Learning Challenge Question: Why do see saws go up and down?

WOW – Investigating forces in our local park.

Week 1: What makes objects move?
WOW - trip to the park thinking about forces. Take photos to label the direction of different forces.
SCIENCE LI: I can label forces on different objects which make it move.
Group different forces acting on a moving body – friction/ gravity/ air resistance/ water resistance / upthrust.

Week 2: Why does a ball fall to the ground?
SCIENCE LI: I know about different Scientists and why they are important.
SCIENCE LI: I can identify how different forces act on objects.
Identify gravity as a force acting on a body; identify the direction gravity moves in. Group different forces acting on a moving body – friction/ gravity/ air resistance/ water resistance / upthrust

Week 3: Is it a push or a pull?
SCIENCE LI: I can explain how magnets work.
SCIENCE LI: I know what makes a fair test.
Identify magnetism as a force acting on a body; classify objects into magnetic and non-magnetic groups; design a fair test, focusing on variables to find out whether the bigger the magnet, the greater the magnetic force – what is needed for a fair test? Tabulate results.

Week 4: What slows it down?
SCIENCE LI: I understand how friction acts as a force.
SCIENCE LI: I can interpret results following a fair test.
Identify friction as a force acting on a body; classify surfaces according to friction properties; design an experiment to find out whether the rougher the surface, the greater the force– how can we measure the force? what is needed for a fair test? Introduce vocabulary, eg variable. Draw graph of results.

Week 5: Can you make Milo pull?
COMPUTING LI: I can create a code for a robot.
COMPUTING LI: I can debug my algorithm.
Lego WeDo. Create a robot to pull different objects. What is the heaviest object your robot can pull? Is there a way you can test how well it pulls different objects? Can we use our knowledge of fair testing to help investigate? Challenge – push milo

Week 6: What can keep an object in the air?
SCIENCE LI: I understand what air resistance is and it acts on objects.
SCIENCE LI: I can design my own fair test investigation.
Identify air resistance as a force acting on a body; predict what might increase air resistance; design an experiment to find out how a paper helicopter can be kept in the air longer– write own question; decide own means of recording results.

Week 7: What does a lever do?
DT LI: I can design, make and evaluate a product.
Design and make a lever operated moving Christmas card, evaluate using forces vocabulary.

Week 8: Reflection week
Invite parents or other classes in to a science fair to share our findings.

ENGLISH:
The Write Stuff: Banning Christmas/The Snowman

RE: Religions and creation
French: Telling the time

DRIVER: Science (Fair testing; Pattern Seeking; Research)
Knowledge
Forces
- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Skills
- I can use scientific knowledge and experience to raise new questions.
- I can select and plan most appropriate type of scientific enquiry to answer scientific questions.
- I can talk about how scientific ideas have developed over time.
- I can plan a fair test and explain which variable need to be controlled.
- I can look for causal relationships in the collected data.
- I can choose appropriate equipment to make measurements.
- I can present data in tables and bar line graphs.
- I can use the collected data to draw conclusions.

Computing
Knowledge and Skills
Children will:
- design, write and debug programs that accomplish specific goals
- use sequence, selection, and repetition in programs
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

Design Technology
Knowledge and Skills
Children will:
- generate, develop and communicate their ideas through annotated sketches.
- understand and use mechanical systems in their products [ie levers].
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

Homework:

Find out how forces are used in everyday life (objects, machinery etc)