

Year 6. LEGO WeDo

Up to this point, the children should have learned and practised how to use motors, gears, pulleys, sensors, crown gears, tilt sensors, and levers, as well as having practised the programming commands within the software. At the beginning of each of these LEGO units, we have chosen to include a 're-familiarising' lesson to begin with to refresh the childrens' memories as to how to use the kit and the software. They are then asked to ensure they practise creating the worm gear and cam mechanisms so they are confident in how they move and work. They are then tasked to build an object which uses these mechanisms. These are open ended activities which have been selected to allow the children to fully explore their own skills and creativity, both in terms of design and technology and programming. It is recommended that the children work in partners for these lessons for peer support. As a matter of good practice, children should aim to create their mechanism before building their object around it, then finally program it to move in the way that they want it to.

Adaptive teaching – Recommended tried and tested practise in these lessons:

Due to the nature of Computing lessons and the common 'firefighting' required in lessons with technical issues or children who are individually confused over what may be considered small stumbling blocks, it is recommended that teachers put time and effort into reinforcing the use of school-wide learning ethos and systems (for example, the use of the 4B's – brain, board, buddy, boss) to encourage children to try to solve their problems in the right way rather than going straight to the teacher, or lessons will quickly become unmanageable. It is also recommended to follow our school's use of the Rosenshine model of mastery teaching strategy and teach lessons in a series of stages, with short, simple tasks being set, and children who finish early can be given encouragement to support and 'lifeguard' other students. This has twofold benefits; the process of teaching others cements and secures pupils' own mastery as well as ensuring the teacher isn't overwhelmed with personal requests for help. If one-to-one support is unavailable for high need children, it is a good idea to make sure these children are sat next to or near a higher ability student who may act as peer support for them, and these children are monitored carefully throughout lessons to ensure they stay on task and understand each objective given. Ensure that any hardware support that is required for individual's SEND requirements are adjusted appropriately and are tied to those students' individual log ins (e.g. Zoom tools or screen tints for students with visual impairments etc). Teachers should have a knowledge of Pupil Premium children, particularly those who have been seen to struggle in Computing lessons, and these children should be monitored alongside those with SEND during lesson time to help ensure they access lessons along with the rest of the class.

Knowledge covered:

NC	Ladders Objectives
(2.1) Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Y6 - CS2 - I can use IF, THEN, ELSE commands to control what happens. Y6 - CS3 - I can create and call FUNCTIONS to better organise my coding. Y6 - CS6 (KPI) - I can control a physical system using a range of commands (e.g. LEGO)
(2.2) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	Y6 - CS4 - I understand what variables can be used to make a game more realistic (e.g. a timer or score). Y6 - CS5 - I understand that any system requires input devices (e.g. keyboards) and output devices (character on screen/ printer/ model) and that the system processes the data.
(2.3) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs	Y6 - CS1 (KPI) - I can write programs to do what I want them to do. I can test and debug these.
(2.4) Understand computer networks including the Internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.	Y6 - CS7 - I understand that my work can be saved in a range of places (the device itself, USB stick or 'in the cloud') and can talk about this.
(2.5) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Y6 - CS8 - I can identify how to use a search engine Y6 - CS9 - I can describe how search engines select results

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(2.6) Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	
(2.7) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	

Medium Term Lesson Plan:

Lesson 1	Familiarisation with the Lego WeDo software L.I I can familiarise myself with LEGO WeDo hardware and software L.I I can control a physical system using a series of commands Y6 – CS1 (KPI) Y6 - CS2 Y6 - CS3 Y6 - CS5 Y6 - CS6 (KPI) Y6 – CS7 Y6 – CS8 Y6 - CS9	S.C I can create a worm gear mechanism I can create a cam-based mechanism	<u>Key Questions</u> *Prior knowledge* What do we know/remember of Lego WeDo? How does it work? What kinds of things can we do with our LEGO programming commands?	Reintroduce the children to the Lego WeDo boxes. Remind the children of need for manners, respect and organisation – we may need parts from other people's boxes in these lessons. Remind children of the preferred logistics of classroom organisation. Remind the children about some things that can be built with the kit for inspiration: http://www.wedobots.com Let the children work through the mechanism challenges once again to refresh their memories. Worm gears and cams, are new this year. Evidence use of the worm gears and cams on Seesaw. Children to review their new learning. Extension – children to build an interesting object around one of these two mechanisms.
Lesson 2 & 3	Creating and programming a robot to meet design criteria L.I I can create and program a physical system to specific criteria Y6 – CS1 (KPI) Y6 - CS2 Y6 - CS3 Y6 - CS5 Y6 - CS6 (KPI) Y6 – CS7 Y6 – CS8 Y6 - CS9	S.C: I can plan my design I can build and program my design I can evaluate my design and suggest possible improvements I can develop and improve my design	<u>Key Questions</u> *Prior knowledge* What does the worm gear/cam do? What kind of a movement does it create? How could this be useful? What could we create around this kind of movement?	Children to plan and an interesting creation that makes use of a worm gear and a cam. Children either create their own design from scratch or select from a list of suggested ideas. Children work in pairs to plan their design, build, evaluate and improve. Reflect on their creation at the end of lesson 3. Discuss how the mechanisms move. Could they turn the mechanism a different way so the movement is in another direction? Could they create an animal? A form of transportation? An everyday object? A human character? Possible ideas include a lizard who sticks its tongue out, a high-fiving hand, a human with an umbrella, a dancing character Possible extensions: Children may include useful technical objects from the WeDo sets that they have used in the past if they wish (e.g. a sensor) and up-level their programming by including sounds or changes to the display when something changes. Lesson 3 to focus on re-building and improving their designs, or creating a new one if they were unhappy with their previous design. Allow time to evidence, evaluate and reflect using Seesaw.