

Bionics4Education

Bionics Kit

FESTO



Highlights

- Learn about technical innovations inspired by nature
- Strengthening the use of digital media
- Using a micro-controller
- Programming with Open Roberta
- Building three bionically inspired robot animals
- Controlling robots via smartphones
- Testing 3D printing technology
- Experiencing an interactive learning path

Nature as source of ideas

Bionics means learning from nature and applying it to technical applications. That's why engineers examine numerous natural role models and, in doing so, optimally develop solutions and technologies that answer complex questions very easily.

In the Bionic Learning Network, Festo has developed many bionically inspired innovations over the past few years and thus found solutions to current technical challenges for industrial applications.

These solutions are designed to inspire learners with enthusiasm for bionics and are ideal to learn from.

Bionics4Education

With Bionics4Education, bionic thinking and working methods are now to be brought into the classroom. Bionics is an interdisciplinary topic and therefore very closely linked to the topic of STEM education (Science, Technology, Engineering, and Maths).

Integral Didactic Concept

Bionics4Education combines analog and digital learning in a didactic form: a practice-oriented educational kit and an accompanying digital learning environment. Bionics and technical education are combined in a meaningful way, because the construction kits strengthen problem-solving, critical thinking, increase creativity, and support playful learning.

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Bionics Kit

Three bionic robots from a modular learning construction kit



Modular concept

With the Bionics Kit the following three bionically-inspired robots can be built one after the other:

1. Bionic Fish
2. Bionic Elephant
3. Bionic Chameleon

Accompanying learning material such as instructions or background knowledge are freely available on the website.

Digital skills

The robot animals are driven by servo motors and controlled by a microcontroller via mobile devices such as smartphones. In addition, the Arduino-compatible microcontroller can be programmed by the learners with the graphical programming interface “Open Roberta” (lab.open-roberta.org). The source code is open source available.

Promotion of creativity

The Bionics Kit is aimed at young people (from 14 years) and facilitates their access to natural sciences and technology. In addition, simple consumables such as cardboard or plastics can be used to promote individualisation and creativity.

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Interactive Learning Poster



Self-guided learning process

The Interactive Learning Poster accompanies the use of the Bionics Kit in the classroom. By scanning QR codes, the learners access the digital content and are guided through the assembly of the robot animals with 3D animations. At the same time, background knowledge is conveyed with the help of online learning content.

Digital Competencies

After a successful assembly, a digital reward awaits: the robot animals are displayed in Augmented Reality.

The interactive learning path thus combines analogue and digital learning and helps to use digital tools such as mobile devices in the classroom in a meaningful and playful way.

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