

# Tech News

## Sorry for missing an issue

I'm sorry that I didn't have time to write a *Tech News* last week—the time I usually would have spent on that was spent instead on getting the parts needed to make soda-bottle rocket launchers. We built 6 of the launchers last week, and I had 6 sets of parts. One set of parts was sold to the parent of a second grader, the other was auctioned off at the Night of the Arts on Saturday. If anyone wants to make their own soda-bottle rocket launcher, and couldn't make last week's session, there are instructions on the web at <http://www.soe.ucsc.edu/~karplus/abe/soda-bottle-rocket.pdf>

## How to animate a flip

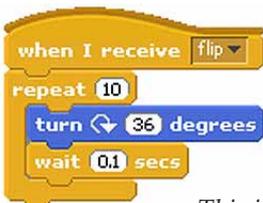
Just about everyone has made the cat walk across the screen as a simple animation. We can use some of the same tricks to do fancier animation, like making a person or stick figure do a flip.

There are two components to the motion of a flip: turning the body 360° and moving it. As in walking, where the movement and the costume change were in different scripts, we can have the turning and the moving in different scripts. (If you want, you can also change the costume in a third script.)

The turning is fairly simple—just rotate 36° ten times with a 0.1 second wait to do a 1-second flip.

The movement is a little messier, depending on how realistic you want the motion to be. The simplest thing to do is to use two glides. It helps to move the rotation center for the sprite also, to make it at or above the center of gravity for the image.

Running both scripts off the same trigger works ok, but the movement is a bit awkward, because the rotation script and the glides may not stay synchronized, particularly on a slower machine.



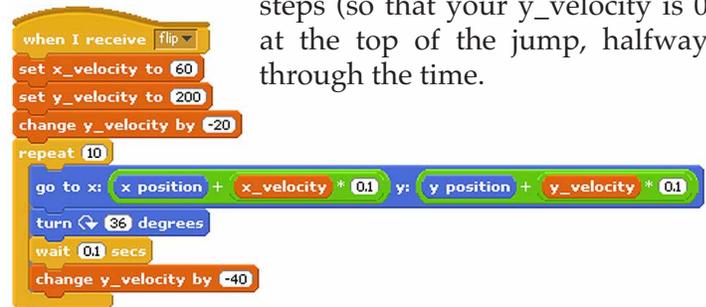
This is the two-script version of the flip.



One can tweak the delay time to make it work better on one machine, but the resulting animation won't be smooth on other machines.

A better solution is to use gravity, which means adding variables for x and y velocity for this sprite only. I like to make the velocity be in pixels/second. Note that I've done half the change in y\_velocity before the first movement, so that the motion is done for the average speed of the sprite during the time interval, rather than the speed at the beginning or end of the time interval.

The gravity script is generally useful. Without the turn, this script can also be used for a plain jump. The height of the jump can be controlled by the initial y\_velocity, but to end up at the same y-value you started at, you have to change the y\_velocity by -2 times the initial velocity, divided by the number of steps (so that your y\_velocity is 0 at the top of the jump, halfway through the time).



Today's Google logo was the result of a contest Google ran for kids. The winner was Grace Moon, a 6th grader from Canyon Middle School in Castro Valley, California. She had this to say about her doodle:

*My doodle, "Up in the Clouds," expresses a world in the sky. This new world is clean and fresh, and people are social and enlightened. Every person here is treated as family no matter who they are. The bright sun heats this ideal place with warmth, love, and brightens everyone's day.*

There were over 16,000 entries, but not all of them are on-line. A few hundred finalists are though, at <http://www.google.com/doodle4google/finalists.html>