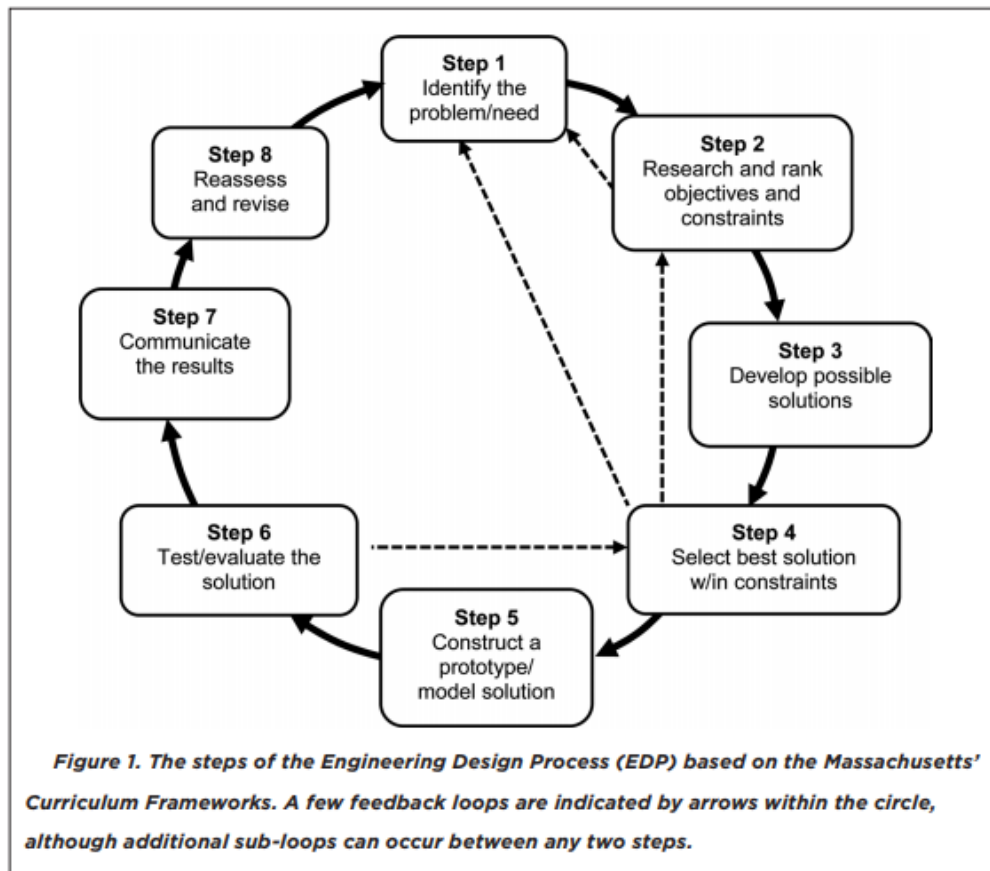


## SESSION SAMARY

### Engineering design process

- The engineering design process is a series of steps that guides engineering teams as we solve problems. The design process is iterative, meaning that we repeat the steps as many times as needed, making improvements along the way as we learn from failure and uncover new design possibilities to arrive at great solutions.
- the engineering design process (EDP) can be used as an innovative, effective, and logical means for formalizing the development of K-12 STEM lessons.



## Personal Image Classifier Tool recommended for 11-14 age group

We started the lesson yesterday by introducing the Engineering design challenge

Ex:

- The Ministry of health is working on a new precautionary measures to improve the CSS - Covid Safety System and limit the spread of coronavirus, and that will be achieved by integrating a new technology - AI to detect if the people wear a mask or not, so we need your help to develop a new system that will be able to detect masks.

The second step based on the EDP is to let the students research about the solution or brainstorm

As well as introducing what they **need to know**



## Mask detector - كاشف الكمام

### What is image classification?

- Image classification is the process in which an image is matched to a specific word.
- You do this all the time with your eyes and brain just looking around at the world!



You can ask them some question like

- Can a computer recognize the photos and emotions like us?
- Is this hard or easy for a machine?

## Why is this hard for machines?

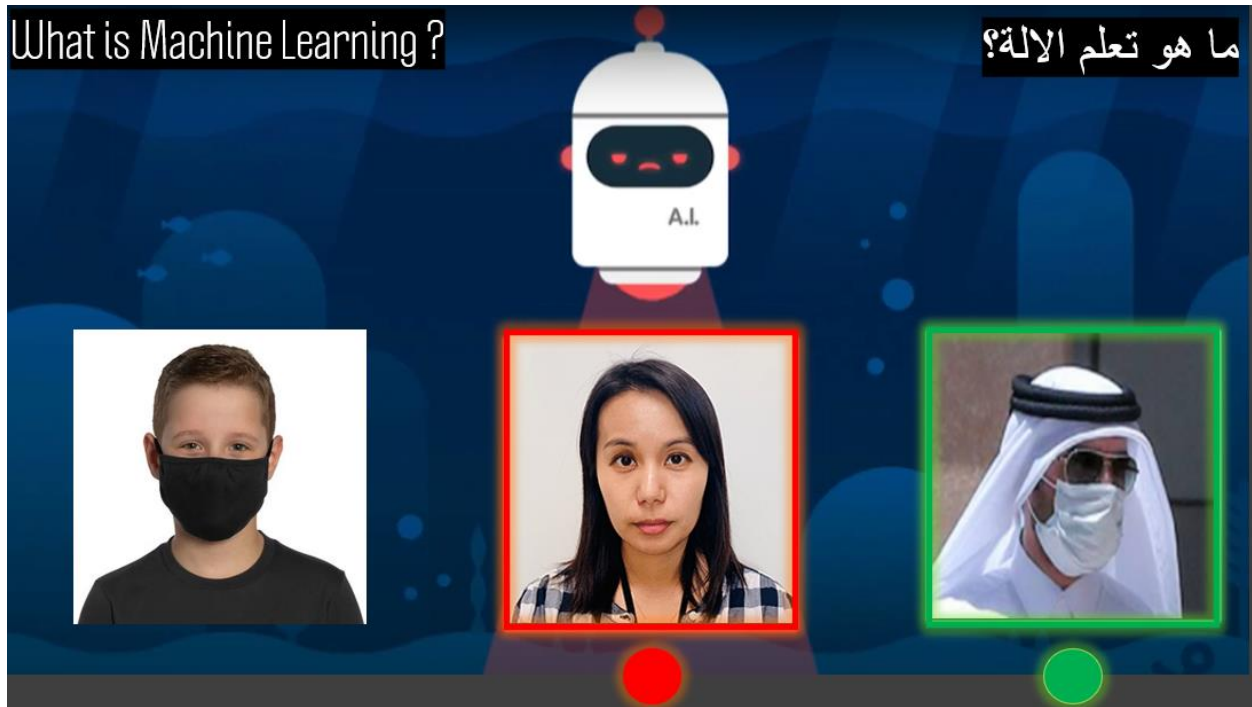
- Machines don't have systems as complex as our brains.
- We can see that these images are masks, but they look so different it would be hard for a machine to figure out.



Now they need to know more about machine learning so you can ask some questions like

What is Machine Learning ?

ما هو تعلم الآلة؟



Have you heard about machine learning?

What do you know about machine learning?

What do you understand from the picture?

- the AI Robot is detecting trash and remove it to clean the ocean, **but how does this Ai robot know how to differentiate between fish and trash??**
- we train the robot by showing him pictures of fish and pictures of trash, so the Ai robot learns from us how to separate between things without being programmed.
- What Will happen if you give wrong training for the machine, for example showing it a purple fish and telling him this is a trash?

He will do the same mistake that you did and classify the fish as trash because the behavior of your Ai robot based in your bias

# What is Machine learning

## Traditional programming



## Machine learning



Explain traditional programming and machine learning from the point of paper rock and scissor game.

Say >> Instead of thinking all about these rules and we have to write and express all of these rules in a code, what if we could provide a lot of answers and we could label those answers and then have a machine infer those rules

Say >> For example, instead of writing a complicated code to describe the shape of a hand for the computer, we can just get a lot of images of people doing a rock so we can diverse hands, diverse skins, and tones. and then we just say to the machine hey this is what rock looks like, this is what a paper looks like.

**you** can show some pictures and video about machine learning and as them if they have experienced AI in their daily life

- email filters
- auto-complete text
- video recommendation systems
- voice recognition
- translation apps
- digital assistants

- image recognition

after we introduce Need to Know participants can start building their prototypes

In the below link you can use the tool to create the training file

<https://classifier.appinventor.mit.edu/>



## MIT APP INVENTOR - Personal Image Classifier Tool recommended for 15-18

In the below link you can find more content, and you can use it to create the mobile application based on the training data

[Introduction to Machine Learning: Image Classification \(mit.edu\)](https://ocw.mit.edu/courses/6-034-artificial-intelligence-fall-2019/lecture-10-introduction-to-machine-learning-image-classification/)



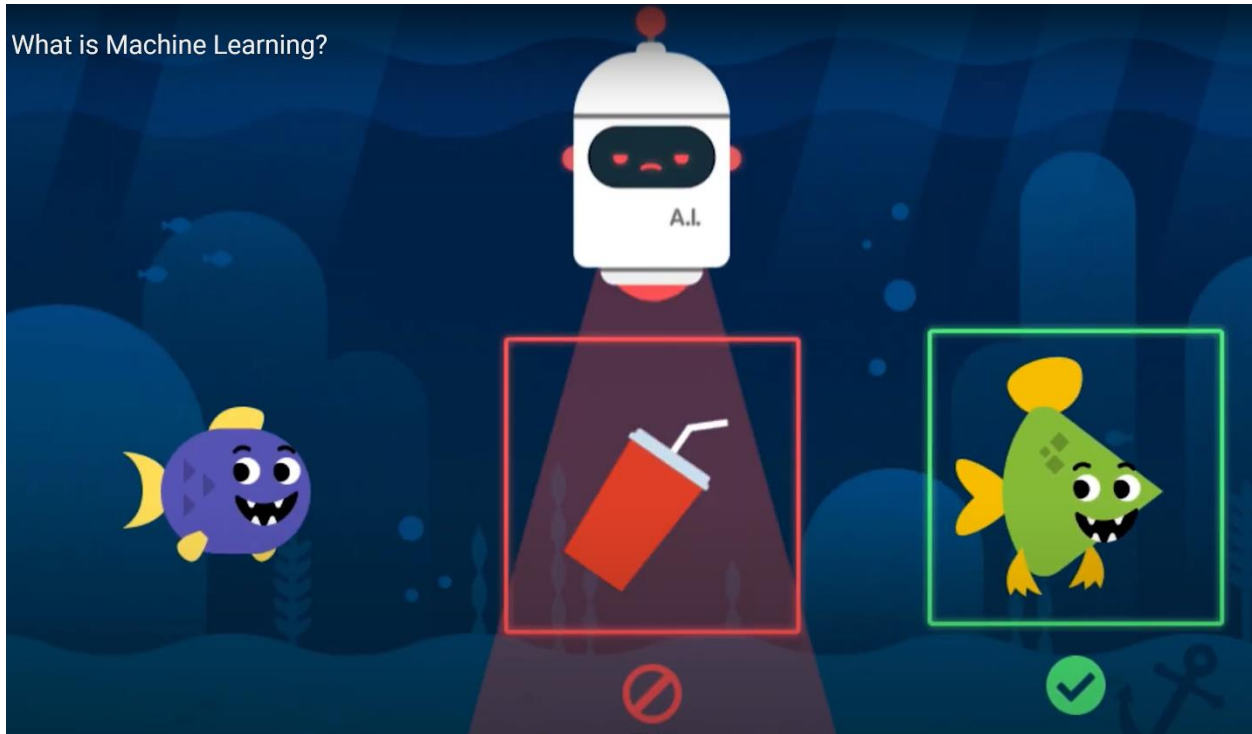
clock 0.14282	sundial 0.13745	keyboard 0.83545	crossword puzzle 0.52246
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### AI FOR OCEANS Recommended for 7-10

Participants will be introduced to machine learning, a type of AI and explore how training data is used to enable the AI machine to classify objects as either "fish" or "not fish" to attempt to remove trash from the ocean.

<https://studio.code.org/s/oceans/lessons/1/levels/1>

What is Machine Learning?



Teacher Resources (Lesson Plan and Activities)

<https://curriculum.code.org/hoc/plugged/9/>