Bollin Primary School

Growing hearts and minds together

Lego We.Do2.0 Long Term Plan – Key Stage 2

Lego WeDo 2.0 uses a project progression defined by three phases.

- **Explore Phase:** pupils connect to a scientific question or an engineering problem, establish a line of inquiry, and consider possible solutions.
  The steps of the Explore phase are: connect and discuss.
- **Create Phase**: pupils build, program, and modify a LEGO® model. Projects can be one of three types: investigate, design solutions, and use models. Depending on the type of project, the Create phase will differ from one project to another.
  The steps of the Create phase are: build, program, and modify.
- **Share Phase:** pupils present and explain their solutions and findings using their LEGO models and the documents they have created with the integrated Documentation tool.
  The steps of the Share phase are: document and present.

Guided Projects

Guided Projects help set the scene and facilitate the learning experience, they are designed to build your pupils' confidence and provide the foundations necessary for success.

Open Projects

Open Projects also follow the Explore, Create, and Share sequence, but intentionally do not offer the same step-by-step guidance as the Guided Projects, they provide an initial brief and starting points to build on.

Develop Science and Engineering Practices

WeDo 2.0 projects develop science practices as they provide opportunities for pupils to work with and develop ideas and knowledge, and to gain an understanding of the world around them. The progression and difficulty level of the projects allows pupils to develop competency while exploring and learning about key science topics.

1. **Ask questions and define problems:** this practice focuses on simplistic problems and questions based on observational skills.

2. **Develop and use models:** this practice focuses on pupils' prior experiences and the use of concrete events in modelling solutions to problems. It also includes improving models and new ideas about a real-world problem and solution.

3. **Plan and carry out investigations:** this practice is about how pupils learn and follow directions for an investigation to formulate probable solution ideas.

4. **Analyse and interpret data:** the focus of this practice is to learn how to gather information from experiences, document discoveries, and share ideas from the learning process.

5. **Use mathematics and computational thinking:** the purpose of this practice is to realise the role of numbers in data-gathering processes. Pupils read and gather data about investigations, make charts, and draw diagrams resulting from the numerical data. They add simple data sets to come up with conclusions. They understand or create simple algorithms.

6. **Construct explanations and design solutions:** this practice is about ways they might go about constructing an explanation or designing a solution for a problem.
7. Engage in argument from evidence: constructively sharing ideas based on evidence is an important feature of science and engineering. This practice is about how pupils begin to share their ideas and demonstrate proof to others in a group.

8. **Obtain, evaluate, and communicate information:** teaching children about what real scientists do is key to this practice. The way in which they set up and complete investigations to gather information, how they evaluate their findings, and how they document, are all important elements. It is important that teachers explore a plethora of ways to have pupils gather, record, evaluate, and communicate their findings. Ideas include digital presentations, portfolios, drawings, discussion, video, and interactive notebooks.

Getting Started (Beginner)

	Year 3	Year 4	Year 5	Year 6
Lego We.Do2.0 Project	**Milo the Science Rover** **Milo's Motion Sensor** **Milo's Tilt Sensor** **Collaborating**			
Purpose	These give the basics of how the motion and tilt sensor work – good to have this base of knowledge before taking on the guided projects. All four could potentially be done across one afternoon.			

Getting Started (Beginner)

	Year 3	Year 4	Year 5	Year 6
Lego We.Do2.0 Project	**Glowing Snail**	**Cooling Fan**	**Moving Satellite**	**Spy Robot**
Purpose	These are to be used at the beginning of each year to go over the basics of assigning kits to different pairs, getting kits out, looking at the grid that shows where things go and how many, going over using the rechargeable battery packs, making a model collaboratively, using the WeDo 2.0 app on the iPads, lost and found box, taking apart model and putting parts away properly.			

Guided Projects – Science (Intermediate)

	Year 3	Year 4	Year 5	Year 6
Lego We.Do2.0 Project *(Cross-Curricular Links)*	**Speed** *(Science: building on Y2 Forces)* **L.O. Investigate the factors that make a car accelerate to help predict future motion** **Frog's Metamorphosis** *(Science: building on Y2 Life Cycles)* ***L.O. Model a frog's metamorphosis using a LEGO representation and identify the characteristics of the organism at each stage*** **Plants and Pollinators** *(Science: Plants)* **L.O. Model a LEGO representation of the relationship between a pollinator and flower during the reproduction phase**	**Prevent Flooding** *(Geography: Rivers)* **L.O. Design an automatic LEGO floodgate to control water according to various precipitation patterns** **Drop and Rescue** *(Geography – Extreme Earth)* **L.O. Design a device to reduce the impacts on humans, animals, and the environment after an area has been damaged by extreme weather** **Pulling** **L.O. Investigate the effects of balanced and unbalanced forces on the movement of an object**	**Robust Structures** *(Geography: building on Y4 Extreme Earth)* **L.O. Investigate the characteristics that make a building earthquake resistant, using an earthquake simulator constructed from LEGO® bricks**	**Sort and Recycle** *(Passion for the Planet: Carbon Footprint)* **L.O. Design a device that uses the physical properties of objects, including their shape and size, to sort them.**

Open Projects – Science (Advanced)

	Year 3	Year 4	Year 5	Year 6
Lego We.Do2.0 Project *(Cross-Curricular Links)*		**Predator and Prey** *(Science: Animals, including humans/Living things and their habitats)* **L.O. Model a LEGO® representation of the behaviours of different predators and their prey** **Hazard Alarms** *(Geography: Extreme Earth) (Science: Electricity)* **L.O. Design a LEGO prototype of a weather alarm device to reduce the impact of severe storms**	**Space Exploration** *(Science: Earth and Space)* **L.O. Design a LEGO prototype of a rover that would be ideal for exploring distant planets** **Cleaning the Oceans** *(Passion for the Planet: Plastic Planet)* **L.O. Design a LEGO prototype to help people remove plastic waste from the ocean** **Wildlife Crossing** *(Science – Living things and their habitats)* **L.O. Design a LEGO prototype to allow an endangered species to safely cross a road or other hazardous area**	**Animal Expression** *(Science: Light)* **L.O. Model a LEGO representation of different communication methods used in the animal kingdom** **Extreme Habitats** *(Science: Evolution and Adaptation)* **L.O. Model a LEGO representation of how habitat influences the survival of certain species** **Moving Materials** **L.O. Design a LEGO prototype of a device that can move specific objects in a safe and efficient way**

Guided Projects – Computational Thinking (Intermediate)

	Year 3	Year 4	Year 5	Year 6
Lego We.Do2.0 Project	**Grabbing Objects** *(Science: building on Y2 Forces)* **L.O. Designing a solution for a prosthetic arm that is able to move small objects around**	**Volcano Alert** *(Geography: Extreme Earth)* **L.O. designing a device for improving the monitoring of volcanic activity in order to guide scientific exploration**	**Moon Base** *(Science: Earth and Space)* **L.O. designing a solution in which a robot would be able to assemble a base on the moon**	**Send Messages** **L.O. Designing a solution for exchanging information using a system of signals that are organised in patterns**

Open Projects – Computational Thinking (Advanced)

	Year 3	Year 4	Year 5	Year 6
Lego We.Do2.0 Project			**Emotional Design** **L.O. Designing a solution in which a robot can display positive emotions when it is interacting with people** **Animal Senses** *(Science: Living things and their habitats)* **L.O. Modelling how animals use their senses to interact with their environment**	**Inspection** **L.O. Designing a solution in which a robot is able to inspect narrow spaces, guiding its motion with sensors** **City Safe** *(Geography: Manchester)* **L.O. Designing a solution to improve safety in a city**