# Learning Computer Science Concepts in Scratch

Department of Science Teaching

Weizmann Institute of Science

Copyright 2012 by Orni Meerbaum-Salant, Michal Armoni, Moti Ben-Ari.

This work is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. To view a copy of this license, visit http://creativecommons.org/licenses/by-nc-sa/3.0/ or send a letter to Creative Commons, 444 Castro Street, Suite 900, Mountain View, California, 94041, USA.

## Posttest

### Question 1

Here is a diagram of the stage with four sprites (giraffe, elephant, mouse, ball), together with scripts for each of the sprites:

position of the sprites:
mouse is positioned in x: -209, and y: 19,
ball is positioned in x: -170, and y: 2,
giraffe is poistioned in x: 7, and y: -125,
elephant is positioned in x: 200, and y: 19

| Mouse script | Elephant Script | Giraffe Script | Ball Script |
| --- | --- | --- | --- |
| when the green falg is clicked, go to x: -209, and y: 19, point in direction 90, when I recieve start, say Kick for 1 secs | when the green flag is clicked, go to x: 200, and y: 19, point in direction -90, when I recieve start, say Ready for 1 secs, wait until touching ball, next costume wait 1 secs, next costume | when the green flag is clicked, go to x: 7, and y: -125, point in direction 90, broadcast start, say start for 1 secs, wait until touching ball, wait 3.5 secs, point in direction -90, wait 1 secs, point in direction 90 | when the green flag is clicked, go to x: -170, and y: 2, point in direction 90,  when I recieve start, wait until touching mouse, glide 1 secs to x: 167, and y: 19, wait until touching elephant, glide 1 secs to x: 8, and y: -157, wait until touching giraffe, wait 1 secs, glide 1 secs to x: -175, y: 0 |

1. (Multi Applying) What operations take place concurrently until the instruction broadcast: start in the script for the giraffe is run?
2. (Multi Understanding) What is the difference between the instructions say and broadcast?
3. (Relational Applying) Describe the behavior of the animals and the ball when (all) the scripts are run after clicking on the green flag.
4. (Multi Creating) We wish the animation to be repeated indefinitely without clicking again on the green flag. What instruction or instructions must be added? (Add instructions only to scripts that actually need additional instructions for this to happen.)
5. (Multi Creating) Add a variable “counter” to the animation. It will count the number of times that the ball is passed from one animal to another.Question 2
6. (Relational Creating) Create an animation for two sprites that will initially be placed at two corners of the stage. One sprite will send a message broadcast: exchange to the other. When the second sprite receives the message when I receive: exchange ,   
   the two sprites will exchange places by gliding glide instructions with amount of seconds and position described.
7. (Relational Creating) Modify the animation so that when the two sprites touch each other, they will exchange greetings.
8. (Multi Creating) Add instructions so that the sprites exchange places five times.

### Question 3

(Multi Understanding) Explain the following concepts. Your explanations may contain examples that are Scratch instructions.

* Initialization
* bounded repeated run
* conditional repeated run
* conditional run
* sending and receiving a message
* variable
* concurrent run