

# Machine Learning For Kids :: Teachers' notes

<b>Worksheet</b>	<b>Ink blots</b>
<b>Activity</b>	Train two different machine learning models to recognize pictures, test them using ink blot paintings, and compare the answers that they give.
<b>Objective</b>	<b>Teach a computer to recognise objects in a picture</b> <ul style="list-style-type: none"> <li>Learn how computers can be trained to recognise images</li> <li>Learn how the behaviour of machine learning systems is described in the media</li> </ul>
<b>Difficulty level</b>	Intermediate
<b>Time estimate</b>	1 hour
<b>Summary</b>	<p>Students work in pairs – one trains an ML model to recognize pictures of animals, the other trains an ML model to recognize pictures of fruit. They test both of these with the same set of ink blot paintings taken from a Rorschach test, and compare the responses that their ML models give.</p> <p>Finally, they learn about the MIT AI research project that this is based on and are asked to think about the way this was described in different news articles.</p>
<b>Topics</b>	image classification, bias, ethics in AI

## Setup

Each student will need:

<b>Print-outs</b>	Project worksheet (download from <a href="https://machinelearningforkids.co.uk/worksheets">https://machinelearningforkids.co.uk/worksheets</a> ) Blocks in Scratch scripts are colour-coded, so printing in colour will make it easier for students.
<b>Access</b>	Username and password for machinelearningforkids.co.uk

Class account will need:

<b>API keys</b>	<b>Watson Visual Recognition - 2 custom models per pair of students</b> One "Lite" API key is free but can only be used to create 2 custom models One "Standard" API key can be used to create multiple custom models more detail at: <a href="https://github.com/IBM/taxinomitis-docs/raw/master/docs/pdf/machinelearningforkids-apikeys.pdf">https://github.com/IBM/taxinomitis-docs/raw/master/docs/pdf/machinelearningforkids-apikeys.pdf</a>
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## Customizing

If you use **PRIMM** approaches with your class, add a step where students predict how the project template works.  
 If you want to **increase the amount of coding** involved, delete some of the code from the project template and add steps to the worksheet so students code it themselves.

If you want to **encourage problem solving**, delete some of the detail in the worksheets and provide more general instructions instead.

Project template files & worksheets in MS Word format are available so you can **modify them to suit your class**.

<b>Project templates</b>	<a href="https://github.com/IBM/taxinomitis-docs/tree/master/scratch-templates">https://github.com/IBM/taxinomitis-docs/tree/master/scratch-templates</a> Scratch 3 templates end .sb3
<b>Worksheets</b>	<a href="https://github.com/IBM/taxinomitis-docs/tree/master/project-worksheets/msword">https://github.com/IBM/taxinomitis-docs/tree/master/project-worksheets/msword</a>

## Help

<b>Potential issues</b>	<ul style="list-style-type: none"> <li>Students will look at the responses from an AI system at <a href="http://norman-ai.mit.edu/">http://norman-ai.mit.edu/</a> Some describe things that could be upsetting to younger children. Review these before deciding if this project is appropriate for your class.</li> <li>You may prefer to train the ML models for your students, to reduce the number of API keys that this worksheet requires. Create "whole class" projects so that they can all create their own robots based on your ML models.</li> </ul> <p>General troubleshooting and help at <a href="https://machinelearningforkids.co.uk/help">https://machinelearningforkids.co.uk/help</a></p>
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