

# Machine Learning For Kids :: Teachers' notes

<b>Worksheet</b>	<b>Rock, Paper, Scissors</b>
<b>Activity</b>	Make a Rock, Paper, Scissors game in Scratch that learns to recognise hand shapes.
<b>Objective</b>	<b>Teach a computer to recognise shapes</b> <ul style="list-style-type: none"> <li>How computers can be trained to recognise pictures.</li> <li>The important of variety in training machine learning systems.</li> </ul>
<b>Difficulty level</b>	Intermediate Taking the training photos of your own hand needs coordination.
<b>Time estimate</b>	45 minutes
<b>Summary</b>	Students will train a machine learning model to recognise pictures of hand shapes. They will use this to make a project in Scratch that plays rock, paper, scissors.
<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.
<b>Files</b>	rock-paper-scissors.sbx (download from <a href="https://machinelearningforkids.co.uk/worksheets">https://machinelearningforkids.co.uk/worksheets</a> )
<b>Technology</b>	Web-cam
<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  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/daledane/ml-for-kids/raw/master/doc/machinelearningforkids-apikeys.pdf">https://github.com/daledane/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 be taking photos of their hands and uploading them to a secure site, where they are kept until their photo or project is deleted. As long as only their hands are visible in photos they take, then students are unlikely to be identifiable from this. If using laptops, angling the screen towards the ceiling helps with this. However, if the chance of photos accidentally including students raises concerns it may be sensible to obtain parental permission.</li> <li>Students often take a large number of very similar training photos. This is less likely to be accurate than photos of hands in a variety of positions and angles. It's helpful to highlight this and encourage students to think about why it is the case.</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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