

# Machine Learning For Kids :: Teachers' notes

<b>Worksheet</b>	<b>Car or Cup</b>
<b>Activity</b>	Train the computer to be able to sort photos into groups.
<b>Objective</b>	<b>Teach a computer to recognise pictures of objects</b> <ul style="list-style-type: none"> <li>How computers can be trained to recognise pictures.</li> <li>The importance of variety in training machine learning systems.</li> </ul>
<b>Difficulty level</b>	Beginner
<b>Time estimate</b>	45 minutes
<b>Summary</b>	Students will train a machine learning model to recognise pictures of cars or cups. They will use this to make a project in Scratch that sorts a pile of photos into groups.
<b>Topics</b>	image classification, supervised learning

## 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.  There are <b>two versions of the worksheet</b> – one that assumes students will work individually, the other assumes students will work together as a whole class.
<b>Access</b>	Access to an image search site (e.g. Google Images, Bing Images, etc.)
<b>Access</b>	Username and password for machinelearningforkids.co.uk

Class account will need:

<b>API keys</b>	<b>Watson Visual Recognition</b> 1 custom model per student (if students are training their own models) or 1 custom model per class (if students work together on a whole class project)  One "Lite" API key is free but can only be used to create 1 custom model One "Standard" API key can be used to create multiple custom models  more detail at: <a href="https://github.com/daledlane/ml-for-kids/raw/master/doc/machinelearningforkids-apikeys.pdf">https://github.com/daledlane/ml-for-kids/raw/master/doc/machinelearningforkids-apikeys.pdf</a>
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## Help

<b>Potential issues</b>	<ul style="list-style-type: none"> <li>Students will need Internet access to search for pictures of cars and cups to train the computer with. Depending on the age of the students, close supervision may be appropriate to ensure safe searching.</li> <li>The starter Scratch project includes a test set of images. Accuracy will be affected by how similar these are to the students' training images. For example, if students collect examples of sports cars to train the computer to recognise cars, this may struggle to recognise non-sports cars. If this happens, encourage them to think about why it's getting things wrong, and how they could improve this by collecting a more varied set of photos to train the computer with.</li> <li>Dragging and dropping doesn't work in Internet Explorer. You can provide your students with a different web browser (Firefox or Chrome work well) or explain to them how to copy/paste image URLs from a page.</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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