Pro-Bot®

Work Book

Name

Date

![TASK]

Conduct a vehicle inspection on your Pro-Bot. Use the diagrams shown here as your reference. Locate each of the parts and features shown on your own Pro-Bot.
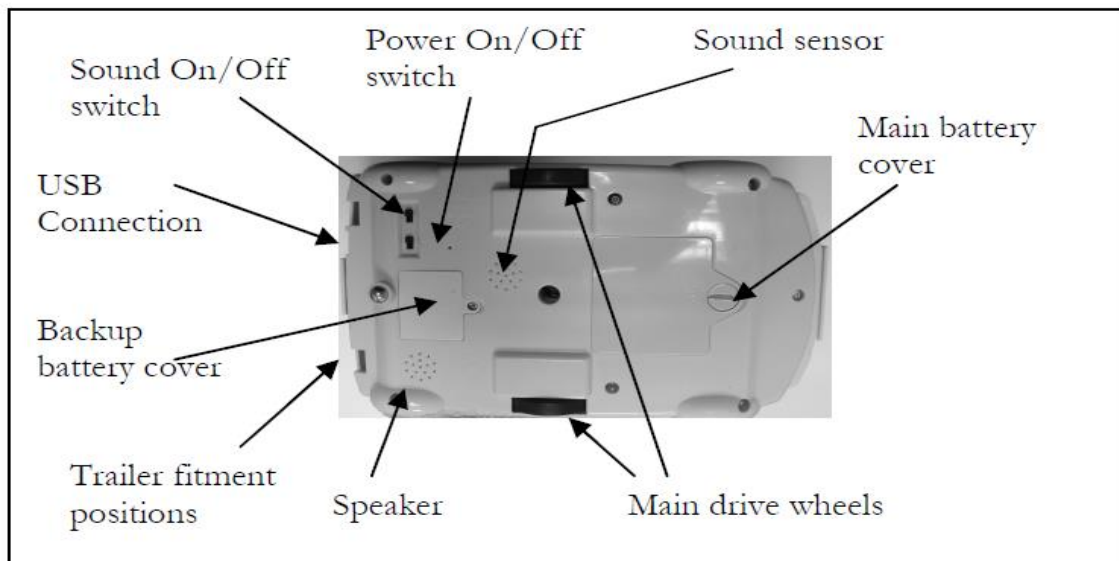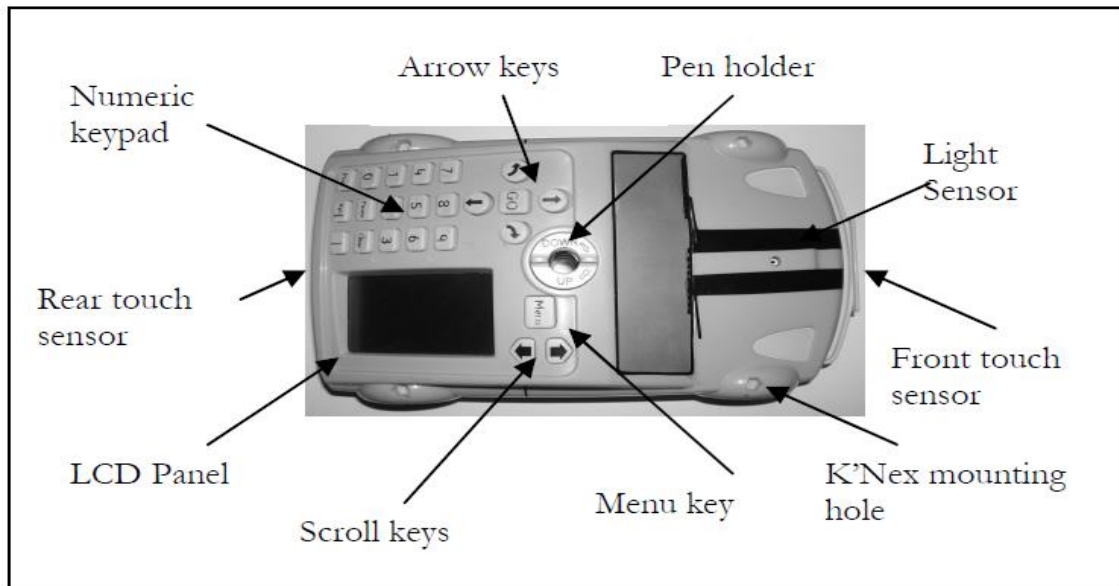
Basic Movements

↑ Or ↓		Will make it move forward or backwards 25cm
← Or →		Will make it rotate 90 degrees

Lesson 1: A Spin Around The Block

It's time for your first Pro-Bot Driving Lesson. Let's turn your Pro-Bot car on and take it for a spin around the block.

To do this, we are going to use the four arrow keys and the go key that is on the top of your Pro-Bot.

When you press these, the commands you enter will appear in the LCD screen.

How the keys work

⬆️ Press the **forward button** to move forward 25cm.

⬇️ Press the **back button** to move back 25cm.

↰ Or ↱ Press to **rotate** 90 degrees.

Clear Press the clear button if you make a mistake. You can also hold the clear button down for three seconds to get to a menu that will allow you to clear all of the instructions you have entered.

Go Press the go button to **start** your pro-bot. You can also press this button at any time when your pro-bot is moving to make it **stop**.

The Pro-Bot is not limited to 25cm steps and 90 degree turns. But for now, we'll just focus on moving it with these increments.

TASK

2. EXPLORE

Now that you know how the buttons work, spend some time programming the Pro-Bot to move forward and backwards and to turn and go in different directions.

3. CHALLENGES

Program your Pro-Bot to:
- move around a square shaped block with 25cm sides.

- move around a rectangle shaped block.

Lesson 2: Cruise Control

Before you can hit the race track or the streets, we need to make sure you can control your Pro-Bot. You will need to be able to estimate how far the Pro-Bot needs to travel and to then be able to program the Pro-Bot to move that distance.

In your last driving lesson, you learnt how to program the Pro-Bot to move forward and back in 25cm increments. In this driving lesson, you'll learn how to program the Pro-Bot to move in other increments.

Setting the distance

To make the Pro-Bot go different distances you press the forward or back button and then enter the number of cm you want the Pro-Bot to move. To move the Pro-Bot 37 cm, you would press the forward button, then press the 3 and the 7 buttons and then press go.
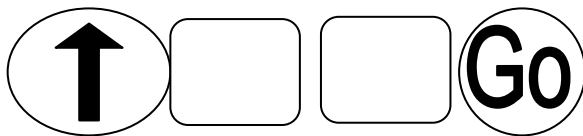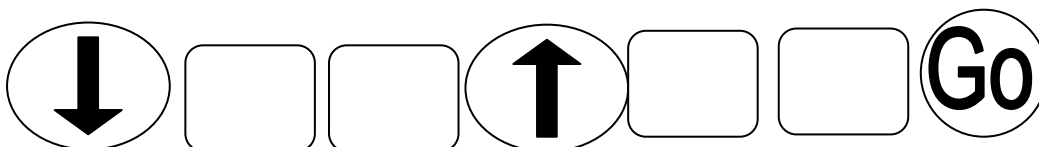
TASK

⬆ 3 7 Go

1. TEST DRIVE

Have a go trying to move your Pro-Bot forwards and backwards different distances.

Can you program your Pro-Bot to move forward **38**cm,(Write the numbers in the box)

⬆ [ ] [ ] Go

Can you make it move back **12**cm and then forward **90**cm? ,(Write the numbers in the box)

⬇ [ ] [ ] ⬆ [ ] [ ] Go

2. STOP SIGN

Create a stop sign and place it in a position away from your Pro-Bot. Estimate how far it is away from your pro-bot and then program your pro-bot to drive towards it.

See how close you can get to the sign without hitting it.

Lesson 3: Stopping And Starting

Did you know that police will fine you if you don't bring the wheels of your car to a complete halt at a stop sign? This is one of the most important road rules that help keep us safe.

When you are driving your pro-bot, the same rule applies when you reach a stop sign. You have to make the pro-bot stop and then restart it's journey after a moment.
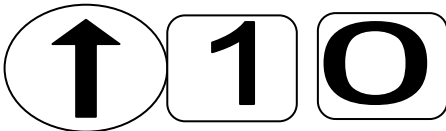
Can you figure out how to do this? Look at the buttons on your pro-bot and see if you can work out.

Stop and Start

To program your pro-bot to stop completely and then go, you will need to use the pause button.
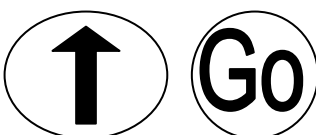
Try this:

Press the **forward** button to move forward **10**cm.

↑ 1 0

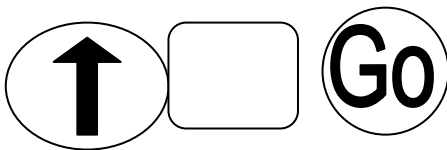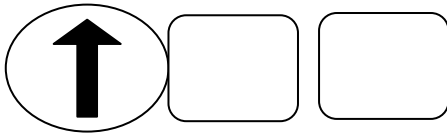Press the **pause** button and press the button to tell the pro-bot to wait **3** three seconds.

Pause 3

Press the **forward** button to move forward **25**cm.

↑ Go

TASK

1. Create your own stop start code and write it below.

⬆️ ☐ ☐

Pause ☐

⬆️ ☐ Go

2. Create a T junction intersection

A T Junction Intersection is an intersection where two roads meet. The sign shown here shows what a T Junction looks like.

Your first task is to use materials in your classroom to design your own T Junction intersection that your pro-bot can drive along.

For safety, a T Junction intersection always has a stop sign for the cars travelling on the road that ends. Place a stop sign in your T Junction.

3. Stopping and starting at the T junction.

Program your Pro-Bot so it drives towards the T Junction, stops for **3** seconds at the Stop Sign and then turns left or right.(remember to put your sign **25**cm from your car)

⬆️

Pause ☐

↩️ OR ↪️ (scribble out the one you don't need) Go
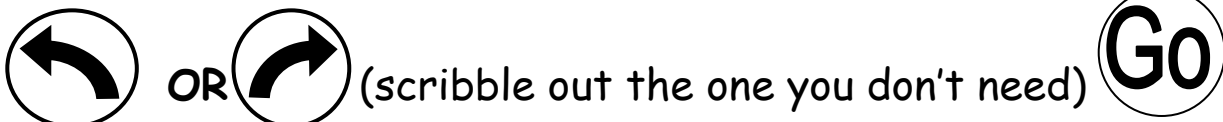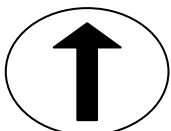
Lesson 4: Mastering turns

If you're going to master driving the pro-bot, you're going to need to master making turns with different angles.

These are some simple angles you could use to turn.
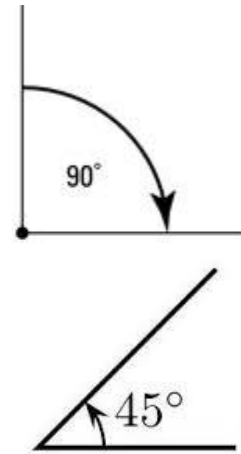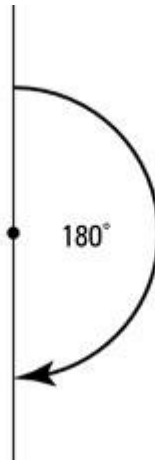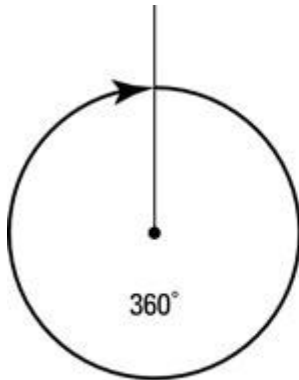
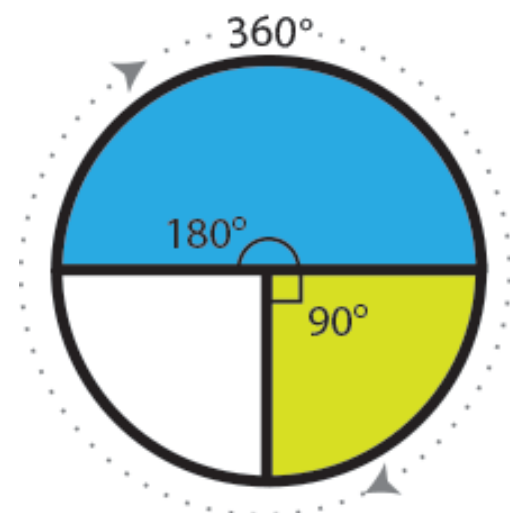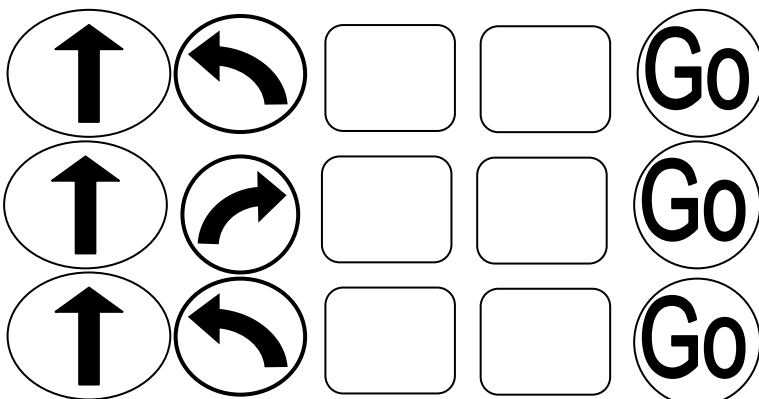Why not try making the Pro-Bot move right **45** degrees:

⬆ ↷ 4 5 Go

TASK

TURNS AT DIFFERENT ANGLES

Program your pro-bot to drive along and then make turns at a number of different angles.

You could begin with a **45** degree angle by following the instructions above.
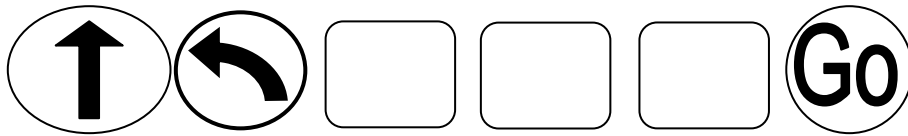
You could then try some angles of your choice.

1. CHANGING DIRECTIONS

Your pro-bot is going in the wrong direction. Program your pro-bot to turn so that it is in the same spot but facing the opposite direction.
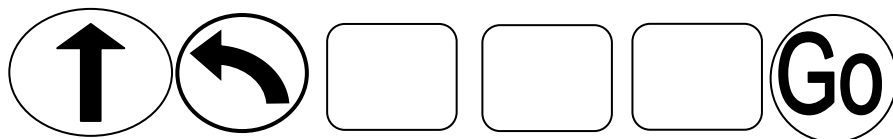
What degree angle did you use?

2. 360 DEGREE TURNS – Donuts!!!

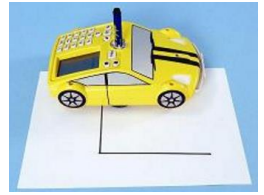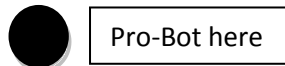Program your pro-bot to rotate 360 degrees. What happens?

Lesson 5: Drawing Lines

TASK

Put a pen inside the Pro-Bot. Enter each set of commands and get it to draw them on this sheet.

1. ⬆ 5 Go

⚫ Pro-Bot here

2. ⬆ 4
↰
⬆ 4 Go

⚫ Pro-Bot here

3. ⬆ 1 0
↱
⬆ 1 0
↰
⬆ 1 0 Go

● Pro-Bot here

4. ⬆ 6
↱
⬆ 6
↱
⬆ 6 Go   ● Pro-Bot here
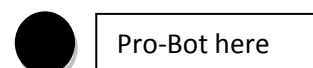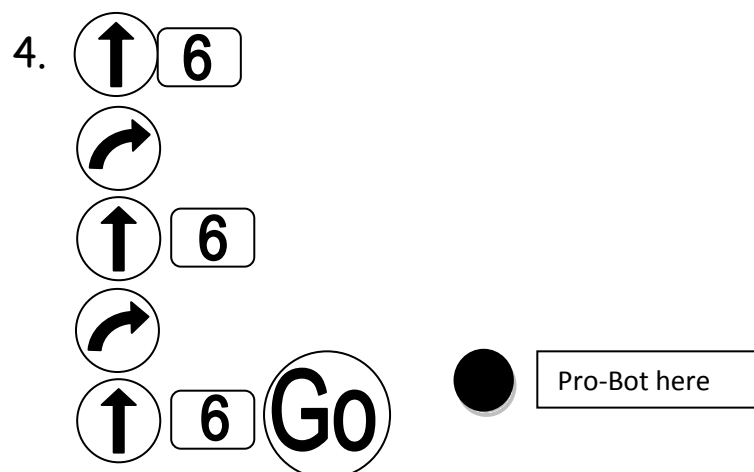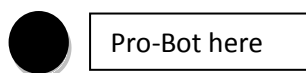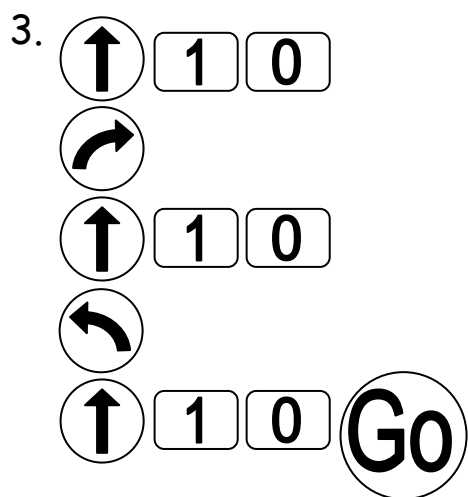
Lesson 6: Drawing Shapes

TASK

1. Put a pen inside the Pro-Bot. Enter these commands to draw a square and a rectangle.

⬆ 6 ↱
⬆ 6 ↱
⬆ 6 ↱
⬆ 6 ↱ Go ⚫ | Pro-Bot here |

⬆ 4 ↱
⬆ 2 ↱
⬆ 4 ↱
⬆ 2 ↱ Go ⚫ | Pro-Bot here |
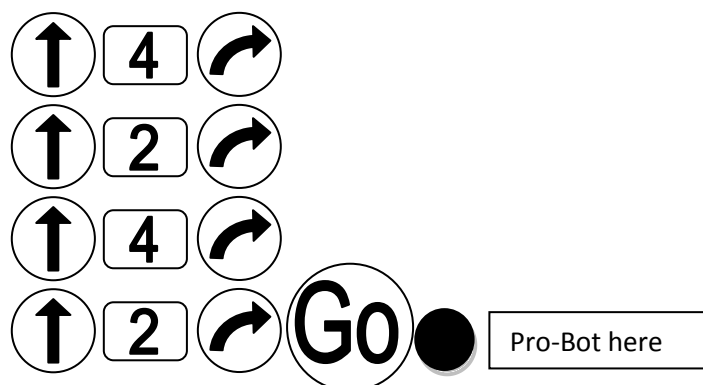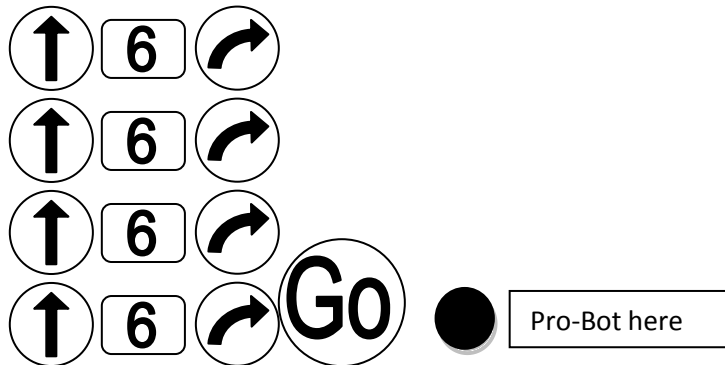
2. Enter the commands needed to draw this square.

⬆ ▢ ↱
⬆ ▢ ↱
⬆ ▢ ↱
⬆ ▢ ↱ Go
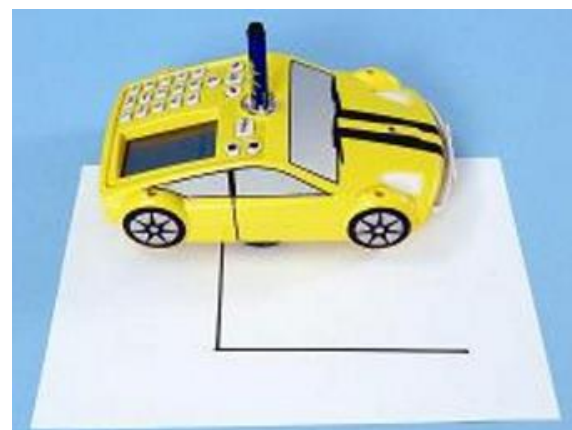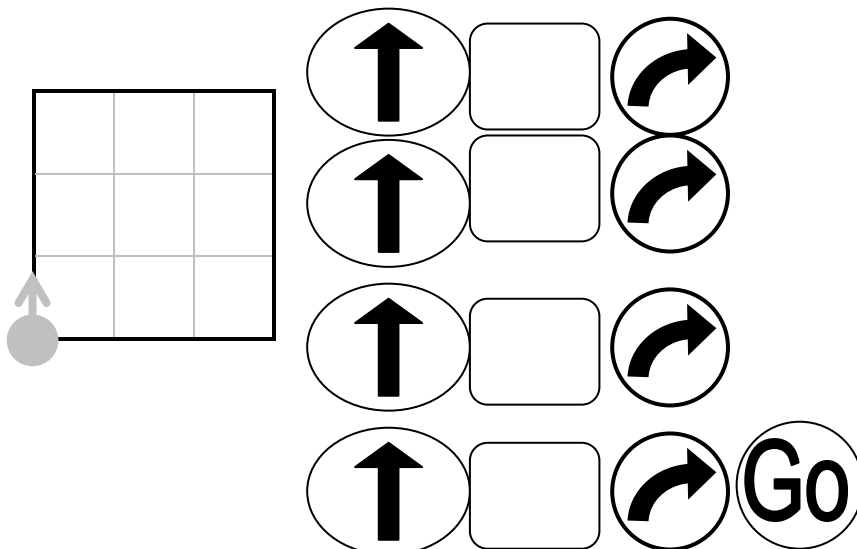
Lesson 7: Repeats(Loops)
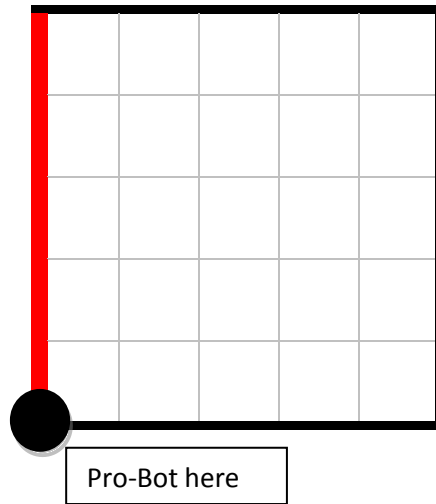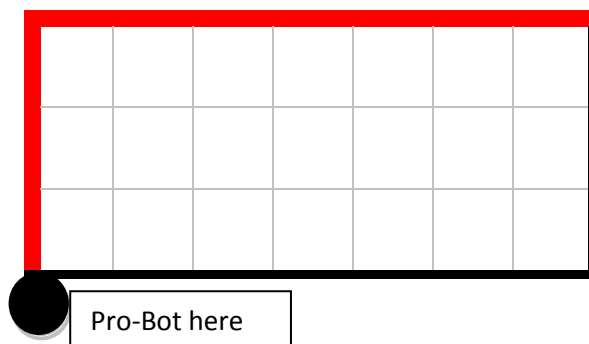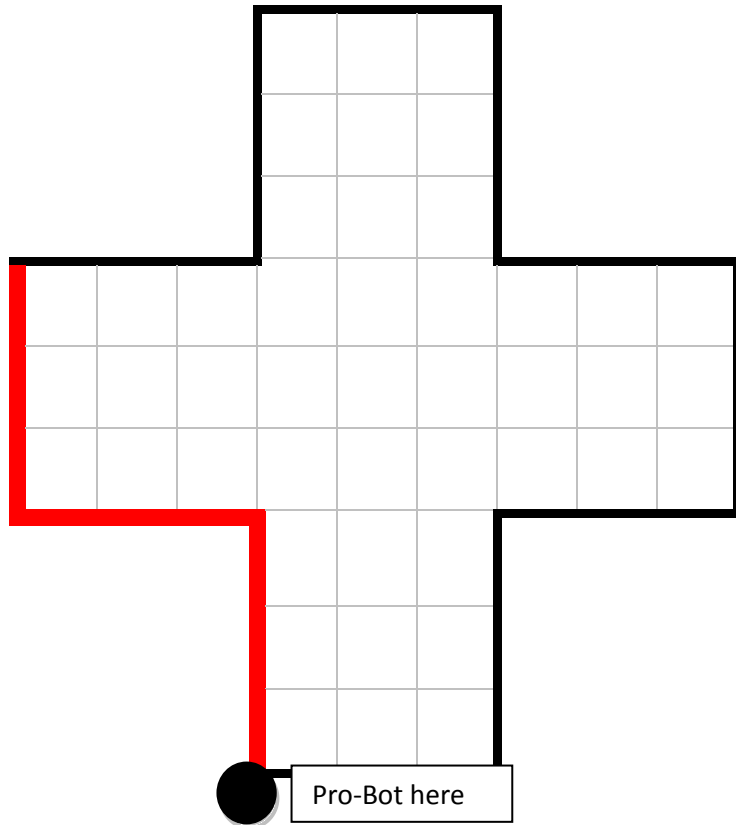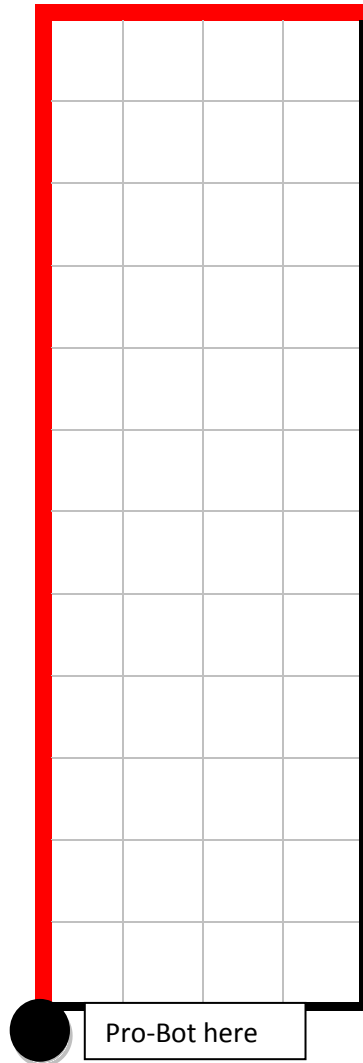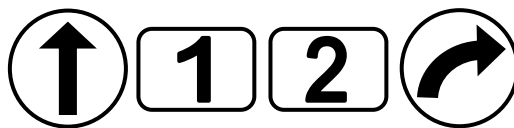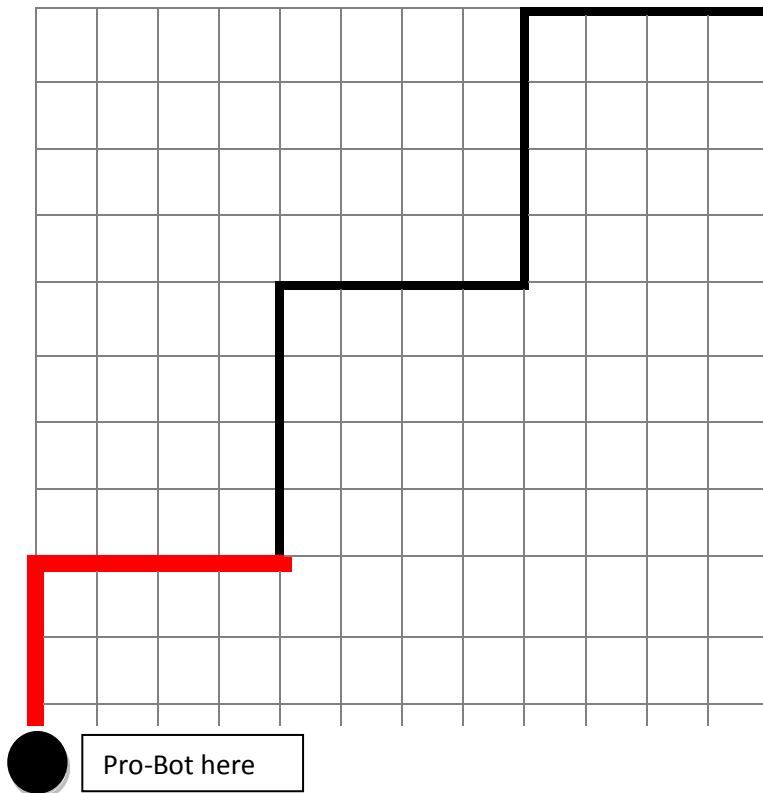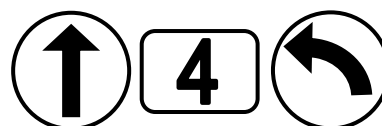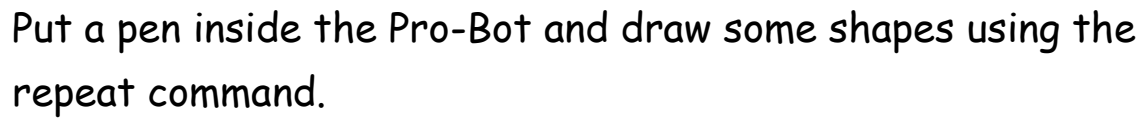
Pro-Bot here

Rpt [**4**

↑ 5 ↱

]

Pro-Bot here

Rpt [**2**

↑ 3 ↱

↑ 7 ↱

]

Pro-Bot here

Rpt [4 ↑ 3 ↰ ↑ 3 ↱ ↑ 3 ↱]

Pro-Bot here

Rpt [**2** ⬆ 1 2 ↱ ⬆ 4 ↱ **]**

Pro-Bot here

Rpt [**3**

↑ 4 ↱   ↑ 4 ↰   **]**

TASK

1. Repeat commands

Put a pen inside the Pro-Bot and draw some shapes using the repeat command.

Rpt [☐ ⬆ ☐ ↱ ⬆ ☐ ↰ ⬇ ☐ **]** **Go**

Pro-Bot here

Lesson 8: Name the Shape

TASK Put a pen inside the Pro-Bot. Enter these commands find out what shape it is drawing.

Rpt [**3** ↑ 1 0 ↱] Go

Pro-Bot here

Name of the Shape:_____

Rpt [5 ↑ 10 ↱ 1] Go
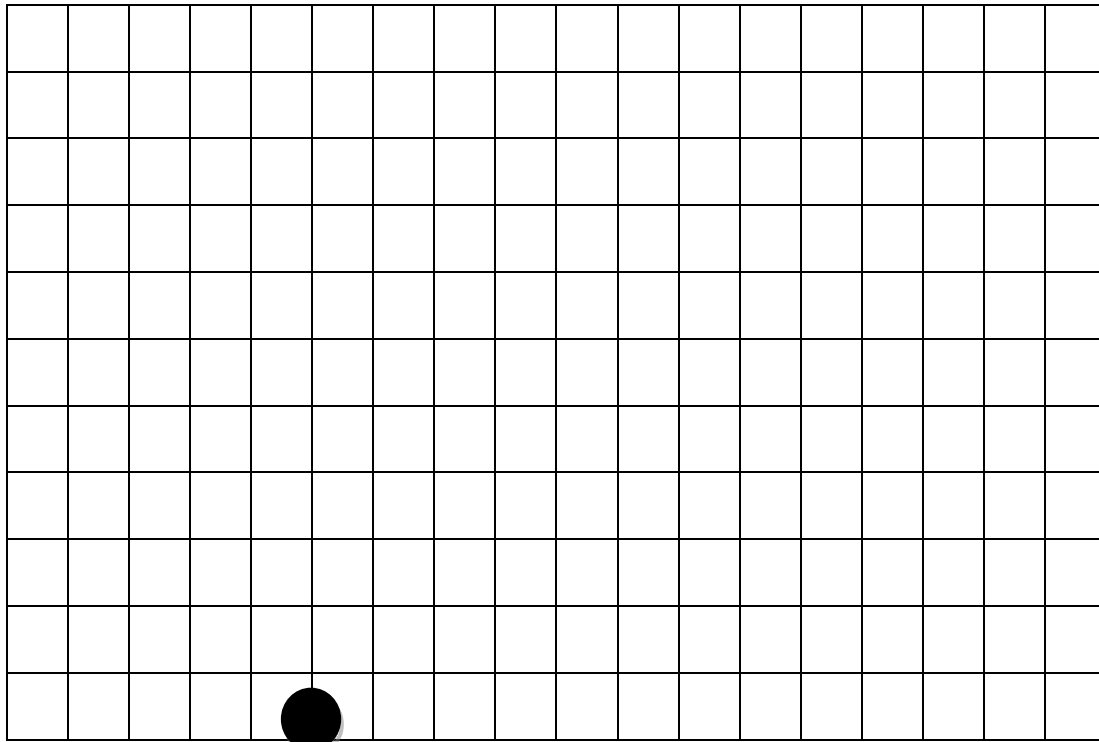
Pro-Bot here

Name of the Shape:_____

My Shape:

Rpt [☐ ↑ ☐ ↱ 1] Go

Pro-Bot here

Lesson 9: Bumper Car (Variables)

Your pro-bot is very special as it has front and rear touch sensors. The touch sensors are located in the front bumper bar and licence plate and the back licence plate.

You can use these to convert your pro-bot into a bumper car that can change directions and move away from obstacles when it hits them.
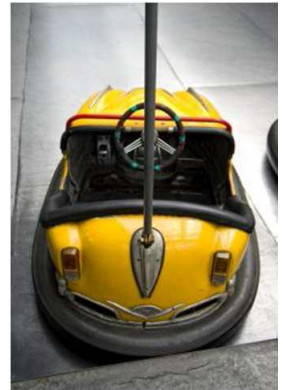
TASK

In this activity, you'll follow a series of steps to get your pro-bot to bump into something and then change direction.

Step 1 – Turning the Touch sensors on.

1. Press the **menu** button to go to the main menu. **Menu**

2. Use the arrow keys next to the menu button to highlight the **Sensors** option from the menu. Press **menu** again to select the sensors option.

3. In the sensors menu, use the arrow keys to move down and select the **Touch sensor.** This should have the word **off** next to it. Press **menu** again to turn the sensor **on**. You can go back into the Sensor menu to confirm that it is on by selecting the menu button and selecting the sensor menu again. You use this same process if you want to turn the sound and light sensors on.

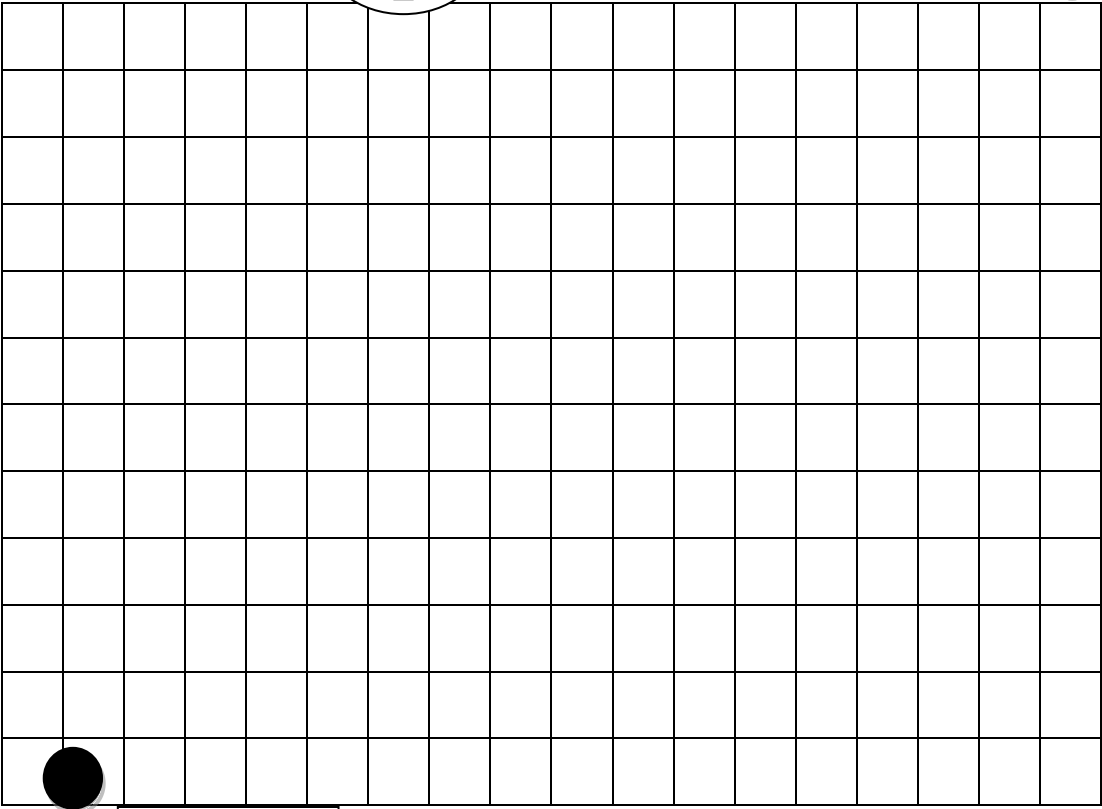**Step 2 – Setting up the procedure for the Touch Sensor.**

1. Press the menu button to go to the main menu.

2. Use the arrow keys next to the menu button to highlight the **Edt Proc** option. This is the option that lets you edit the pro-bots built in procedures (33 – 37).

3. You are now going to choose and edit procedure number **33** which is the front touch sensor procedure. To find this, press the up arrow next to the menu button. Select the front sensor procedure (33) and press menu.

4. You will now see the text **33 FRONT** at the top of the screen. This shows you are editing the procedure for the front touch sensor. You can now put in what you want the pro-bot to do when it bumps into something.

Enter the following:

⬇ ↱ ⬆ Menu
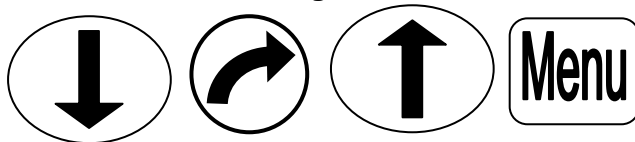
Step 3 – Setting up the Procedure.

5. You will now be back editing the **main procedure** for your pro-bot. Enter the following:

⬇ Menu Menu Menu
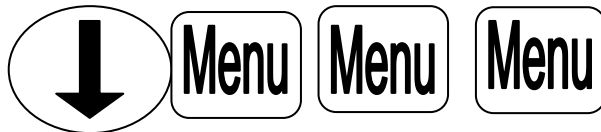
6. Place an object **2** metres in front of your pro-bot. Press **Go** to get your pro-bot to move forward.

When it hits the object, it should reverse, change direction and drive forward.

If not, try again by working through the steps above.

Lesson 10: BEEP BEEP!(Variables)

As a learner driver, chances are from time to time you'll need to beep our horn to tell other cars and people to get out of your way.

To make your pro-bot beep the horn, you need to use a special command. The pro-bot has arrange of special commands you can add into
your main program and secondary procedures.

These include:

Light On	**Sound 1**	**Pen Up**
Light Off	**Sound 2**	**Pen Down**
	Sound 3	
	Sound 4	
	Sound 5	
	Sound 6	
	Sound 7	

TASK

In this activity, you will learn how to access the special commands and to add them to your program. You will also program your pro-bot to put on a musical performance complete with lights, honks and beeps. If you have more than one pro-bot, you could program each pro-bot differently to create a pro-bot orchestra.

1. Access the **Special Commands** Menu by **holding the Menu button down for 1.5 seconds**.

2. Use the **arrow keys** next to the Menu button to **select** one of the seven sounds.

3.Press the **Menu** button to select the sound and return to the main program.

4. Press **Go** to listen to the sound you have added to your program.

5. Repeat steps 1 – 4 and choose different sounds or alternatively try one of the light commands. **Build up** your program so that you have lots of different special commands being used. You should have a lovely symphony of lights and sounds.

6. Now that you have had a go at using the special commands, press the **Menu** button and select **Clear**. From the **Clear menu** select **Clr Main** to clear your main program. Do this anytime you want to start from scratch creating a program on your pro-bot.