

What's on the DVD

**On the home folder:**

A copy of the press release – as a Word document and as a PDF – files with the name

***Las Cruces Academy students and a teacher build a great device for learning science***

The full story of the LUPT – a narrative, with images, about all the work that went into designing and building it – as a Word document and as a PDF, with the name ***full\_story\_of\_the\_LUPT***

The 8-minute video we put together (it's also on YouTube) – a file, ***video\_story\_of\_the\_LUPT.mp4***

**A folder: narrations** – the 315 stories about the elements that the students researched, wrote, and recorded; you can play them individually here. In another folder, **python\_programs**, you can get Python programs to install in Windows or in Linux that operate much like the program on the LUPT

- **A Word document (and a PDF of same):**  
**playing\_the\_narrations\_without\_using\_python\_programs** – for those who choose to skip the computer work and listen to the stories one-by-one in any order
- **Sub-folder: elements\_by\_atno** - 112 stories about the elements, for each element (each atomic number)
- **Sub-folder: elements\_by\_abundance\_EC:** 80 stories about elements whose abundances in the Earth's crust are known well enough
- **Sub-folder: elements\_by\_abundance\_HB:** 20 stories about elements whose abundances in the human body are known well enough (there are more, which we haven't yet recorded)
- **Sub-folder: elements\_by\_order\_of\_discov:** 111 stories about the elements in their order of discovery by science (including 13 known to the ancients, as a separate story); oops – silicon is missing!
- **Sub-folder: elements\_by\_order\_of\_nucleosyn:** 3 stories: how hydrogen, helium, and lithium were created in the Big Bang; the elements being made in our Sun currently; and how a supernova makes all of them!

**A folder: python\_programs**– you can play any of 315 stories about the elements that the students researched, wrote, and recorded, using Python programs in Windows or in Linux that operate much like the program on the LUPT. There are instructions on how to install and use these program, with keystrokes taking the place of button-pushes on our actual LUPT

The two main files are these Python 2.7 programs (note that Python 3.x has very different syntax!):

- **a file: elements\_linux\_KB\_no\_GPIO.py** – for use on a Linux box; the “KB\_no\_GPIO” part means that keyboard inputs are used and there are no GPIO pins from a Raspberry Pi computer to control LEDs or to respond to button pushes
- **a file: elements\_windows\_KB\_no\_GPIO.py** – for use on a Windows machine (tested on Windows 10)

Also here are:

- **a folder, all\_narrations** - all the 315 narrations, which must be copied into the same folder as the Python program, which accesses them by type (atomic number, order of discovery, ...) as needed, using their filenames – you'll need to move all these files into the same directory where you install the Python program
- **a file, elements.py** – the original program used on the Raspberry Pi computer, which accesses the GPIO pins to control the LEDs and to respond to the button pushes
- **Demo programs** – these run only on our LUPT, but they are amusing:

- **a file: test\_2d\_w\_GPIO.py** – the program, once started, alternates between two modes: (1) lighting up 10 elements chosen at random, at 1-second intervals; (2) a sub-program chosen at random to light up 6-11 elements that have some affinity by chemical properties or name
- **a file, LCA.py** – lighting up elements at 1-second intervals to spell out “LCA” on the chart

And, of course, instructions for installing Python and modules, setting the environment path in Windows, and Windows installers

- **A Word document, installing+running\_python.docx**
- The Windows installer for Python 2.7.12, a file **python-2.7.12.msi**

Finally, three extracts from the Web, about using the **colorama** for Python, to get nice colors in a Command Prompt, much as we have on the monitor of the LUPT