SASTA OLIPHANT SCIENCE AWARDS

SOUTH AUSTRALIAN SCIENCE TEACHERS ASSOCIATION

Prize Winner

Programming, Apps & Robotics

Year R-2

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ROWE SCIENTIFIC PTY. LTD. www.rowe.com.au

Australian Government
Department of Defence

Government of South Australia
Department for Education

SASTA South Australian Science Teachers Association

Bouncy Balls Computer Program

I like watching animations of marbles on YouTube, so I wondered if I could make a model of bouncing balls in Scratch.

My Aim

The aim is to make the balls bounce around the screen and off each other as if they were on a table and we looked down on them.

I would like it if the balls bounced off each other in the same way they would in real life.

If it was right, this model could be used to show how balls would bounce around a walled table.

To Run Bouncy Balls

Bouncy Balls can be run in Safari or any other web browser.

To start Bouncy Balls, go to https://scratch.mit.edu/projects/857638581 and click the green flag. The balls will bounce around the screen. Sometimes they get stuck, you can unstick them by moving one of the balls away.

Comments

The balls bounce off the edges properly, but I could not get the balls to bounce off each other properly. My dad said there is some maths to work it out, but I did not understand it and so I could not make the code. Instead, when bouncy balls hit each other, they change direction randomly. Sometimes they get stuck together for a little while and you can move them apart or wait until they unstick.

Also, sometimes only one bouncy ball bounces and the other one does not. I do not understand why. Daddy tried to explain how I could fix it, but it was too tricky.

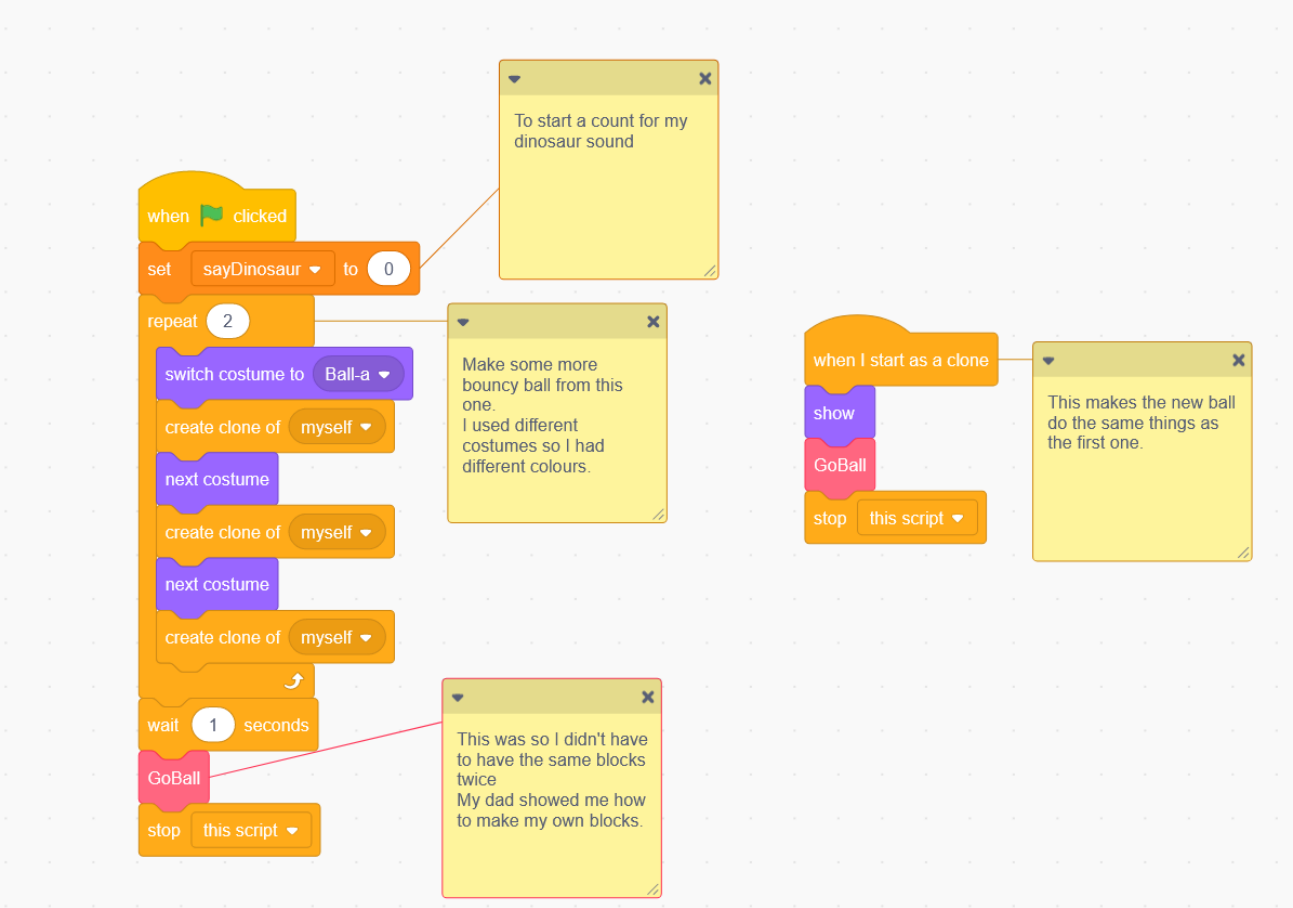
I did not make the balls slow down with friction as they rolled or hit each other either.

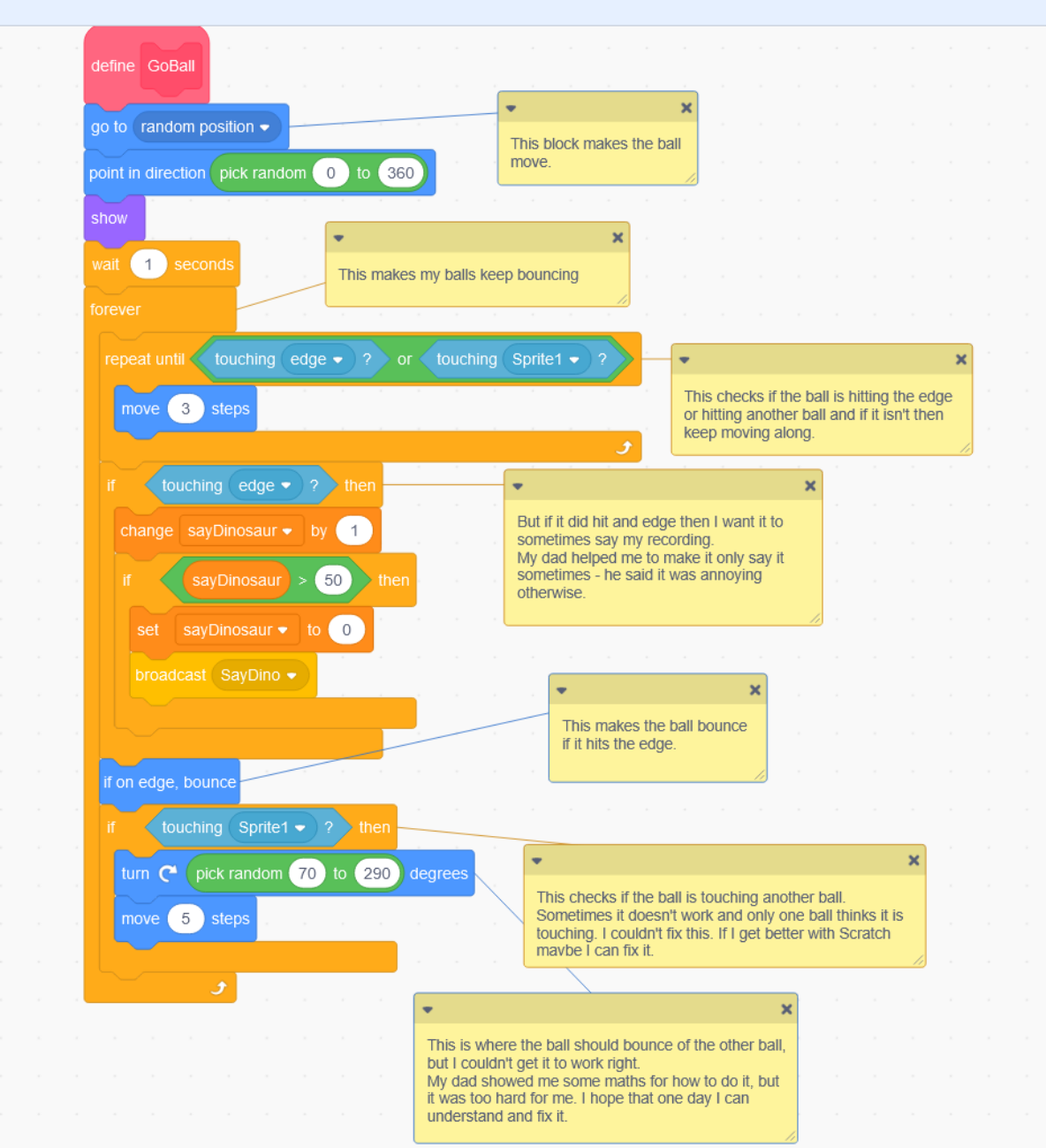
Because I like dinosaurs, I made the balls play a recording after they hit the edge 50 times.

Acknowledgement of Assistance

My dad helped me to start coding in Scratch. He also helped me to code my ideas, search the Scratch forums for help with my problems, and to write this report.

Thanks to Science Max TV show for teaching me about friction. I love that show.


when clicked
set sayDinosaur to 0
repeat 2
switch costume to Ball-a
create clone of myself
next costume
create clone of myself
next costume
create clone of myself
wait 1 seconds
GoBall
stop this script
To start a count for my dinosaur sound
Make some more bouncy ball from this one.
I used different costumes so I had different colours.
This was so I didn't have to have the same blocks twice
My dad showed me how to make my own blocks.
when I start as a clone
show
GoBall
stop this script
This makes the new ball do the same things as the first one.


define GoBall
go to random position
point in direction pick random 0 to 360
show
wait 1 seconds
forever
repeat until touching edge ? or touching Sprite1 ?
move 3 steps
if touching edge ? then
change sayDinosaur by 1
if sayDinosaur > 50 then
set sayDinosaur to 0
broadcast SayDino
if on edge, bounce
if touching Sprite1 ? then
turn pick random 70 to 290 degrees
move 5 steps
This block makes the ball move.
This makes my balls keep bouncing
This checks if the ball is hitting the edge or hitting another ball and if it isn't then keep moving along.
But if it did hit and edge then I want it to sometimes say my recording.
My dad helped me to make it only say it sometimes - he said it was annoying otherwise.
This makes the ball bounce if it hits the edge.
This checks if the ball is touching another ball.
Sometimes it doesn't work and only one ball thinks it is touching. I couldn't fix this. If I get better with Scratch maybe I can fix it.
This is where the ball should bounce of the other ball, but I couldn't get it to work right.
My dad showed me some maths for how to do it, but it was too hard for me. I hope that one day I can understand and fix it.


when I receive SayDino
play sound wearethedinosaurs until done
stop this script
This is a recording of me - I wanted my balls to say something and I like dinosaurs.