Title:	**Hopping game: a gentle introduction to programming**		
Date :		**REF No:**	4.22, 4.23
Contributors:	Srinath Perur	**Std:**	IV
		Reviewers:	
Brief Description:	This lesson introduces the concept of programming through an activity.		
Goal:	To introduce the broad concept of programming through a fun activity. A secondary goal is to design the activity such that it eases the transition into learning simple Logo.		
Pre-requisites:	None		
Duration:	Two classes		
Resources:			

Detailed description:

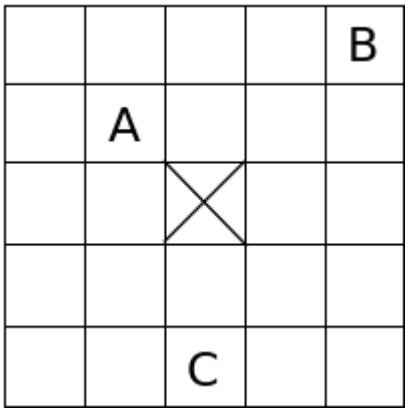
When we want to tell the computer how to perform some task, we give it detailed, step-by-step instructions. These instructions are together called a program. A program is usually written in a programming language, which consists of some special keywords that the computer can understand. In future lessons, we will use a programming language called Logo to make the computer perform simple tasks. In this lesson, we will have an activity in which the students, without being aware of it, will follow a process similar to programming in Logo.

The activity we will do for this lesson is called the Hopping game. The game is played as follows:

- A grid is drawn on the floor and the centre square is marked.
- Two to three objects are taken and placed on other squares of the grid. These could be balls or sweets or any small thing that the class finds attractive.
- Two students will play the game together. One student stands on the centre square. He will try to move to the squares with the objects in them and pick them up. But he can only move by hopping according to the instructions of his partner.
- The partner stands at the edge of the grid and gives directions. He can only use the following four instructions to guide his hopping friend:

  1. Move **`forward`** by some number of squares
  2. Move **`backward`** by some number of squares
  3. **`turnright`**
  4. **`turnleft`**

- The game ends after all the objects in the grid have been retrieved



For example, see the grid shown above. The cross represents the starting position of the hopper. **A**, **B** and **C** represent the three objects placed in the grid. Now, a possible set of instructions that could be given to the hopper to pick up the objects in that order are:

```
forward 1
turnleft
forward 1 (pick up A!)
backward 3
turnleft
backward 1 (pick up B!)
forward 4
turnright
forward 2 (pick up C!)
```

Of course, there can be many different ways of picking up the three objects in this example.

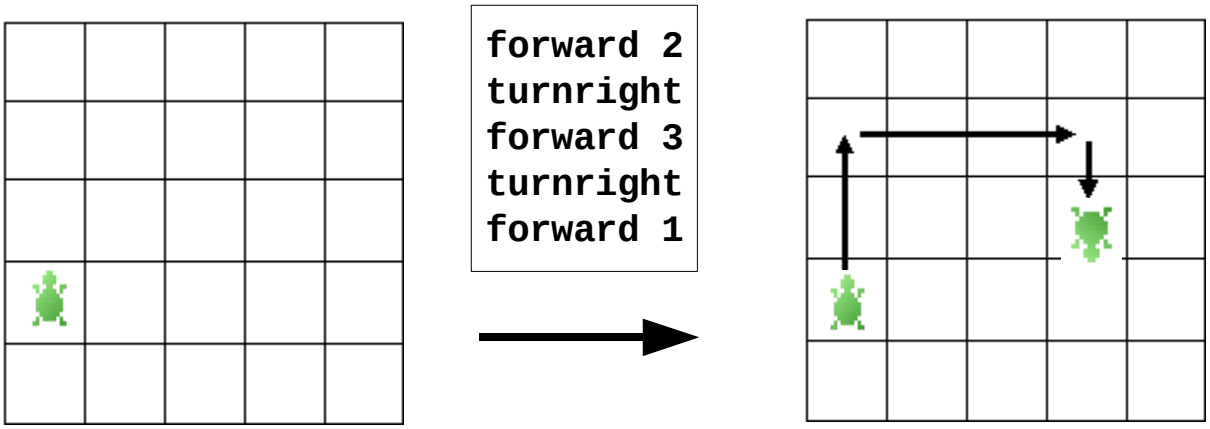
Lesson Plan:

The Hopping game can be treated as a fun activity and there is no need for any introduction at this stage. Some guidelines for conducting the game:

- Try to organise the game in a room with conveniently sized tiles. This will make drawing the grid much easier and only the boundaries may need to be drawn.
- Make sure the grid is neither too large nor too small. 7x7 and 9x9 would be appropriate sizes.
- Try to make the objects to be retrieved something the children find attractive. For example, there could be four sweets placed in the grid which the hopper and his partner could share after retrieving.
- Ensure that every child gets a chance either to give instructions or to be the hopper.

Worksheet

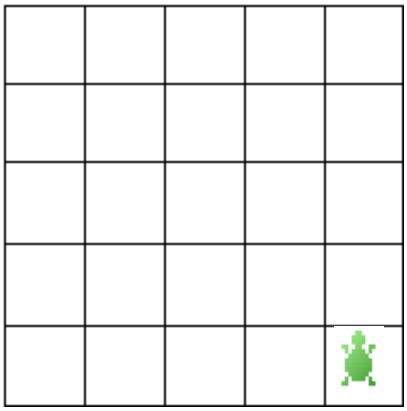
1. Where will the turtle be after following these instructions? Trace the path with a pencil and draw a turtle in the last square. One example is shown below:



```
forward 2
turnright
forward 3
turnright
forward 1
```

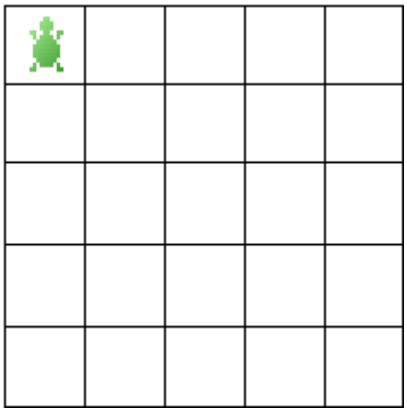
a.

```
forward 4
turnleft
forward 4
```



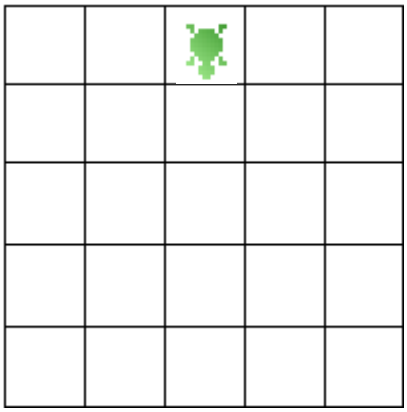
b.

```
backward 4
turnright
forward 4
turnleft
forward 4
turnright
```



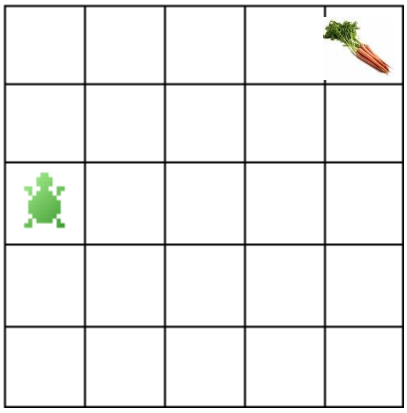
c.

```
forward 2
turnright
forward 2
turnright
forward 2
turnright
forward 2
```



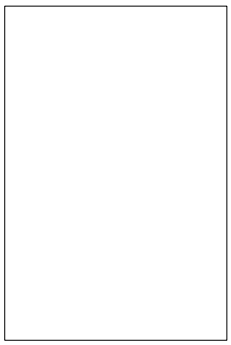
2. Help the hungry turtle reach the carrots! Fill in the correct numbers in the blanks. [Hint: first trace the path, then count the squares.]

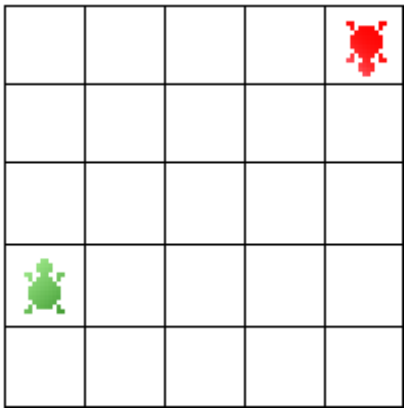
```
forward ___
turnright
forward ___
```



3. The green turtle and the red turtle want to meet in the centre square. Can you write simple instructions for each of them so that they reach the square?

Green turtle





Red turtle