.

If you make the copies of fish1 before you write the script, the copies do not have a script and you must open a viewer for each copy and make a script for it. This is useful to know if you want many objects that look alike but behave in different way. For example you might spend an hour drawing a very detailed example of a fish and this drawing can be used and modified in a project so that the copies are not exact after you finish with them.

If you make the copies of the fish after you write the script for fish1 the copies look like the first fish and they have the same script. They and their scripts can still be changed using the halo handle's cyan eye.

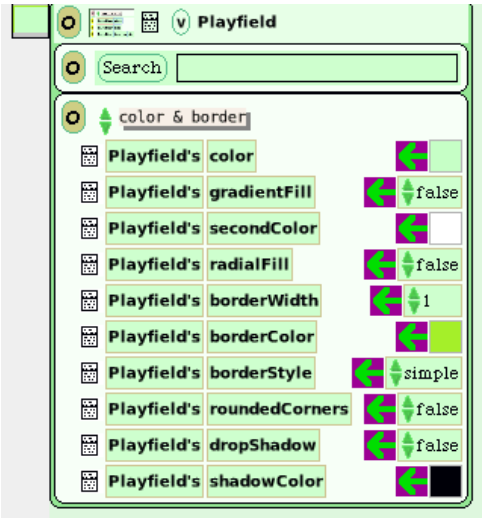
Get the halo for the fish and use the bright green handle  to make as many copies as you wish. Each fish will follow the same script but because they are placed in different locations on the playfield, each fish will move in its turn to edge of the playfield and then will bounce back in the other direction. Drag the bright green arrow in the direction you want the fish to move when the scripts start.

Add a playfield to this project by clicking on the Supplies flap and dragging out a copy of the one you find there. Get the halo for the playfield.

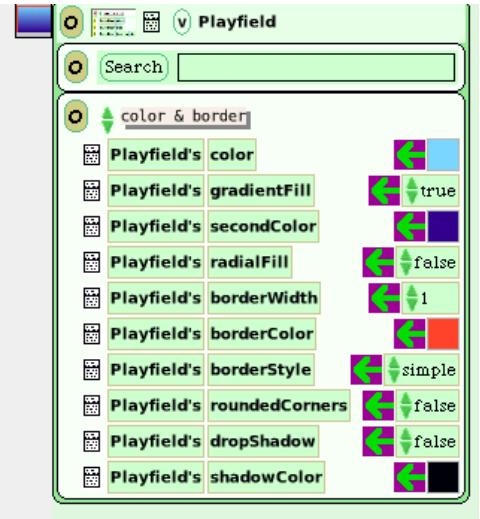


In this project, the playfield stays in one place (playfields can be scripted to move just like any other object in Squeak) but the color has been changed to make it look more like an aquarium. There are two ways to do this. Use the magenta paint brush in the playfield's halo. Or, use the cyan eye to open a viewer for the playfield and make the changes there.

These are the playfield's properties when you drag one out of the Supplies flap.



Here is the same playfield's color and border viewer with changes made.



There are many property tiles in this viewer panel. Each of these can help make a project more like what you want it to look like.

Changes and choices like this take time to get used to but experimenting with them is a good use of time. It builds your own vocabulary of ideas.

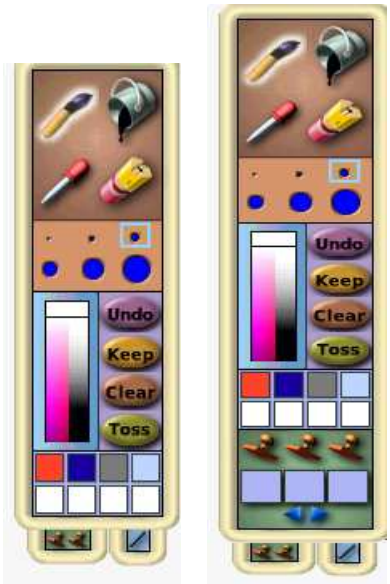
Put each of the school1 fish into the playfield.

To make the other fish and have them look similar, click on the paint brush in the Navigator flap and open a new paint palette. The light haze of color that appears with the paint palette will allow you to trace a shape in another color. That is what this project shows for the red outline fish.

A script was written for the first red fish and then copies of the fish were made using the bright green halo handle. The direction arrow in the halo was changed for the first red fish too. These red fish were put into the playfield too.

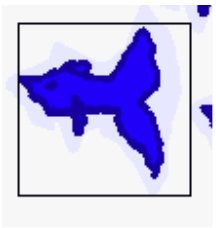
The dark blue school of fish was made differently. Open the Navigator flap and use the paint brush to trace a copy of the original fish using a darker blue color. Fill in the outline using the paint bucket.

Click on the white loop on the lower left side of the paint palette to open a set of rubber stamp tools.



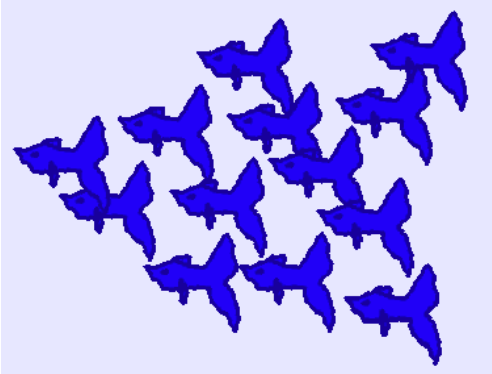
Click on one of the stamp tools. 

It will change from the stamp into a tool that looks like a right angled corner. Click and drag this angle to draw a box around the part you want to copy.



This stamp tool will allow you to make any number of copies. These will all be treated as one object though when you click on keep and write a script for the school of fish you created.

Here is the school of fish made using the rubber stamp tool in the paint palette.



Get the halo for the school of bluefish and click on the cyan eye to open a viewer of script panels.

Change the name from sketch to something meaningful like blueschool. Change the forward direction by clicking on the bright green arrow and dragging it to point to the left (for these fish anyhow).

Now start and stop each script of the three scripts so that all show ‘paused’ instead of ‘normal’. If you do not do this, the All Scripts (stop-step-go) button can not work the way this project uses it. The go button has a help balloon which says “Resume running all paused scripts”. So, if a script is not

already set to paused, then clicking on the go button will not have any effect.

Open the Supplies flap and draw out an All Scripts button and drop it on the screen in an empty place outside of the playfield edges.

Click on go to start all the fish swimming forward.