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Bitlink Internet of Things Kits: An Inquiry-based Approach to Technology Education

Over the past decade, the Bitlink team have spent countless hours working with teachers, students and schools to run STEAM education workshops (ranging from electronics, to programming, to game design, to community building in Minecraft). During this process, we have learned that many teachers want to do more with electronics, programming and the internet of things in their classrooms, but existing educational resources are confusing, difficult to use, require pre-existing knowledge or are otherwise unsuitable for use in Australian classrooms. On many occasions, the Bitlink team have arrived at a school to find out that they had a class set of a popular electronics kit, but after a teacher had tried the first few activities and finding them to be too difficult or confusing, the kits were packed away in a cupboard, never to be used again.

This problem inspired Bitlink to seek funding for a new project which would entail the creation of a new internet of things kit and associated teaching materials. The Bitlink team secured funding and have spent 18 months (from early 2020 to mid 2021) building a new kit (based around the micro:bit v2) and developing a range of lessons across four themes (introduction to IoT, smart homes, smart farms, smart cities). The Bitlink resources have been co-designed with teachers from 10 Tasmanian schools (including Government, Catholic and Independent schools) and have been rigorously tested in classrooms throughout the life of the project. Each lesson in the series has been mapped to the Australian Curriculum, with links provided for Design and Technologies and Digital Technologies from grades 3-6.

In this workshop, participants will learn about the codesign process that led to the development of these new resources and will have an opportunity to work through some of the early lessons in the series, just as students would in the classroom.

Workshop participants will work individually or in pairs with one laptop and kit between two. After a brief introduction which outlines the codesign process through which the Bitlink resources were created, participants will have the opportunity to work through a series of Bitlink lessons in much the same way that those lessons would be presented in the classroom. Each lesson will have an introductory video that sets up a problem/theme for the lesson, then a series of challenges where participants will be shown a target behaviour for the micro:bit and given suggested code blocks with which to complete the challenge.