

**CREATION OF HIGH QUALITY STEM CURRICULUM MATERIALS**

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**1.0 EXECUTIVE SUMMARY**

- 1.1 The purpose of this report is to provide an update to elected members on the outcome of a funding bid to the UK Government Community Renewal Fund (UK CRF).
- 1.2 Argyll and Bute Council's Digital Learning team were awarded £100,000 through the grant to commission the creation of high quality Science, Technology, Engineering and Maths (STEM) materials.
- 1.3 The STEM materials – called the Curiosity Labs - were custom designed around areas of future economic growth across Argyll and Bute.
- 1.4 The Curiosity Labs materials are comprised of 69 documents for experiments (including presenter notes and worksheets), 10 custom videos specifically produced for Argyll and Bute and 25 PowerPoint presentations to support teachers in delivery of the materials.
- 1.5 A number of bespoke items were designed to support the STEM materials and manufactured using the latest 3D and laser printing technology

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**2.0 INTRODUCTION**

- 2.1 Argyll and Bute Council's Digital Learning team was awarded £100,000 through the UK Government Community Renewal Fund (UK CRF).
- 2.2 The funding was used to commission the creation of high quality Science, Technology, Engineering and Maths (STEM) materials.
- 2.3 Following a robust procurement exercise the Glasgow Science Centre was awarded a contract to create the STEM materials for £78,100. The remaining grant was used to purchase equipment, technology and complete a

### **3.0 RECOMMENDATIONS**

It is recommended that the Community Services Committee:

- 3.1 Recognise the benefits the STEM materials, which have been created, will provide to the pupils and employers in this area.

### **4.0 DETAIL**

#### **4.1 Cyber Security:**

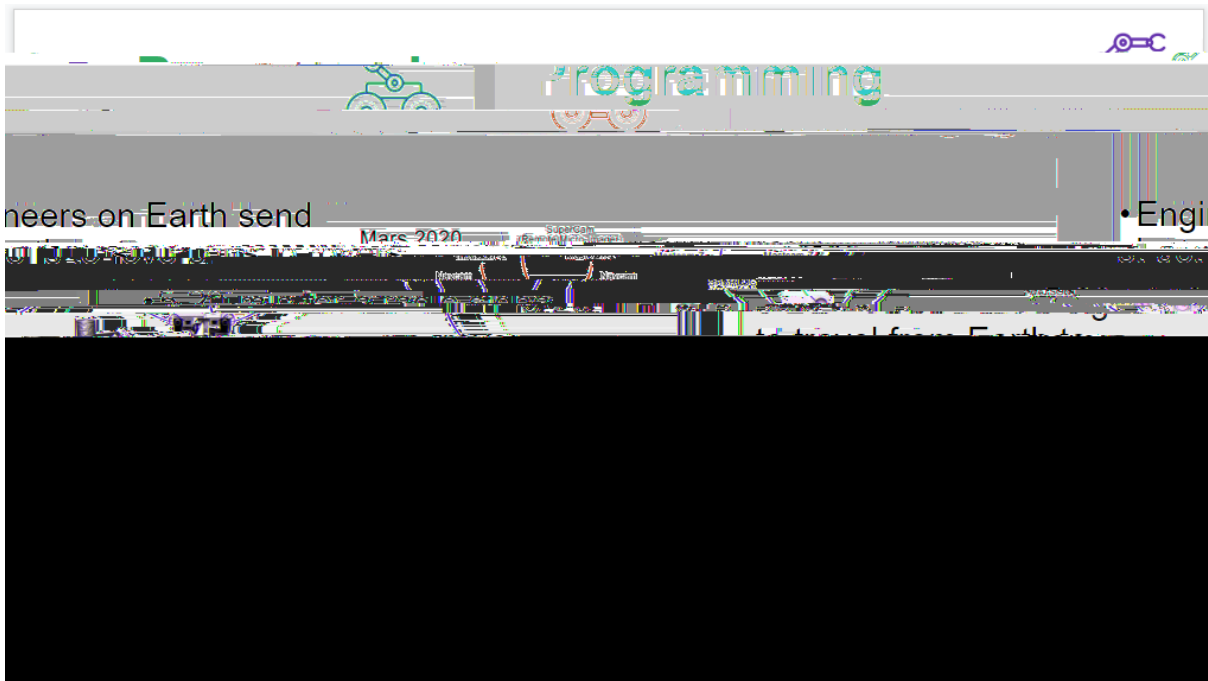
The custom made tangram puzzles and lock box (pictured below), are part of an escape room style activity where pupils must complete a series of linked puzzles in





This custom designed hydraulically controlled robotic arm has been created for pupils to test and identify the skills required to be able to operate remote controlled machines. The arm is operated using sliders on a control unit. These sliders cause water to be pushed to different sections of the arm, which, in turn, cause the arm to turn, extend or grip. This arm is used in combination with an activity examining the use of robots in space.

Below is an example slide from the Engineering and Physics module. The activity associated with this slide looks at the problems of navigating



#### 4.3 Renewable energy:

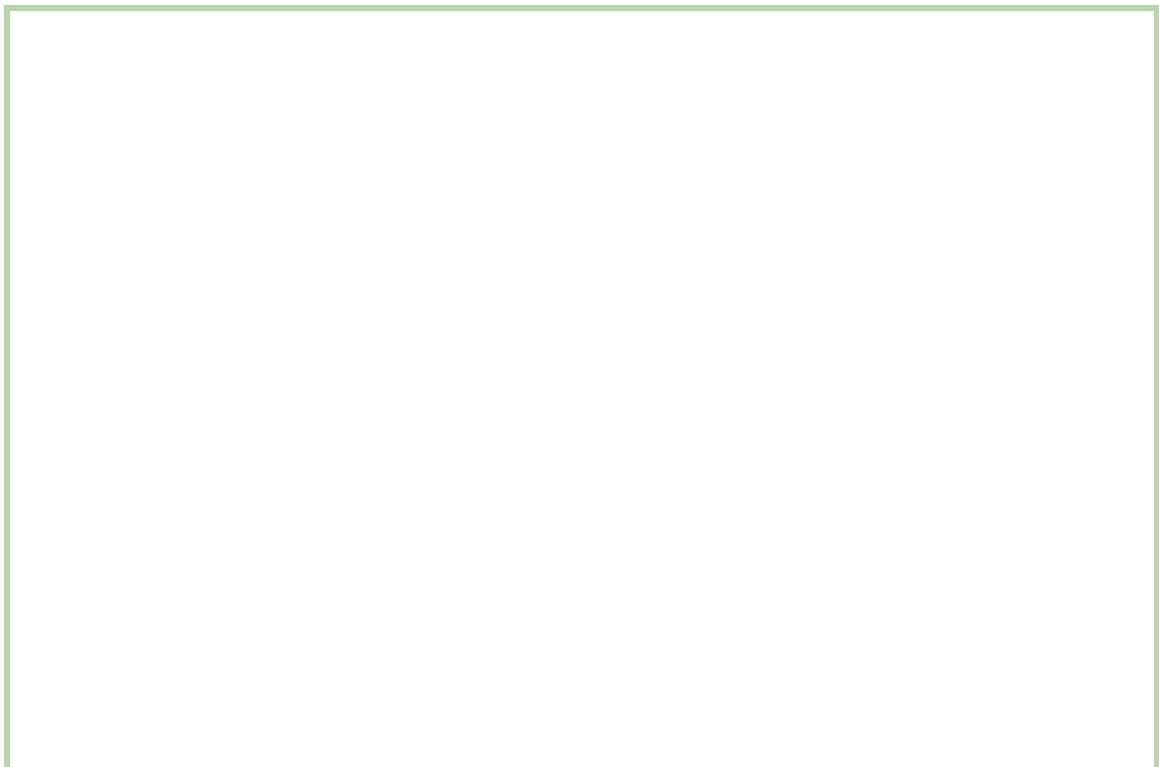
The wind turbine (pictured below) will be used to explore how to generate electricity from wind power. Pupils can experiment with the pitch (angle setting) of turbine blades and find out the optimum number of blades for generating electricity. Nine blades, with three types of profiled blade based on NASA aeronautics and one type of polypropylene sheet blade, provide the opportunity to find the perfect balance of wind resistance, weight and angle.



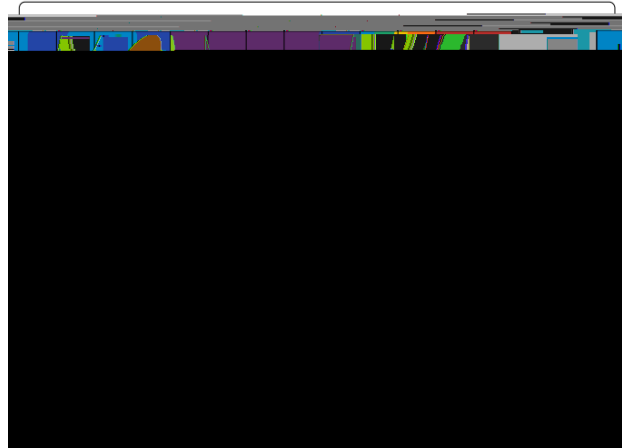




Below is an example of the presenter notes describing links to the Curriculum for Excellence.



must then plot safe sailing routes, mark points of interest for divers, and plot a safe submarine route.



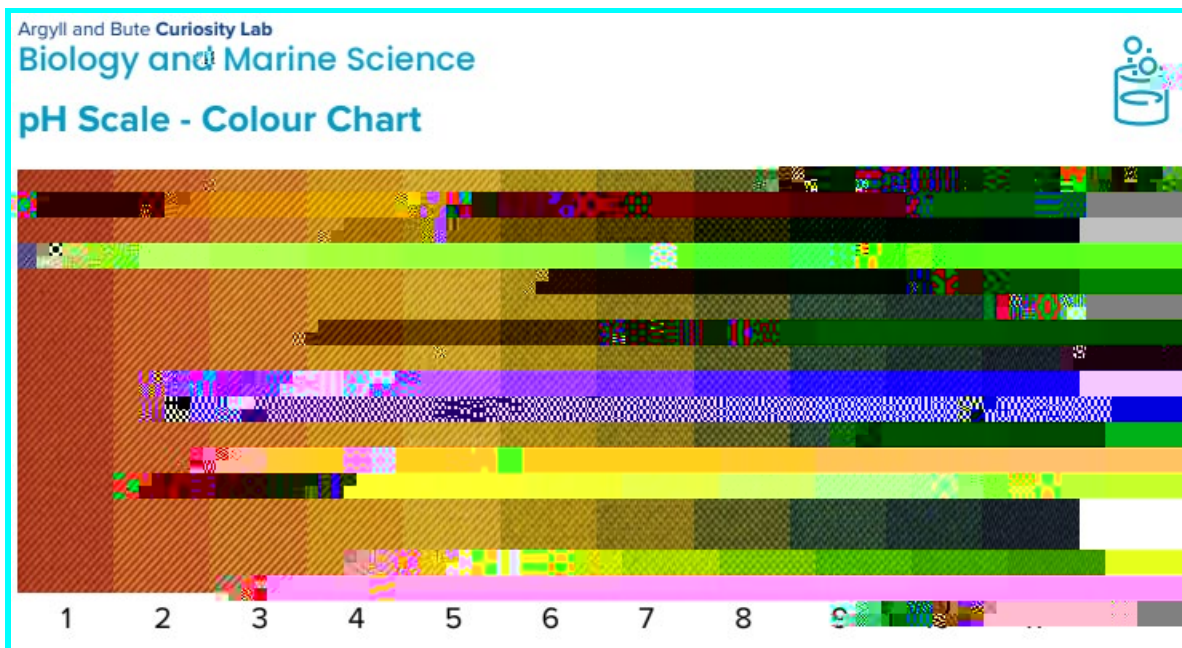
Below are two examples of slides from the Marine Science and Biology module. The first slide is used in conjunction with the above activity. The second slide is used in the introduction of an animal tracking activity where pupils assume the roles of scientist and ocean wildlife and use micro:bits (and it's on-board radio transceiver) to simulate animal tracking in the wild.

Mark the locations at 40m depth where divers could search for artifacts.

Guess where the artifacts will be found by marking an 'X' on your maps at one of the locations.



The pH colour chart will be used to introduce pupils to what acids and alkalis are, where they are used in everyday life, and how they relate to the ocean and climate change. Pupils will have access to pH papers which they can use to test solutions of various household substances.



## **5.0 CONCLUSION**

### **5.1**

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