

Let's make
learning fun!



education
EXPERIENCES

This book belongs to: **Teacher**

Class: **WeDo Workshop**

Education objectives

The objectives of this programme are to give your group the opportunity to:

- Be introduced to computer control.
- Experience and explore how they are used through Hands On activities.
- Put into practice the principles of computer control through Hands On activities.
- Relate Hands On activities in the workshop to the experience of the attractions in the LEGOLAND® Windsor Park.

Different activities are built into the programme to enable pupils to work at their own pace and according to their individual needs.

Although rides and attractions cannot be reserved, your school party is encouraged to enjoy the Eyes On and Body On activities before and/or after the workshop. There are some height restrictions on the rides so it is advisable to check these before you visit. If your group has special needs requirements there is a guide available that will help you make the most of your visit.

National Curriculum Mapping

This resource corresponds to the following areas of the National Curriculum:

KS2

Information &
Communication
Technology

KS2: 2b

KS3

Design & Technology

KS3: 4c



LEGO® WeDo - Teachers' Notes

Dear Class,

Yesterday we heard that you are all coming on a school trip to LEGOLAND® Windsor. We are sure that you will have a great time while you are here! There are lots of exciting things to see and do in the Park. Your teacher will tell you more about them.

One of the great things about your visit is a special workshop that you will be taking part in. Here you will be working with our brand new robotics system LEGO® WeDo and learning how to build unique moving, talking and interactive robots. Your task will be to help us achieve the perfect programme for our robots and test them in the Exploratorium workshop room.

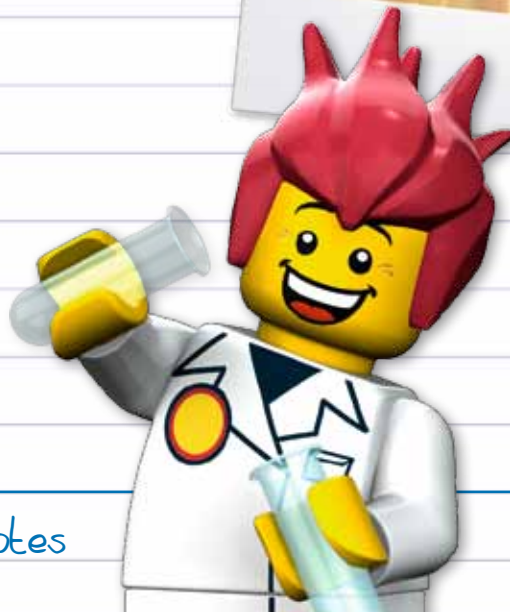
Other pupils have already created some amazing robots. I bet you can do better than them though, especially if you prepare for the workshop. Think about the different types of computers that you see everyday and discuss how you think they work.

So, when you come to LEGOLAND Windsor, it would be great if you can help us in our quest to create the perfect programmed robot.

See you soon

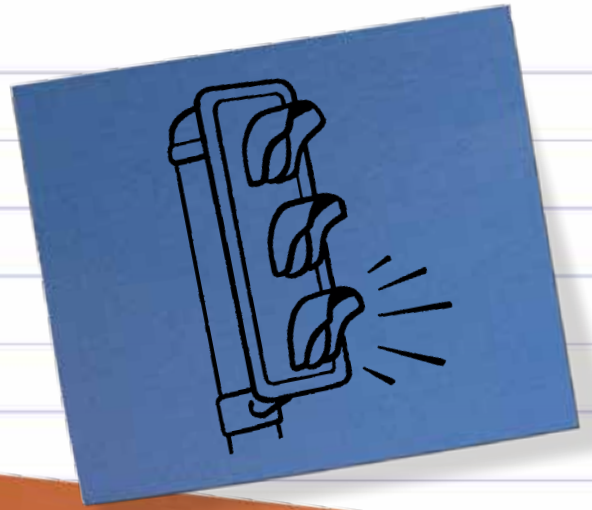
Professor Albrick

Professor Albrick
Dept. LEGOLAND Learning
LEGOLAND Windsor



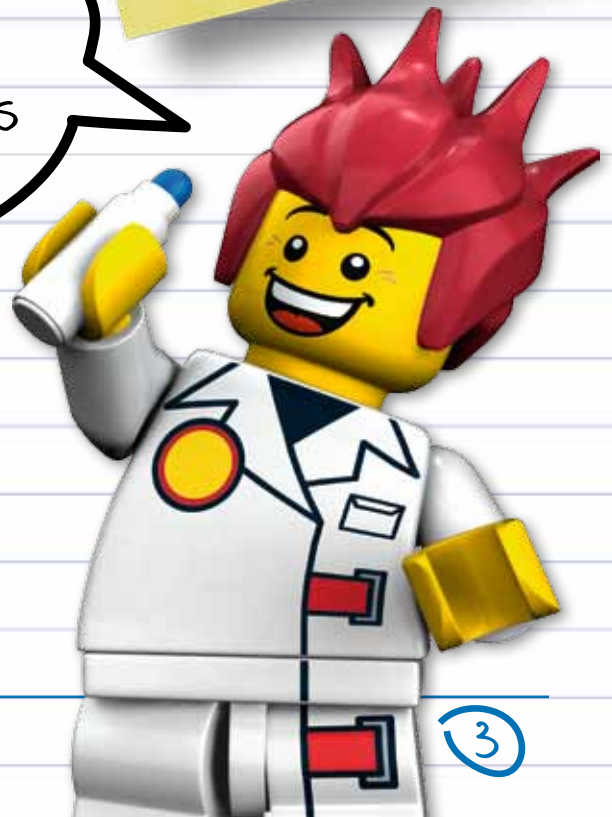
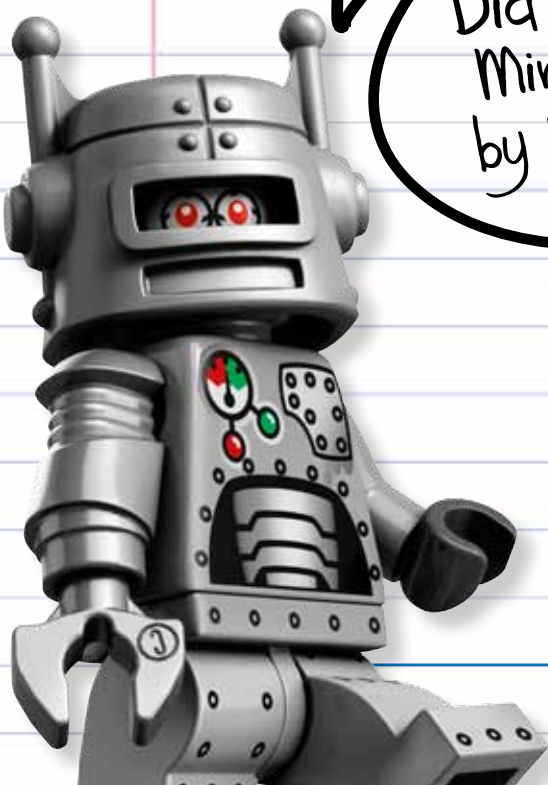
Computers in control

- The first general-purpose calculator was developed as far back as the mid-19th century. It was an 'analytical engine' which could be instructed, or programmed, to perform different sets of mathematical operations.
- Today, computers and microchips surround us even though we do not always recognise that they are there: cash registers, traffic lights, washing machines, microwave ovens, cars, toys... the list is endless.
- In simple terms, a computer operates according to a list or sequence of instructions called a program. The computer program tells the computer how to perform an action.

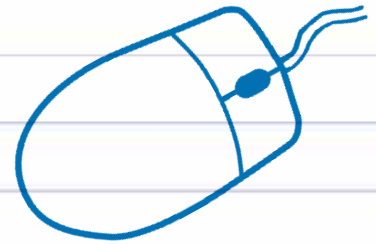
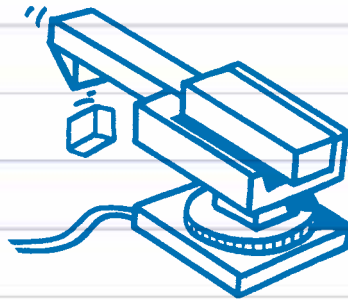
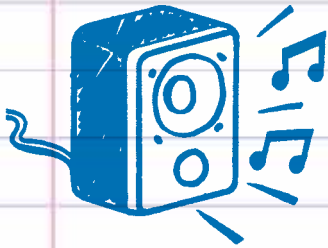
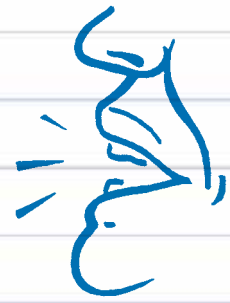
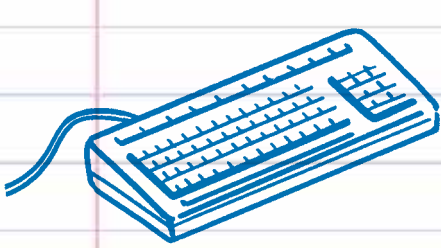


Robots rely on a computer program to operate

Did you know.. Miniland is run by 14 computers



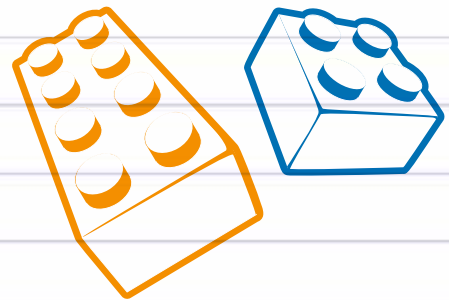
Information provided to the computer program is called input. Input can arrive via various sources such as a keyboard, a mouse, a barcode reader or a voice.



Once the computer has been told to do its task it must then show us the result, which is called output. This can occur in a number of ways: on screen, on a printout, by sound or by causing something to operate.

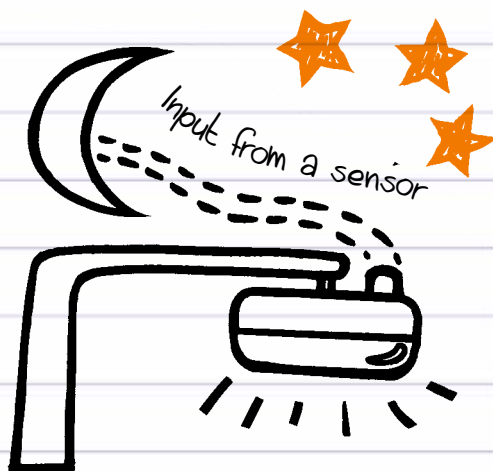
The real benefit of using computers appears when:

- the same action has to be performed several times
- you have to handle large amounts of information.



Computer control falls into two broad categories:

- Sequenced control – a series of commands is stored and repeated. Typically used for such things as traffic lights, rotating advertising boards, and a disco lighting system.
- Feedback control – the computer reacts to input from a sensory device. For example the windows in a modern greenhouse will open when the temperature reaches a certain level; street lamps will switch on when it gets dark; the burglar alarm will start when there is a movement in the room... and so on.



Store and repeat



Store and repeat



Activities before the visit

- Show your pupils the map of LEGOLAND Windsor. Discuss their expectations of the visit and any concerns, e.g. what to do if they are separated from the group or if they feel unwell during the day.
- Talk about the activities that will take place.
- Introduce the pupils to the concept of computer control. Talk about computer controlled things that the pupils are familiar with.

Activities after the visit

Tasks through direct commands:

- The pupils work in pairs: one is a controller, the other the robot.
- The controller must command the robot to carry out a task such as pick up a book, walk round a table and place the book on a shelf or perform a silly walk or dance.
- The robot can only react to specific instructions from the controller. To say "walk" is not enough.
- The instruction needs to be precise, such as: "Lift a leg. Move leg forward and put it down on the floor 15cm in front. Shift body weight onto left leg and repeat action with right leg."



LEGO WeDo Workshop

A 45-minute workshop introduces pupils to the concept of computer control. Pupils will create, input, store, test and modify simple computer programs using LEGO WeDo Models.



Miniland

This miniature wonderland offers lots of opportunities for observing computer-controlled models: bridges, boats and many more.





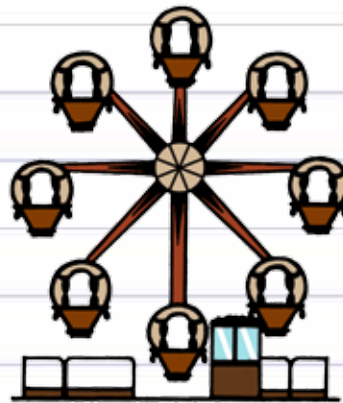
Desert Chase

This carousel gives pupils the opportunity to see and feel computer control in action.



Aero Nomad

Here the pupils will see the instructions that tell the wheel to start, rotate a number of times and stop.



Pirate Falls Dynamite Drench

During this exciting flume ride the pupils will see and experience a series of computer controlled models. They will also experience input, motion process and output as they have their photo taken.

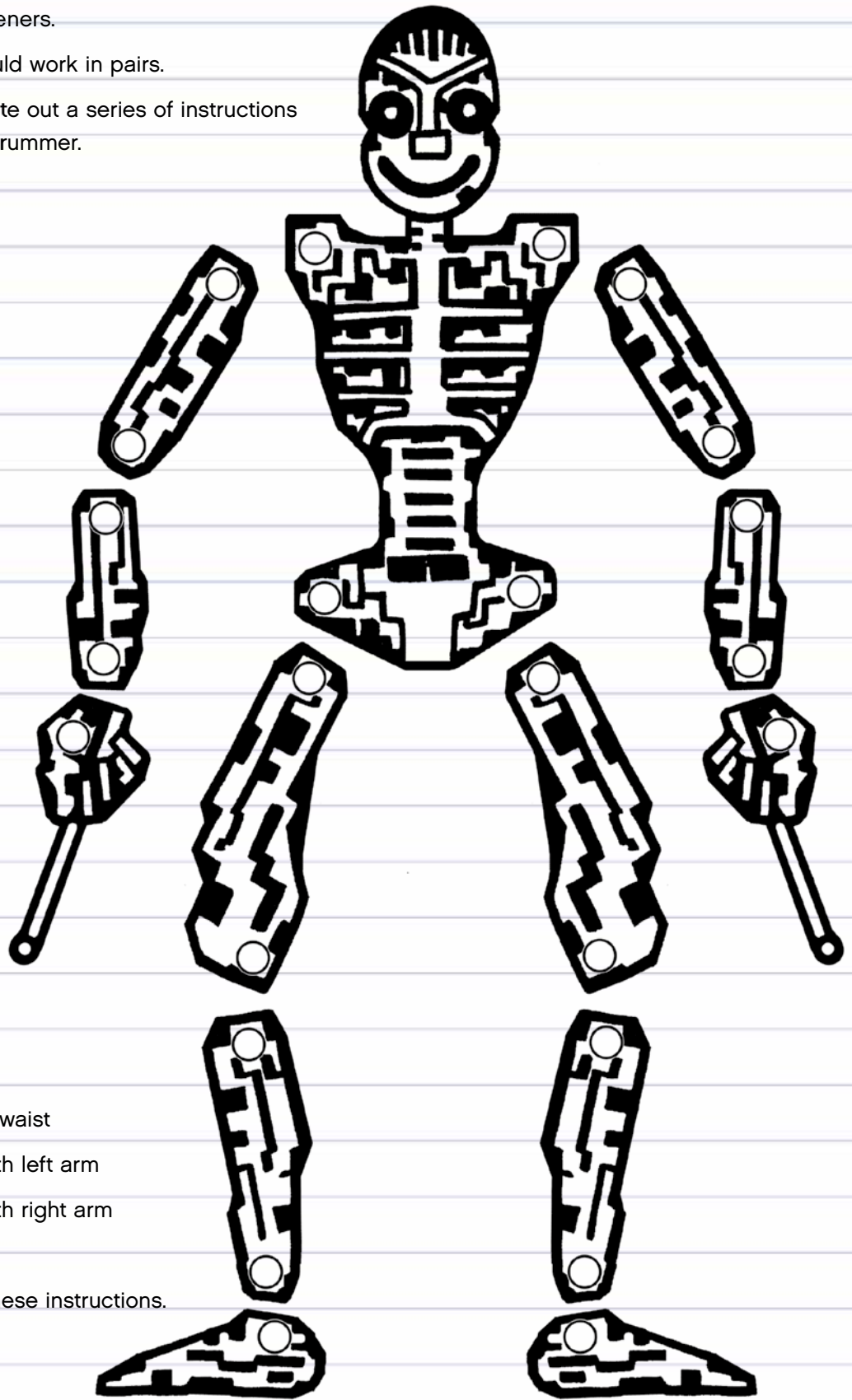


The Robot Orchestra

Make a copy of the Robot Orchestra's drummer on thick paper, then cut him out and assemble him with paper fasteners.

The pupils should work in pairs.

Ask them to write out a series of instructions to control the drummer.



For example:

- lift left arm
- lift right arm
- bend at the waist
- tap drum with left arm
- tap drum with right arm
- tap foot

then perform these instructions.

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