BIG DATA: ATLAS
Project flow map

As with all IRIS projects, Big Data: ATLAS offers training and an opportunity for students to apply to a research project of their choice. However, Big Data: ATLAS gives students multiple routes, depending upon their interests and experience.

Look at the flowchart on the next page.

The **green boxes** show the training notebooks (Books 1 to 7) – these books must be completed in the order shown, but students do not have to finish them all. The books become more challenging as Python skills are progressively developed and applied to analysing and interpreting data.

The **blue boxes** show opportunities to (a) complete the optional exercises to help consolidate student learning before moving on to the next book, or (b) to leave the training books and use the exercise/s as a student research project.

All students start at Book 1, which provides some background to Big Data: ATLAS. However, from Book 2 onwards it is up to the student how far they go before switching to their research project. For example, it would be acceptable to gain some Python training in Book 2 before switching to the optional Book 2.5 and use one or more of the exercises as their research project. Alternatively, the student could dip into to Book 2.5 to gain some consolidation, before proceeding to Book 3 and beyond.

Note that other than Book 2.5, all optional exercises/research opportunities are at the end of each book (for Books 3 to 7). You can choose to ignore these optional exercises, use them for consolidation or select an exercise for your research project.

In June, IRIS will be running three conferences for schools. We hope that you will be able to attend and show what you have achieved in Big DATA: ATLAS! To take part, you'll need to create a PowerPoint talk or an academic poster. You can find out more about how to do this in the Phase 4 section of the Big Data: ATLAS page on IRIS' Dedicated Resource Centre (ask your teacher how to access this).

Happy coding!

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Project flow map continued

IRIS

INCREASING DIFFICULTY

	CONSOLIDATION/ PROJECT IDEAS
Book 1 **Before we begin** An introduction to particle physics and accelerators	
Book 2 **Intro to Python 1** An introduction to coding in Python	**Book 2.5** **Using Python for Physics** Optional exercises for consolidation or as ideas for your own research
Book 3 **Intro to Histogramming** An introduction to computing techniques used in High Energy Physics (HEP) analysis	**Book 3** **Optional Histogramming exercises or project ideas** Optional exercises for consolidation or as ideas for your own research
Book 4 **Z^0 decays #1: finding the Z^0 boson mass** An introduction to Feynman diagrams and Lorentz vectors	**Book 4** **Optional Z^0 exercises or project ideas** Optional exercises for consolidation or as ideas for your own research
Book 5 **Z^0 decays #2: quark – antiquark interactions** Quark interactions & production of Z0	**Book 5** **Optional Z^0 exercises or project ideas** Optional exercises for consolidation or as ideas for your own research
Book 6 **Searching for the Higgs boson #1** Using the $H \rightarrow \gamma\gamma$ channel	**Book 6** **Optional Higgs exercises or project ideas** Optional exercises for consolidation or as ideas for your own research
Book 7 **Searching for the Higgs boson #2** Using the $H \rightarrow WW$ channel	**Book 7** **Optional Higgs exercises or project ideas** Optional exercises for consolidation or as ideas for your own research