




















# Lesson 1 – Introduction to Scratch Block Extension

 A teal square icon featuring a white silhouette of a human head in profile, facing right. Inside the head, there are various colorful icons representing different cognitive services: a lightbulb, a gear, a speech bubble, a document, and a network diagram.	 A blue square icon featuring a white Scratch cat head in the center. Surrounding the cat are various icons: a folder, a magnifying glass, a document, and a network diagram.	 A blue square icon featuring a white line graph with a rising trend, a bar chart, and a pie chart.	 A purple square icon featuring a white cloud with the letters "AI" inside. Surrounding the cloud are various icons: a document, a speech bubble, a network diagram, and a computer monitor.	 A blue square icon featuring a white cloud with a speech bubble inside. Surrounding the cloud are various icons: a document, a speech bubble, a network diagram, and a computer monitor.
<b>Cognitive Services</b> By mBlock official    The cognitive services API allows users to add other features, for instance, Video, Speech, Language and Knowledge. <a href="#">More</a>	<b>Teachable Machine</b> By mBlock official   With Machine Learning, you don't have to program but still can train computers to learn things and establish artificial	<b>Data Chart</b> By mBlock official    Use this extension to visualize your data. A chart speaks louder than lengthy words.	<b>AI Service</b> By mBlock official    The extension is only available in China. Use Baidu AI service to recognize images, texts, speeches, human body, and process natural	<b>User cloud message</b> By mBlock official    With the user cloud message extension, you can easily sync data of your account across different devices and projects.

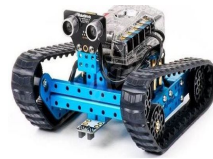
## **Need for Scratch Extensions**

Functional capabilities of learning scratch using sprites is **limited**.

To broaden the capabilities we need to enter the three dimensional **World of Real Devices**.

Extensions **allow us to connect** scratch to external hardware like:

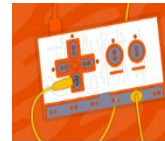
- Real robots.



- Boards.



- Apps.



- Plugins etc



Makey Makey

## Extension Blocks

These are colour coded **in different colours**



Dependant on the extension service you select. They allow you to:

- Expand your learning from a virtual world to a **real world**.
- Make it possible to connect Scratch projects with **external** hardware.

They **add a collection** of command and reporter blocks.



These are then used to **interact** with a particular device or data source.

## Types of Block Extensions

We have two types of Block extensions:

- Block extensions for Sprites
- Block extension for Devices.


The functional procedure of both is similar.  
Do have a look at both.

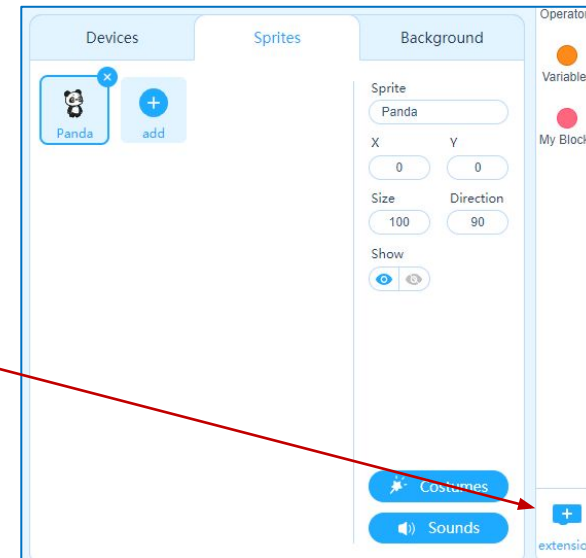
# What is Sprites Block Extension

Sprite block extension is a utility of mBlock 5, containing a large number of **customised blocks**, for undertaking **advance coding projects** using scratch.

# Accessing the Sprite Block Extension

To access the sprite block extension:

- In SIA, select working mode Sprites.
- Click on  at the bottom of Block area.

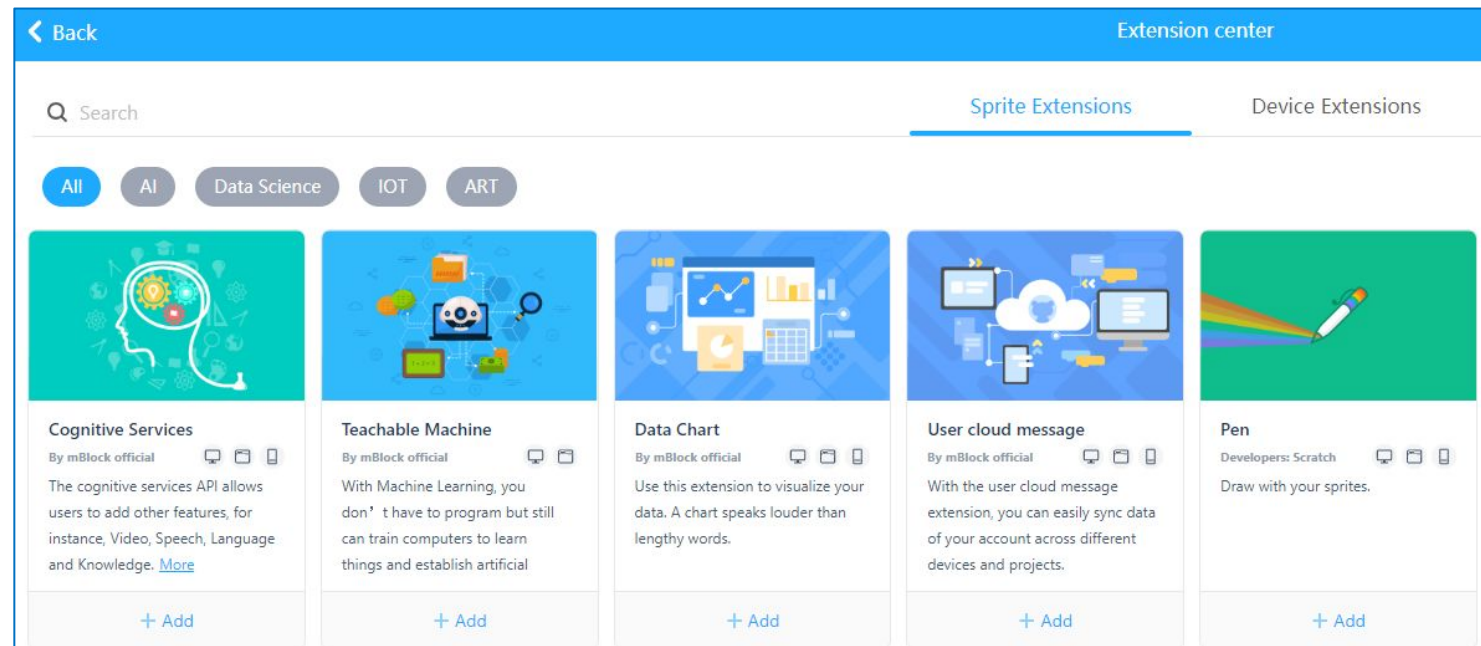




The Sprite extension library opens.

It contains blocks for the following categories:

- AI.
- IoT.
- Data Sciences.
- Arts & Music.



# **Blocks Related to Artificial Intelligence (AI)**

Provides blocks for

Cognitive/recognition Services

Machine Learning

Text to speech conversion

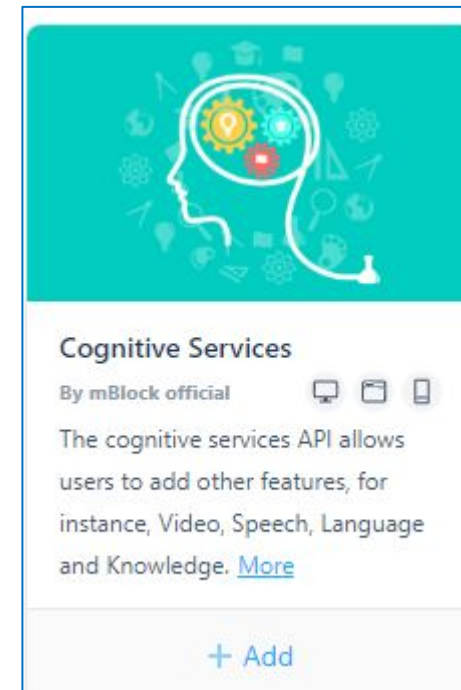
Translation

# Blocks for Cognitive Services

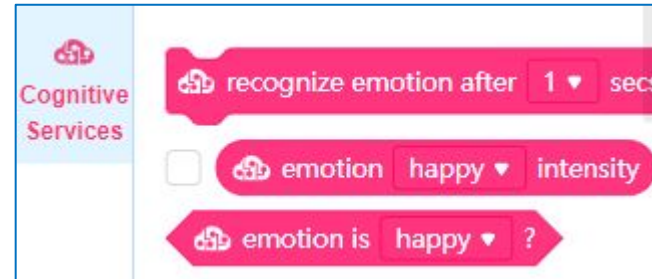
Scratch based Cognitive Services brings learning of AI within the reach of primary school students.

It grants them the ability to see, hear, speak, recognise, convert, search & introduce advanced decision-making into their codes & apps.

To open click on **+Add**.



**Blocks related to cognitive services will open.**



**The method of using these is same as that for using the blocks learnt so far.**

# Blocks for Machine Learning

Using these blocks we do not have to code but we can train machines to learn things to work intelligently for us.

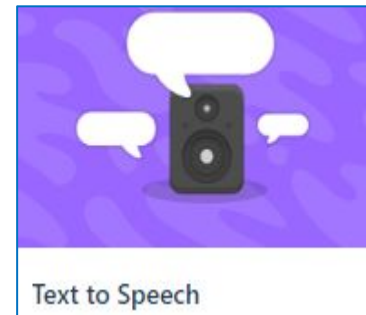
This is done by making a training model.  
We shall learn it a little later.

Method of use is same as for cognitive services



# Blocks for Text to Speech Conversion

Learn to make your projects talk through code



# **Blocks for Translation**

Translate to 48 world languages



# **Blocks Related to Data Sciences**

Provides blocks for

**Data visualization**

**Climate data**

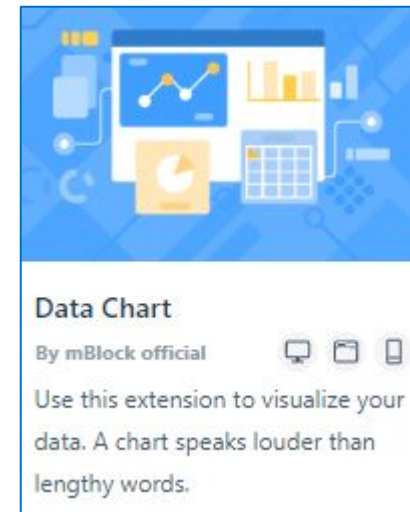
**Working with Google sheets**



# Blocks for Learning Data Visualisation

Convert raw data into charts.

Improve data visualisation.



# Blocks for Climate Data

**Make projects using real time  
Global climate data.**



# Blocks for Coding with Google Sheets

Make projects to input data into Google sheets



# **Blocks Related to IoT**

Provides blocks for

Interaction with other devices

Video sensing

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# **Blocks for Interacting with Other Devices & Projects**

**Synchronise your data with other Devices & Projects using Cloud messaging**



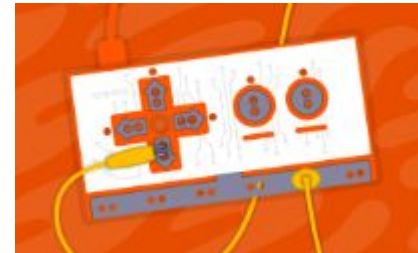
# **Blocks for Video Sensing**

**Make projects  
sensing motion with camera**



# Makey Makey Blocks

Convert things into keys



# **Blocks for Art & Music**

Provides blocks for

**Making SW Musical  
Instruments  
Virtual pen sketching**



# **Blocks for making SW Musical Instruments**

Learn to make 21 Software Musical instruments



# Blocks for Sketching with a virtual Pen

Learn to sketch & make  
Your own sprites & More





**WOW!**  
Block extensions have given me  
tons to learn



**Code Karega India Badhega**