

### Overview:

In the 2 sessions for this activity, your aim is to reduce carbon emissions in a model of your school. Your teacher or leader may ask you to work individually, in pairs, or in groups for these activities. This is the Student Guide for Session 1.

#### Session 1



**Challenge 1: Program Grover the Rover** to collect school CO<sub>2</sub> data

#### Session 2



**Challenge 2: Get Grover to collect your current school CO<sub>2</sub> data**



**Challenge 3: Get Grover to collect your ambition school CO<sub>2</sub> data**



**Challenge 4: Use the Boop! spreadsheet to create persuasive data**

### Set up (20 minutes)

- **File download:** Your teacher or leader will demonstrate where you need to save / can find the student files on your school or setting system, so each computer user has a copy.
- **Step 1:** open the Student Guide (you'll have already done this if you're reading this on your computer!).  
(filename: 1 - Net Zero VEXcode Activity Session 1 Student Guide (ages 11+).pdf)
- **Step 2:** open the VEXcode VR website using the MAGIC LINK:  
<https://hocdemo.vexcode.cloud/?classcode=PBBDXH>
- **Step 3:** open the Session 1 coding template within VEXcode VR using 'File > Open', 'File > Load' or similar (this should be in the file you created in the file download step above)  
(filename: 1 - Net Zero VEXcode Program 1.vrblocks)
- **Step 4:** open the virtual school – use 'Select Playground' button, and open the school playground.  
(Playground: 'HOC Data Science')  
(use the Debugging Help at the end of this guide if it takes too long to open for everyone).
- **Step 5:** while you wait, have a think about what settings you would choose for your school (ignore school size for now as it's not currently working).  
(NB only use setting 1, the starting point, or setting 2 for each slider).

**Do not click 'Confirm & Close' just yet.**

### Challenge 1 - Program Grover the Rover (20 minutes)

(can be completed in Session 1, or continued in Session 2)

- **Initially:** click confirm and close to generate the model representing your school. Meet Grover the Rover!



- **Step 1:** move the playground window to one side by clicking the top and dragging, and open the data monitor by clicking the data monitor button (it looks like a speedometer or peacock!)



- **Step 2:** test the template program, and see what it does, by clicking the 'play' triangle to start the test and the square button to stop.



- **Step 3:** Look at the data gathered so far - you can see the data station ID, the day of the month, the actual data, and the unit of measure.

- **Step 4:** respawn (or restart) back at the beginning using the 'circular arrow' reset button and clear the data monitor.



- **Step 5:** move the playground window and click the rest of the code together, adding the pink 'data collection' block into the main sequence after each 'wait' step – or 'click and collect' as we like to call it!



- **Step 6:** test it out by clicking the 'play' triangle to start and the square button to stop.



- **Step 7:** check if you have collected from all 5 data stations. If not, respawn, clear your data monitor, do some debugging, test again.



- **Step 8:** save your program under 'File > Save As', 'File > Save to your device' or similar. Rename with your initials (replace the xx below) and save into the folder you used earlier.


(filename: 'xx My Net Zero VEXcode Program 1')

- **Extensions:** try out the extensions on the next page if you have time!

### Extension Challenges

- **1) Quick extension:** drag and drop more coding blocks to add motion (drivetrain) code to the end of your first program, and program Grover to get back to the start!
- **2) Write Grover's block code yourself (with the help of some My Blocks):** first, save your code, ready for Session 2, then open the extension activity in the folder 'Student files - extension' (filename: [Net Zero VEXcode Extension Program 1 - reduced template with My Blocks.vrblocks](#))

Use trial and error to find your way and don't forget the map of the school which you can find in '[student files > Session 1 > Net Zero VEXcode Activity School Data Map.pdf](#)'

- **3) Try and reach the data stations in a particular order:** try reaching data stations in numerical order, or finding the fastest route to take. Is there a way to speed up Grover (it will also speed up the testing!)
- **4) Switch some of the block code to python-like code one block at a time:** try right clicking each block and choose 'convert Block to Switch Block' and see if you can still read your code – you could also try 'convert Stack to Switch Block'.
- **5) Switch all of your code to text and continue programming in python-like text code:** first, save your code so you don't lose it, then click on the code viewer button , near the data monitor button. Click the 'Convert to Text Project' button at the bottom – this will create a .vrpython file, which cannot be converted back into block code, so only make changes if you're sure you've saved the .vrblock file.

### Plenary / Summary:

So, in Session 1 what have you achieved?

- you've inputted settings so you could create a school modelled on your own
- you've used coding and computer science to program Grover the Rover to move around the virtual school, collecting environmental data generated to match your slider inputs
- you might have done some debugging, if needed, to get all the code to work as we'd hoped
- finally, you've had a look at the data you've created in the data monitor, and observed that it isn't in a format that's particularly helpful for us to understand at a glance ... at least not yet!

### Debugging help

Sometimes in coding, things don't work out quite the way we'd planned, and this happens so often we have a term for it – debugging.

If you are having issues, please try the following:

#### VEXCode Activity

- If you're having trouble accessing the VEX Playground it may be due to network restrictions on your school computers.
- If you haven't already, your teacher or leader might like to try using a teacher's login and computer to access the playground, <https://hocdemo.vexcode.cloud/?classcode=PBBDXH>
- If this works, it suggests the issue may be caused by restrictions on the student logins or computers.
- Please share the following link with your IT department or specialist so they can ensure students have access to all the necessary domains.

Domain Access Requirements for VEX Websites and Software: <https://kb.vex.com/hc/en-us/articles/30676963229204-Domain-Access-Requirements-for-VEX-Websites-and-Software>

If the above fails to solve the issue, please email us on [getintouch@getwiththeprogram.org.uk](mailto:getintouch@getwiththeprogram.org.uk) so we can send you instructions for how to raise a technical issue with our team.