

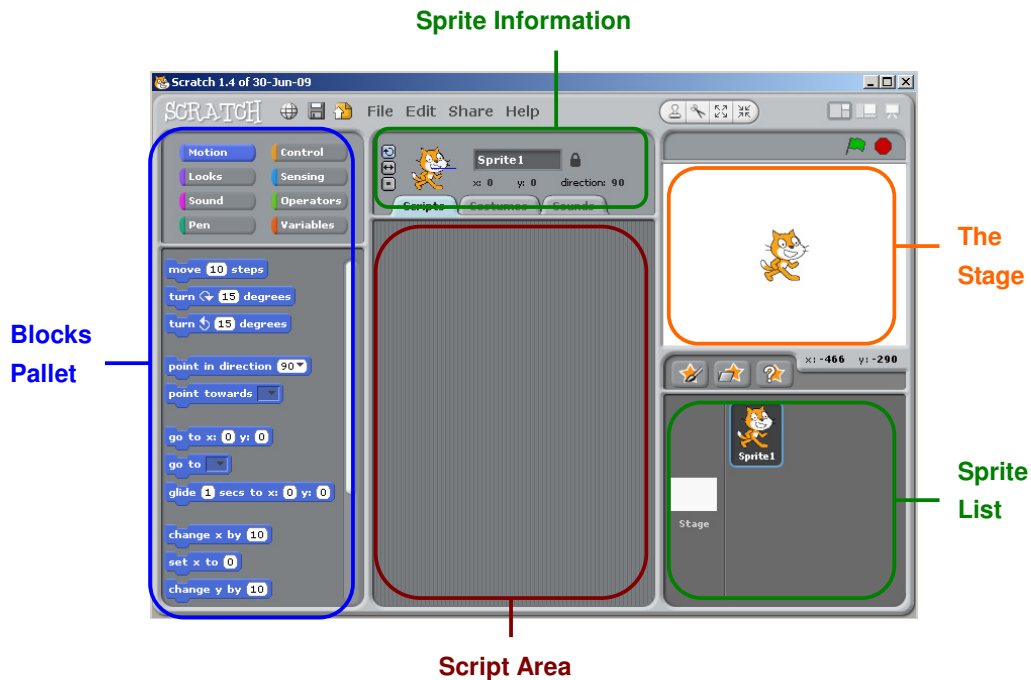
# Scratch 1.4 Exercises

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## Introduction

Welcome to Scratch 1.4 Programming. In this unit, we will focus on the three basic programming techniques called: Sequence, Selection and Repetition. Scratch is an integrated development environment (IDE) for teaching programming. It is a powerful tool that will provide you with the tools you need to make many kinds of advanced 2D (two dimensional) applications.

## The Environment



**Blocks Pallet** – Select programming blocks from this area to program your sprite. To make a program, drag the blocks from the pallet to the script area.

**Script Area** – In this area you will place all the programming blocks to run your sprites. Blocks together form a program. Double-Click blocks run blocks.

**Sprite List** – This area shows you all the sprites in your program.

**The Stage** – When you run your program, the results appear on the stage.

**Sprite Information** – Here are all the details related to the selected sprite.

## Our First Program: Dancing Cat

In our first program we will learn the concept called sequence. Sequence means step-by-step instructions. The computer will execute each instruction starting with the first instruction, one after the other. In our specific example we will program the cat to “dance” by moving the cat back and forth.

Step 1: From the Motion pallet, drag the move block to the script area.



Click the single instruction and watch the stage area. The cat will move right.

- Step 2: From the Control pallet, drag the wait block to the script area.
- Step 3: From the Motion pallet, drag the move block to the script area.
- Step 4: Change the move block to -10 by clicking into the white space.
- Step 5: Combine (put together) all of the blocks in the script area.



Click the block of instructions and watch the stage area. The cat will move right and then wait for one second and then the cat will move left.

- Step 6: Duplicate (copy) these commands to make the cat dance right-left three times. Combine (put together) these commands into a single block.

## Helpful Hints



To copy a block of code: Select the first item in the block. Right click, and choose duplicate. Remember to combine the code into one block to run the sprite with a single click of the code.

## Our Second Program: Dragon and Cat

In our second program we will learn two important concepts: Running (programming) multiple sprites, and the concept of Repetition. To run (or execute) more than one block of instructions, we must use a “*When Flag Clicked*” control block. Repetition means doing an instruction block (or set of blocks) over and over again. In Scratch, this is called a repeat block.



Step 1: Start a new project

Step 2: Add the dragon sprite. You will find this sprite in the “fantasy folder” called dragon1-a



Step 3: Import the dragon’s second costume by choosing “import”. You will find his costume in the “fantasy” folder.

Step 3: On the stage, place (drag) the dragon’s sprite to the left of the cat (just behind the cat).

Now we are ready to program the two sprites. See the diagram on the next page for details on programming our two sprites.

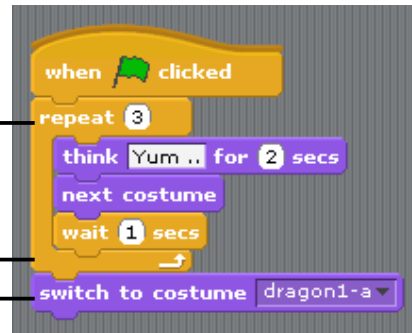
## Programming Two Sprites

The Cat Sprite



The Dragon Sprite

Inside the  
repeat block



Outside the  
repeat block

Above, we have two code blocks one for each sprite. There are a number of new instruction blocks to examine. The “*When Flag Clicked*” control is the first instruction block for each sprite. This means when the flag is clicked on the stage area, both blocks of instructions will execute (run) together.

The repetition in this program is created using the repeat block. Here we have the same actions repeat 3 times for both the cat and the dragon sprite. Visually we can see that the sequential (step-by-step) instructions are “inside” the repeat block for the dragon and the cat. In the dragon’s block we have one more instruction outside the repeat block. This instruction outside the repeat block is only (executed) done once.

In this program we have three kinds of blocks, control blocks, move blocks and look blocks.

- Step 4: Select the Cat sprite and drag the control blocks, move blocks and look blocks as show in the picture above.
- Step 5: For the Cat sprite, change the move, think and repeat information in the white “text” areas to be the same as in the picture above.
- Step 6: Select the Dragon sprite and drag the control blocks, move blocks and look blocks as show in the picture above.
- Step 7: For the Dragon sprite, change the move, think and repeat information in the white “text” areas to be the same as in the picture above.
- Step 8: Execute (run) the program by clicking the green flag on the stage.