Welcome to Mission Mars

Movement Module

MODULE 3

Learning Tool

The key ingredient of Mission Mars is the Mars Rover.
This helps us explore the surface of mars.

Its movements to explore are controlled remotely from earth.
It is thus very similar to mBot the mobile robot which we control by coding it to move as desired by us.

What we learn using mBot, will in real life apply to Mars Rover.

We shall start learning about movements using sprites.

- Movements of a sprite are controlled by Motion Block.
- They are blue in colour.
- They provide us 18 different block statements

The18 block statements are divided into nine categories:

- **Move.**
- **Turn.**
- **Go to.**
- **Glide to**
- **Point.**
- **Set to.**
- **Change by.**
- **If.**
- **Three Booleans.**

In this lesson we shall cover the following:

- Move.
- Turn.
- Go to random.
- Glide to random
- Point towards.
- If on edge.

Rest will be covered in positioning Module.

Basic move & Turn Blocks

Code 01. Basic move.

The story is:
When green flag is clicked, Mr Panda takes 10 steps ”

Any idea how this will be done?

Yes you are thinking on right lines.

Drag & drop the move block to script area.

Add a trigger above it.

Run the code.

Mr Panda has taken ten tiny steps.

Code 02. Changing Value of Steps to be moved.

The story is:
When space key pressed, Mr Panda takes 50 steps.

This again is very easy.

To change click on white roundel.

Change to desired value.

Add trigger & code is ready to run.

Code 03. Moving Backwards.

The story is: *“When green flag clicked Mr Panda takes 50 steps backwards, says I have moved”*

Think how it will move backwards.

Yes you were all thinking on right lines.

1. We shall use Negative Numbering.

2. Add a trigger.

3. Run the code.

Mr Panda has taken 50 ten tiny steps backwards.

Try it yourself.

Code 04. Turning Left or Right.

The story is: *“When down arrow is pressed, Mr Panda takes 50 steps. He then turns right 15 degrees & says “I can see the cat”*

It is easy. Try & do it yourself.

Who will show it to us all?

The code is.

The degree of turn can be any & can be changed.

Code 05. Turning Left or Right in Steps of specified degrees.

The story is: *“When right arrow is pressed, Mr Panda turns right 45 degrees”*

It is easy. Make it yourself now.

Now keep pressing the trigger with small gaps in-between.

What do you observe?

This is the turning perspective you get. Any idea why?

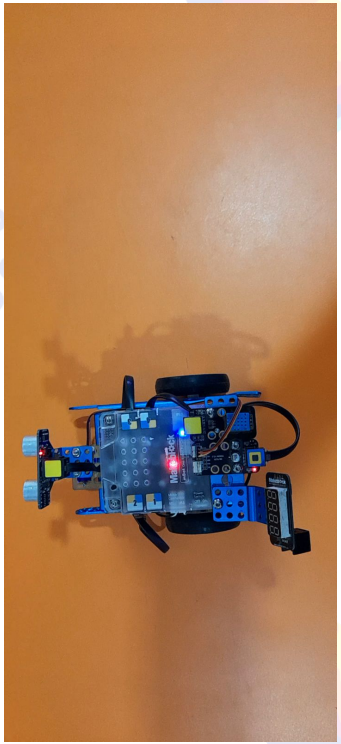
This happens because sprites are 2D images.
& this is the perspective that 2 D will give us.

Now let us upload the same code to a mBot which is a real robot.

Let us see its video to see it turn.

What did you see?

You got a totally different perspective
Because this is in 3 D.



Now change the sprite with brush one & use the same code on it.

Use two different triggers & two different methods of repeating

Method 1. **Using left arrow & manual repeat.**

Rotating Paint Brush.mblock

We see the brush rotate with each pressing of left arrow.

Method 2. Automatic rotation.

Now if we put it in a forever loop & press the right arrow we see it rotate like a fan.

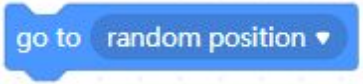
Rotating Paint Brush.mblock

Who will now show this code run to us all?

While these may appear as small tricks, when multiple tricks are put together, we get a big effect.

At this stage keep learning these.
Later they will help you make great projects.

Go to/Glide to Blocks



This has two flavours:

- **Go to. In this the move takes place fast.**
- **Glide to. In this the move takes place slowly.**

Code 06. Go to & glide to Random Position.

The story is: *"When green flag clicked, Mr Panda goes to a random location. Waits for 2 sec, then glides for 1 sec to another random location".*

It is easy. Try & do it yourself.

Now who will show it to us all?

The code is:

Run & see the effect for yourself.

Now change glide time to 2 sec.

It moves slower.

Change to 0.5 sec. It moves faster.

Code 07. Go to & glide to Position of Mouse Pointer.

The story is: ***"When space key pressed, Mr Panda looks for the mouse pointer & moves toward it with a jerk or slowly".***

It is easy. Try it yourself.

Hint: Use the dropdown to make the block.

Now who will make a small Code e& show to us?

Block for Bouncing Back from Edge

Code 08. If on Edge Bounce Back.

The story is: *“Athlete 23 has gone for camping. He is walking slowly in the garden in front of his tent. When he reaches the edge of the garden. He turns back. He goes to the other end. Again he reverses. He repeats it 5 time”*

Now who will tell us how this will be done?

Its stage is:

Its Code is:

Do you see something funny?

E

We note that:

In one direction the boy is upright.

After bounce back he is inverted.

We shall learn its remedy after learning Costumes.

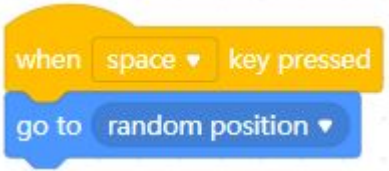
In that case, for the reverse direction, the boy will switch his costume.

Consolidation Project

Code 09. Juggling Ball.

Let us understand the thought process in five steps.

Step 1. Delete panda & add sprite Basketball.
Code the ball as shown.
Run & see the effect.



Now try along with me.

Step 2. Add three more blocks as shown.
Press trigger multiple times
& see the effect

Step 3. Add sprite Athlete 5.
Position it in a way that the ball appears to land on his arm as shown.

Select ball & run the same code.
See the effect.

Note: In this, the athlete is not coded.

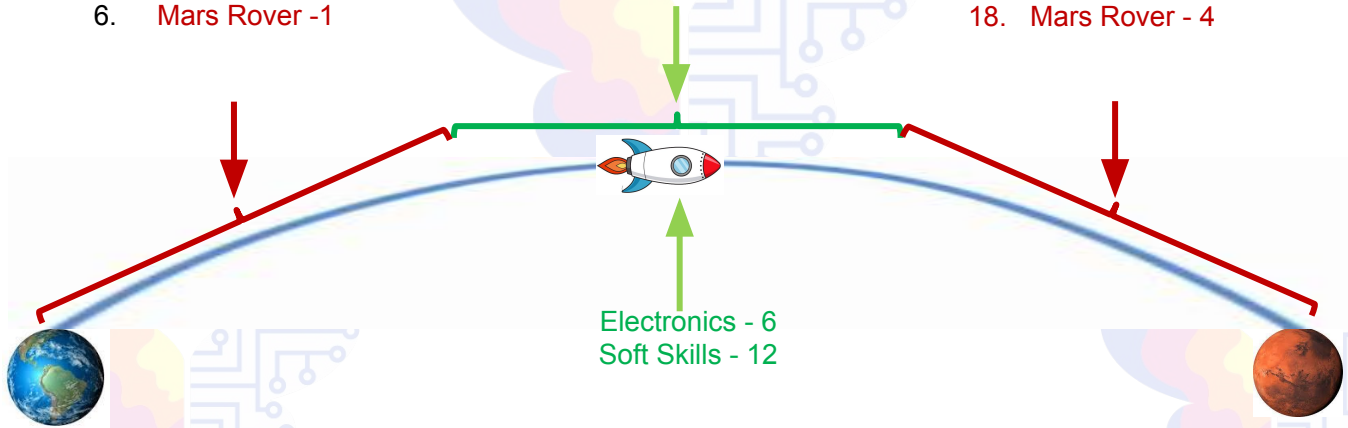
Step 4. Now place it in a repeat loop & specify the number of repeats.
See the effect.

Step 5. Replace repeat loop with forever
See the effect.

Note: We shall learn about loops ahead.

Mission Mars Learning Status – Modules Crossed

1. **Foundation**
2. **Text**
3. **Movement**
4. Positioning
5. Sound
6. Mars Rover -1
7. Sequencing
8. Looping
9. Decision Making
10. Mathematics
11. Logical Comparison
12. Mars Rover - 2
13. Sensing & Broadcast
14. Animation
15. Gaming
16. AI & IoT
17. Mars Rover - 3
18. Mars Rover - 4



End of Part 1 Module 3

Code Karega India Badhega