



## ANNUAL ACTIVITY REPORT OF THE CROMAR FUTURE GROUP AUGUST 2018 TO JULY 2019

Cromar Future Group is a small charity based in Tarland, which aims to bring science and technology activities to our local area. It runs : three after school science clubs covering four local primary schools; a series of winter talks for adults; an annual Science Festival; a local youth club Everything Electronics; and science sessions for local Primary schools and Community Groups on request.

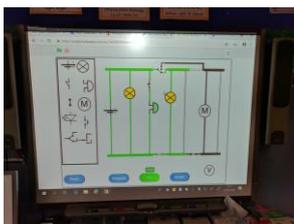
### 2019 MAD MARCH SCIENCE FESTIVAL

March 2019 saw the largest science Festival yet. It included a month-long schools' programme which reached around 800 children, a Family Festival weekend, two events for Community Groups and two adult science talks.

We focused on working with the smaller and more remote schools and took an individual hands-on activity into 14 primary schools from Braemar to Finzean around the Dee valley, and Strathdon to Tough around Donside. Our activities are normally individual and hands-on so that every child gets a go at the science activity. In this case it was electrical circuits. Local retired educator Peter Craig built circuit boards for a classes up to 30. The flexible boards allowed for an easy range of different circuits featuring switches, motors, lamps and LEDs.



Building the boards from scratch helped keep the cost down by using cheap and simple components. It also allowed youngsters to experiment freely and made it visually easy to see where the electricity flowed and why circuits did, or did not work. For some schools who were new to the Festival, we used the popular MadLabs Team who introduced them to soldering a circuit board project.



Accompanying the session was a short cartoon explaining how electrons were involved in electricity and how batteries worked; and a "Circuit Builder" system which showed the circuit diagram as components were placed on the board. These were developed by coders in the our Everything Electronic youth club.

We knew we were getting things right when we had children wandering out of a session saying "Science is such fun", or "Can we have some more science?" or exclaiming "I always wanted to know how a motor worked."



Our Family Mad March Science Festival weekend involved Robert Gordon University's Department of Computing with Lego Mindstorm robots and virtual reality; Robogals whose banana and lemon keyboard was an instant success; Amy Coulam's popular Spy School; a display of the "Save the Planet" projects carried out by our science clubs; and a range of hands on science activities and coding workshops organised by our volunteers.

We thought people would stay a couple of hours, but they stayed for most of the day; and we were not allowed to close our chemistry section on the Saturday, as two little girls pleaded to have a go before they left. The main thing we learned was to place a picnic table in the hall, so exhausted parents could supervise from a distance!



*"Thank you, thank you, Cromar Future group and all the wonderful team! We came on Saturday and had to come back on Sunday as the children demanded it! What an incredibly exciting and engaging weekend you put on. We appreciate it so much and are very grateful for all you do. Thank you!"*

*"We had an amazing, amazing time thank you all, you are awesome!!"*

Every year we think carefully about whether or not to run the Science Festival as it is a huge commitment for such a small organisation. It does work however. Much as we love our weekend Festival, we mostly engage those who are already interested in science. The advantage of taking an activity into the schools we visit, is that we get to every child locally with a quality science and technology activity.

## **EVERYTHING ELECTRONIC YOUTH CLUB**

This year, in addition to the three Science Clubs and our annual science festival, the charity launched Everything Electronic youth club in September, 2018. This is aimed at age 10 and above and helps youngsters develop useful modern skills in the digital economy whilst also having fun and enjoying a Club atmosphere. Activities we have done with the youngsters have included :

- Coding
- Graphic design
- Robotics
- Stop motion animation
- Filming
- Electronics



Our local Angie's Cafe has done sterling stuff by opening every week for us to allow the youngsters and their parents to buy coffee, soft drinks and cake during the session, (a very popular part of the Club). We are the only regular weekly public Club affiliated to Code Club locally, and the only CoderDojo affiliated Club in Aberdeenshire.

27 youngsters sampled the Club and we have ten regular youngsters. In addition, we ran three sessions for our local Autistic Group (the Aboyne Drop-in Club) during our March Science Festival who tried stop motion animation; soldering an electronic project; programming a robot and using a graphic design tablet. This involved around 15 young adults and teenagers. Youngsters come from Tarland, Banchory, Torphins, Lumphanan, Kincardine O'Neal and Logie Coldstone to the Club.

During the launch year members :

- Entered all coding competitions run by CoderDojo and Code Club, producing a game, a film, a logo design and a simulation of Kepler's Orbits programmed in python. The latter won the international CoderDojo competition.
- Entered our Christmas and Easter coding competitions.

- Most learnt Scratch (coding language) - some to a very advanced level.
- Enjoyed a session run by Robert Gordon University on graphic design.
- One member learnt HTML (web-site programming language).
- One member self-taught himself python for the Kepler simulation, subsequently joined us and has become our python expert.
- Produced a You-Tube film explaining what goes on in the Club.
- Built Marty robots in a “Buildathon”.
- Produced a coding simulation of an electrical circuit, which supported our physical circuits boards used when running sessions in the local Primary schools during our Science Festival.



Unfortunately, our volunteer covering electronics was diagnosed with inoperable cancer around Christmas and sadly died in March. This has left a big hole in our organisation. We are an electronics club with no electronics specialist. We desperately need to fill our electronics gap, which is our top priority for our next year’s operation. In addition, we would like to recruit a filming specialist.

This year, we have been continually evaluating what works. I am glad to say, the youngsters are no longer very interested in playing on the Xbox, despite us providing that as a chill-out option.

One change we shall make for next year is to run “Starters Coding Courses” in order to bring on youngsters coding skills faster. This year, we have worked with youngsters as they joined, but that does not give them the same reliable start as a course does.

We have one big challenge for next year, which is to replace 9 out of the 16 refurbished computers which we use. They will become obsolete once the Windows 7 operating system is no longer maintained (from January 2020). All of our refurbished computers are around 7 to 10 years old, and we intend to replace the 9 obsolete computers with newer second-hand computers of around 3-5 years old. For ease of maintenance and equipment compatibility, we shall continue to use Dells.

These computers are our workhorses and without them there is no Everything Electronic, nor can we use them to support our coding lessons in the schools. We are in the process of applying for grants to do this, as we do not charge for Everything Electronic (which would violate our agreements with Code Club and CoderDojo).

*“Luke enjoys electronics club because... he gets to learn html as he wants to build websites. Luke and James enjoyed building and using Marty robots. James enjoyed graphic design and is looking forward to getting a moonrover drawing scanned and online. Luke likes filming and James enjoys Stikbot animation and he’s used it at home too.”*

## **SCHOOL SCIENCE CLUBS : HIGH-TECH TOWIE, TARLAND AND LOGIE YOUNG SCIENTISTS, AND CRAIGIEVAR EXPLORERS**

Our three school science clubs have been “Saving the Planet” this year as their theme. Our aim was to carry out four projects to be presented by each Club at the Mad March Science Festival and in school:

1. Investigate bioplastics – alternatives to using plastic. Make items from bioplastics and check their properties and ability to degrade naturally.
2. Look at typical plastic waste. Find alternative ways of using it



that slows its entering into, or totally removes it from the environment.

3. Carry out a review of the energy used by our school including carrying out a thermal energy loss survey. Make recommendations on how to reduce our energy use.
4. Design a way of removing small particles of plastic from the sea.

As time progressed, we dropped the last aim (4) to concentrate on the others. As a result the youngsters learned about :

- Planetary wide issues (climate change, loss of biodiversity, pollution and population growth)
- Bioplastics
- Properties of Materials
- Atoms and radiation
- Scientific method and scientific reports
- Thermal mass and Phase change
- Heat and heat pumps
- Understanding thermal imaging
- Types of lighting and heating
- Using tools such as hacksaws, hot glue guns and laser thermometers safely
- Plastic recycling (Towie)

This year, we did not run in the summer term as we find numbers fall away with the good weather. Our volunteers also appreciate not being entirely tied to school term times and it gives us a chance to do activities with some of the other local schools who request help. In the three terms :

- Each school carried out a good survey of the energy inefficiencies in their classrooms, which was presented to the school. A summary will be going to the Council.
- Two schools came up with practical ways of reusing plastic and other waste, one developed an insulated horse trough from a tyre, old insulation and black plastic; another a passive solar heater for greenhouses from black plastic and old wax.
- The other school brought together a lot of information about plastic types and disposal tips.



We were delighted to when one of our science club members, who had been coming to our clubs since their inception three years ago, won a bursary to go to Robert Gordon School in Aberdeen, a well-respected science focussed school.

We are totally constrained within this area by a lack of regular volunteers. It is difficult to find people who are willing to volunteer regularly during day time hours. This year, one of our regulars has had to have an operation which left us critically short at Tarland. We were only able to continue, due to the help of parents. We could run as many science clubs as we can get volunteers. Those who do get involved, find it very enjoyable and rewarding.

## **OTHER SCHOOL ACTIVITIES**

In addition to the Science Clubs, we ran three courses within the schools to help them cover off areas of the Scottish Curriculum and to help teachers learn . At Braemar, we ran an "Introduction to coding course".

Torphins approached us for help on coding and we ran a similar course for them in the summer term. They have asked us to continue to help them improve their coding ability next academic year and we have agreed a programme which includes helping their teachers to gain these valuable skills.

For Tarland P4/5 we ran four sessions on the science of sound with their class teacher, also in the summer term.

We also loan our equipment to the schools. This summer term, we loaned Braemar our Goblin car kit so they could take part in the Goblin car challenge, and four of our refurbished computers so they could start their own Code Club.

### **OTHER COMMUNITY ACTIVITIES FOR YOUNGSTERS**

Whenever we can, we respond to requests for talks and sessions for other Community Groups. To that end we ran a “Wonderful Waves” session for Tarland Development Group’s Food and Music Festival; a virtual reality and use of graphic tablets session for the Aboyne Guides; and a talk for the Women’s Guild.



### **CAFESCI ADULT TALKS**



From fungi that live on humans, through local weather and geology, plus clinical trials and climate adaptation, the winter talks became a popular monthly session.

Angie’s Cafe provided us with a true cafe home and ambience.

We shall continue with our winter series which as our only non-grant income, is also an important part of our income.

### **THANKS**

We cannot thank enough those who help fund us which this year have included :

- The Jennie S Gordon Foundation
- Aberdeenshire Council – Youth Opportunities
- Aberdeenshire Council – Marr Area Committee
- Coop
- BP
- David and June Gordon Foundation
- British Science Week
- The Rotary Club of Aboyne and Upper Deeside
- Meet and Code

And those who volunteered their time, Bob Menage, Richard Burns, Maria Dawson, Barbara Warren, Jim McLean, Dave Harper, Gary Polhill, Les & Dave Ellis, Peter Craig, Janet Urquhart, Natasha Walker and Jude Bain.

Special thanks also to Angie’s Cafe, Tarland and their staff who have made our Cafe Sci talks and Everything Electronics Youth Club something special.

We would also like to recognise posthumously the contribution made by Steve Roberts who set-up the electronics section of Everything Electronics.