

Computer Programming

Meet Your Pro-Bot



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Pro-Bot can

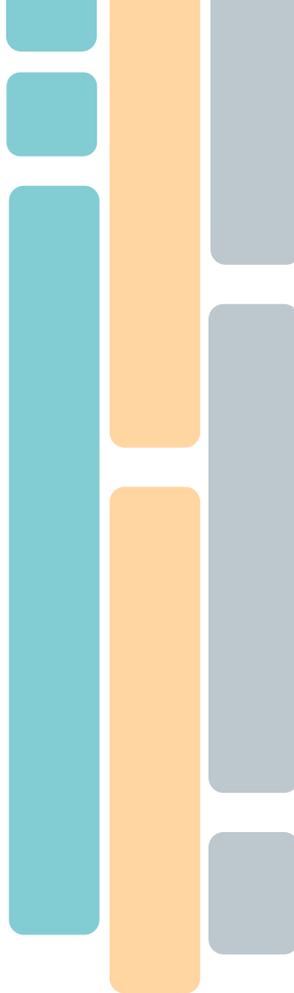
- Move according to a series of commands in specified distances and degrees.
- Display its program, highlighting each command as it is followed.
- Store and incorporate sub-programs into a main program.
- Draw as it moves with standard pens.
- Respond to feedback from touch, sound, and light sensors.

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Navigating the Program

Pro-Bot's main screen displays the commands you have entered and highlights them as they are executed.

When the commands are displayed on the main screen, the up and down arrow keys at the top right of the screen to the right of **Menu** may be used to move the highlight up and down through the series of commands.



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Insert or Delete Commands

To remove a command from the list, highlight that command and press the **Clear** button on the bottom right of the keypad below the 3 key to delete the command.

To insert a command in the program, highlight the command before when you want to enter a new command. Press the key for the new command and it is inserted in the list below the highlighted command.

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Clearing the Program

You may delete the program one line at a time by following the previous instructions.

To delete the entire program at once, hold the **Clear** key down for 3 seconds and then using the down arrow key to the right of the **Menu** select **Clr Main** from the list of commands that appear. Then press **Menu** to clear the main program.

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Stop, Go, and Off

If you need to stop Pro-Bot while it is following a program, press the **Go** key and Pro-Bot stops. Press **Go** again and the main program initiates from the beginning.

When you turn Pro-Bot off, the current main program is preserved and appears when the power switch is turned on again.

Computer Programming Using the Numeric Keypad

You can use Pro-Bot's default movements of 15 cm (6 in) and 90 degrees by using the **Forward (Fd)**, **Backward (Bd)**, **Left (Lt)** or **Right (Rt)** command.

You can also use more detailed routes by programming the numeric keypad.

- After entering **Forward** or **Backward** you can enter a number to specify how many centimeters Pro-Bot will move.
- After entering **Right** or **Left**, you can enter the number of degrees for it to turn.

Computer Programming Using the Numeric Keypad

TRY IT: Press the following sequence of keys to tell Pro-Bot to go **Forward** 10 cm and turn **Right** 45°.

F10R45

The following appears in the Main window:

Fd10

Rt45

Press **Go** and watch Pro-Bot complete the command. Pro-Bot can remember up to 128 commands.

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Creating a Repeat Loop

There are 4 steps to tell Pro-Bot to repeat a series of commands:

1. Tell Pro-Bot to repeat by pressing the **Rpt[** key.
1. Tell Pro-Bot the number of times to repeat by pressing the appropriate numeric key.
1. Tell Pro-Bot what to repeat by entering a series of commands.
1. Tell Pro-Bot you are finished with the sequence of commands to be repeated by pressing the **]** key.

Computer Programming

Creating a Repeat Loop

Try it.

Think of a series of commands you would like to repeat. For example, you can use the repeat function to command Pro-Bot to follow the square route you did earlier, but can do so by entering fewer commands. Start by pressing the **Rpt[** key.

The command appears on the Main screen as

Rpt[

Computer Programming

Creating a Repeat Loop

Then press the number of times you would like Pro-Bot to repeat the commands you plan to enter. In the case of a square route, press the **4** key.

The Main screen displays:

Rpt4[

Computer Programming

Creating a Repeat Loop

For Pro-Bot to follow a square route, it must move either **forward** or **back** and **left** or **right** four times. Enter the combination of movement command (**Fd or Bd**) and turn command (**Lt or Rt**) you prefer.

If you choose **Fd** and **Rt**, the screen displays

Rpt4[

Fd

Rt

Computer Programming

Creating a Repeat Loop

To confirm that you have completed the repeat sequence, press the **]** key.

The screen will display

```
Rpt4[  
Fd  
Rt  
]
```

Computer Programming

Pro-Bot's Pen

- Pro-Bot has a pen mechanism enabling it to draw as it moves.
- Pro-Bot's pen mechanism is in the middle of Pro-Bot and is marked Down and Up with 2 small handles that allow it to be turned.
- The pen is in the middle of Pro-Bot's wheels which means Pro-bot pivots around the pen when it turns.
- Pro-Bot draws when it moves forward and back but does not draw when it turns.

Computer Programming Pro-Bot's Pen

- Raise the Pro-Bot pen mechanism to the up position by turning it counter-clockwise so that the handles are aligned with the direction of Pro-Bot.
- Remove the cap from the marker and gently insert the pen. Lower the pen mechanism by turning it clockwise until the pen drops into place, so that the point is touching the paper.
- With the pen in place, Pro-Bot draws as it follows the Main program you have entered.

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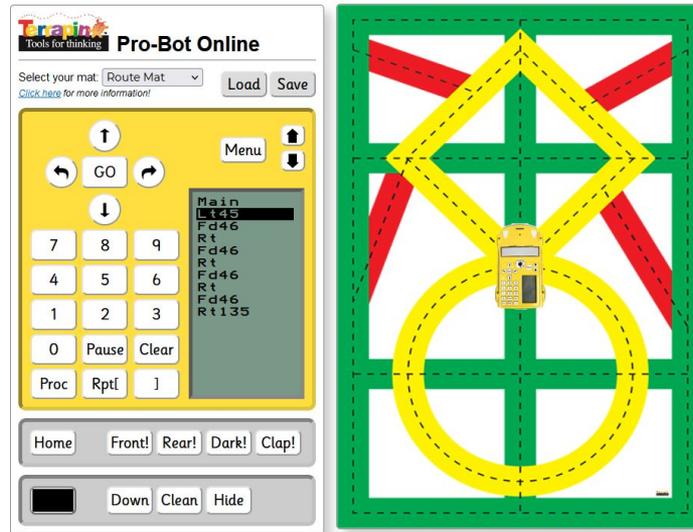
Pro-Bot's Pen

TRY IT:

1. Place a piece of chart paper under your Pro-Bot. Work in your team to create a program that will draw a shape. Write the program on your chart paper.
1. Insert the Pen into Pro-Bot.
1. Test your program.
1. Debug if necessary.

Computer Programming Using the Online Emulator

The online [Pro-Bot Emulator](#) lets you program a virtual [Pro-Bot](#) in your browser. Choose any of the [Learning Mats](#) Terrapin offers as a surface for Pro-Bot to traverse.



Computer Programming Connections to Lessons

- How can programming devices enhance or extend learning in your classroom?
- Using your Elementary Model Lesson Reflection Sheet from Day 1, go back to each lesson and consider ideas for how to incorporate these devices.
- Discuss with your team and jot your thoughts in the space provided.
- Be prepared to share out.