Activity: Physics Simulation using Algodoo

Objectives

- To look at how computer models and simulations can be used to explore scientific and engineering ideas.
- To construct virtual versions of various experiments and collect data within a simulation.
- Create a simulated version of the Race For The Line model rocket car and simulate its movement and produce a data log of its performance.
- Add manual controls to their simulation so that they can 'drive' their models.

Suggested Time

90 minutes

Activity Description

Make Algodoo available to students and ensure they all complete the tutorial tasks that will explain all the features of the software.

Construct a basic pendulum in Algodoo by fixing a block and suspending an object from it using a rope. Right click (long press on tablets) the suspended object and use 'show plot' options to display a graph showing displacement or acceleration over time. Change the mass or length of the pendulum and speculate on and test the effects. Have students create other experiments, e.g. objects of different sizes and masses rolling down ramps or create various classes of levers and pulleys.

Construct a basic vehicle chassis using a block and circles with axles through them. Attach a rocket motor to the simulated car and plot what happens when the simulator runs.

Students can change the density of the car or the strength of the rocket to observe different effects. Manual controls can be added to the Rocket by right clicking the motor and adding a keyboard letter.

Resources

Computer or tablet with Algodoo software
http://www.algodoo.com/

Taking it further

Build models with precise dimensions and masses.

Experiment with removing gravity and air resistance effects and apply knowledge of forces and vectors to create virtual spacecraft or physics-based games.