20 Computing Science Lessons

Phil Bagge

Computing Inspector/Advisor Hants

CAS Master Teacher

Teacher Ringwood Junior & Otterbourne Primary Schools

Author code-it.co.uk computing resources

Author How to teach primary programming using Scratch

Computational Thinking Symbols

- Algorithmic thinkers

Think through steps or rules to achieve something

- Algorithmic evaluators

Which algorithm is best, most efficient?

- Decomposers

Break problem up into parts and solve parts separately

- Abstractors

Find the most important part of problem

- Generalisers

Adapt solution from one problem to solve something else

I recognise there is more than one way to solve/describe a problem

I don't just accept the first solution

I look for a range of solution to the same problem

I can evaluate my solutions against a set criteria

Handles Ambiguity

Open Ended Problem Solver

I look for how a project can be extended

I can design criteria to evaluate my creations

I can break complex problems into parts

I can contribute useful ideas to a partner or group

Evaluates

Computing Problem Solver

Copes with Complexity

I can discover / concentrate on the most important part of a problem

I can encourage others to share their ideas

Communicates

Adapts

I can identify patterns in problems & solutions

I lead using all the people talent in my group

I can adapt existing ideas to solve new problems

I learn from setbacks and don't let them put me off

Investigates

I can develop, test and debug until a product is refined

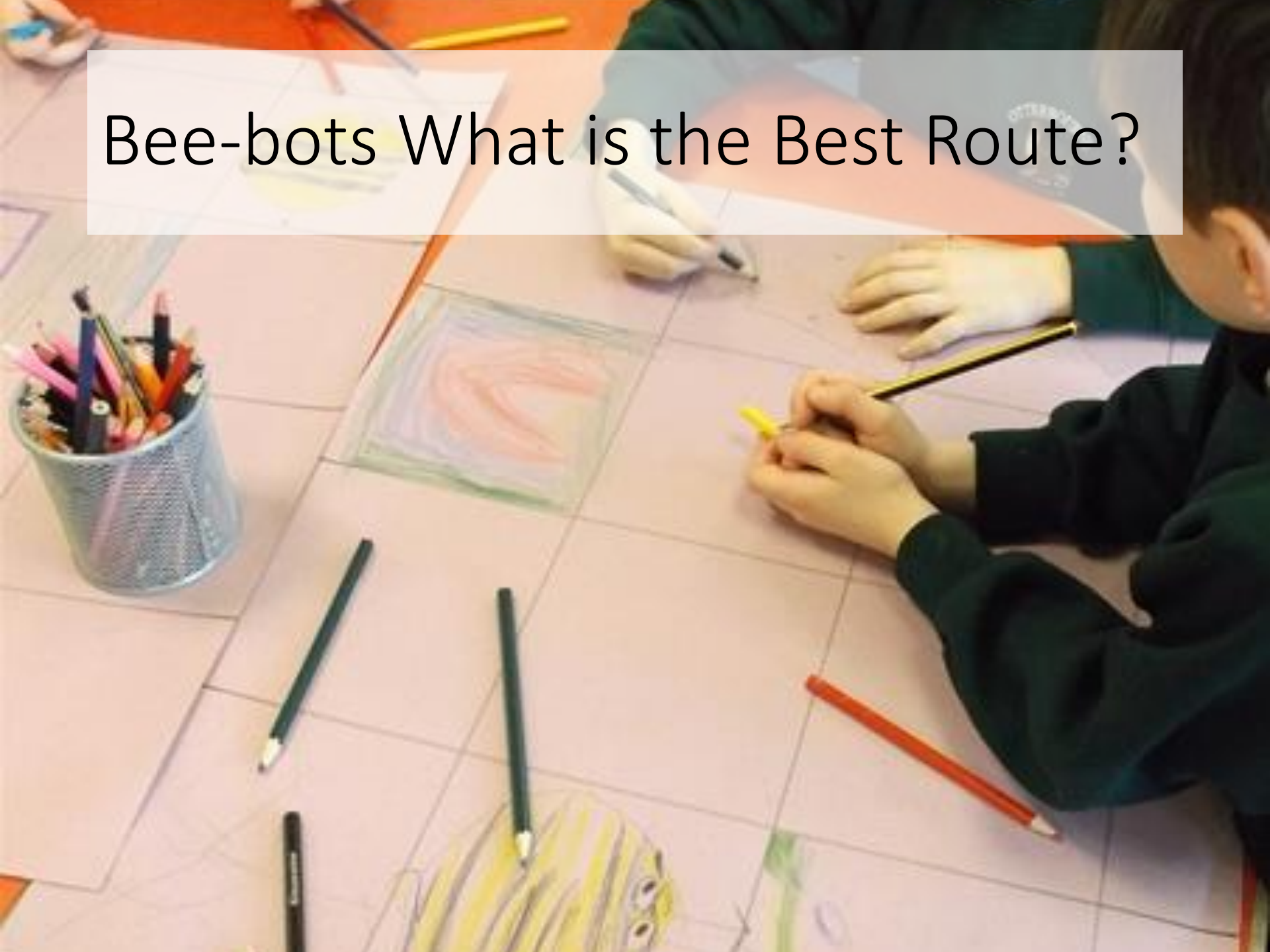
I can persevere even if the solution is not obvious

Perseveres

I repeatedly experiment through making, testing & debugging

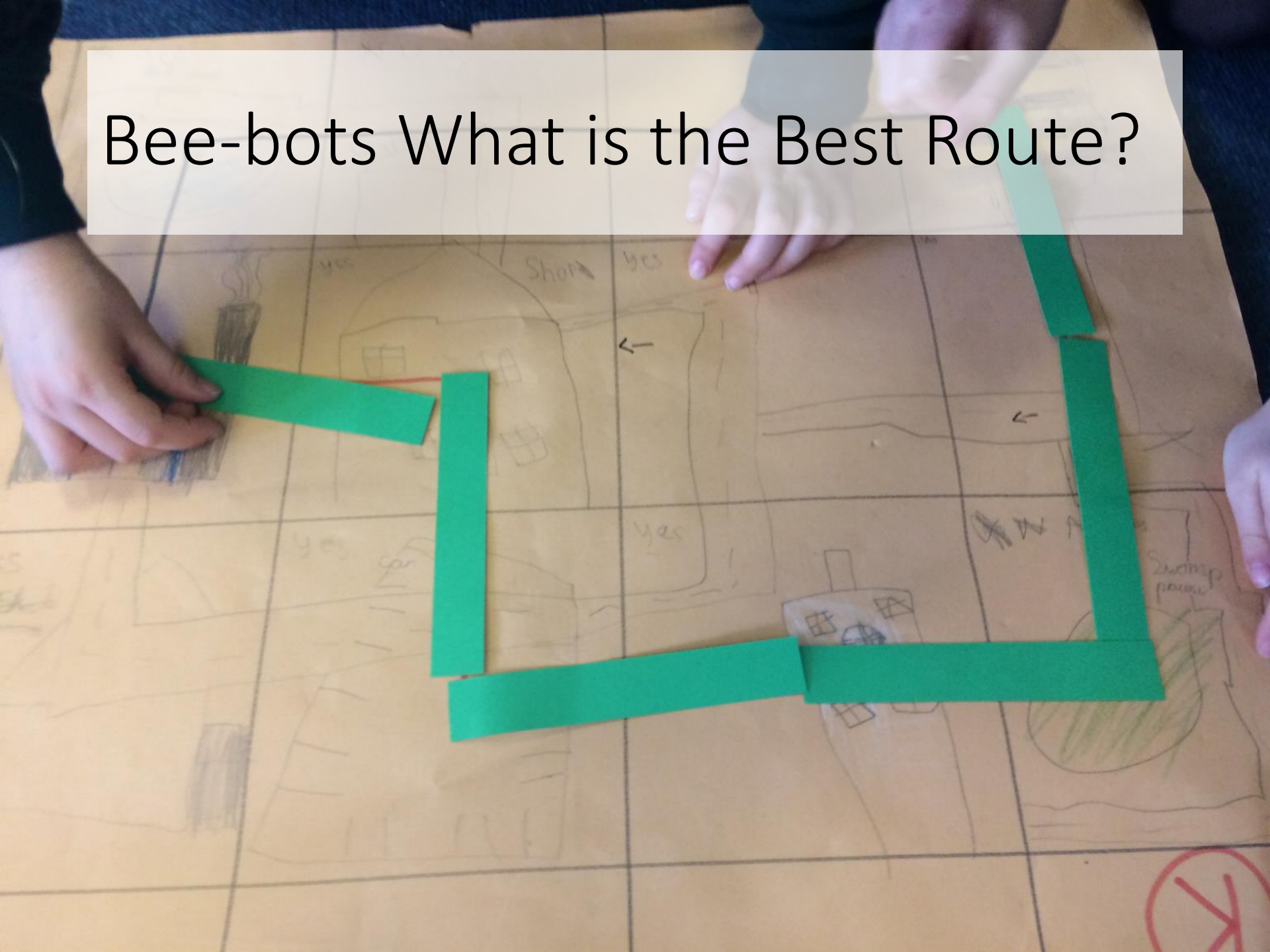
Inspired by Behaviour Rubric created with @MarkDorling and linked at http://code-it.co.uk/attitudes/

Bee-bots What is the Best Route?

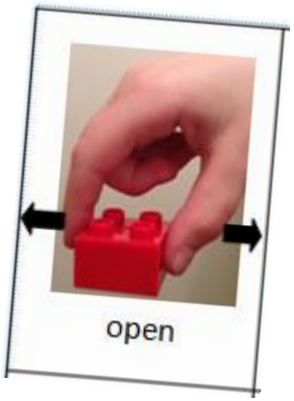


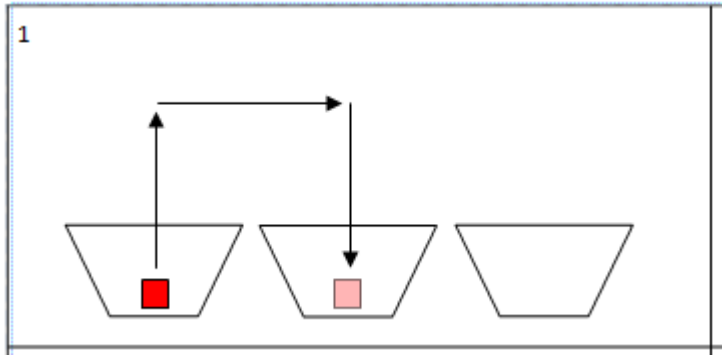
Bee-bots What is the Best Route?

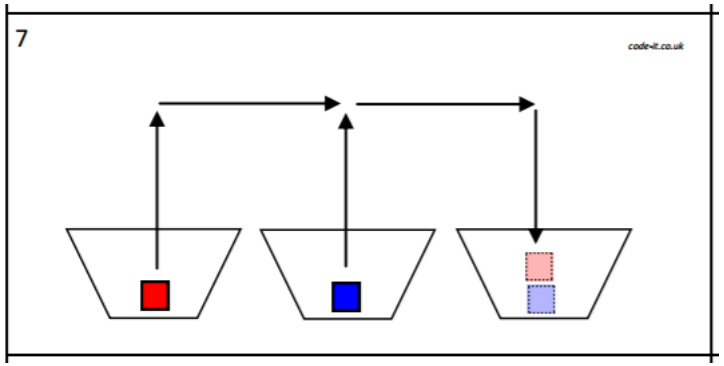
Bee-bots What is the Best Route?

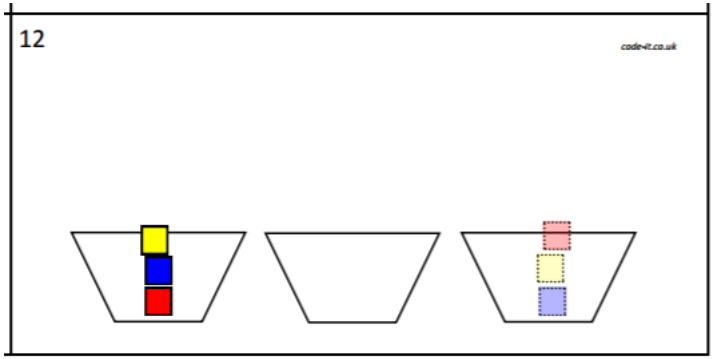


Human Crane Algorithm





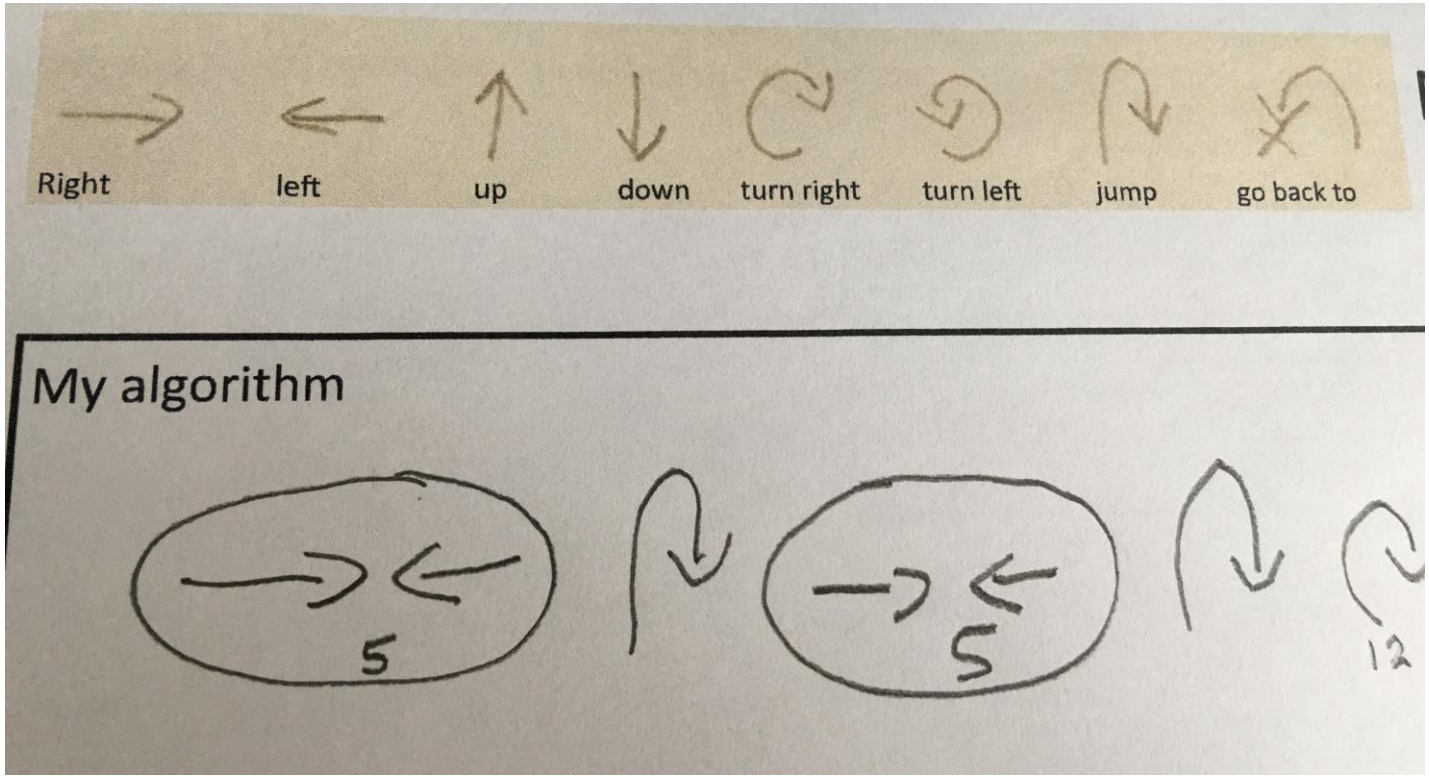


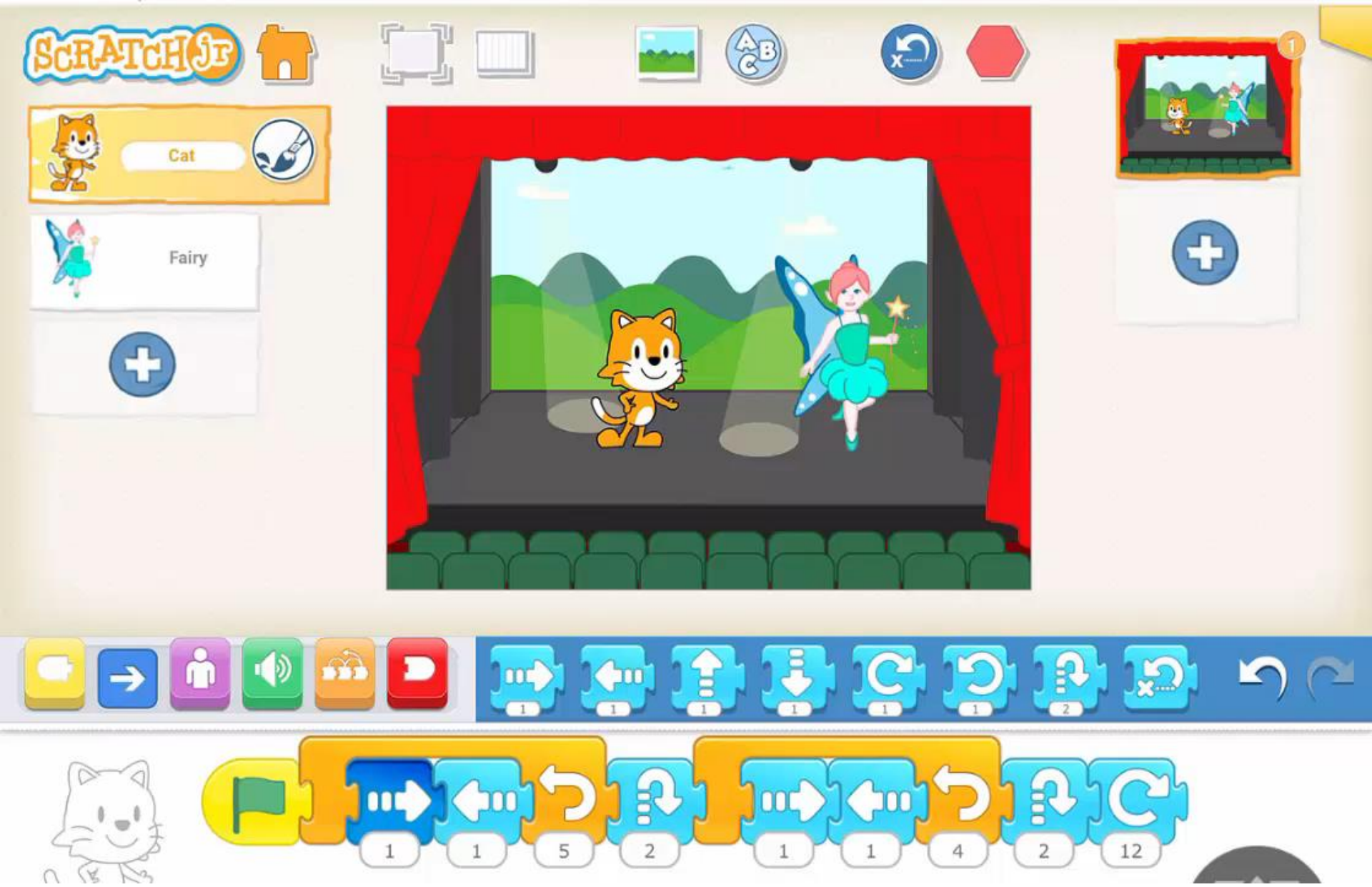


Human Crane Algorithm

Scratch Junior Dance

Scratch Junior Dance



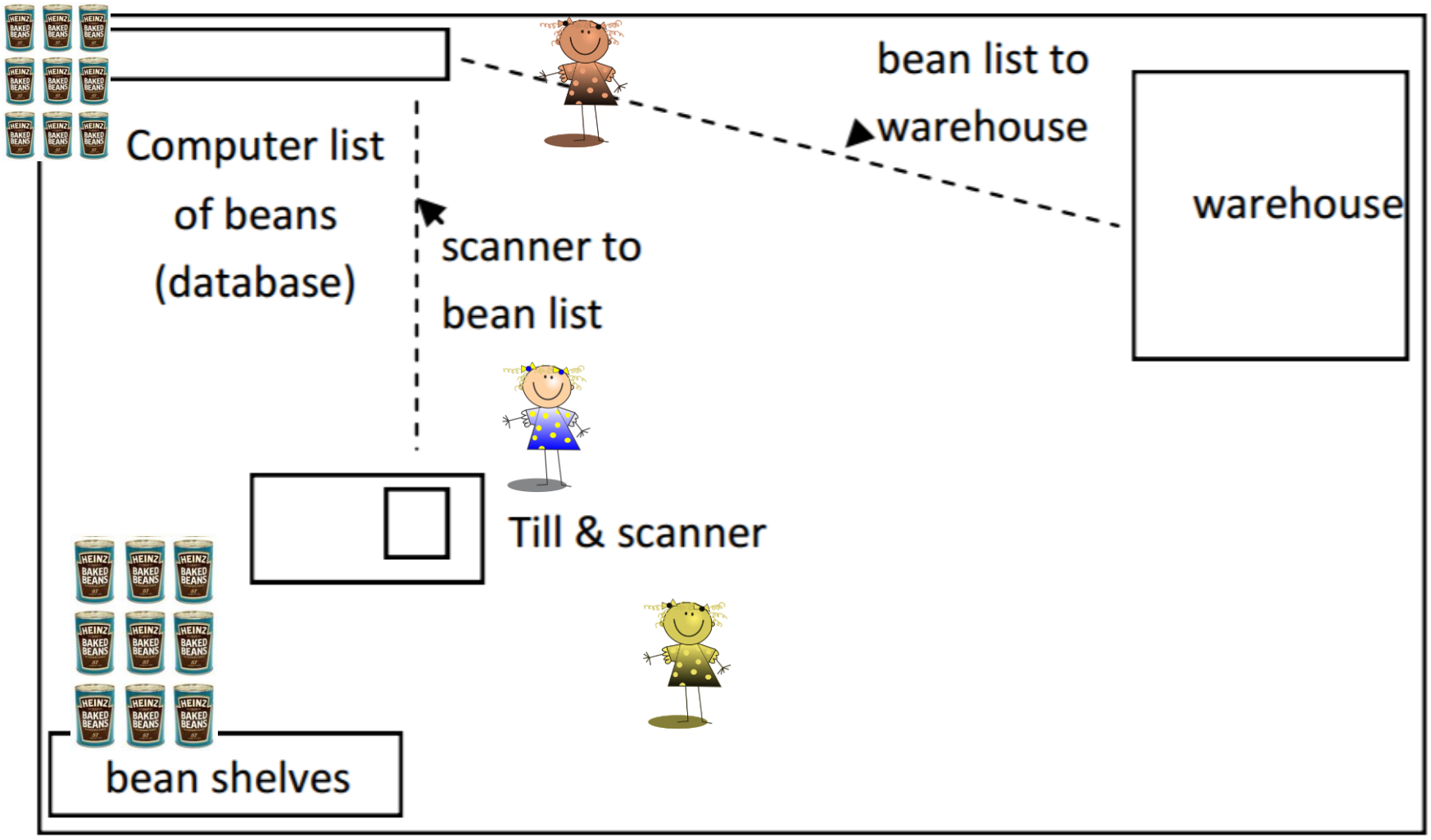


Scratch Junior Dance

Scratch Junior Pathway

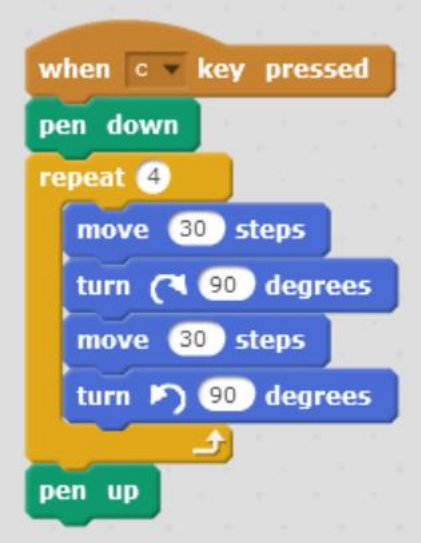
Scratch Junior Pathway

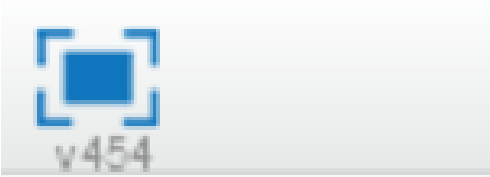
How a supermarket works

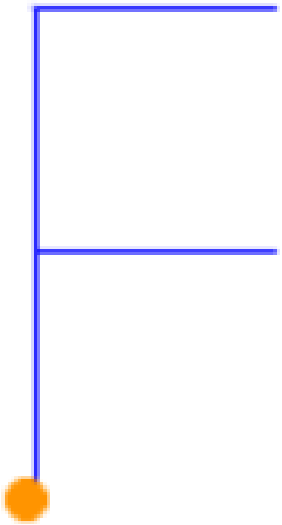


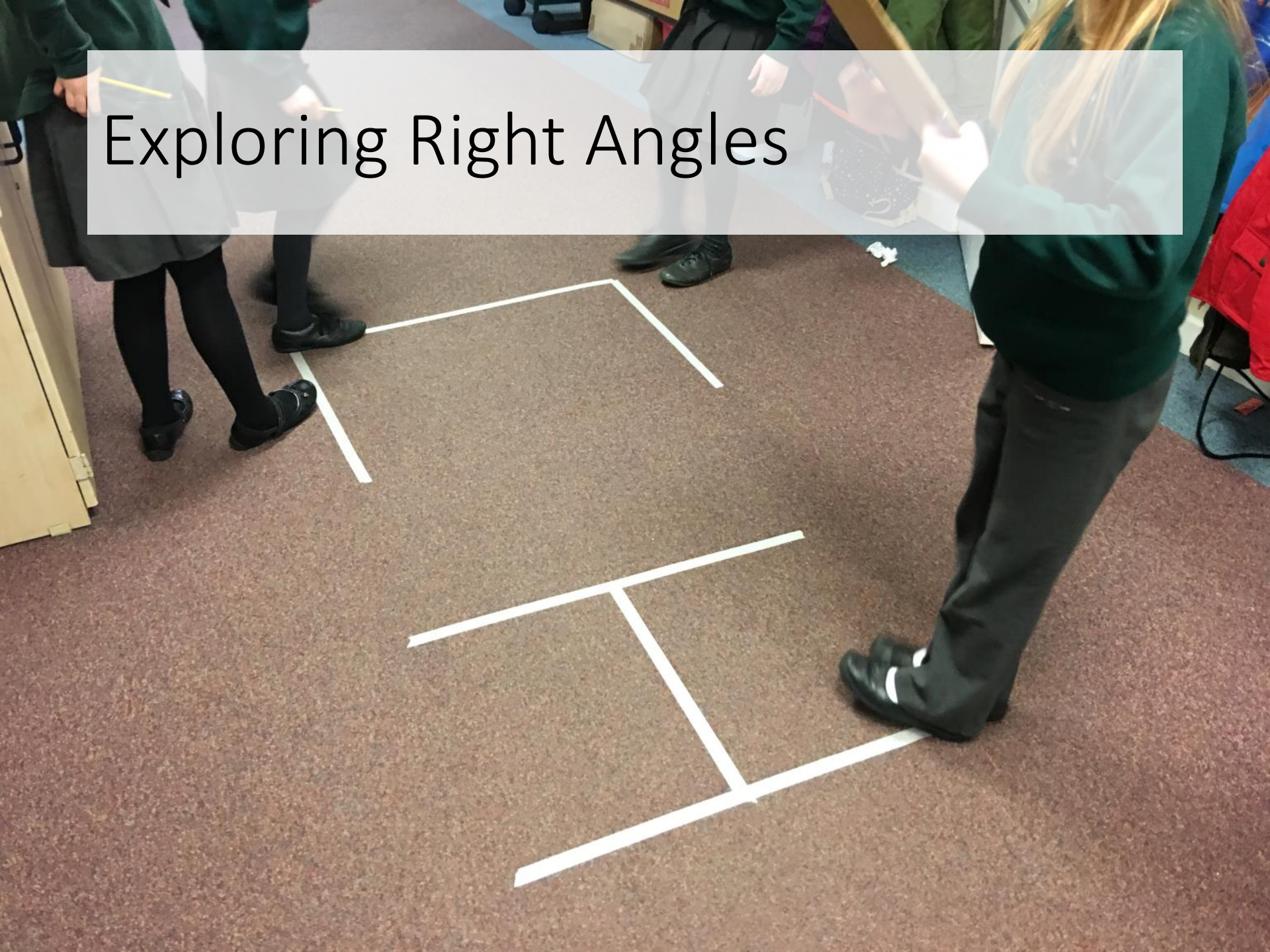
Exploring Right Angles

Exploring Right Angles








Exploring Right Angles

Travel Europe

Aim of the game:

Ask your partner which countries to visit

Steer your character to draw a route

Press i for instructions

Travel Europe

List the objects you will need to make

Child, Europe Map, Country names

instructions, the game

Aim of the game:
Ask your partner which countries to visit
Steer your character to draw a route
Press i for instructions

Europe Decomposition Sheet Answers

Name _____

Class	I debugged	Teacher

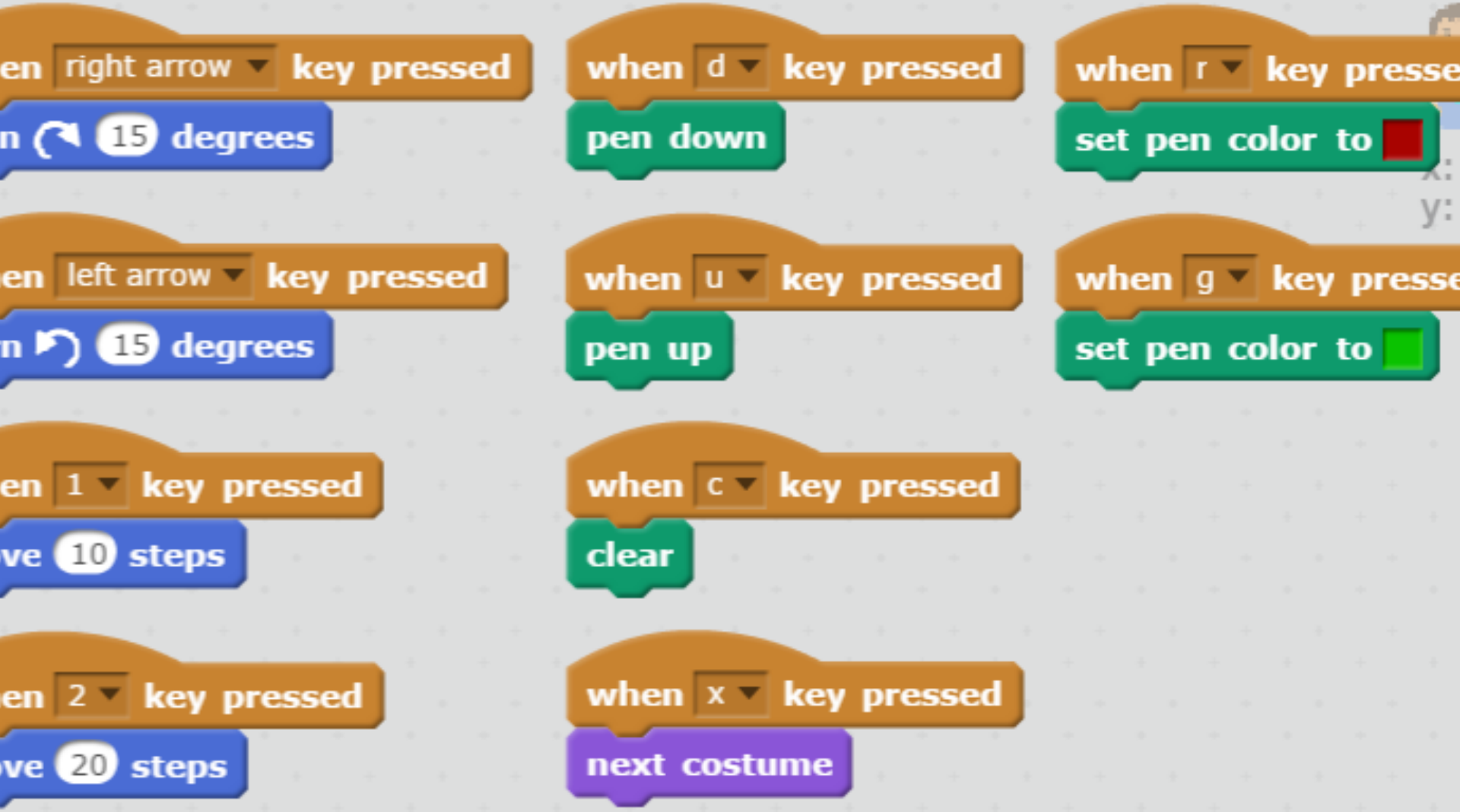
code-it.co.uk

Circle all the things the game does at the moment

- Move when the 1 key is pressed
- Zoom when the z key is pressed
- Move further when the 2 key is pressed
- Darken the background when the k key is pressed
- Turn to the right when right arrow key is pressed
- Spin round when the s key is pressed
- Turn to the left when the left arrow key is pressed
- Grow the child when the g key is pressed
- Leave a trail when d key is pressed
- Stop leaving a trail when the u key is pressed
- Clear all lines when the c key is pressed
- Show instructions when the i key is pressed
- Change to a new background when the x key is pres
- Shrink the child when the t key is pressed

What would you add to the game?

CC BY



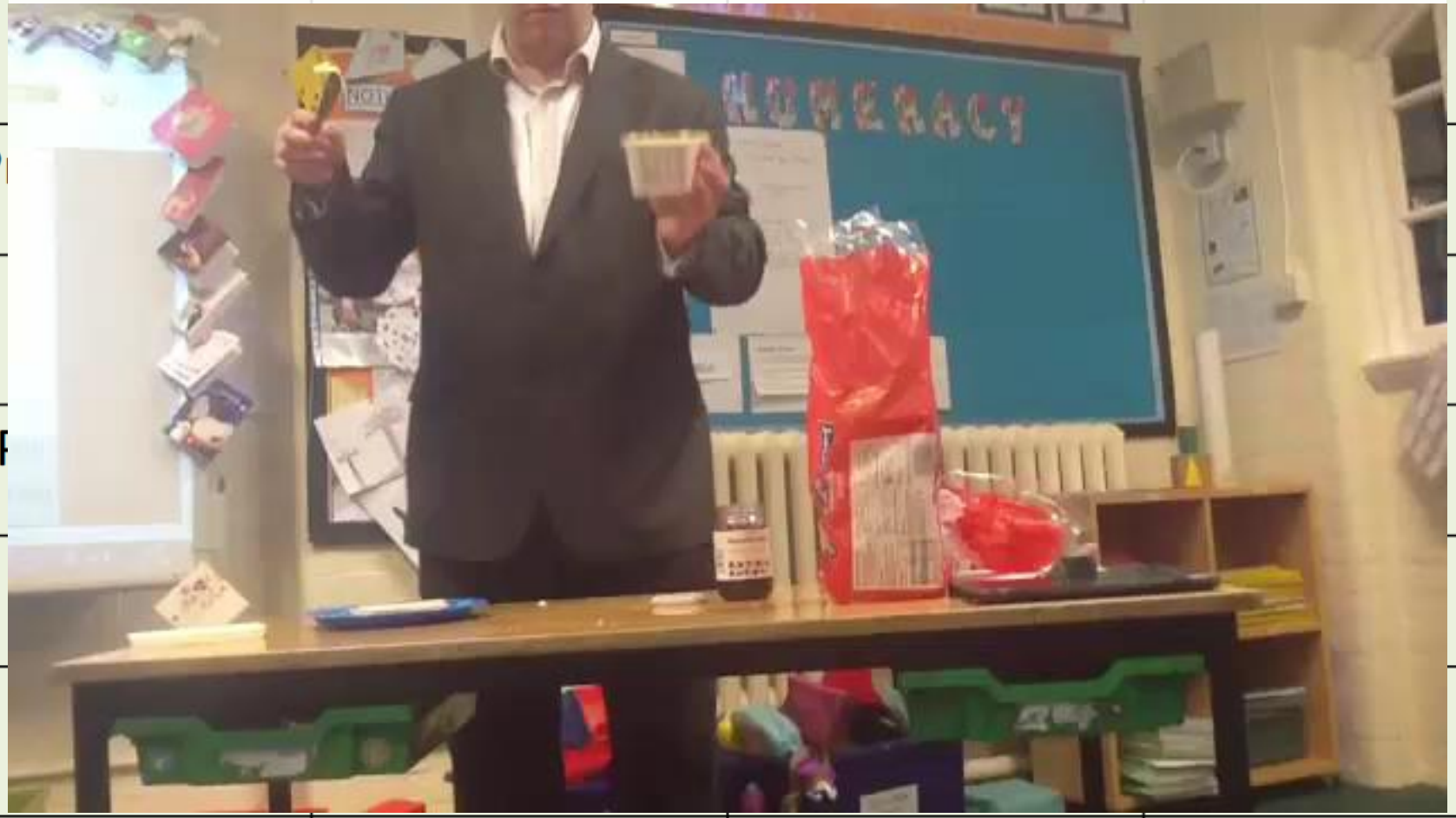
Travel Europe

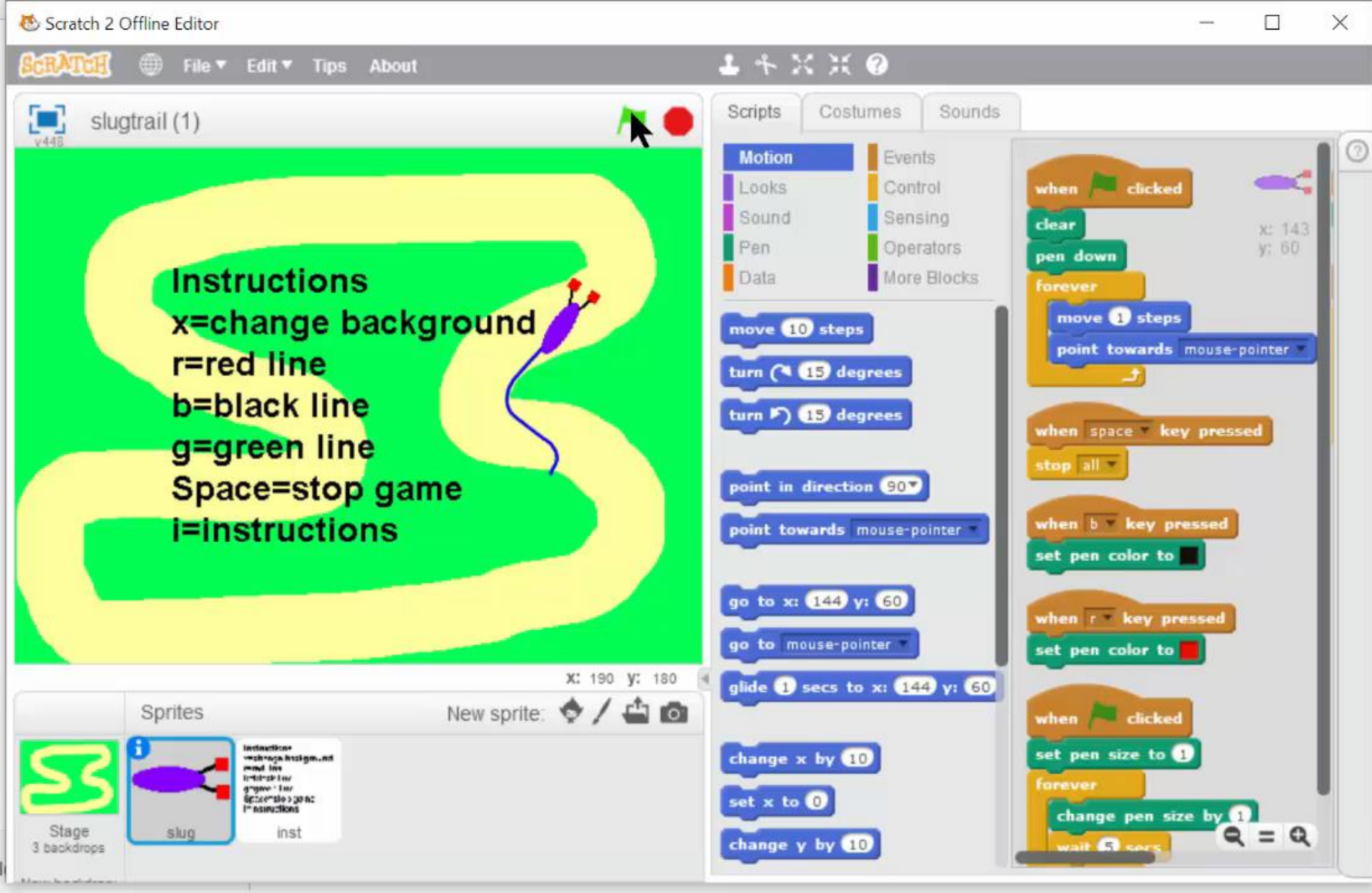
Jam Sandwich Algorithm

Right Hand	spread	butter	fast
Left Hand	scoop	rub	repeat
Pick up	packet	bread	hard
Press down	knife	slice	soft
cut	blade	plate	forward
Put down	handle	turn	back
hold	jam	top	put
unscrew	jar	bottom	Table
remove	lid	slow	Surface

Right Hand	spread	butter	fast
L			repeat
P			
remove	lid	slow	Surface

Jam Sandwich Algorithm



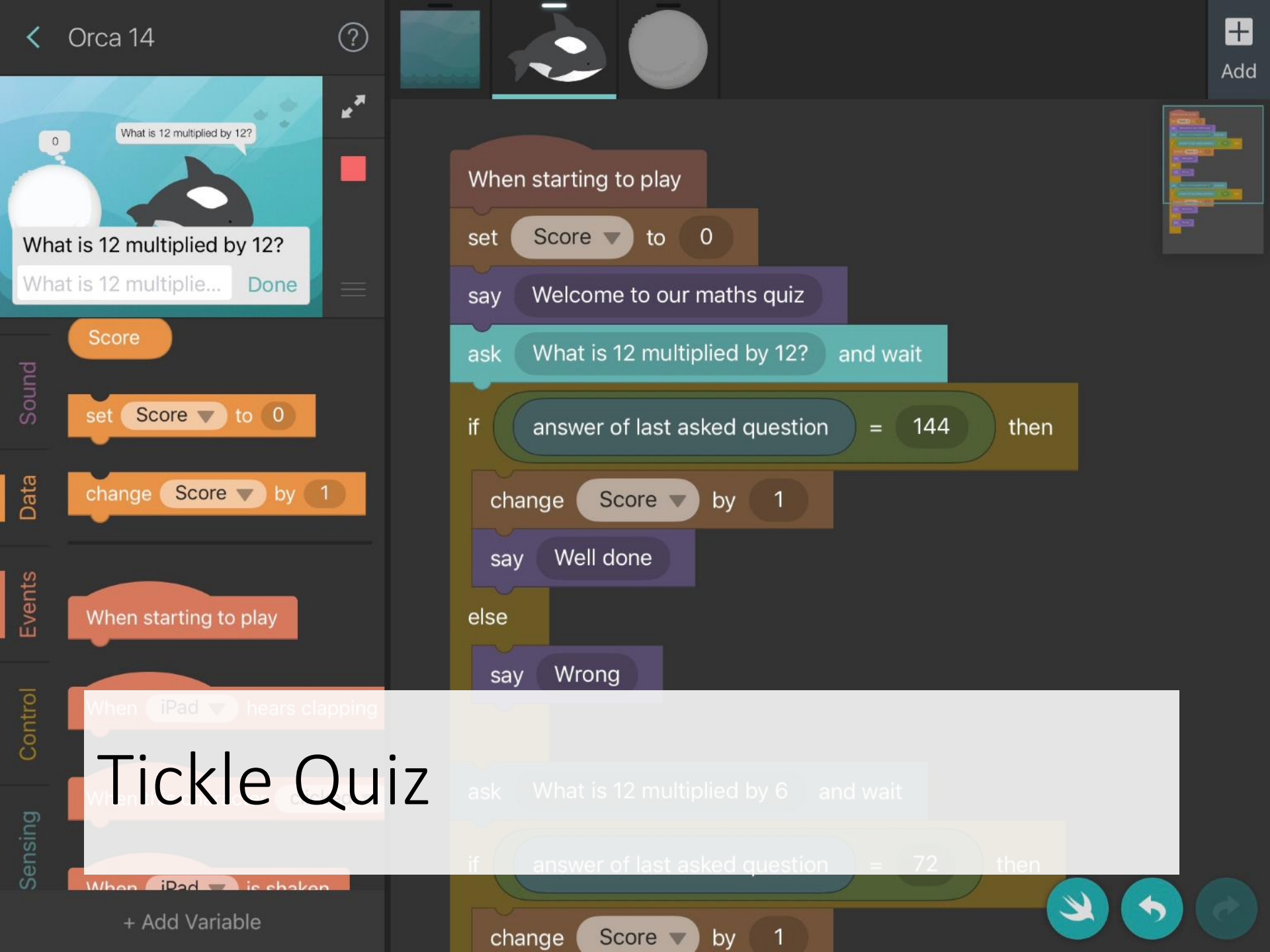


Slug Trail Game

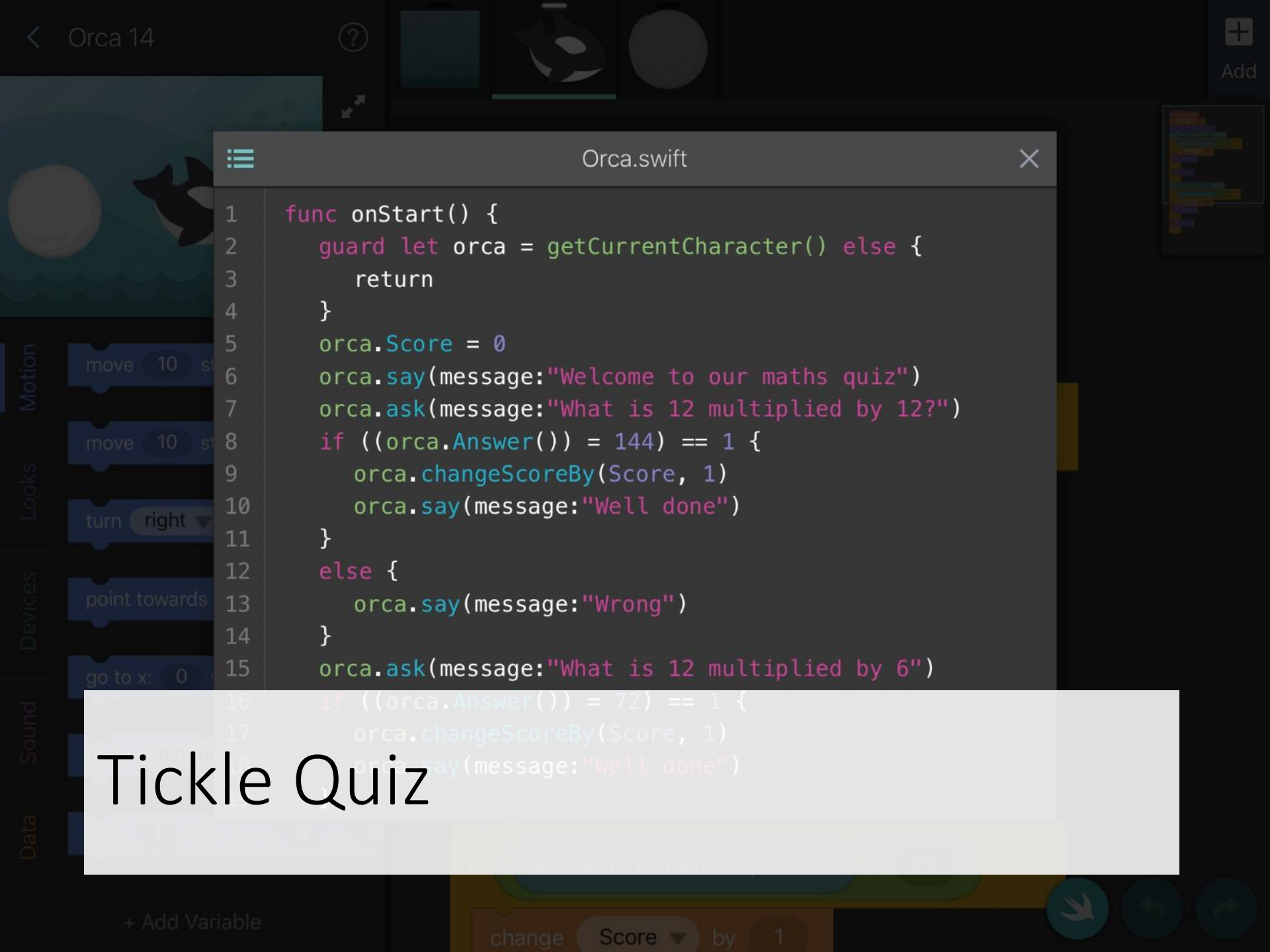
Tickle or Scratch Quiz

How do humans ask a quiz question?

Think of question
Think of the right answer
Ask the question
Collect in the answer
Compare answer with right answer
Give point if they are same

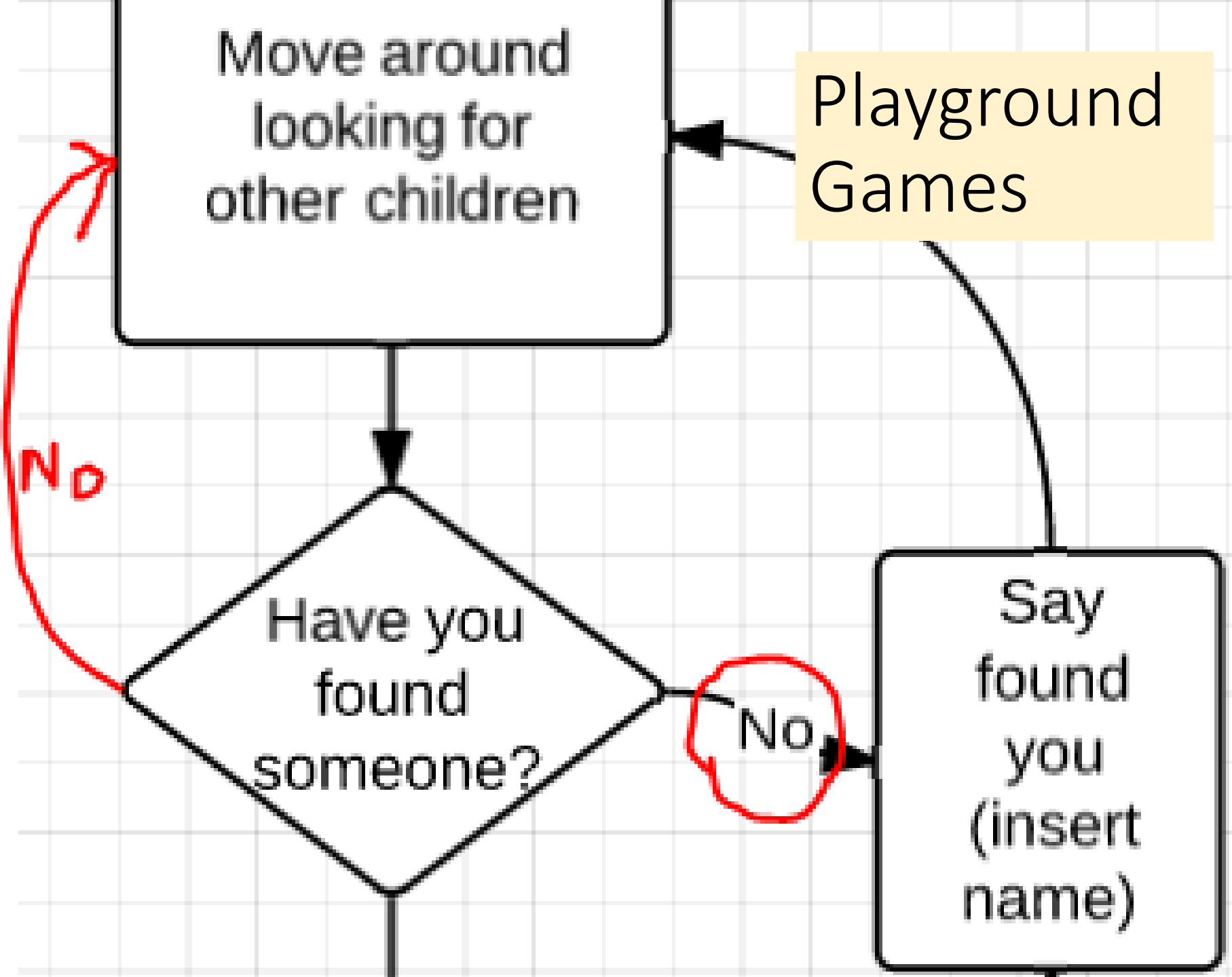

Orca 14
What is 12 multiplied by 12?
What is 12 multiplie...
Done
Score
set Score to 0
change Score by 1
When starting to play
When iPad hears clapping
When iPad is shaken
+ Add Variable
Sound
Data
Events
Control
Sensing
Add
When starting to play
set Score to 0
say Welcome to our maths quiz
ask What is 12 multiplied by 12? and wait
if answer of last asked question = 144 then
change Score by 1
say Well done
else
say Wrong
ask What is 12 multiplied by 6 and wait
if answer of last asked question = 72 then
change Score by 1

Tickle Quiz

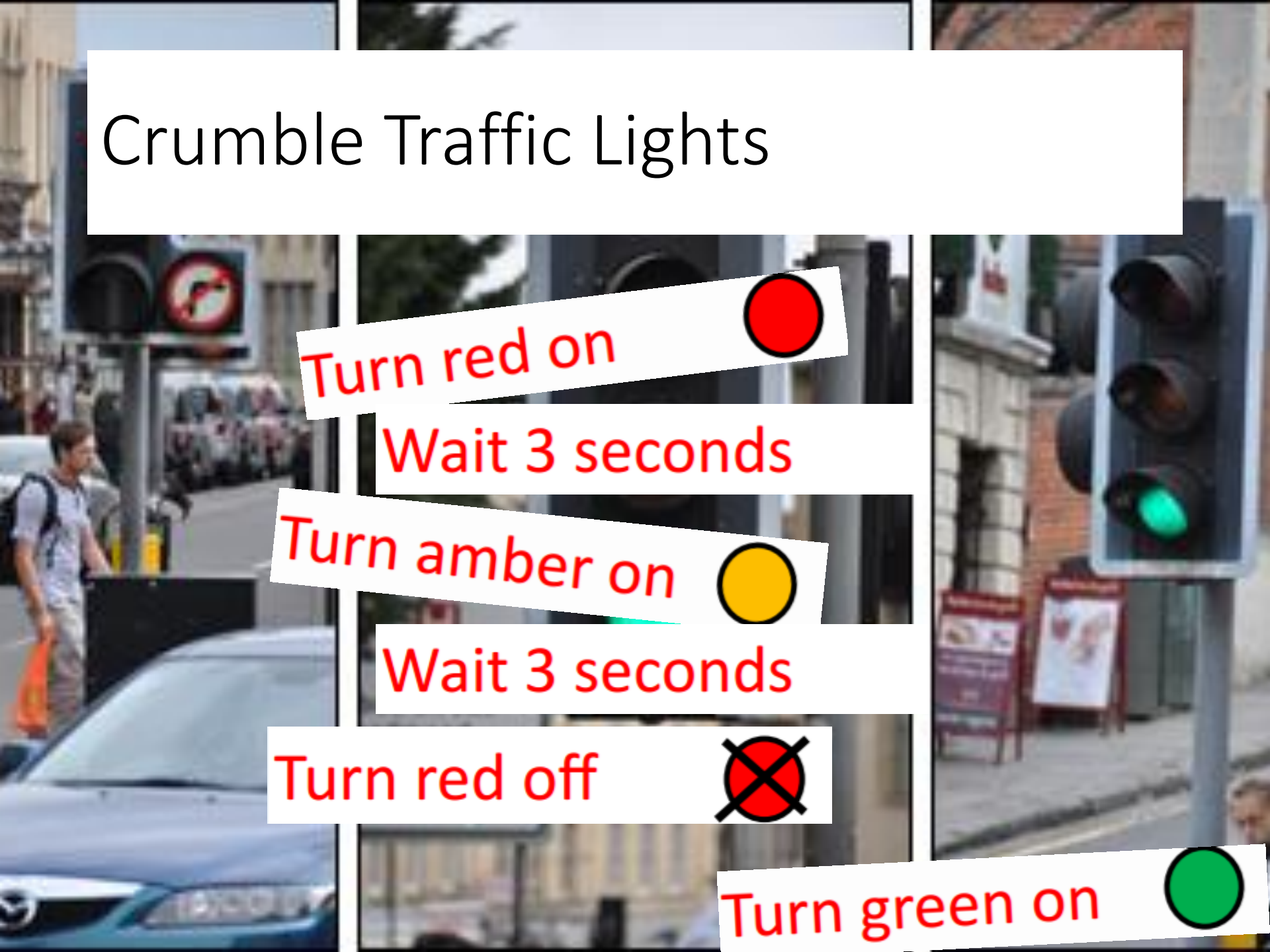

Orca 14
Add
Orca.swift
1 func onStart() {
2 guard let orca = getCurrentCharacter() else {
3 return
4 }
5 orca.Score = 0
6 orca.say(message:"Welcome to our maths quiz")
7 orca.ask(message:"What is 12 multiplied by 12?")
8 if ((orca.Answer()) = 144) == 1 {
9 orca.changeScoreBy(Score, 1)
10 orca.say(message:"Well done")
11 }
12 else {
13 orca.say(message:"Wrong")
14 }
15 orca.ask(message:"What is 12 multiplied by 6")
16 if ((orca.Answer()) = 72) == 1 {
17 orca.changeScoreBy(Score, 1)
18 orca.say(message:"Well done")
Motion
Looks
Devices
Sound
Data
move 10
move 10
turn right
point towards
go to x: 0
+ Add Variable
change Score by 1

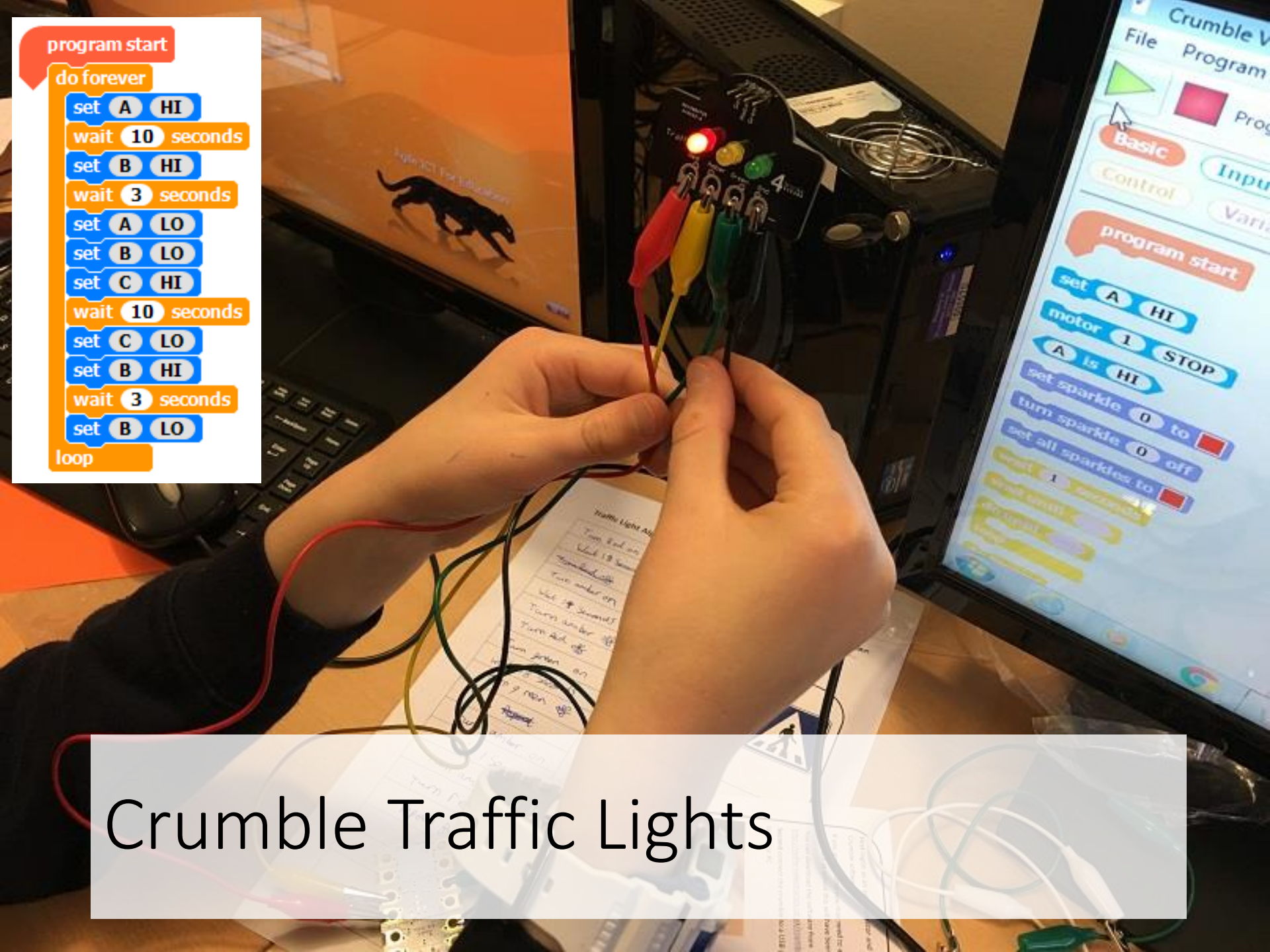
Tickle Quiz

Playground Games



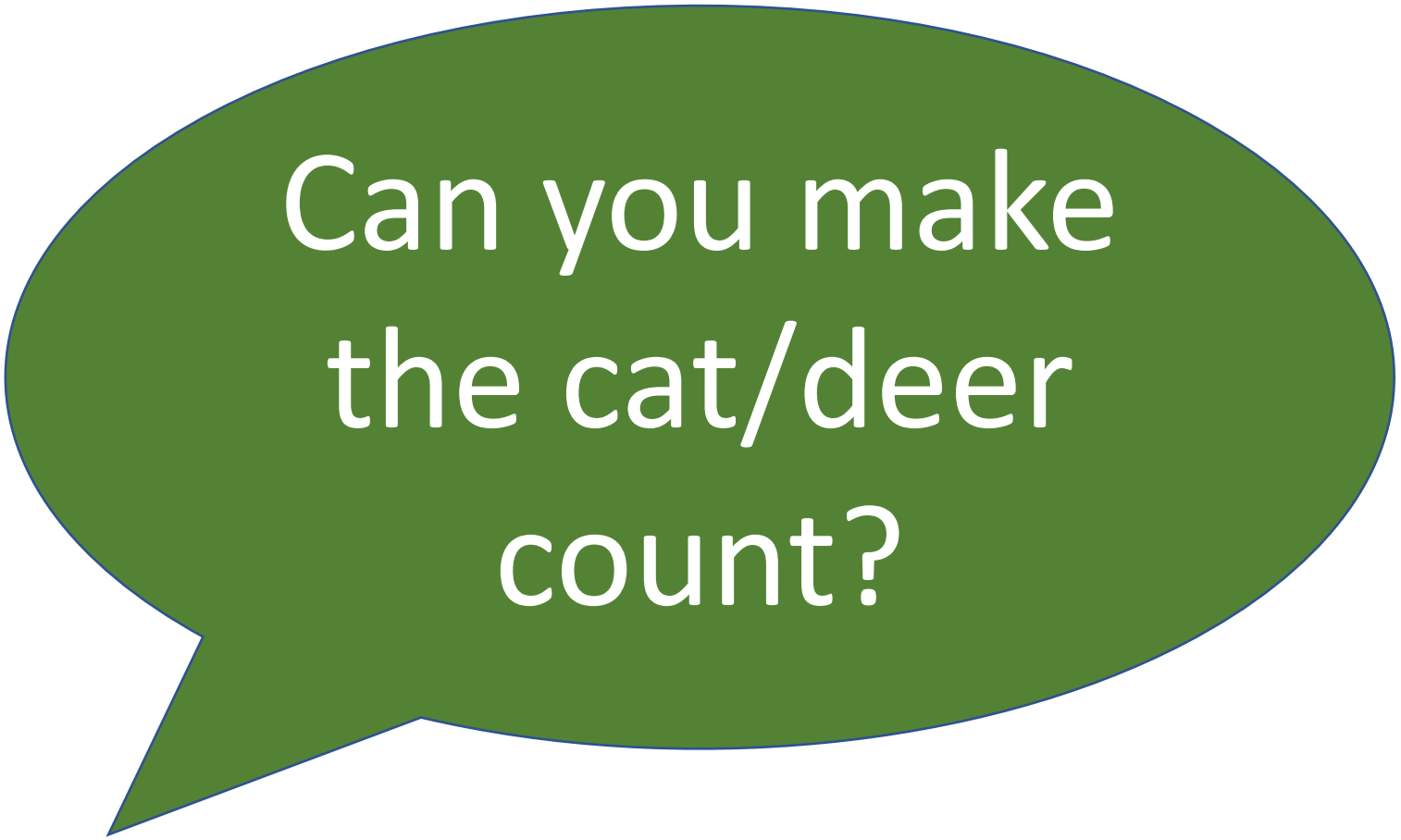
Crumble Traffic Lights

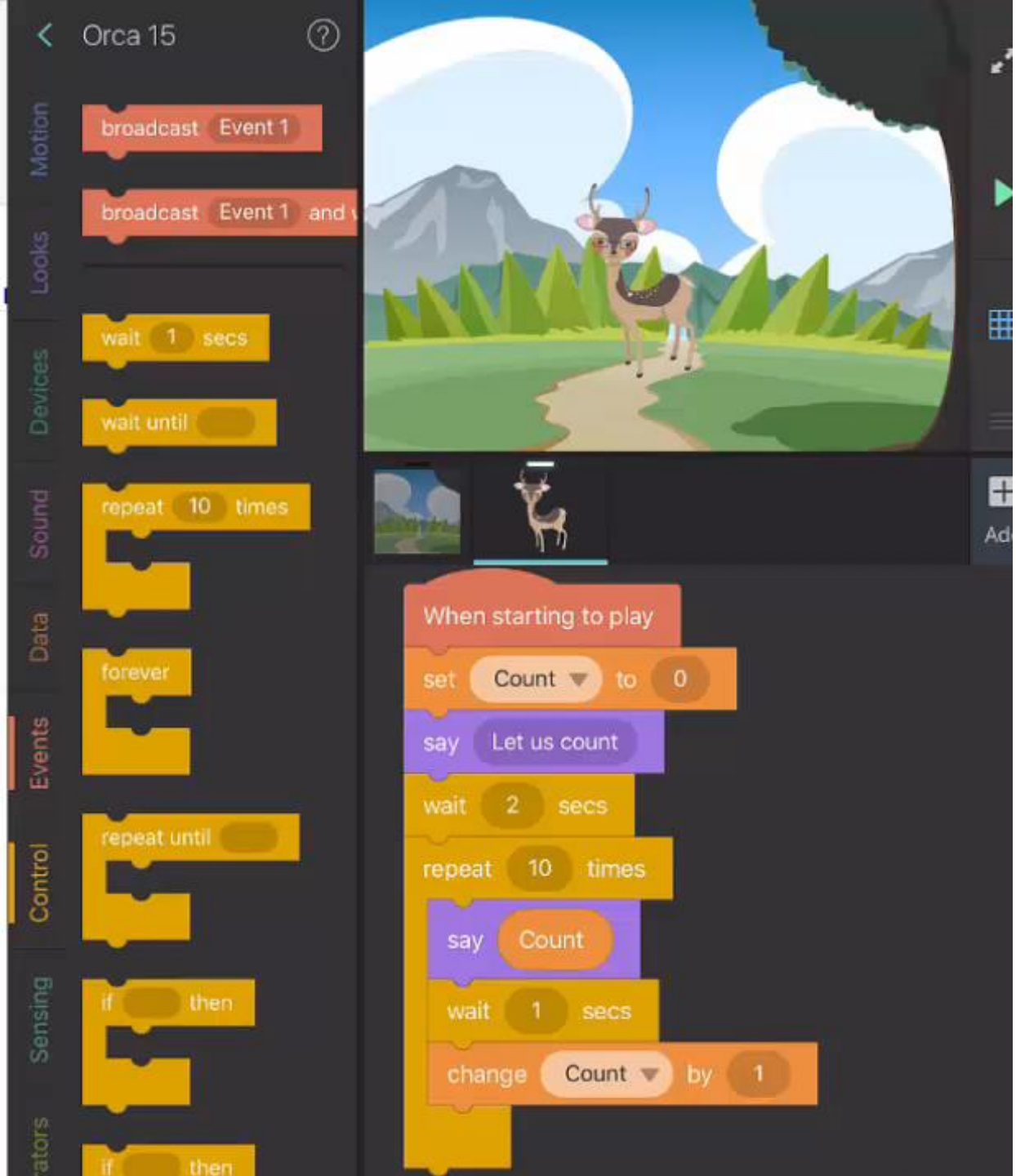




Crumble Traffic Lights

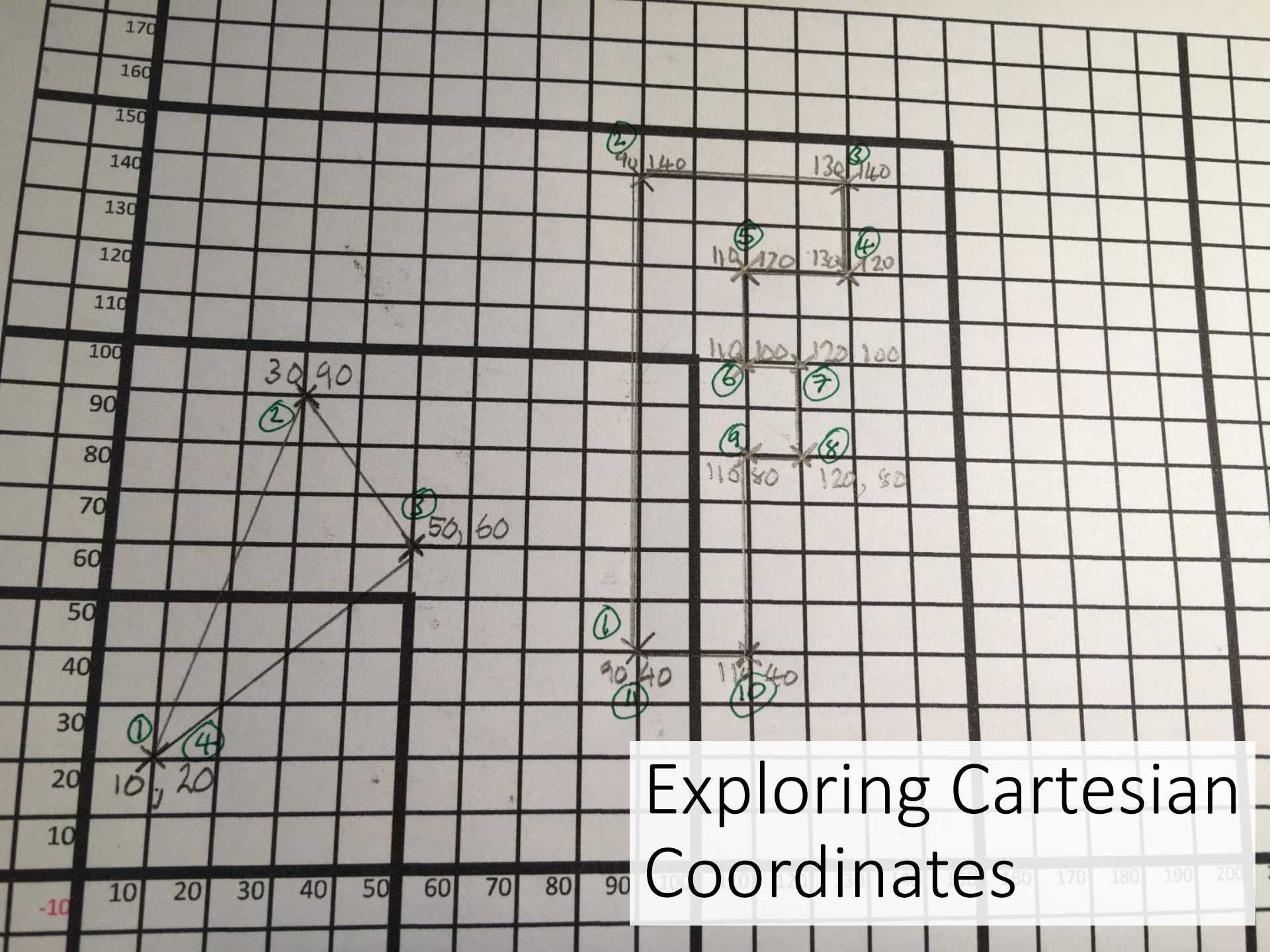
Make the Cat/Deer Count





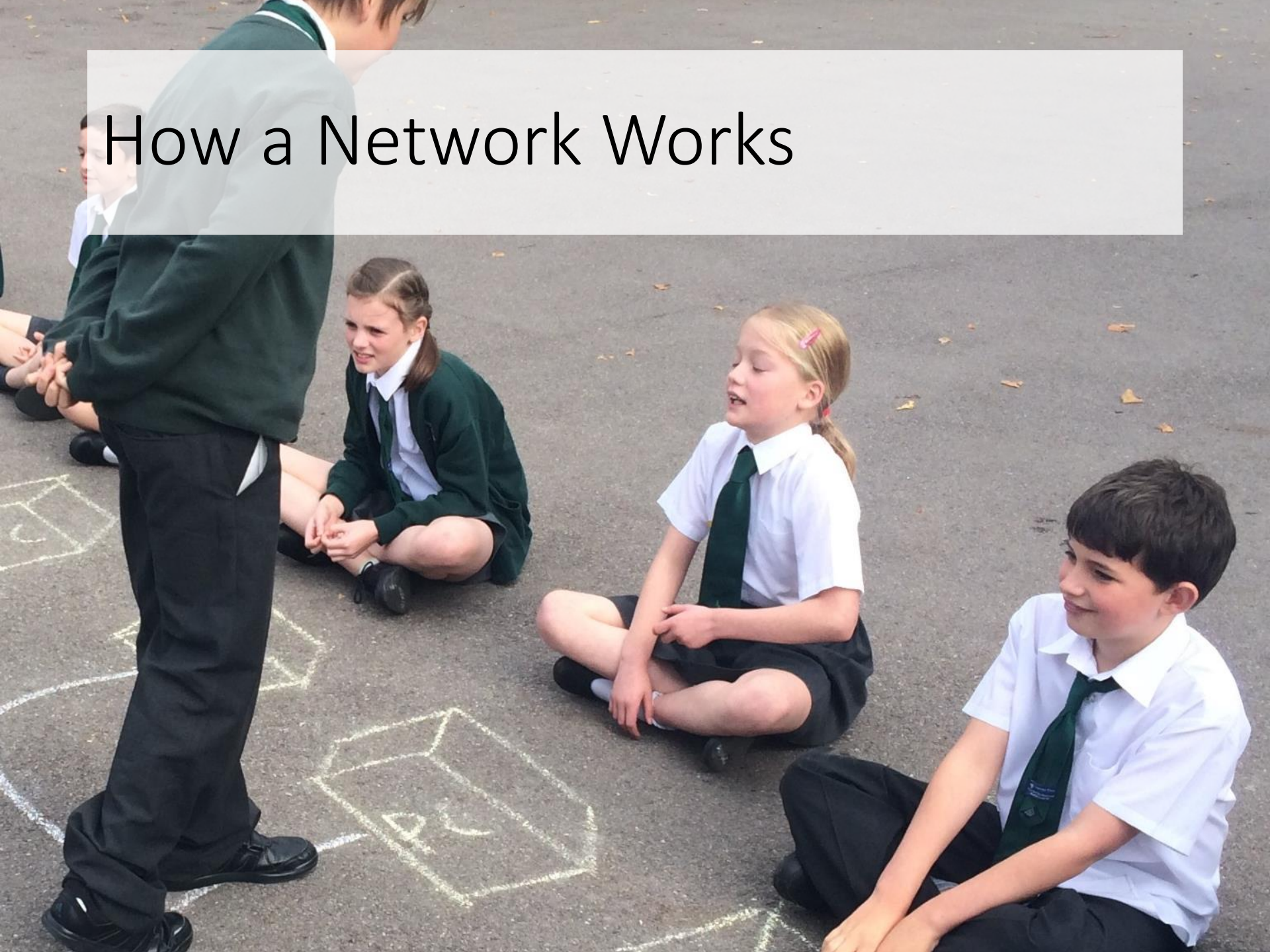
Make the Cat/Deer Count

Faster
Backwards
In multiples
In decimals
Starting at 100


Exploring Cartesian Coordinates

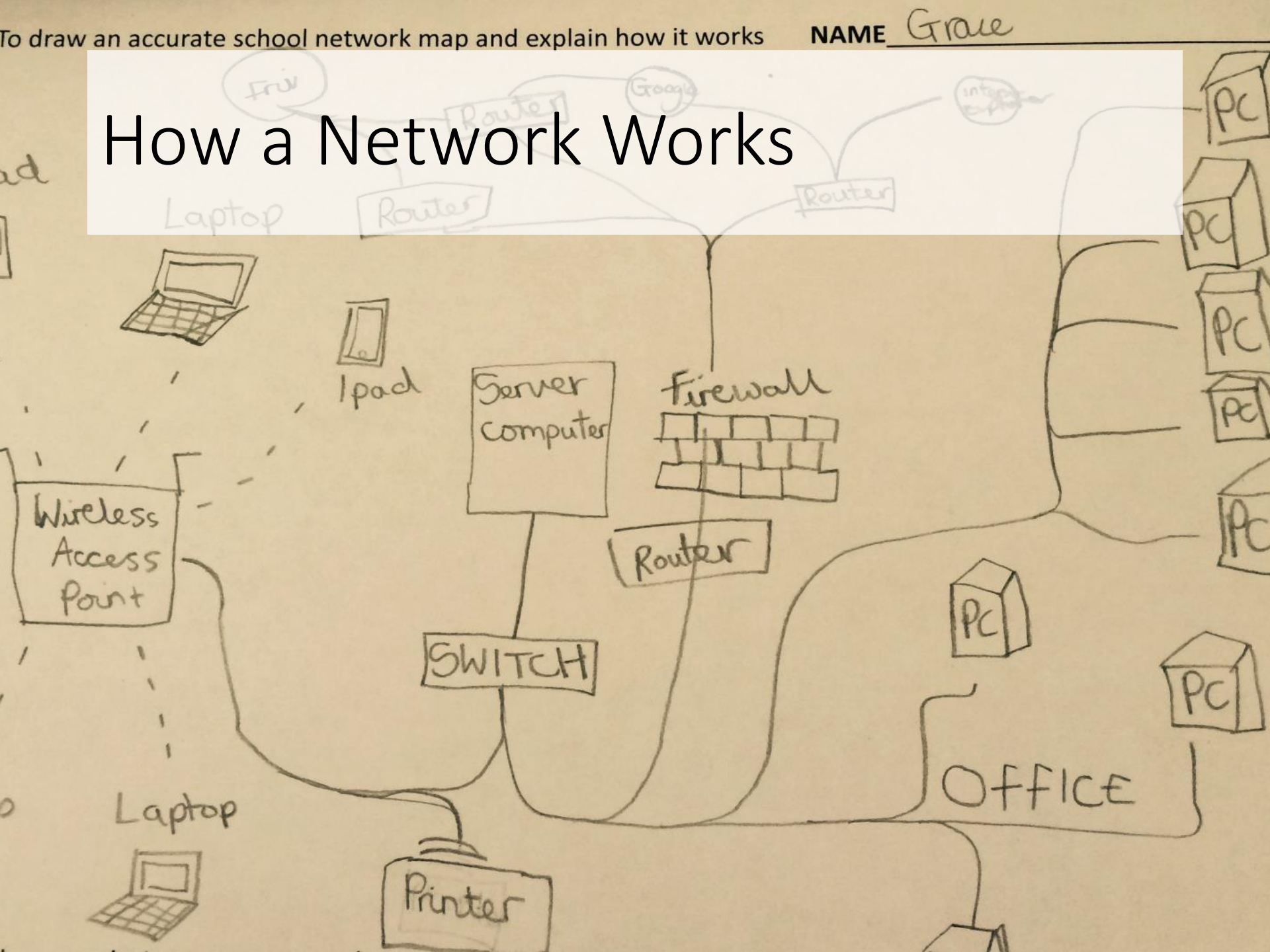
v445.2
cartesiancoordinates
Y
(X:0,Y:180)
100
(X:-240,Y:0)
(X:0,Y:0)
(X:240,Y:0)
-200
-100
100
200
X
-100
(X:0,Y:-180)

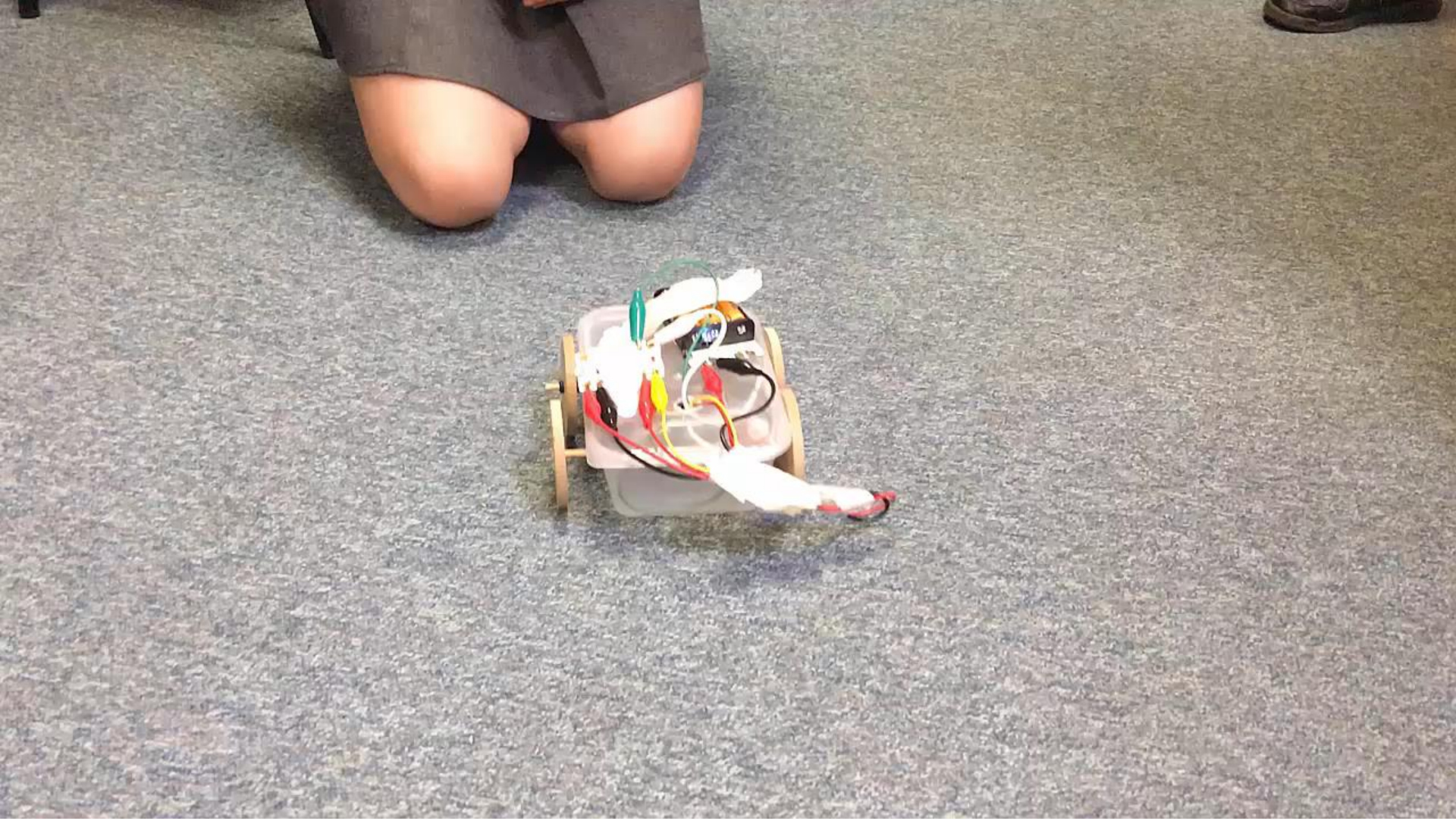
How a Network Works



To draw an accurate school network map and explain how it works NAME Grace

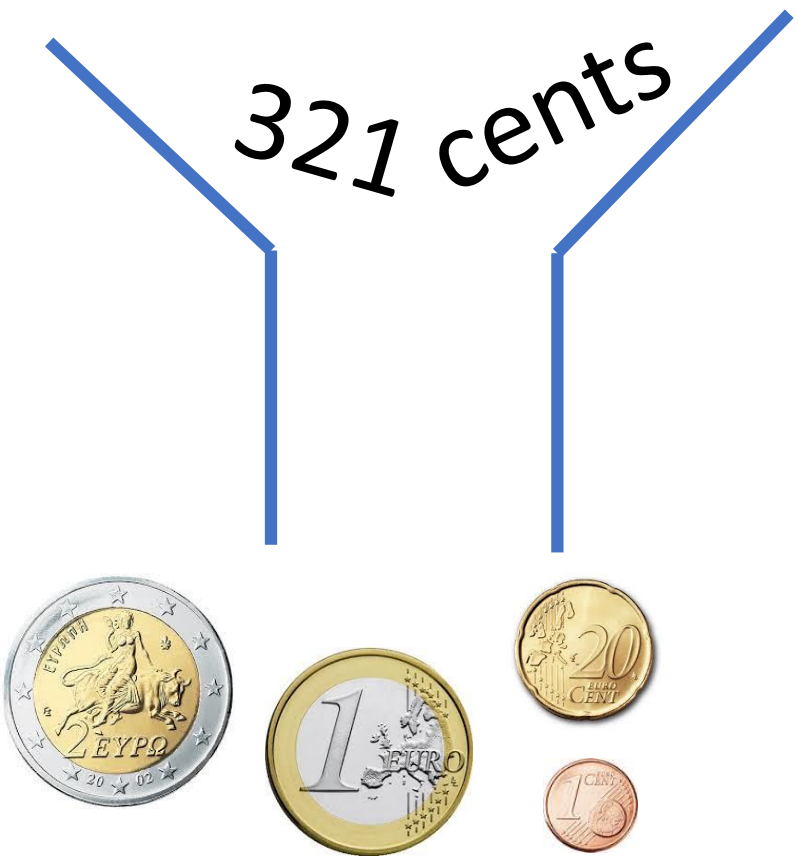
How a Network Works





Buggy

Coin Sorter



321

x1

121

x1

21

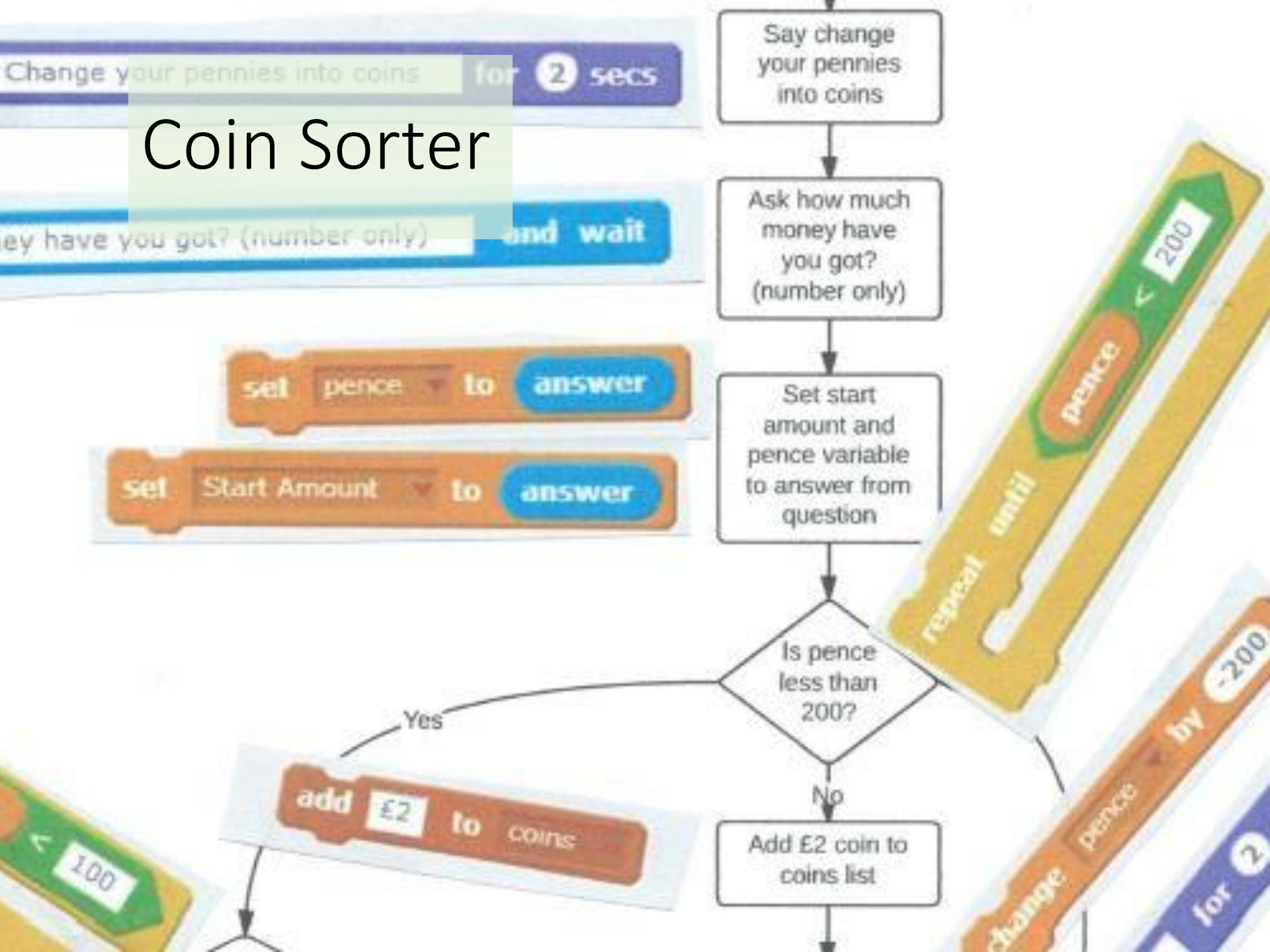
x1

1

x1

0

Coin Sorter

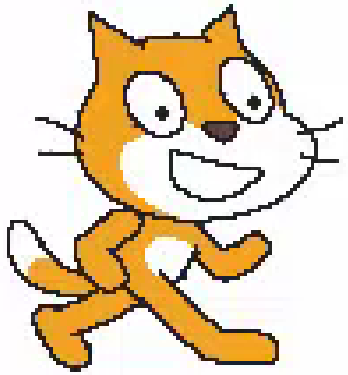

Change your pennies into coins for 2 secs
Say change your pennies into coins
ey have you got? (number only) and wait
Ask how much money have you got? (number only)
set pence to answer
set Start Amount to answer
Set start amount and pence variable to answer from question
repeat until pence < 200
Is pence less than 200?
Yes
No
add £2 to coins
Add £2 coin to coins list
< 100
change pence by -200
for 2

v445.2

Maths_what coins to use

Start Amount 1567

pence 0

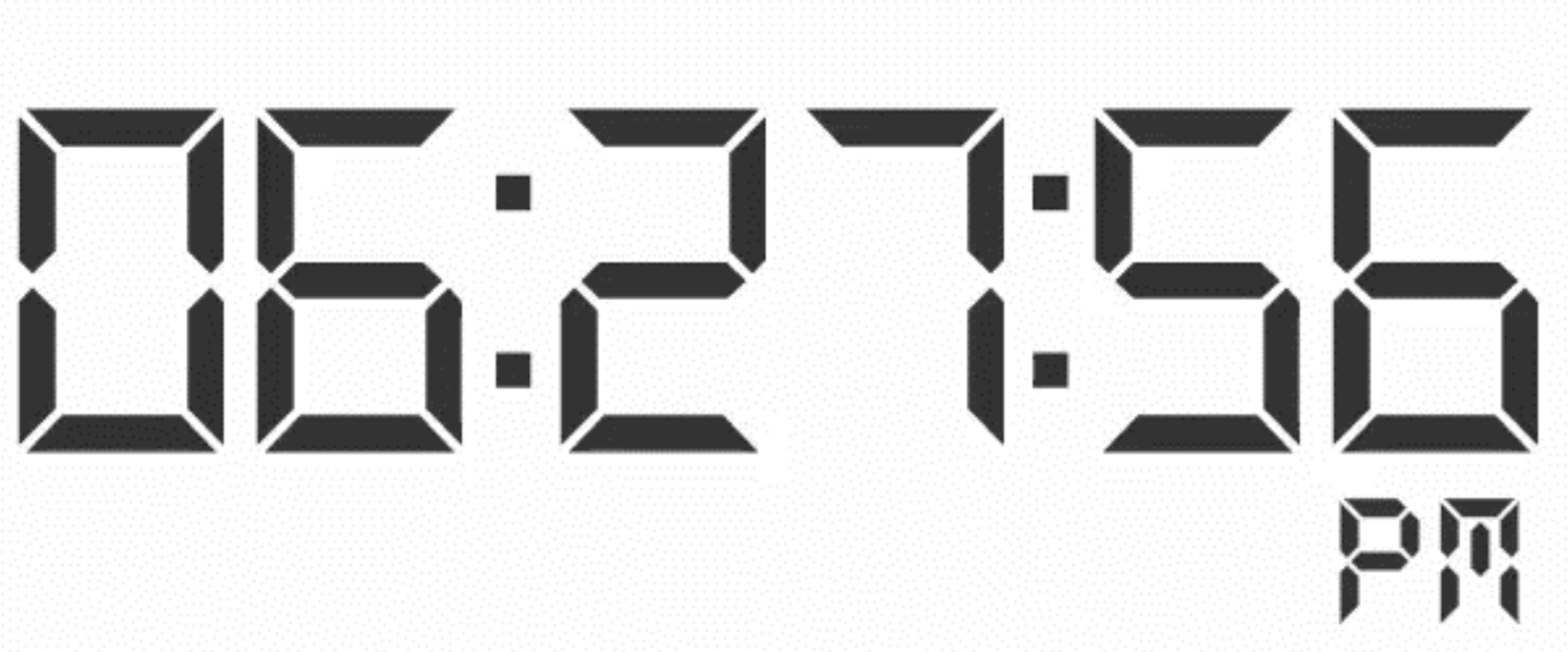


coins

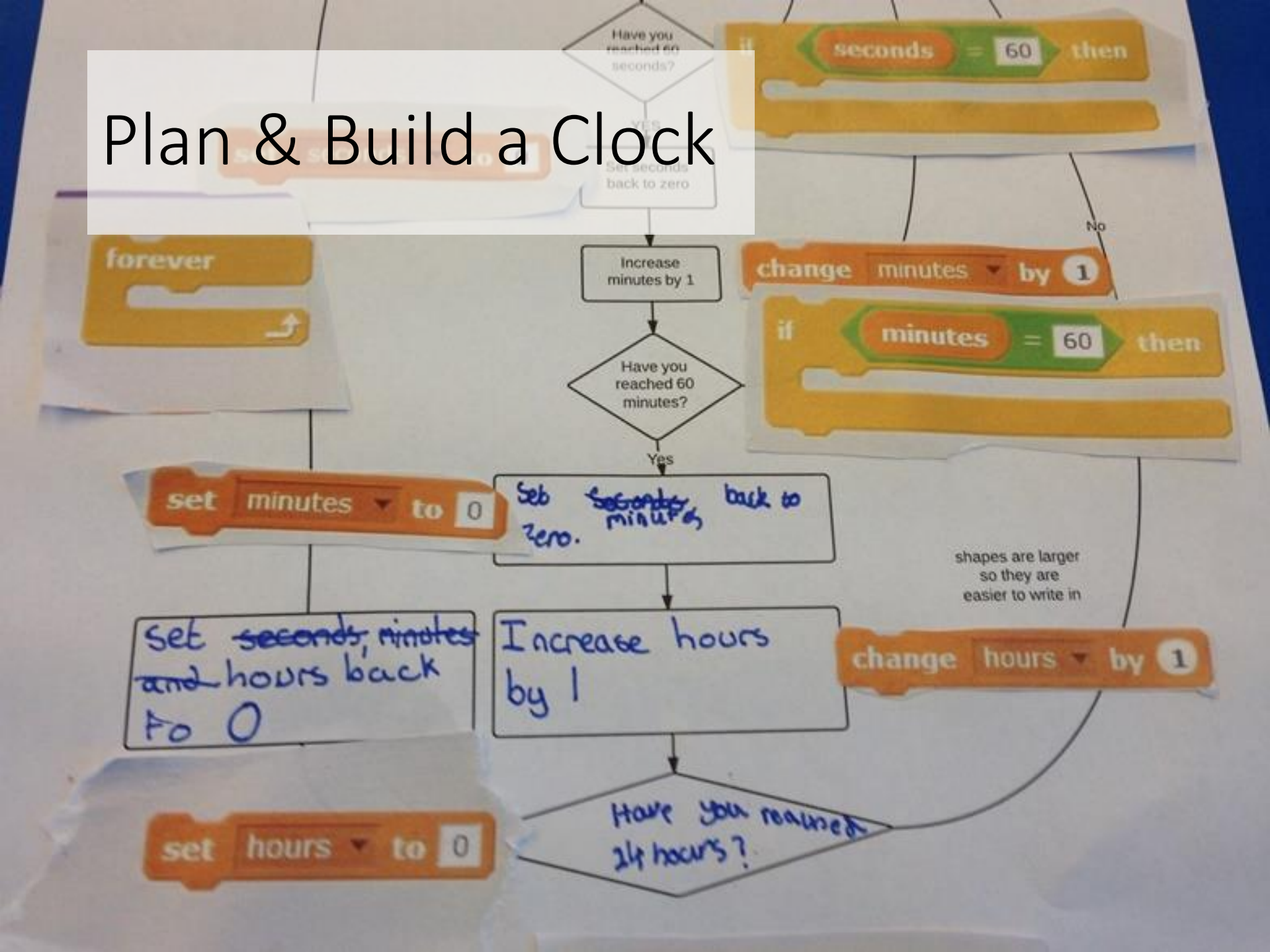
1	£2 Coin
2	£2 Coin
3	£2 Coin
4	£2 Coin
5	£2 Coin
6	£2 Coin
7	£2 Coin
8	£1 Coin
9	50p
10	10p
11	5p
12	2p

length: 12

Plan & Build a Clock



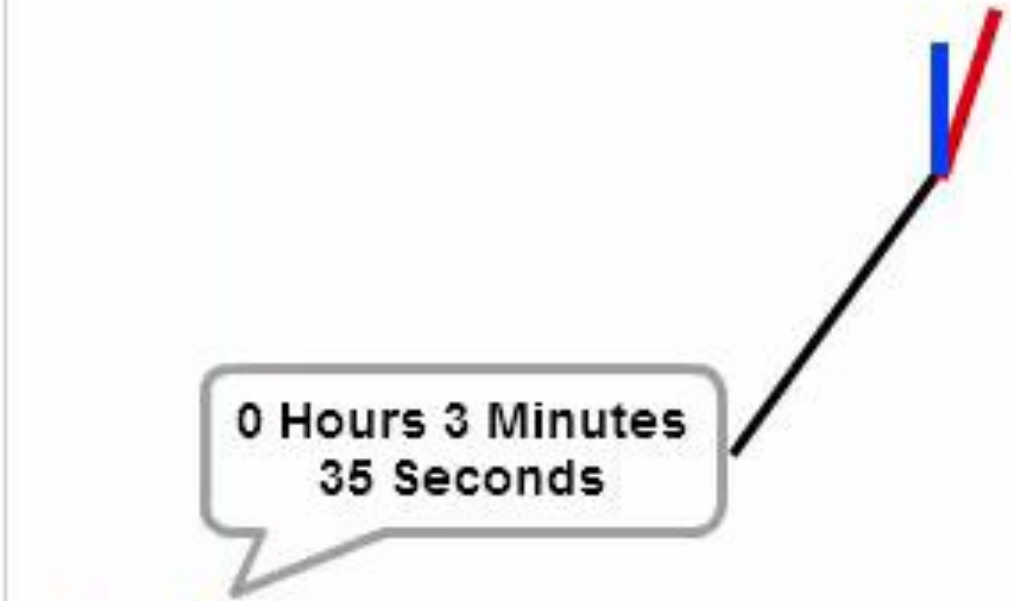
Plan & Build a Clock



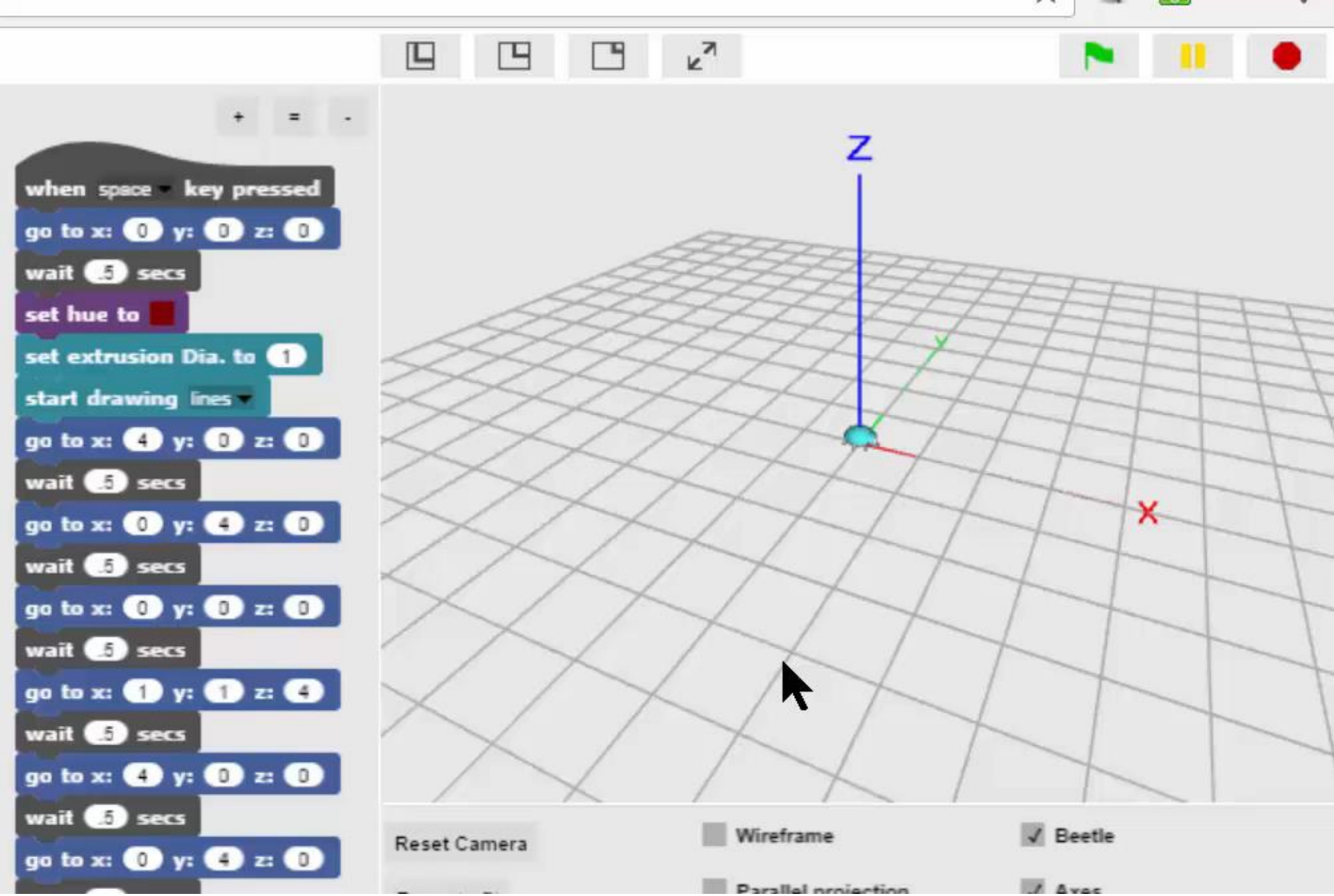
clock2

v445.2

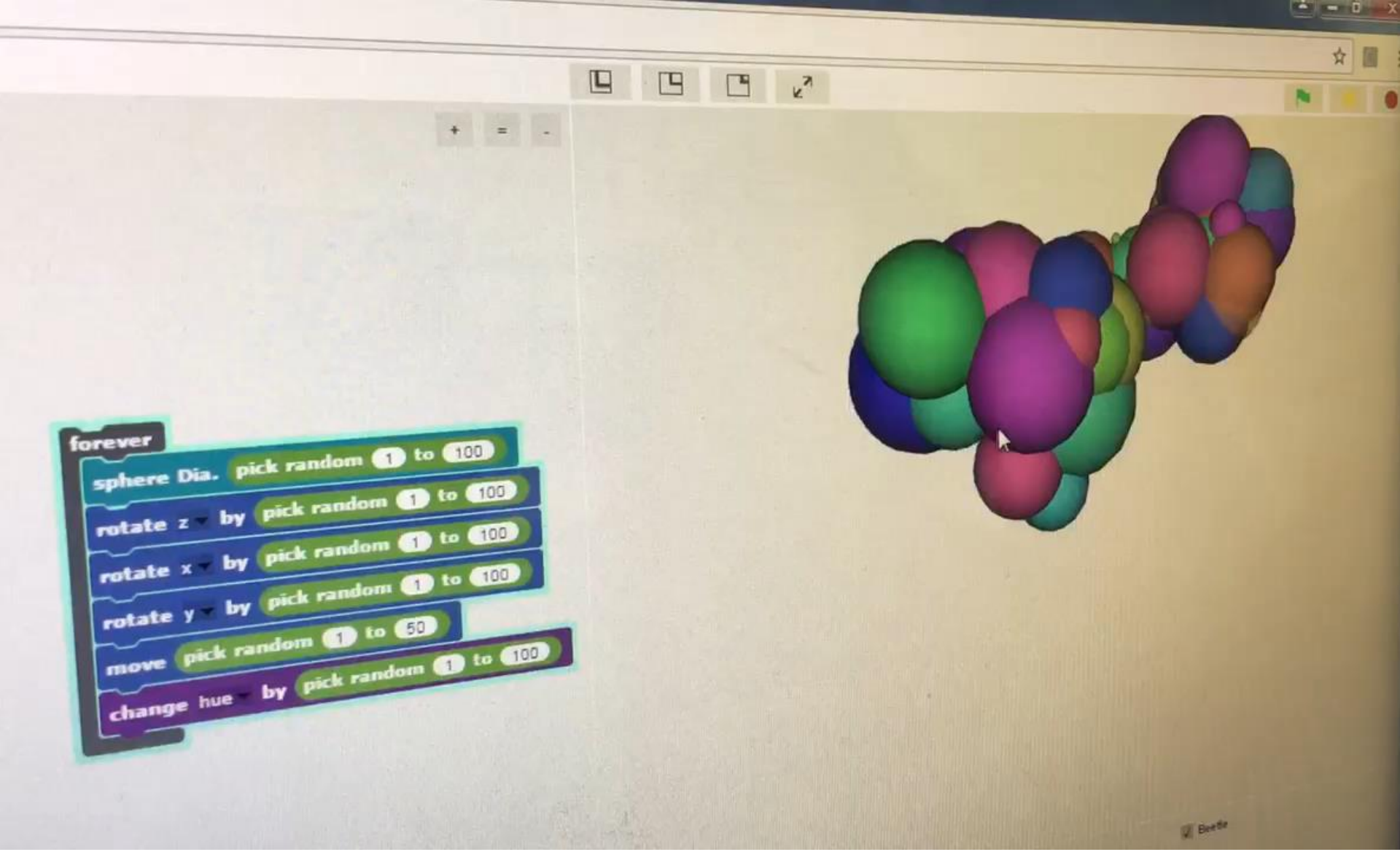
hours 0 minutes 3 seconds 35



0 Hours 3 Minutes
35 Seconds



3D Programming with Beetle Blocks



3D Programming with Beetle Blocks

Paralympic Project

Paralympic Project

Tech Solutions for Blind Athletes

Name (s) Jake

1, The BIG idea My big idea is to help blind people do long jump by creating a sound to tell them when to jump.

Example When the blind athlete approaches the throwing line the distance sensor detects them and beeps so they know when to throw.

2, Map the circuit

Computer

buzzer

Distance Sensor

Crumble board

3, Program it and test it

4, Advertise

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(F) = Free

Links

- Bee-bot World
- Human Crane Algorithm (F)
- Scratch Junior Dance (F)
- How a supermarket works (F)
- Exploring Right Angles (F)
- Travel Europe (F)
- Jam Sandwich Algorithm (F)
- Slug Trail Game (F)
- Tickle or Scratch Quiz (F)
- Playground Games (F)
- Crumble Traffic Lights
- Make Cat Count (F)
- Exploring Cartesian Coordinates (F)
- Now a network works (F)
- Buggy
- Easy Buggy
- Coin Sorter (F)
- Build a clock (F)
- 3D Programming with Beetle Blocks (F)
- Paralympic Project