

Build a Smart Sorter

Name		Date	
Class / Sec		Roll no.	

1 · AIM

To train an image classification model using the no-code tool **Teachable Machine**, test it on unseen images, and evaluate how well it performs.

2 · SOFTWARE AND TOOLS USED

TOOL	WHAT IT IS FOR
Teachable Machine	The no-code training tool — teachablemachine.withgoogle.com
A webcam or phone camera	To capture training and testing images
A browser	Nothing to install — the model trains in the browser

3 · THEORY

Image classification is a **Computer Vision** task: the model is shown labelled examples of each class, learns the pattern, and then predicts a class for an image it has never seen. This activity runs the full **AI Project Cycle** in one period.

TERM	WHAT IT MEANS
Class	One category the model can predict — for example paper, plastic, metal
Training images	The labelled examples the model learns from
Testing images	Unseen images used to judge the model honestly
Confidence	How certain the model is, shown as a percentage for each class

Test on unseen images: A model tested on its own training images will look almost perfect and prove nothing. **Hold some images back** before you train — those are the only ones that measure real performance.

4 · METHOD

This entry is a **worked activity** rather than a program. Follow the attached worksheet, and staple it behind this cover page.

STAGE	WHAT YOU DO	WHAT IT PRODUCES
1	Problem Scoping	The problem stated, and the classes agreed
2	Data Acquisition	Training images captured for each class
3	Data Exploration	A check that the images are varied, not near-identical
4	Modelling	The trained model, produced by Teachable Machine
5	Evaluation	Accuracy on the held-back testing images

Attached worksheet: Activity_Smart_Sorter — the full worksheet with all five stages and the scoring table. Complete it and staple it behind this page.

5 • RESULTS

Record your key figures here, then attach the completed worksheet and screenshots behind this page.

WHAT TO RECORD	YOUR RESULT
Number of classes	
Training images per class	
Testing images held back	
Correct predictions / accuracy (%)	
The class most often confused	

[ATTACH WORKSHEET AND SCREENSHOTS HERE]

The completed Smart Sorter worksheet, plus screenshots of your training screen and your test results

6 • OBSERVATION AND RESULT

Two or three sentences in your own words. Give your accuracy figure and say which class the model found hardest.

Example observation: The model was trained on three classes with 40 images each and tested on 12 held-back images, of which 10 were classified correctly — an accuracy of 83%. Paper and plastic were confused most often, probably because several of our plastic samples were transparent and looked similar against the background. More varied training images would likely improve this.

7 • VIVA QUESTIONS FOR THIS ENTRY

LIKELY QUESTION	SHAPE OF A STRONG ANSWER
Why did you hold some images back?	So the model could be tested on data it had never seen . Testing on training images measures memorisation
Which stage of the AI Project Cycle did the tool not do for you?	Problem Scoping. Deciding what to classify and why was our decision, made before the tool opened
What would improve your accuracy?	More varied training images — different lighting, angles and backgrounds, not simply more of the same
Is 83% good?	It depends on the class balance and the cost of a mistake. A number alone does not answer it

8 • HOW THIS ENTRY IS MARKED

FULL MARKS

All five stages completed on the worksheet · testing images **genuinely held back** before training · accuracy calculated and shown · screenshots of **your own** model · an observation naming the confused classes and a reason

LOSES MARKS

Tested on the training images · no accuracy figure calculated · screenshots from someone else's model · an observation that only says the model "worked well"

Before you submit: Check that your testing images were **set aside before** training, not after. If every prediction is correct with high confidence, you almost certainly tested on training data — and the examiner will ask.

