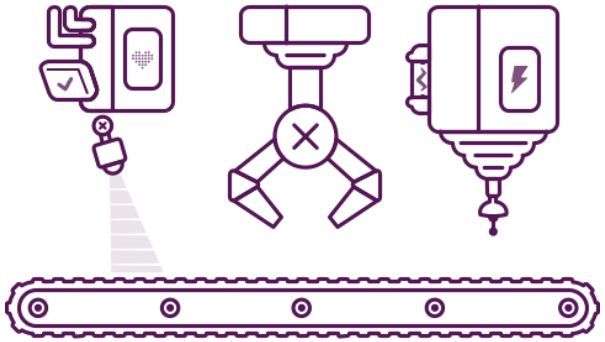
# photon

discover the **magic**
of modern **education**

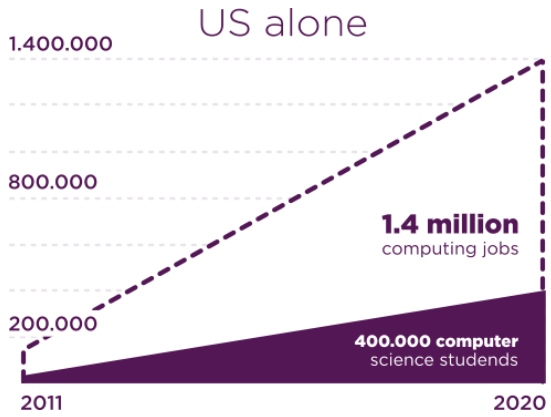
# Schools are failing to deliver STEM education



McKinsey Global Institute estimates:

**New technology will yield new types of jobs**

Between 400 million and 800 million of today's jobs will be automated by 2030.




Code.org report says:

**Global economies require more programmers.**

Only on the US job market to 2020 will be more than 1.000.000 jobs gap for computing jobs.

Gallup report says:

**Schools adapt STEM education too slow.**

Only 35% of high schools teach programming. On the lower stages of education is much worse.

**The big opportunity for EdTech solutions:** Smart Education and Learning Market will grow from $105.23 Billion in 2015 to $446.85 Billion in 2020. (global forecast at a Compound Annual Growth Rate (CAGR) of 24.4%)

# Complex issue

Global economies require more programmers

Schools adapt STEM education too slow

**Schools fail because they lack engaging tools**

# Challenges of modern education

### Challenges

- Educational istitutions need to implement STEM curriculum as fast as they can
- Lack of teachers with knowledge about new technologies

### Ideal solution

- All-in-one STEM tool
- Easy to adapt for non-technical teachers
- Explaining materials for teachers in multiple languages

### Desired outcomes

- Ability to teach students about new technologies, coding and AI
- Increase the educational level of educational institutions

### Challenges (proof)

- Only 35% of Highschools teach coding
- Increasing gap between the number of jobs for engineers and number of qualified employees

### Ideal solution (why clients need this)

- Limited budget for buying multiple solutions
- Non-technical teachers have no skills to use advanced solutions
- Non-English countries have troubles when using English-based tools

### Desired outcomes (proof)

- Educational institutions are obligated to follow national curriculum standards that consist of STEM subjects
- Better educational offer increase attractiveness of educational institutions for clever students and their parents

# Complex issue needs a complex solution

**Coding lessons made easy**
no coding experience required

**Suitable for kids of all ages**
from kindergartens to high schools

**Compatible with most tools & devices**
available in home or schools

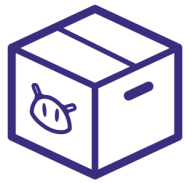
**Ready out of the box**
no configuration required

**Worldwide community of teachers**
creating scenarios for all levels of education

**Photon teaches children how to:**

- **think** logically,
- **solve the problems** in many creative ways,
- **code** using new technologies and sensors.

# The most universal STEM didactic tool

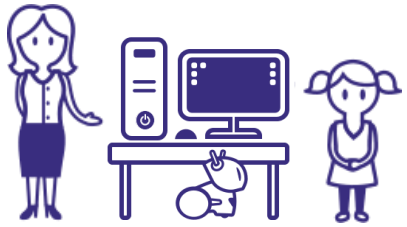


**Ready-to-use**
tool

**Preset lesson plans**
and examples for teachers

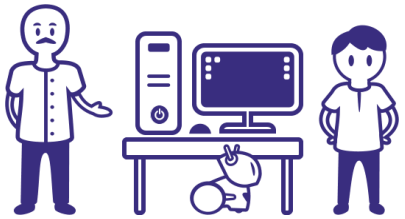
**Kindergarten**
Preschool

(PRE-K / ISCED 0)



**Primary School**
Elementary School

(K-5 / KS 1-2 / ISCED 1)



**Middle School**
Secondary School

(K-12 / KS 3-5 / ISCED 2-3)

# PRE-K approach

## Aims

- Visual-motor coordination and manual skills,
- Spatial orientation, determining direction skills,
- Planning, anticipation and understanding the logics of 'step-by-step' events
- Algorythmics (activities reccurence)
- AI introduction

## Recommended tools

Photon EDU

Photon Coding

Photon AI Junior

## Recommended devices

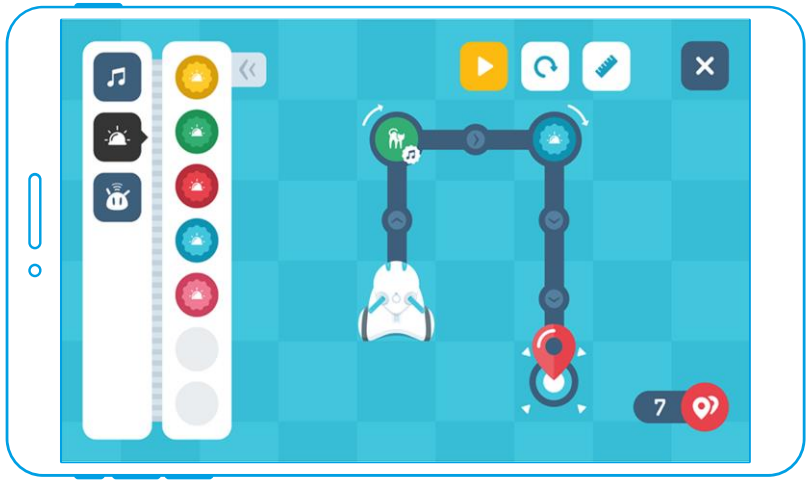
Mobile

Interactive floor

Interactive board

# Coding - PRE-K approach

## Photon Draw (4+)

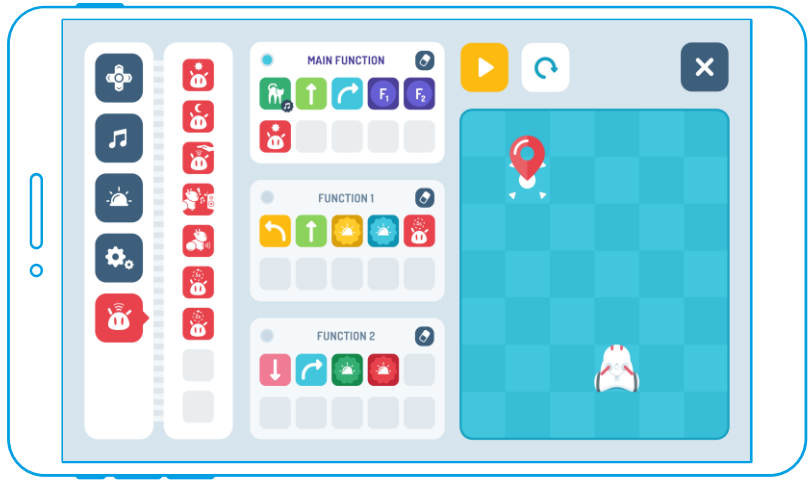



Photon Draw was designed for the youngest. Even 3-4 years old children are able to program by drawing a path with your finger on the screen.

Develops in children:

- Manual skills
- Spatial orientation
- Understanding the logic of events

## Photon Badge (5+)




Photon Badge was created for children who can understand more complex logical sequences. We design a robot program using simple instruction symbols.

Develops in children:

- Spatial imagination
- Planning, anticipation
- Algorithmics (repeatability of activities)

# AI - PRE-K approach

AI Introduction in Kindergarten focuses on finding patterns, unique features, simple encryption. Children can use their hand drawings and use AI to recognize them and control Photon

# K-5 approach

## Aims

- Understanding of new technologies, programming in script language
- Ability of matching systems and environments, multi-aspect comprehension
- Computation thinking – a process of finding solutions to open complex problems
- Ability of creating the same outcomes in different ways
- Basic AI creating skills – creating models, image, text and speech processing

## Recommended tools

Scratch

Microsoft MakeCode

Photon AI

Photon Coding

## Recommended devices

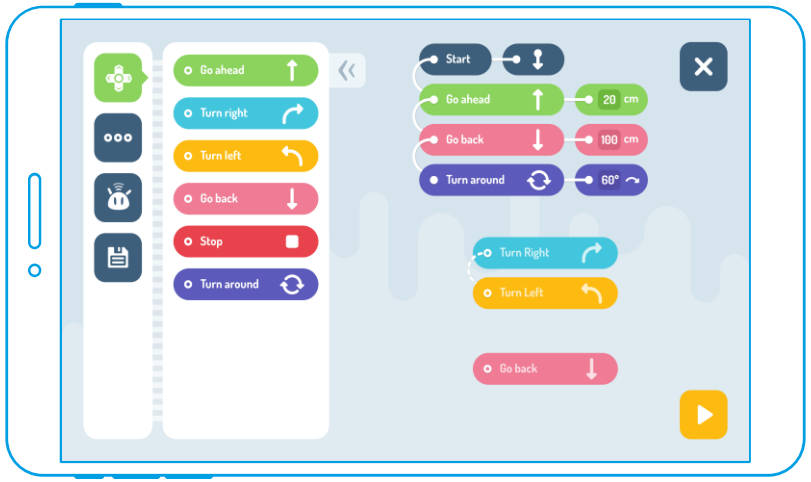
Computer & mobile

Makey Makey

Interactive board

# Coding – K-5 approach (1/2)

## Photon Blocks (7+)




Photon Blocks are designed for children who can already read. At this stage of development, by arranging colorful blocks of instruction, children are able to understand what complex operations are.

Children develops skills in:

- Creating complex programs
- Optimization of written programs
- Early detection of errors

## Photon Code (10+)

Photon Code introduces children to the world of real programming. The interface is in English, it resembles the classic code in the console. Children uses ready-made blocks of text to create their programs.

Children develops understanding of:

- The structure and syntax of the programming code
- More advanced algorithms
- Programming with the use of sensors

# Coding – K-5 approach (2/2)

## Integrations with

The most popular tools

Scratch

Microsoft MakeCode

JavaScript

# AI – K-5 approach

**Photon AI (alpha, closed tests):**

Photon AI application is a tool that teaches block-based programming with the usage of AI tools. Application uses Microsoft Cognitive Services to detect different objects and then program the robot to react on these objects by analyzing the camera images.

# K-12 approach

## Aims

- Complexity and possibilities of code syntax knowledge
- Multithreaded programming skills, event-driven programming
- Creating advanced software with use of various systems
- Data science, AI and cloud architecture modules creating skills

## Recommended tools

JavaScript

Python

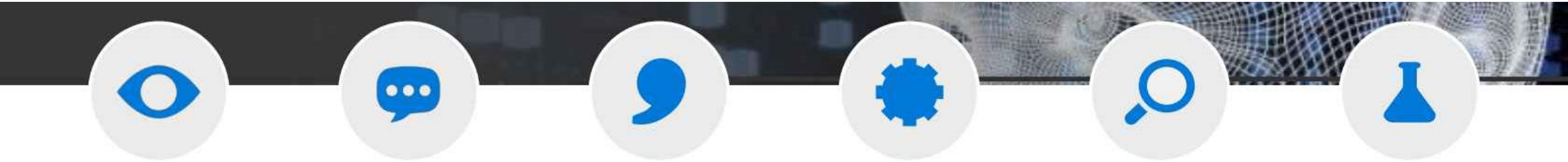
Azure IoT Hub

## Recommended devices

Computer & mobile

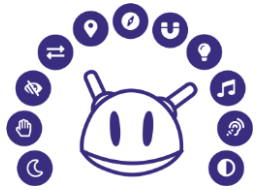
Makey Makey

# AI learning tools based on Microsoft Cognitive Services



| Vision | Speech | Language | Knowledge | Search | Labs |
|---|---|---|---|---|---|
| Computer Vision | Bing Speech | Bing Spell Check | Academic Knowledge | Bing Autosuggest | Project Prague (gesture) |
| Content Moderator | Speaker Recognition | Language Understanding | Entity Linking | Bing Image Search | Cuzco (events) |
| Emotion | Custom Speech Service | Linguistic Analysis | Knowledge Exploration | Bing News Search | Johannesburg (routing) |
| Face | | Translator Text & Speech | Recommendations | Bing Video Search | Nanjing (Isochrones) |
| Video | | Web Language Model | QnA Maker | Bing Web Search | Abu Dhabi (distance matrix) |
| Video Indexer | | Text Analytics | Custom Decision Service | Bing Custom Search | Wollongong (location) |
| Custom Vision Service | | | | | Enduring Freedom (just kidding ☺) |

# Why customers should choose Photon?



The most technologically advanced STEM didactic tool within its price level

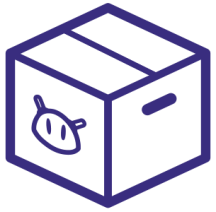
Compatible with mobile devices, computers and other hardware

The most available integrated coding tools

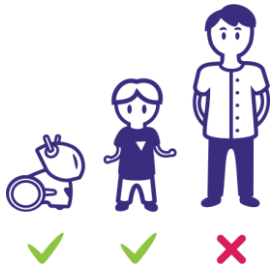
**EN, PL, GER, CZ, SK, SW**

Teaches coding and AI in native languages

Universal for various age groups



Ready to use out of the box, no configuration or tech background required



Does not require adult's support

Adjusted to group work. Non 1:1 approach.

# Testimonials

„Working with Photon is like mind gymnastics. On the one hand... schematics. We need to be very precise while providing information. On the other hand... we look for new creative solutions. Thanks to the fact that children transform a symbolic code into real action, they can pay attention to details, which is very important when preparing them to reading and writing. Coding is very stimulating for imagination”

Katharina Dardzinska, Pre-school educator

„Students are willingly using Photons during classes and these are not only extra coding classes but also obligatory school activities. For example we actively use our robot during maths lessons. Nowadays, when technology is everywhere around us and affects our space, I, as a headmaster cannot imagine that children would not benefit from such technologies as robots.”

Slawomir Radecki, Principal of Primary School

# Global presence already established

photon

rt
agram.com
dować! 👂🔥🦘#scratch
photon

emia_prymusa
agram.com
n#photon#akademiapry

bibliotekabojszowy
instagram.com

Roboty **Photon** są słodkie 😍! Klub Kodowania programował nowymi robotami. I przy okazji świetnie się bawił 😊. #**photon** #klubkodowania #coding #programowaniedladzieci #gbpbojszowy #bojszowy #biblioteka #library #kids #tydzienbibliotek

mbp_chrzanow

mbpmorag
instagram.com

Takie tam... z kumplami #kumple #czytosław #maskotka #**photon** #**robot** #robotywbibliotece #nowoczesnabiblioteka #library #friends #frendsforever #inlibrary #fun #games #robots #**programowanie** #wbibliotece #aplikacja #zabawa #dladzieci #dlamłodzieży #dlawszystkich

bajka.biuro
instagram.com

# Poznajcie **Photona** - interaktywnego **robota** edukacyjnego, który wziął z nami udział w zajęciach z kodowania na dywanie. Za pomocą specjalnej aplikacji mobilnej i telefonu komórkowego mogliśmy samodzielnie sterować robotem i wyznaczać mu drogę, którą pokonywał. Ale była zabawa!!! ❤ #zabawa #...

biblioteka.dobczyce
instagram.com

Warsztaty z Robotami **Photon** dobiegły końca! Od marca tego roku uczestnicy spotkań stawiali swoje pierwsze kroki w świecie programowania. #roboty#warsztaty#mbp#dobczyce#biblioteka#ciekawemiejsce#ciekawychludzi#ciekawychzajec

mbp_chrzanow
instagram.com

Dzisiaj super szkolenie w ramach projektu #kodowaniewbibliotece w @rajska.info 🙂💪 #an_mbp #szkolenie #warsztaty #**programowanie** #kodowanie #**photon** #**robot** #robotyka #informatyka #mbpchrzanow

sektor_3
instagram.com

🟦 Znacie już naszych małych przyjaciół @photonrobot ? #inspiracja #**robot** #technology #event #charity #ngopl #techforgood

energetyczne_centrum_na...
instagram.com

...po nowe wyzwania!
Zaprogramowaliśmy naszych zwiedzających na szkołę razem z #macedukacja, a pomagał nam @photonrobot
#energetycznecentrumnauki #ecn #kieleckiparktechnologiczny #kpt #kielce #świętokrzyskie #nowyrokszkolny #**programowanie** #**photon** #**robot** #warsztaty #nowewyzwania #drużynamocy #dajemyenergię

gadzetyadama.pl
instagram.com

...z tego spotkania. Szykuje się fajna niespodzianka :) Mieliście okazje zabawy z **Photonem** lub innym narzędziem ułatwiający naukę programowania? #**robot** #**photon** #projekt #tajemnica #niespodzianka #zabawka #gadżet #toy #gadget #gadgets #dziecko #dzieci #kids #fun #play #learn #programming #techlove...

mediateka_kozie
instagram.com

Mój przyjaciel **Photon**! #koc #naukaizabawa #robotywal

biblioteka_w_ket
instagram.com

...#instabiblioteka #instalib #instaksiążka #instabooks #reading #read #biblioteka #dzieciczytają #dziecko #dzieciwbibliotece #ksiazka #polskaczyta #tuczytam #li #czytambolubię #czytanieje #sięczyta #**photon** #robotyk #programowaniedladzieci #wakacjewbibliotece

# Photon + Microsoft services

**Joint Microsoft and Photon solutions** provides implementation of the newest technologies and STEM curriculum to every school.

### Coding in early and primary education

Photon Microsoft MakeCode coding platform. Didactic materials in OneNote on the online web platform (Azure cloud)

### AI curriculum for kids

Set of AI tools (connected with lesson plans) for Kindergartens and Primary Schools, based on Microsoft Cognitive Services and Azure Cloud.

### AI curriculum for students

Set of tools connected with projects for Secondary Schools, based on Azure IoT Hub and Azure Cloud

# Contact

**Barbara Polit**

Sales Manager

b.polit@photonrobot.com

M: +48 605 650 716