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# Programmable Baby Toy

## Computing Science Concepts

- Conditional selection
- iteration

## Program Aim

Use Lego Wedo programmed through Scratch to create and program a rattle that can grow with the baby

## Computational Thinking

- Algorithmic Evaluation
- Decomposition

## Maths Concepts

- Equals means the same as

## Where in KS2

- In my scheme of work I would put this in Year 4 after pupils have made quiz and slug trail game

## National Curriculum Programs of Study KS2

### Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts**
- **use sequence, selection, and repetition in programs; work with variables and various forms of input and output**
- **use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs**

(Coverage in Bold)

## Design & Technology Programs of Study

### Technical knowledge

- apply their understanding of computing to program, monitor and control their products.**

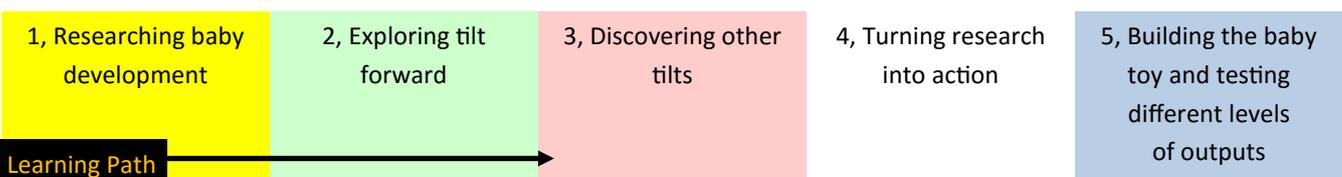
(coverage in bold)

### Resources

Lego Wedo, Scratch 1.4 or 2.0

Web access

Recording Sheet

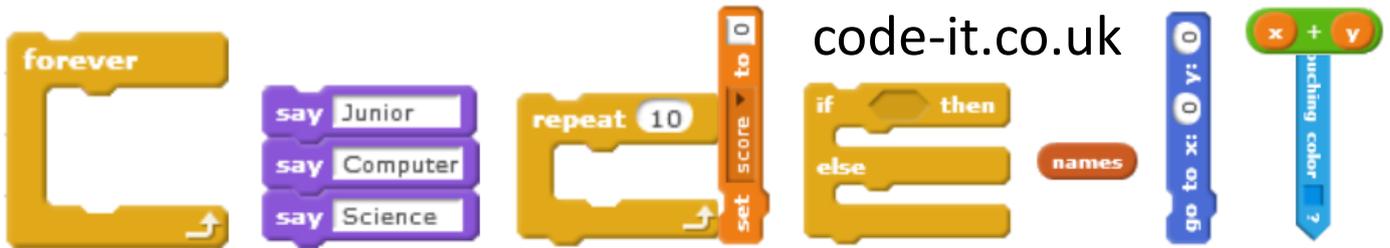


## 1, Researching Baby Development

Explain that they have been tasked with creating a programmable rattle that can be played with by very young children and changes what it does as the child grows up.

To enable them to decide what type of things to program the rattle to do they need to spend some time learning about baby development. Navigate to <https://childdevelopmentinfo.com/child-development/normaldevelopment/> and look at the rows from 0-2 years. Using the recording sheet can they pick out key information that will help them program a rattle.

Alternatively you could also talk to your class about what babies need in their early stages of life and group source stimulus from discussion of pupils experiences and the baby development website.



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## Programmable Baby Toy p2

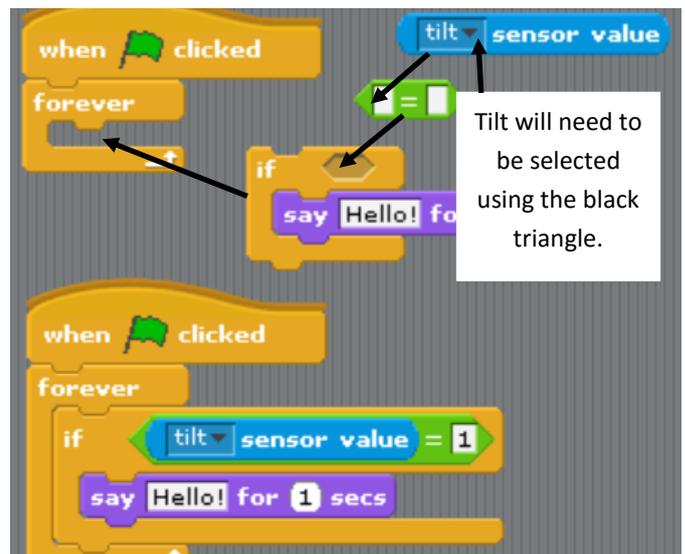
By doing this pupils are using the computational thinking skill of abstraction, looking for the most important information and excluding information that is less important to their specific need. It can help to work with your lowest literacy group sharing the writing and reading and letting them concentrate on which information is vital to the task.

### 2, Exploring Tilt Forward

Show pupils how to plug in the Lego Wedo tilt switch to the USB hub and then into the computer if using Lego Wedo and connecting by Bluetooth if using Lego Wedo 2.0.

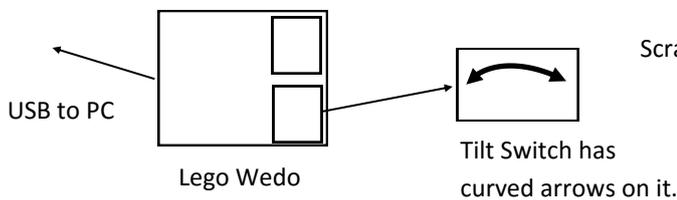
Choose or draw a sprite that is a block. Explain that appearance will change once the programming needs are decided upon so the block is just a placeholder to be replaced with a real design later on.

Build the short program on the right. If you have used conditional selection before remind pupils of those times. If it is your first time illustrate selection by handing out digit number cards. Ask all the pupils who hold even numbers to stand up. Explain that this is your condition and you have programmed them to obey those commands. Illustrate this with



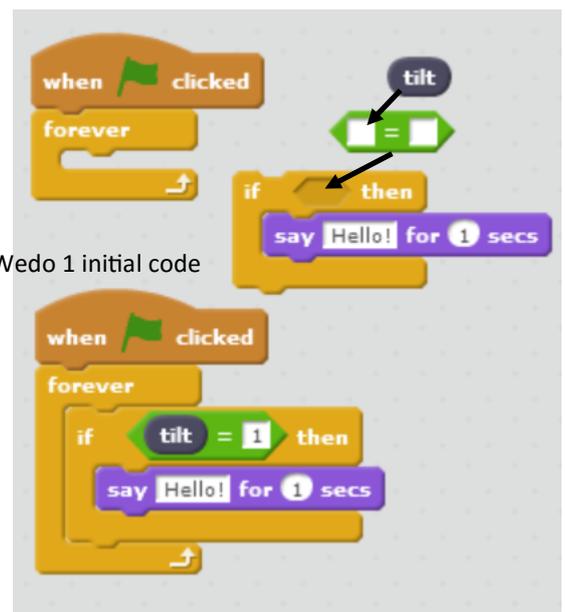
Tilt will need to be selected using the black triangle.

Scratch 1.4 Lego Wedo initial code

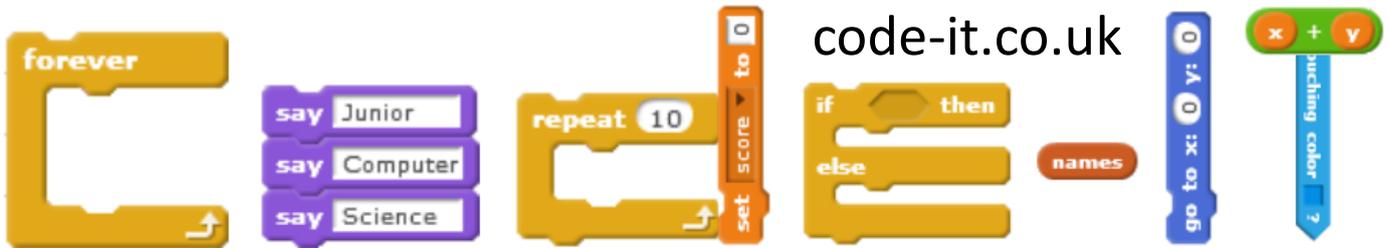


Lego Wedo Connections

Scratch 2.0 Lego Wedo 1 initial code



some more conditions. Ask pupils how we would get the class to check that condition for the rest of the lesson. Answer we would put it into a forever or repeat loop.



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# Programmable Baby Toy p3

If you are using Scratch 2.0 you could also use the when tilt = block. In reality this is running inside a loop as well but that is hidden to help younger students. I think it is worth the trouble to explain selection and loops properly as it opens lots of other creative programming doors.



**Scratch 2.0 with Lego Wedo 2.0**

The blocks are slightly easier to code with in Lego Wedo 2.0 but you also miss out on making the output of the block the same as the output you want using the = sign which helps later.

What else can your students find to action instead of hello? Give them plenty of time to explore and group source a list of what they all discover. Encourage them to keep blocks that work loosely near the control block.

### 3, Discovering other tilts

Pupils using Lego Wedo 2.0 will often discover other tilt actions earlier as the menu triangle next to down invites investigation. If they haven't started to investigate this aspect challenge the class to see if they can discover how to make their hardware respond to a tilt in another direction.

**Answer in lego Wedo** change the numbers to 1 = wire up front down, 2 = Tilt left, 3 = Wire down, 4 = Tilt right, 0 = level

### Answer in Lego Wedo 2.0

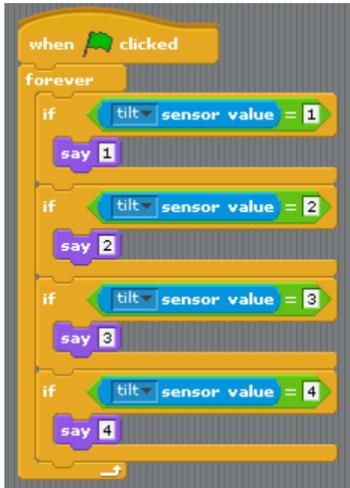
Alternatively Pupils could create multiple single blocks all controlling a different tilt but all starting with a green flag



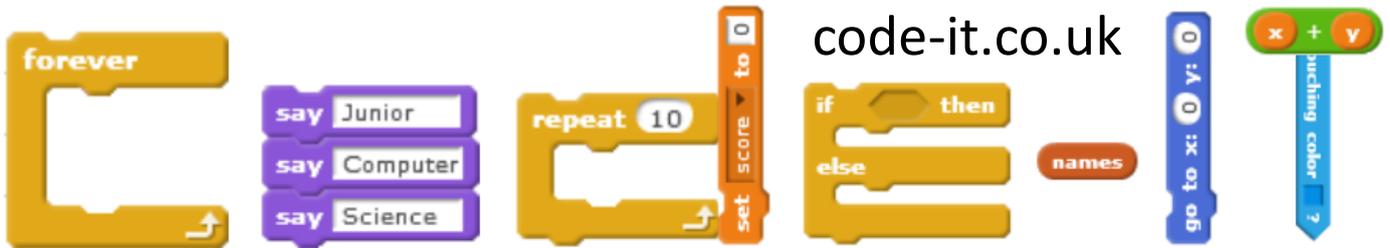
When pupils have discovered every tilt it is important that they can action any tilt to cause an action as their baby toy can have 4 outcomes.



Wedo 2.0 with Scratch 2.0



Wedo with Scratch 1.4



## Programmable Baby Toy p4



### Lego Wedo with Scratch 2.0

NOTE

You can use 0 for level but that creates too many outputs for our baby toy and means it can't go into non active mode easily

### 4, Turning research into action

Go back to their recording sheet.

Which sets of actions will they choose for each stage in the babies development. Pupils look at the blocks they chose earlier (end of part 2) and decide which sets to create at which age.

Can they justify their choices?

This is a great activity to use Talk for Computing

Set up a tablet on a tripod and ask pupils to record 30 second video justifying some of their output choices

### 5, Building baby toy and testing the different sets of outputs

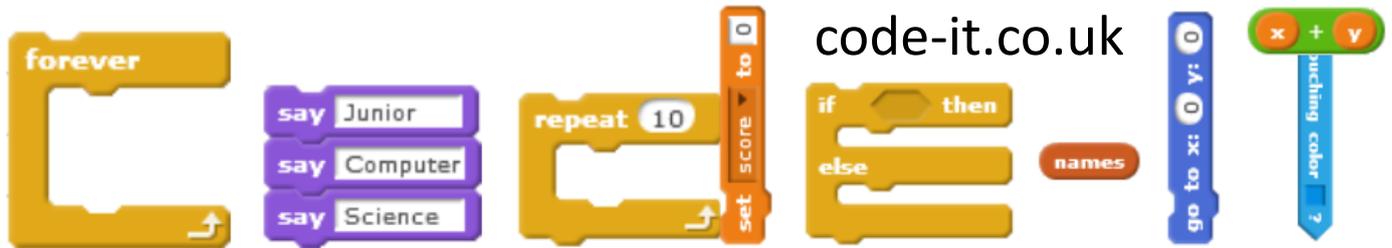
Instruct pupils to create a different sprite for every baby level

Each level should start with a different letter starting block

Each level should have an off button as well **stop script** in Scratch 1.4 and **Stop this script** in Scratch 2.0 so that the parents can switch between levels when it is appropriate for the baby to move on.

Testing is key here. Pupils should make changes and then test before making more tweeks. This cycle of create test debug is important in computing as well as DT.

Ideally all the electronics would be housed inside the baby toy and there would be no wires can pupils come up with good materials to make this out of. Could they draw and label their designs. If you had a 3D printer they could make the housings although I don't recommend testing on real babies if you do.



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## Programmable Baby Toy p5

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For lots of great Scratch planning and advice on how to teach programming purchase [How to teach primary programming using Scratch](#)

If you use Twitter why not follow Phil Bagge @baggiepr who can also be contacted for advice on promoting computing excellence in your school.