

Children

Didactic competences
Training differentiated observation skills

Didactic competences
Reflecting on different pedagogical methods in the context of promoting knowledge about robots and AI

Technical competences
Knowledge about data collection, data processing and data protection

Technical competences
Knowledge about the energy forms and electric circuits

Pedagogical professionals

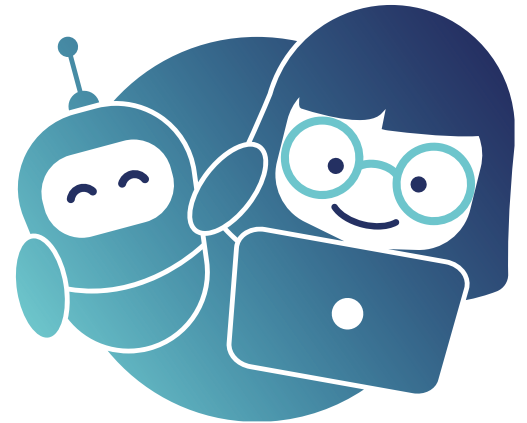
Goals

How many bowls do we need?

Exercise Level ● ○



I'm not a Robot



Reflection
Children learn to plan activities by first gathering specific information and then carrying out the action based on the data. In our case, we first need to know what the main meal is that day, what kind of dishes we need and how many children are in kindergarten that day.

Tip
This could be a fix part of your morning circle routine

Implementation
• Meet with children in the morning circle and begin it as usual. After questions about the day of the week, the month etc. ask them about who of them would like to be the table service on that day.
• Ask them, what do they have to know, when it's going about the meal of the day; the possible answers would be: today we are going to eat soup so we need bowls and spoons. But before they prepare the tables, they have to know how many bowls and spoons they need. To know get information about it, they have to know the number of the children in the group on that day.

Preparation
No special preparations needed

Materials
Camera
Picture Puzzle

Tips for in-depths study

Literature

„Digital Genial: Elektrizität und Stromkreise“
by Bostelmann, A. and Schaper, S., 2022

„Strom, Technik und Computer im Kindergarten“
by Bostelmann, A. and others, 2023

„Das Maker-Buch für Kita und Grundschule“
by Jammer, J. and Narr, K., 2018

„Hello Ruby. Wenn Roboter zur Schule gehen“
by Linda Liukas, 2019

„Hello Ruby. Journey inside the computer“
by Linda Liukas, 2019

Imprint

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Toolbox #6 What does a robot eat

Vermutlich haben Kinder bereits eine erwachsene Person beim Surfen im Internet beobachtet und bemerkt, dass diese über unerwünschte Werbung flucht. „Noch einmal die Werbung für die Bergschuhe, dich Internet Spuren hinterlassen, die uns durch gezielte Werbung widergespiegelt werden. Für manche ist das nervig, für andere verführerisch. Das Internet dient also nicht nur dazu, dass Nutzer Dinge finden, sondern auch, dass Produzenten ihre Dienstleistungen und Waren in den Fokus unserer Aufmerksamkeit rücken. Im schlimmsten Fall, ein Fremder nutzt Informationen von uns, um uns zu schaden.“

Fokus Informationsbedarf

Energie hat viele Formen. Wenn wir im Winter unsere kalten Hände fest aneinander reiben, werden sie wieder warm (Muskelwärmeenergie). Wenn ich einen mit Luft gefüllten Ball gegen die Wand werfe (kinetische Energie), verformt er sich (elastische Verformungsenergie) und prallt zurück (kinetische Energie). Ein Motor verbrennt zum Betrieb ein Gemisch aus Benzin und Luft (kinetische Energie der Verbrennung). Wenn Menschen oder Tiere hungrig sind, essen sie etwas und wandeln dabei chemische Energie in Körperwärme, Muskelkraft oder Denkkraft um. Wir wissen auch, dass Roboter oder KI-gesteuerte Geräte eingeschaltet sein müssen, um zu funktionieren. Bei Verwendung von Timern starten die Roboter automatisch zur programmierten Zeit. Es gibt Roboter, die mit Batteriebetrieb betrieben werden, andere mit Strom oder Solarenergie. Was passiert eigentlich mit der Energie, wenn der Roboter aufgeladen oder ein KI-gestütztes Gerät mit Strom versorgt wird? Der Saugroboter sammelt die Krümel vom Boden und der Computer verarbeitet die Daten. Während der eine Prozess noch durch Beobachtung erfolgt werden kann, bleibt der andere dem Betrachter verborgen. Erst die Ergebnisse der Energieumwandlung sowie der Datenverarbeitung können wieder wahrgenommen werden

Was wir wissen

Fokus Energiebedarf

Introduction

What is this about?

With the question „What does a robot eat?“, on the one hand, the process of energy assimilation is addressed, but on the other hand, data collection and processing can also be meant.

Focus Energy demand

In this context, children can learn about different forms of energy and how they are produced and processed. They can develop hypotheses about how and where energy (as a physical quantity) is involved and how it is generated. Here is also the possibility of linking to the topic of sustainability and environmental protection.

Focus Information demand

Another possible answer can be: „He eats data“. In this case, the educators can choose materials that focuses on private and sensitive data and involve the children in thinking about identity and privacy.

Children’s point of view

Questions from Children

- What does a robot eat when it is hungry?
- And how often does it have to eat?
- Do all robots need electricity?
- Can a robot recharge itself?
- What does a robot do when it is charged with energy?
- What does a robot do when it reads, processes and reveals data?
- What else does a robot need to work?

- Discuss the different materials together with the children and present them briefly. The web-based application Scratch is opened. The application can be used with and without account.
- Next, the „Develop“ field is selected. The tutorial can be closed for this application.
- Under the globe, the language of the application can be change if required.
- Select the block „When space key is pressed“ under Events and drag and drop it into the programming interface.
- This block is dragged under the block „When space key is pressed“. These connect like pieces of a jigsaw puzzle. This procedure is now repeated four times, so that in the



Sounds of vegetables

Materials

- Notebook/laptop with speakers, or tablet with corresponding cable and Wi-Fi connection
- Makey Makey kit
- Various vegetables/fruits

Web-based application

scratch.mit.edu

Exercise

Level



Exercise

Level



end there are five such small programming blocks. With four programming blocks, clicking on the space key in the “When space key is pressed” block now always select a different function of the keyboard (↓ ↑ ← →).

- In the menu under the tab “Sound”, four additional sounds can be added in the lower area (speaker). After adding, the system switches back to the Skripe tab.
- In the block “Play sound Miau”, the corresponding sound for the respective key is now selected by clicking on the point Miau.
- Connect the Makey Makey circuit board to the notebook (via USB). Connect one end of the crocodile clips to the Makey Makey (arrows and space). These later replace the keyboard of the notebook.
- A crocodile clip is connected to one end as earth. The other ends of the crocodile clips can be inserted into five different pieces of vegetables.
- One child holds the other end of the crocodile clip, which is connected to the earth. Now this child can make different sounds by touching the pieces of vegetables.

Reflection

- Reflect the meaning of different building elements and the structure of a simple electrical circuit.
- Which meaning have those elements and the electrical circuit for the robots?
- What would be “healthier” for a robot: electrical circuit or vegetables which were used in the activity?
- Was the programming with Blockly necessary for our activity?
- How can we get more different sounds?
- Can our body be a music instrument too?

Variation

- The vegetable pieces can, for instance, also be replaced by flowers which are lying in water.

Instruction

Print front and back on one sheet. (Turned over long side)

Fold

