

Background

We offer an extra-mural activity in the form of a robotics, science and technology club. The vision of the club is to mentor learners in developing the mental and hands-on skills typical of the scientific-technical world. Such skills include abstract problem solving ability, spatial (three-dimensional) reasoning and planning, algorithm design, computer programming, and building technical artefacts such as electronic circuits, robots and various gadgets. We would like to introduce learners to the world of scientific discovery and technical innovation by discovery-based learning, where they tackle both concrete and abstract problems and solve them in team activities.

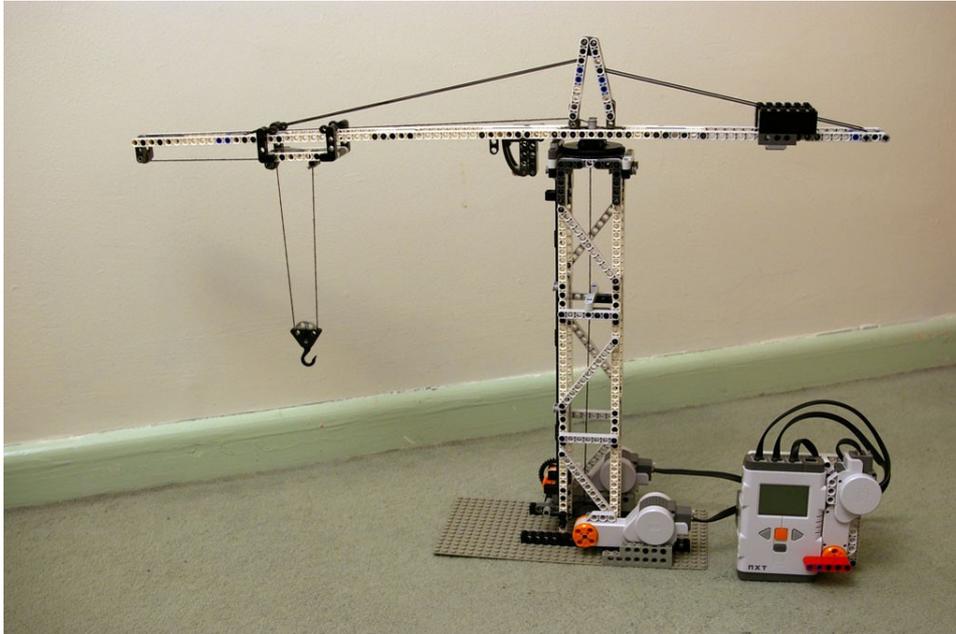
What we offer

We to run the science club as an extra-mural activity at a frequency of one afternoon per week, six weeks per term. Sessions would be about 75 minutes long. The plan is to cover introductory robotics, and to help learners complete projects that match their skills and competencies. As such, the scope of what we do is open-ended, and each learner would be able to proceed at his or her own pace.

At the moment, we pitch the Science Club at the Senior Primary School level (Grades 4, 5 and 6), but we can expand it to other age groups if there is enough interest.

A typical project (model crane) is shown on the next page. In order to build a model crane, we will take the learners through a number of steps, based on discovery and incremental improvement of the design, which is part of the problem-based learning design that we subscribe to. The steps that we will guide the learners through are as follows:

- Understand and conceptualise the basic functions and objectives of the artefact (crane).
- Define its design requirements—this is where the learner tries and fails to build a crane that can meet the specifications—for example the initial design might be too weak to lift a load.
- Think through the physics of the situation—understand concepts such as centre of mass, stability, forces, torque, strength of materials etc.
- Based on discovery and failure, learning will take place when the learner discovers how to overcome the initial problems.
- The learner will come to understand how the design requirements of the crane ties



in with the physics and hence how to solve the design problem.

- Finally, the learner will learn to program the device to perform intelligently.

The science club will not be a place where the learners merely build models or electronic circuits from a plan without any understanding of what

they are doing. Our goal is to stimulate critical thinking and a love for learning by allowing the learner to try and fail, and then to improve based on what was learned. We will have small groups with two to three children per robotics set. In this way we can give individual attention at your child's level.

Our teaching methodology is inspired by the work of Professor Seymour Papert of the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology (MIT). See www.papert.org for more information.

Cost

The cost would be R600 per term.

Day and time

The club will start on Friday 27 January, after school (please select the correct session on the entry form). We will accept children on a first come, first served basis. If your child is interested, but the time does not suit, please contact us. We will attempt to accommodate you if possible, but perhaps only later in the year.

About the instructors

Dr Jaco Maritz has a passion for stimulating a love for science in young people. He holds a PhD in Physics and a MSc in Engineering Science (Electronics). He will be joined by Mr Mike Ferguson (BSc).

We are hiring!

If you are interested in becoming an instructor, please let us know. No prior knowledge will be required, just a passion for teaching and an interest in technology. We are planning to launch into other schools during 2017. We are also planning to launch a home school oriented club, which would be ideal if you are available only mornings.

Contact information:

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