Lesson 2 – A Physical System

Aims

- To design and write a program that simulates a physical system.

Success criteria

- Pupils can explain how their program simulates a physical system, i.e. my vehicles move at different speeds and angles.
- Pupils can describe what they did to make their vehicle change angle.
- Pupils can show that their vehicles move at different speeds

Resources

Unless otherwise stated, all resources can be found on the main unit 3.1 page. From here, click on the icon to set a resource as a 2do for your class. Use the links below to preview the resources; right-click on the link and 'open in new tab' so you do not lose this page.

- Properties video
- 2Code Freecode Gibbon (this is found on the main 2Code page).
- (Optional) print storyboard templates for program design.
- (Optional) Exercise books to be used as 2Code workbooks for recording coding exercises, if desired.
- (Optional) Self-Assessment templates:
  - Pdf for printing
  - Writing template

Activities

1. Today we will be creating a new program to do something specific that simulates a physical system. Ask the pupils if they know what this means. Take some suggestions.

2. It means creating a program where the **objects** behave as they would in the real world. We will be using vehicle objects and they should move at different speeds and should change angles.

3. Demonstrate opening free code Gibbon and go into Design Mode and drag in a vehicle object.

4. Double-click on pupils that they something else if even draw their one from their retain the
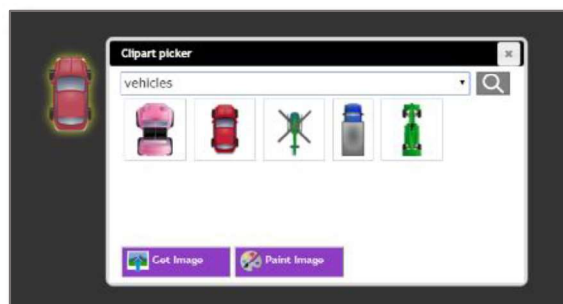
the vehicle and show can change it into they like. They can own image or upload computer, but it will properties of a vehicle.

This is important for them to be able to change the speed and angle. The Properties of Objects video explains this.

5. Exit Design Mode and drag the vehicle into the black code box. Show the pop-up menu and ask pupils where the angle and speed options are.

6. For the program that they are going to make, pupils should include at least three vehicles that travel at different speeds, and at least one vehicle should change angle. The Chimp activity, 'Vehicles', shows cars moving at different speeds.
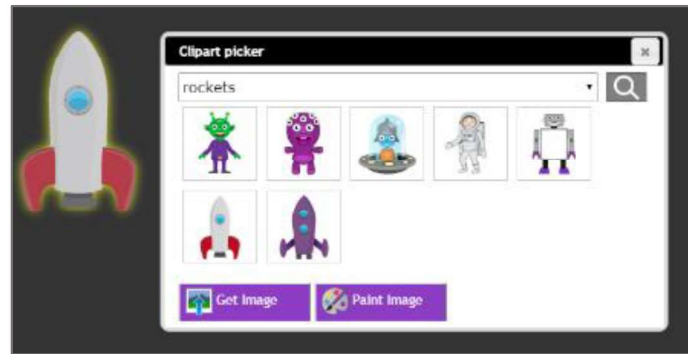
7. Pupils should work in pairs to discuss what program they want to design and should create a design document before coding. Pupils can use their 2Code workbooks to write down notes that will help them plan their programs or they could create a labelled diagram or storyboard. They should decide:

• Which physical system they are simulating?

• How many vehicles they will include in their program?

• The steps of their algorithm - What their program should do?

8. Once pupils have their programs planned out, they can try to create it in Free Code Gibbon.

9. For extension, pupils can look at the Gibbon activity 'Vehicles 2', which adds other elements to the movement of the vehicles.

10. It is also useful for pupils to spend some time evaluating how successful they were in creating their programs in Free Code Gibbon. Did planning help? Did their tinkering in the previous lesson using Free Code give them ideas? Pupils can use their workbooks or the self-evaluation files to record this.