

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.

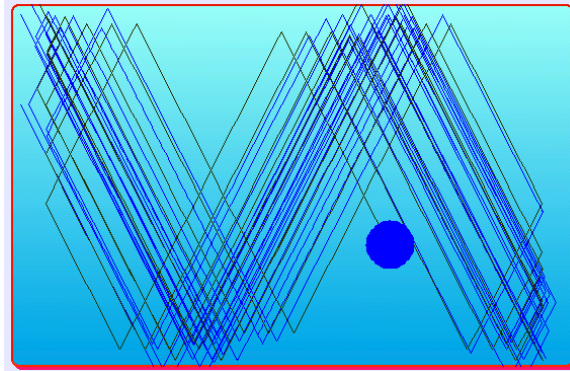
Section II

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 at www.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

The Office for Mathematics, Science, and Technology Education
University of Illinois Urbana-Champaign





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

Kathleen Harness

squeakcmi@uiuc.edu

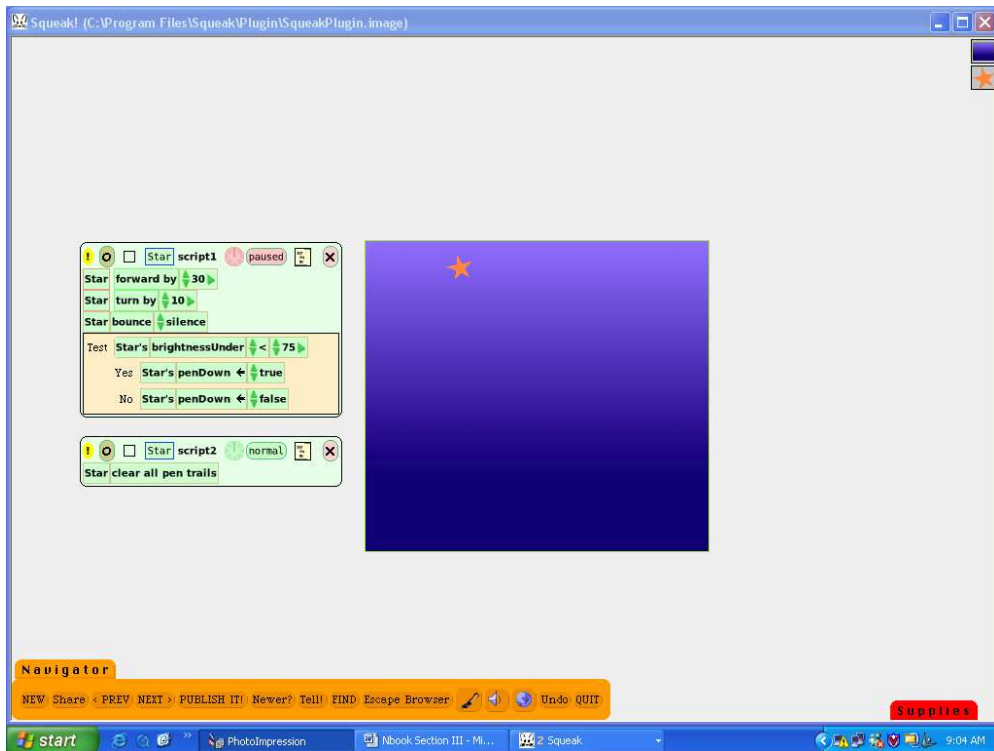
www.Squeakcmi.org

The Office for Mathematics, Science, and Technology Education
University of Illinois Urbana-Champaign

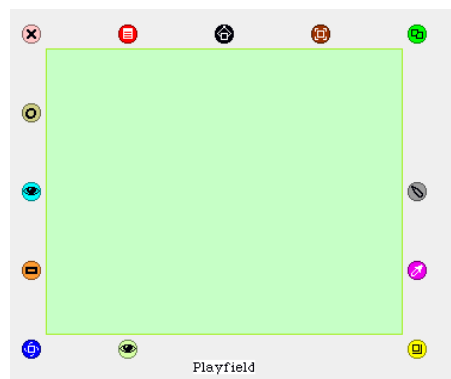


Gradient fill: gradientfillplayfieldnb

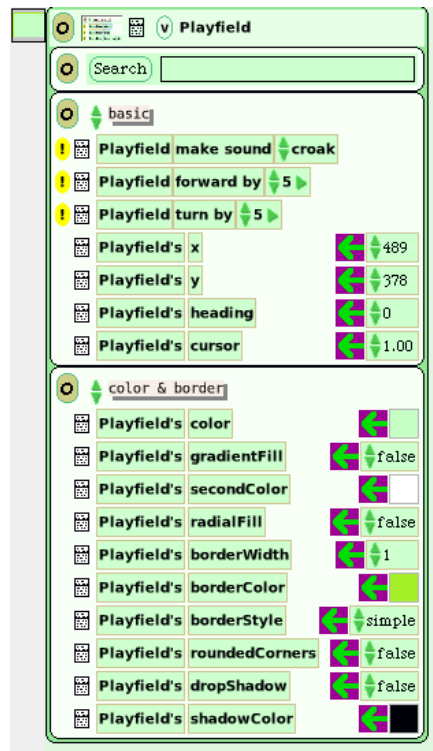
Learn to use gradient fill in projects. There are many ways this can be used to cause effects in a project. In this example the star will leave a trail of dots when the brightness of the background underneath it is less than 75.



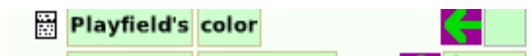
Open Supplies and drag out a copy of a playfield. Click on the cyan eye in the halo of handles and open a viewer panel of scripts.



Playfields are one of approximately fifteen objects from Supplies or the Object Catalog that are provided with a large number of options to change the appearance of the color and the border of the object. The things you draw using the paint brush from the Navigator flap will have much more limited options for color and border so those must be drawn with the kind of detail you want in your finished drawing.



Change the color of the playfield by clicking in the light green box to the right of the Playfield's color script tile.

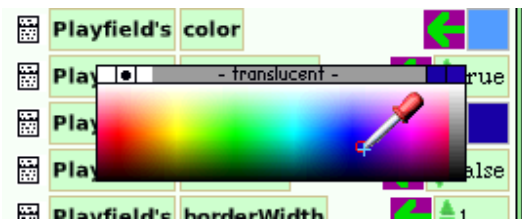


This will open a paint palette and a color chooser.



Now change the statement Playfield's gradientFill to read true rather than the false. Use the tiny green up/down arrows. There are only two choices: true and false.

The color will shade from your first choice color to some other color. If you do not like the second choice color that appears then, just click in the small box to the right of the tile Playfields secondColor and use the color chooser and paint palette that appear.

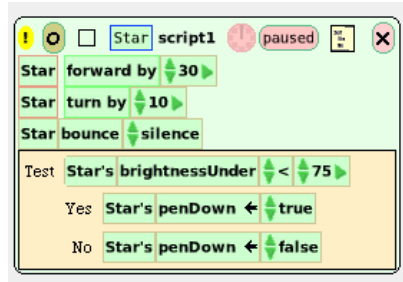


The playfield colors will shade gradually from your first choice color to your second choice color.



Open Supplies, drag out a Star and drop it in the playfield. Use the cyan eye in the halo of handles to opening the star's viewer panel of scripts. Use Color and Border choices to change the star. Put the star on the playfield. The finished script will look like this.

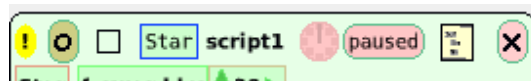




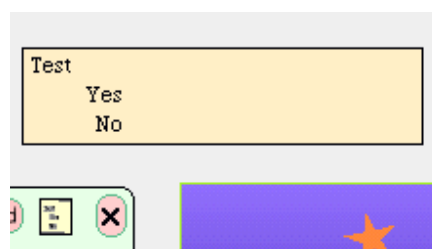
Drag star forward by 5 and drop it on the screen but not in the playfield. Change the number to 30 or some other number that will make the star move far enough to touch against the side of the playfield. Add star turn by 5. This script shows turn by 10 to make the curve not as sharp as the one if 5 is the value. It is a matter of your choice, so choose.

This project includes a test so that the pen trail will only show in part of the playfield.

Get a test form by clicking on the small beige and black box to the left of the pink oval with a black X in it. This will give you a copy of a test form to drop into the script you are building.

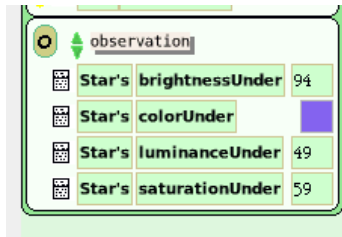


Drop the test into the script below the first three statements you have there already.



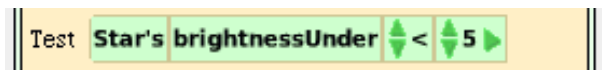
Click on the basic category of script tiles and hold down to open the menu of other categories. Choose observation by clicking on it. This category of tiles can be used to determine where and when the star makes a pen trail.



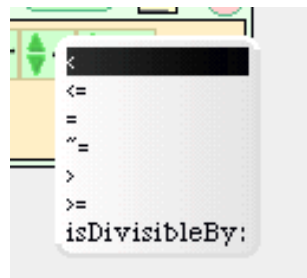


Drag a copy of the phrase Star's brightnessUnder into the test form and drop it in the top line of the test form.

The tile changes form after you have dropped it to look like this. The additional arrows, the math symbol < (less than), the number five, and the arrow pointing right are all added when the tile is dropped into a test form.



Open a menu of choices by holding down on the '<' to see all of them at one time. The tiny green up/down arrows allow you to scroll through the choices without opening the whole list.

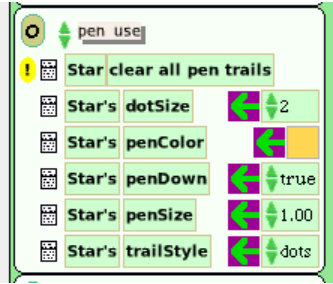


This project uses the '<' which mean 'less than'. So, if the degree of brightness under the star is less than 75, the pen will be down and leave a pen trail of dots.

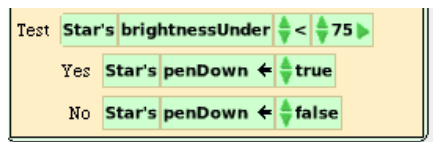
This example uses dots instead of the default lines in the star's pen use category in the viewer panel. The dot size was changed to 2 and the color of pen trail was changed too.

Here is the list of pen use options and the choices for this project show.

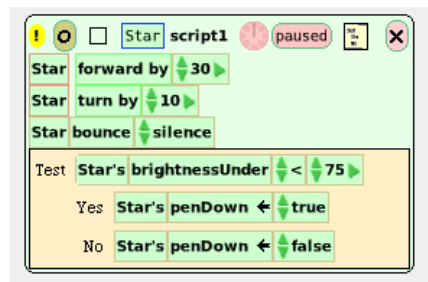




The tile Star's pen down true will be dragged into the test form and dropped by the word yes. The same phrase tile but with the choice false will be dropped into the test form by the word no.



The finished script looks like this.



The phrase clear all pen trails was dropped in a blank part of the screen to open a new script that will make it easy to erase the pen trails from the playfield. Click on the yellow oval with the exclamation mark to run the script one time. Or use the start and stop clock next to the word normal.

