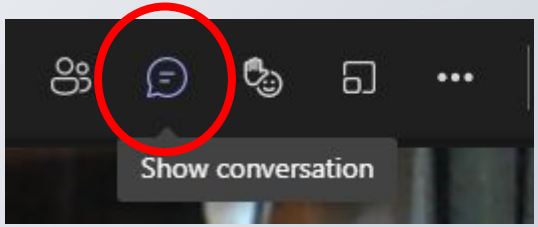
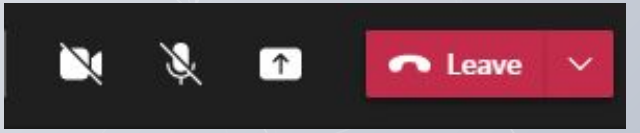
While we wait to get started ...

Open the chat



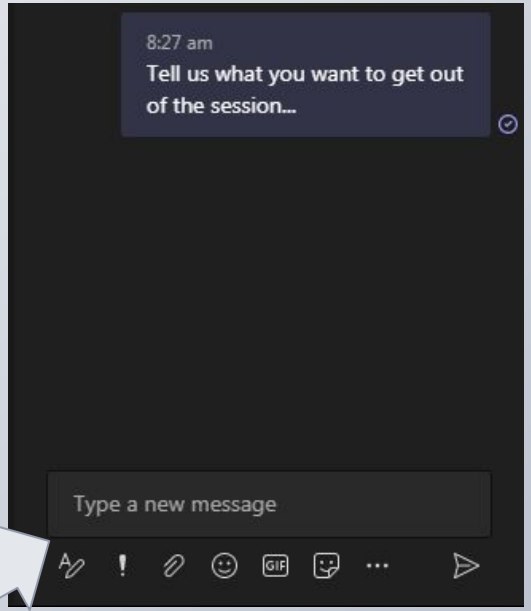


Your mic is on mute
... and camera disbaled

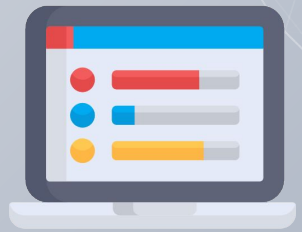
Tell us what you want to get out of the session.

NOTE:
your name will appear with your comment.

The chat won't be part of the recorded version.



Take our poll ... you will find it in the chat...



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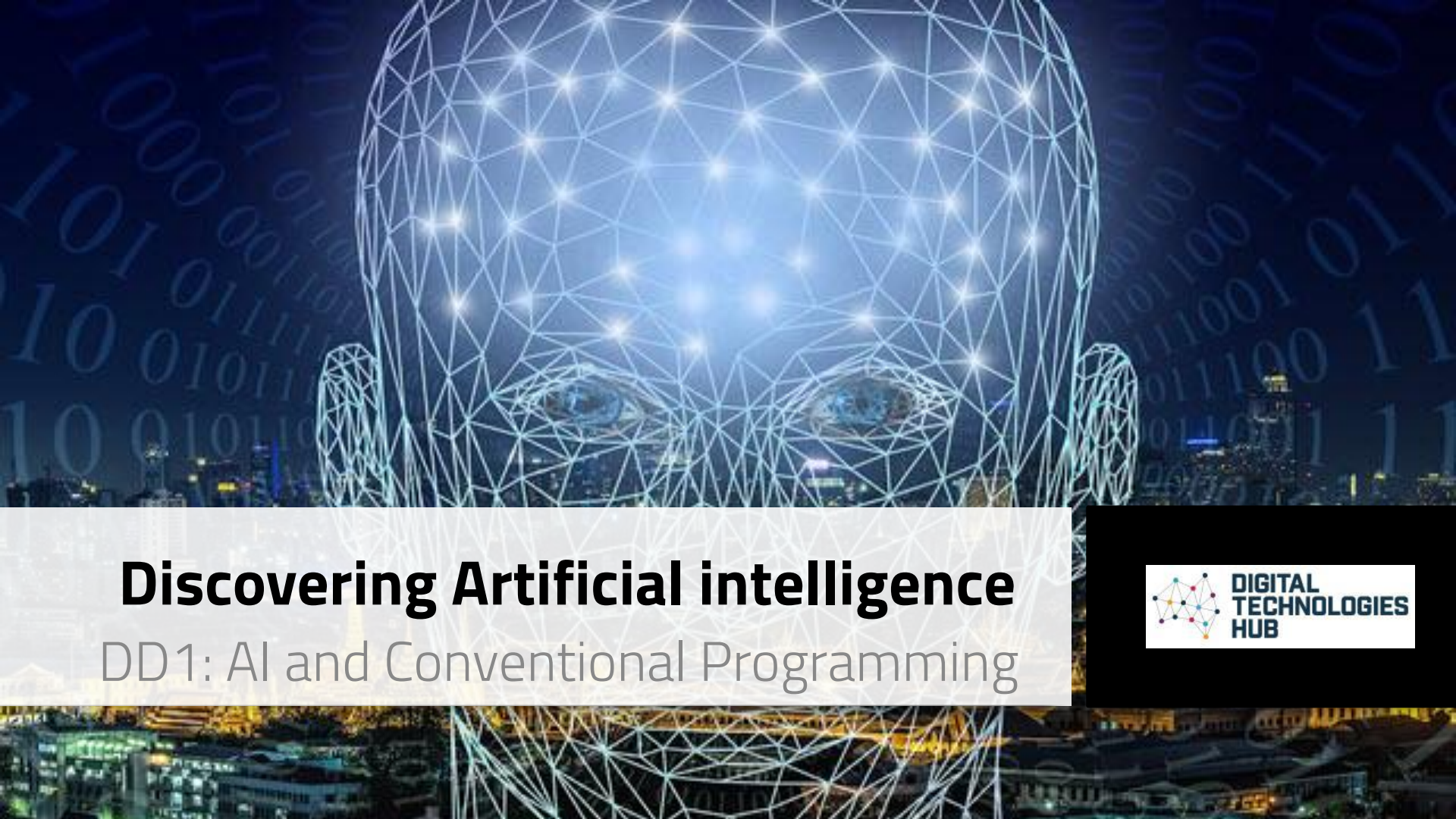

Discovering Artificial intelligence

DD1: AI and Conventional Programming

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By the end of this session...

You should be able to:

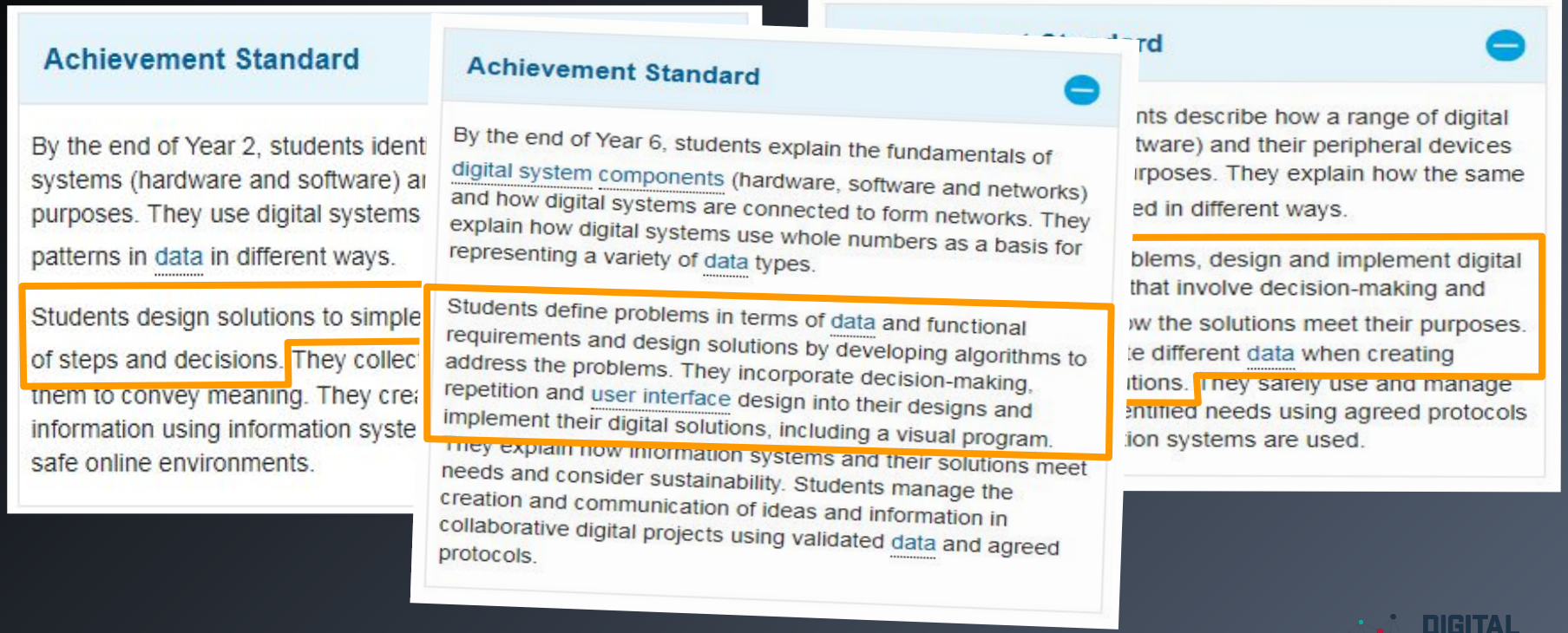
Create a program that includes user input.

Build your teaching strategies to help your students program.

Assess student's programs and identify inputs, branching and repetition.

Undertake a risk assessment to ensure AI tools are safe to use

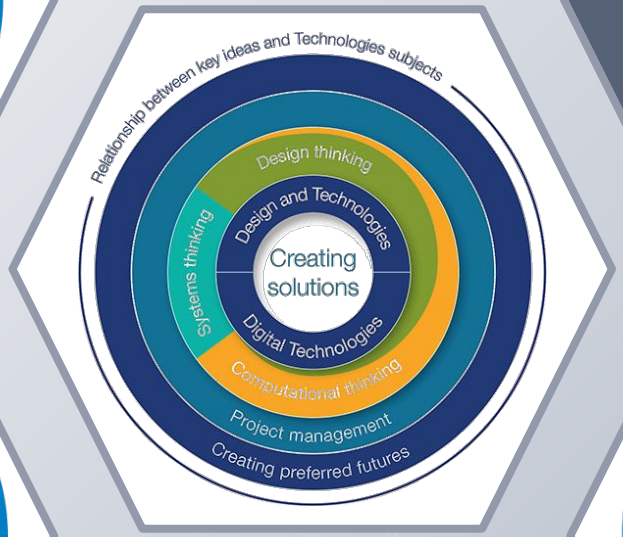
Achievement standards: starting point

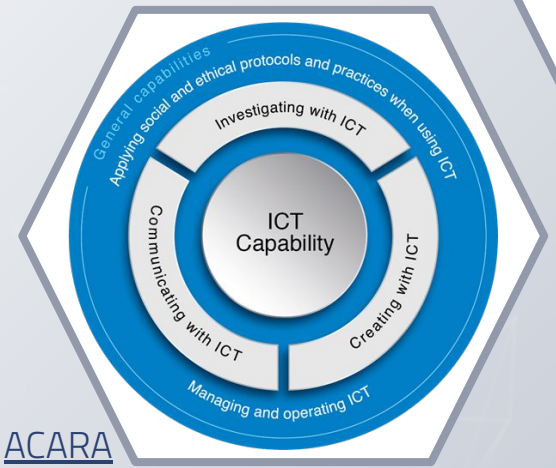


Credits: ACARA Achievement Standards

AI topics

Australian CURRICULUM





Source: ACARA

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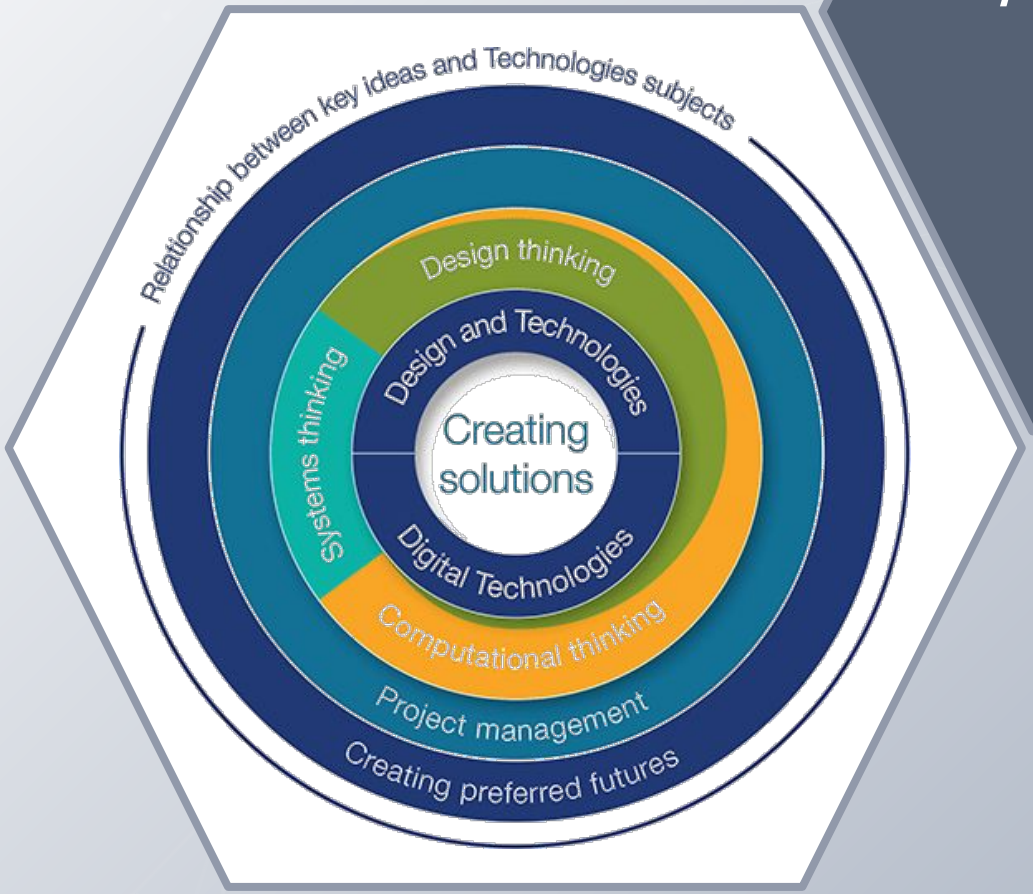
AI topics



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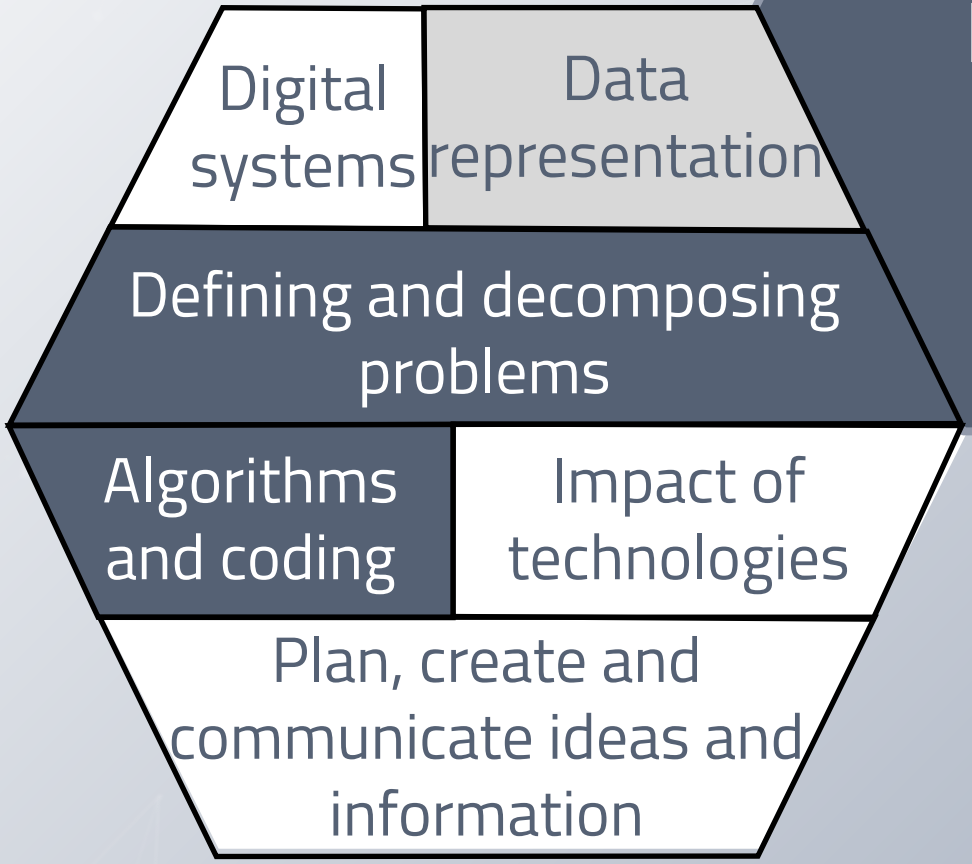
Foci of this deep dive



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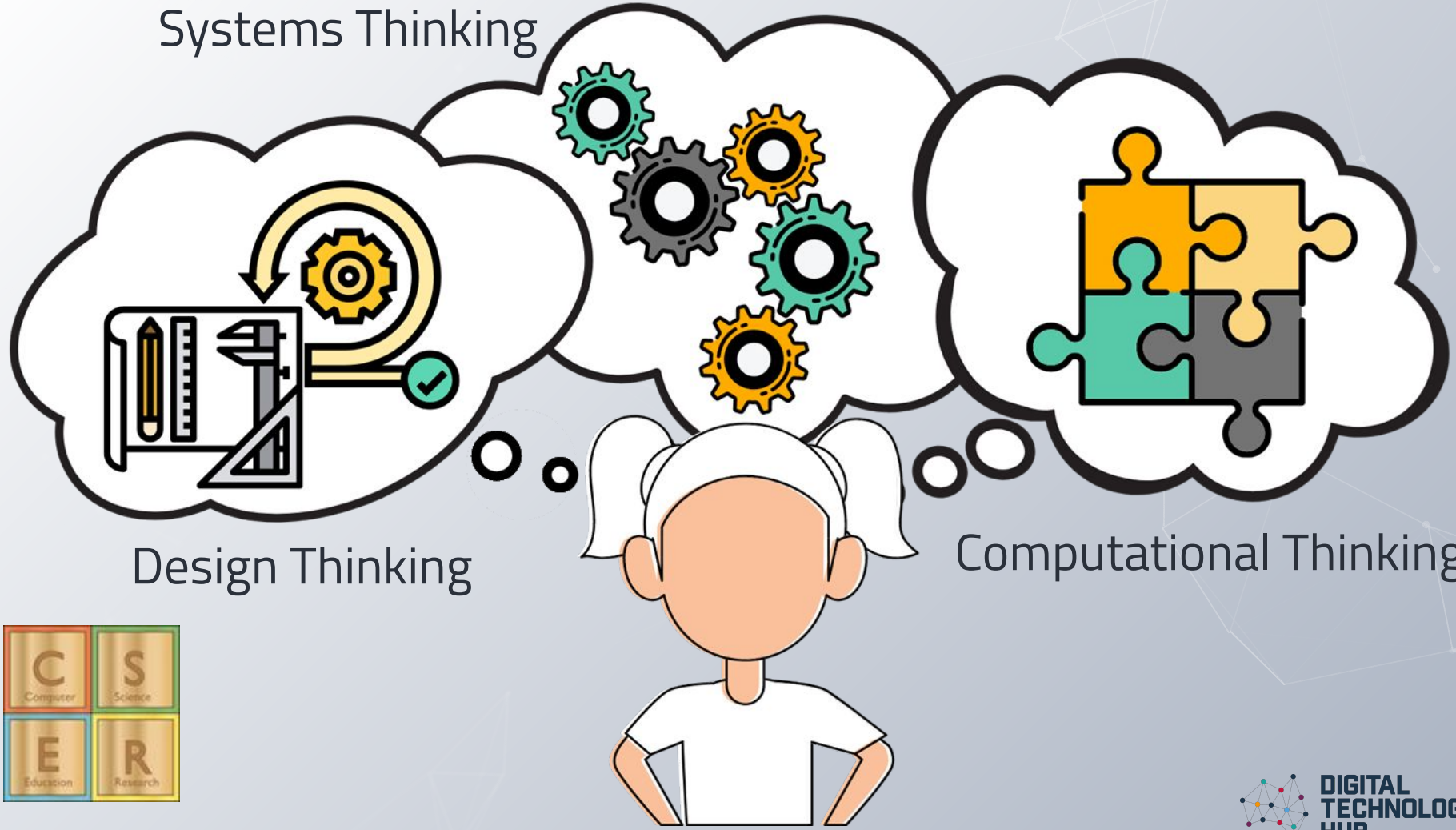
Systems Thinking



Design Thinking

Computational Thinking

How is AI different from conventional programming?

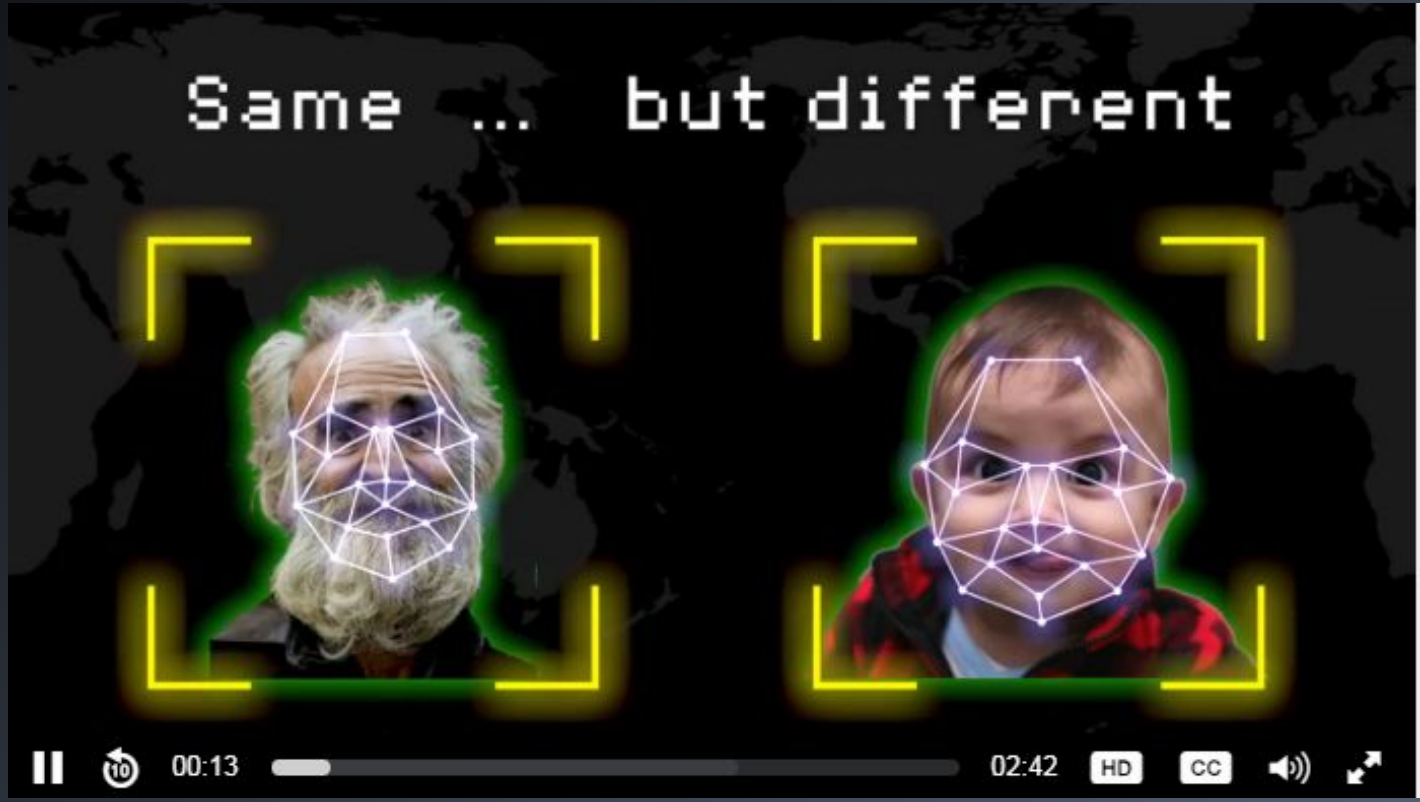
Ai vs conventional programming

What to do:

Pre ...?

During ...?

Post ...?

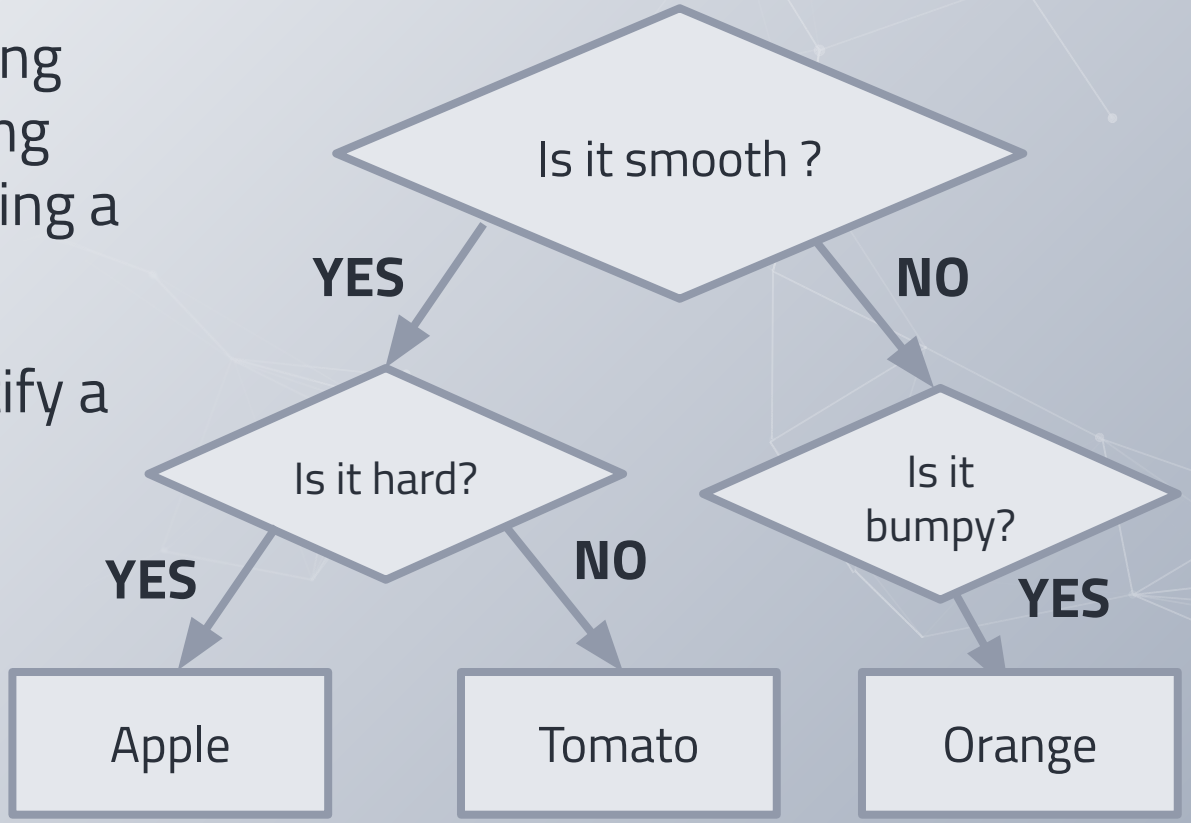


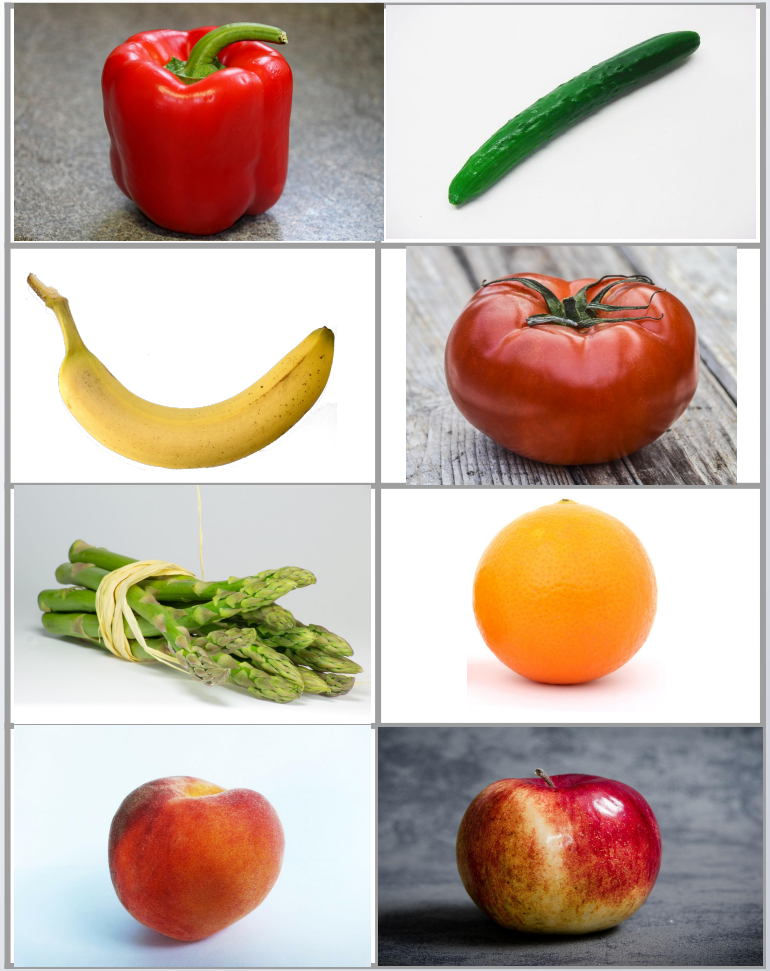
Artificial Intelligence Explainers: Video 1: Introduction to AI & machine learning

Conventional programming

A traditional programming approach works by asking YES/NO questions, making a decision tree.

The task here is to identify a fruit or vegetable.





The task here **for the computer** is to identify a fruit or vegetable.

One way to program the computer is to eliminate others by their attributes.

Shape

Texture

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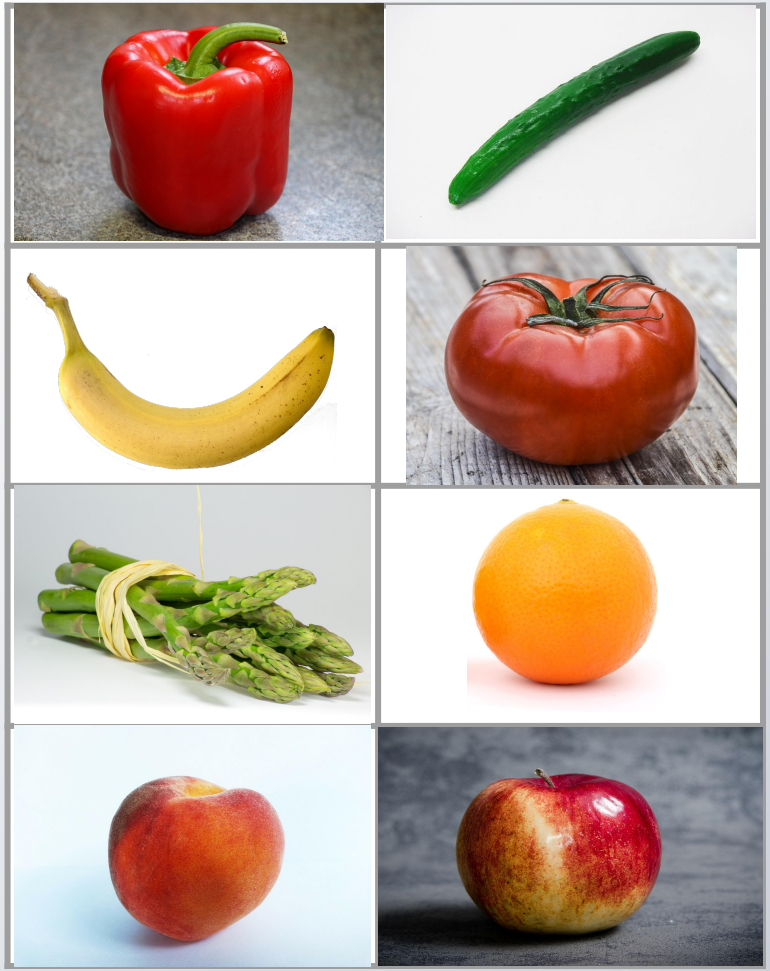

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Is it mostly round?

YES

NO

Is it smooth?

Is it mostly straight?

Is it mostly round?

YES

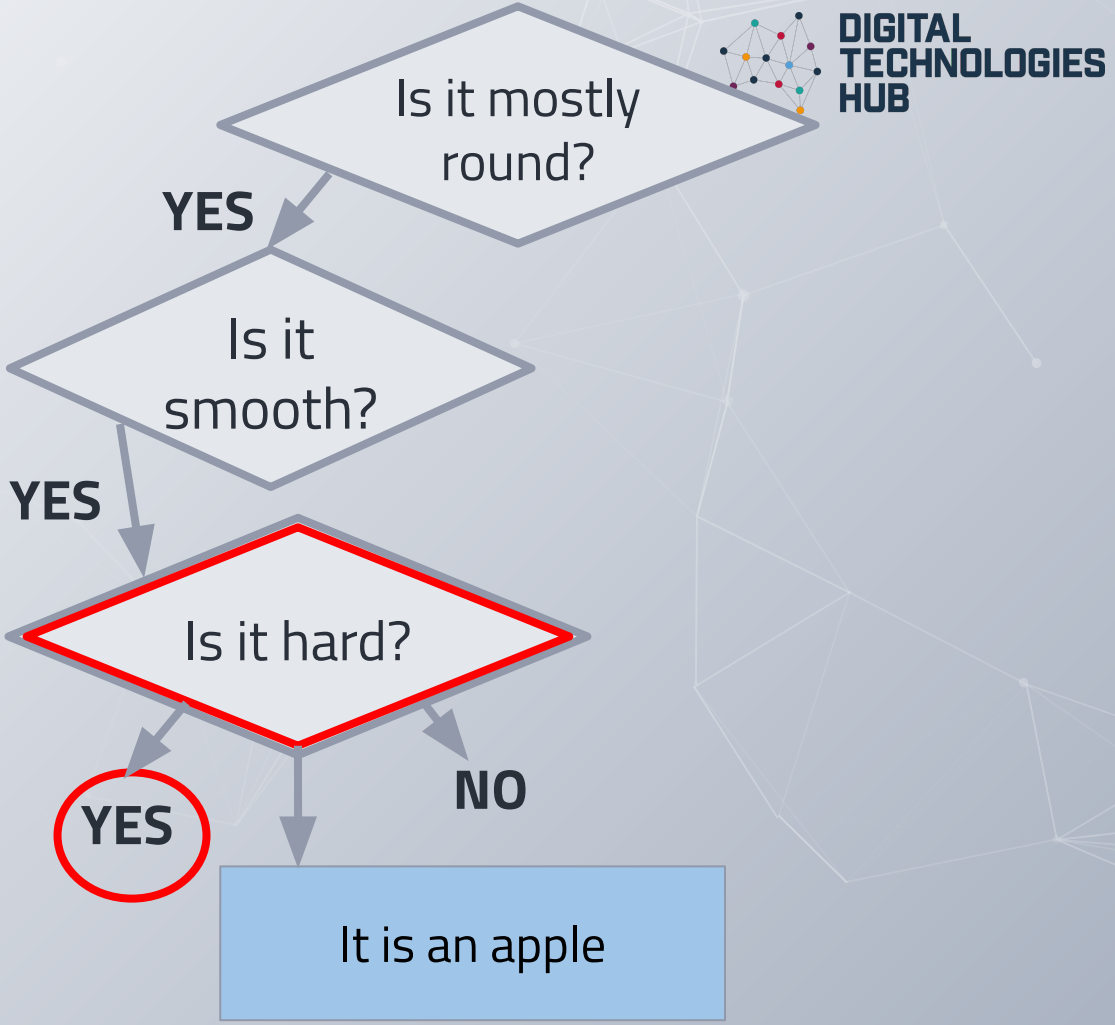
Is it smooth?

NO

YES

Is it hard?

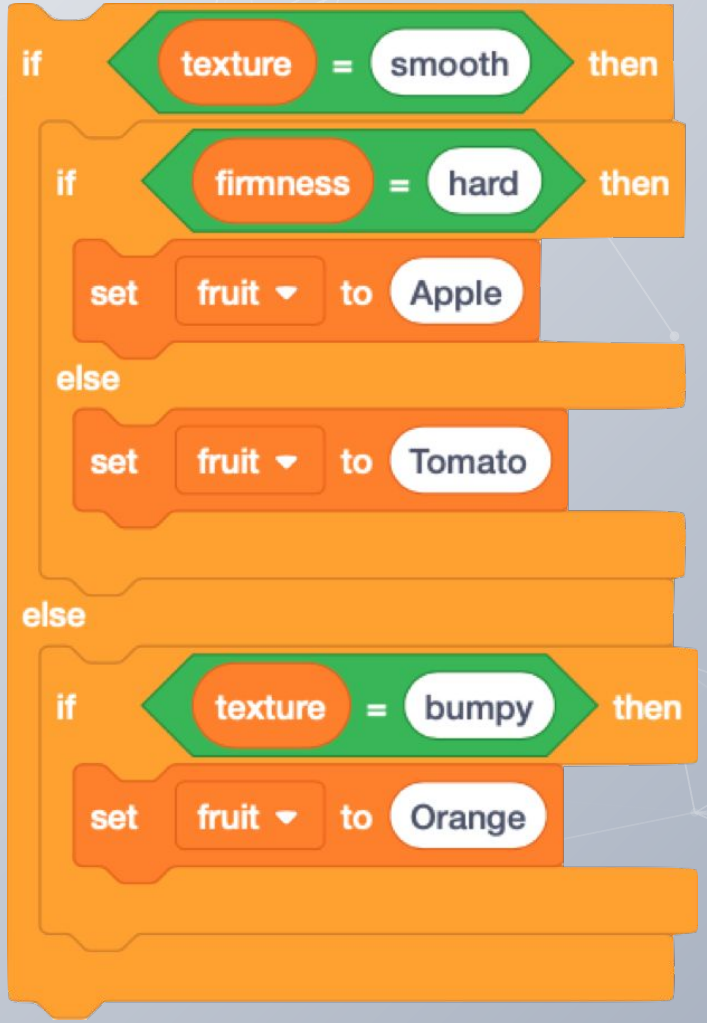
Is it bumpy?


Is it mostly round?
YES
Is it smooth?
YES
Is it hard?
YES
NO
It is an apple

Conventional programming

A programmer writes a computer program that precisely instructs a computer what to do to solve a particular problem.

Full of branching (if statements)

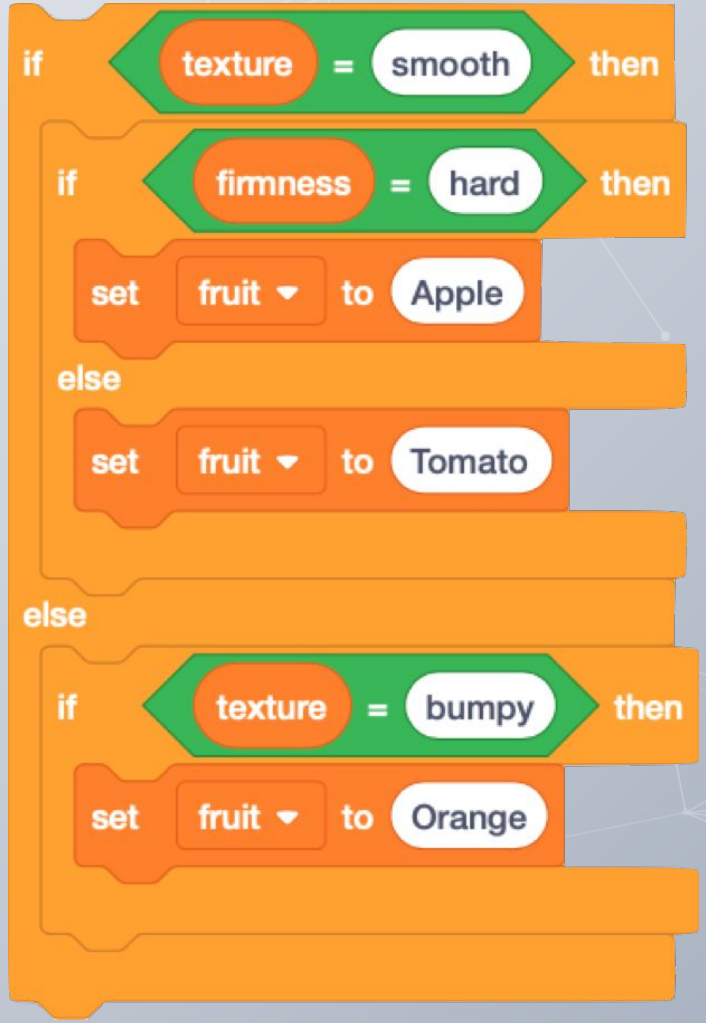


Conventional programming

Decision trees can quickly grow out of control when we need to check multiple things.

And we also need to explain to the computer what the adjectives *smooth*, *hard*, *bumpy* mean.

And what if we need to add something else … Pumpkin?



AI Programming

But with an AI, our code gets so much simpler

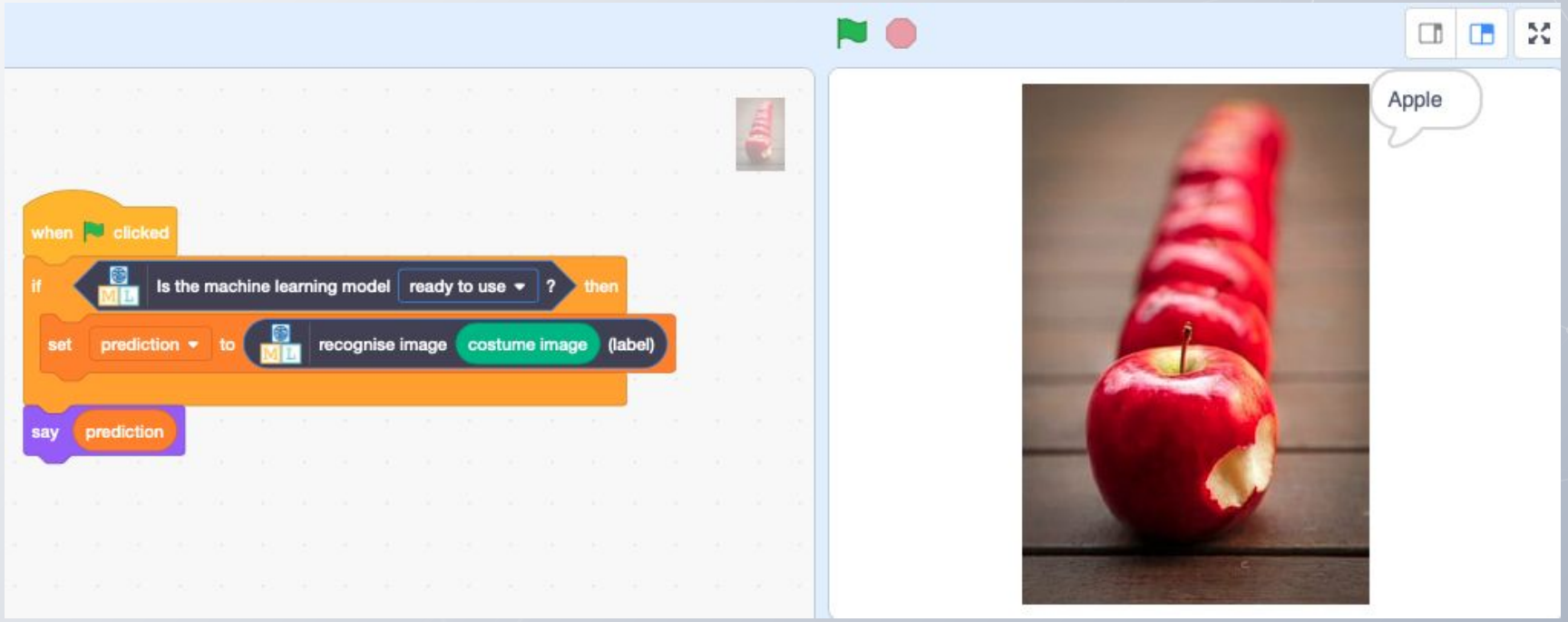
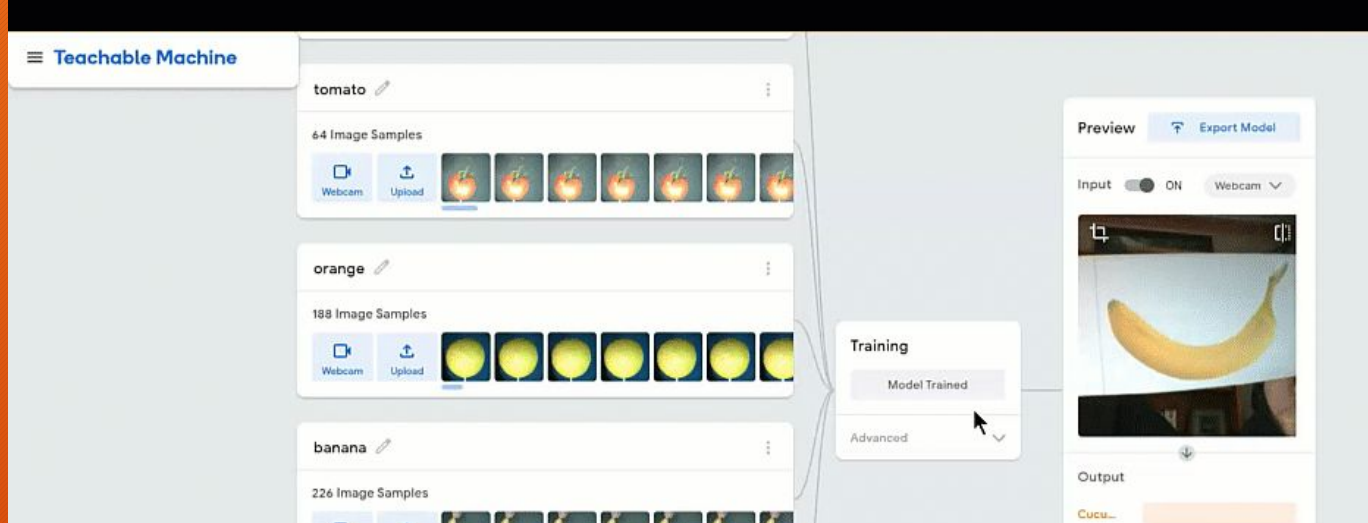


Image: Pixabay

Creating & training an AI model



https://teachablemachine.withgoogle.com/models/oE7da2vzM/

Use this pre-made model to test the AI to see how well it recognises fruit and vegetables. (You will need a device with a webcam).

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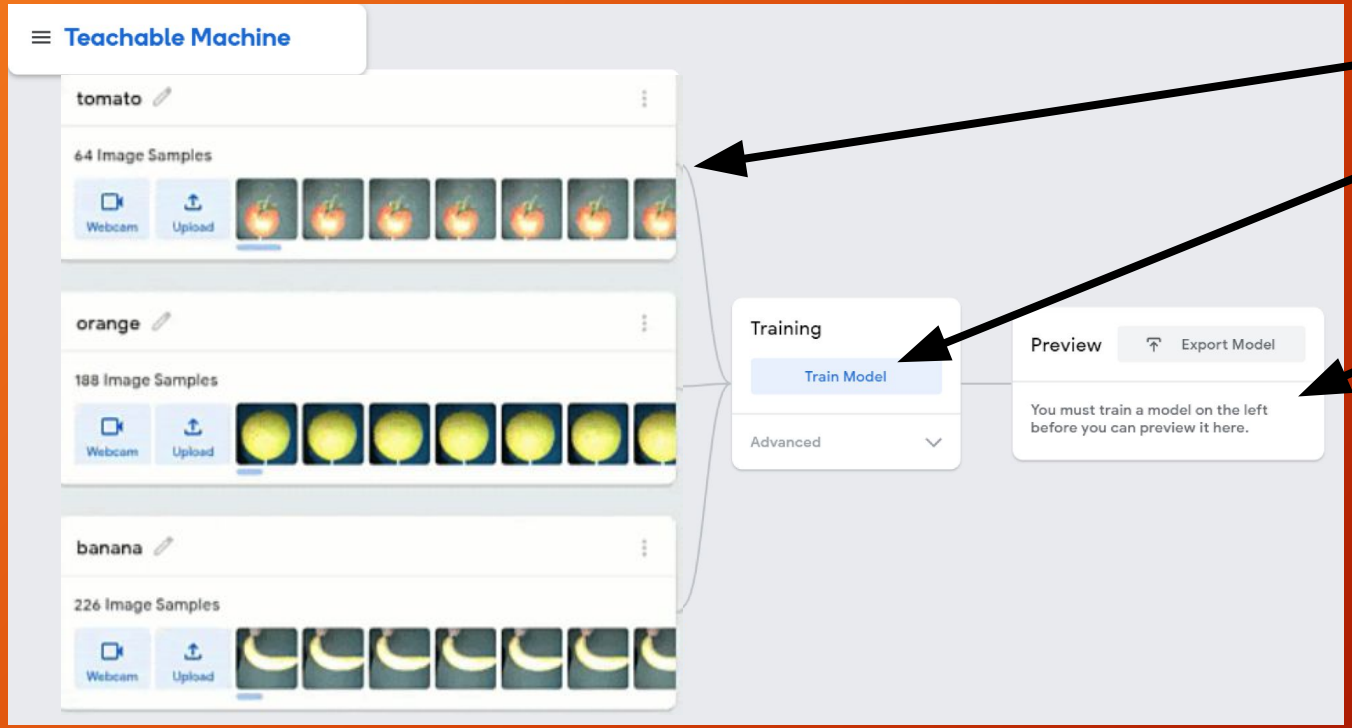
2. Prepare an AI model: train the AI



1. **Collect data**.

2. **Train** the AI model.

3. **Test** the trained model.

Google **Teachable Machine**

Conventional Programming

Algorithms

Implementation

- Programs involving branching, iterations

Artificial Intelligence

Data

- Representation, Collection, Interpretation

Impact

Recognising voice, images, and filling in the data gaps.

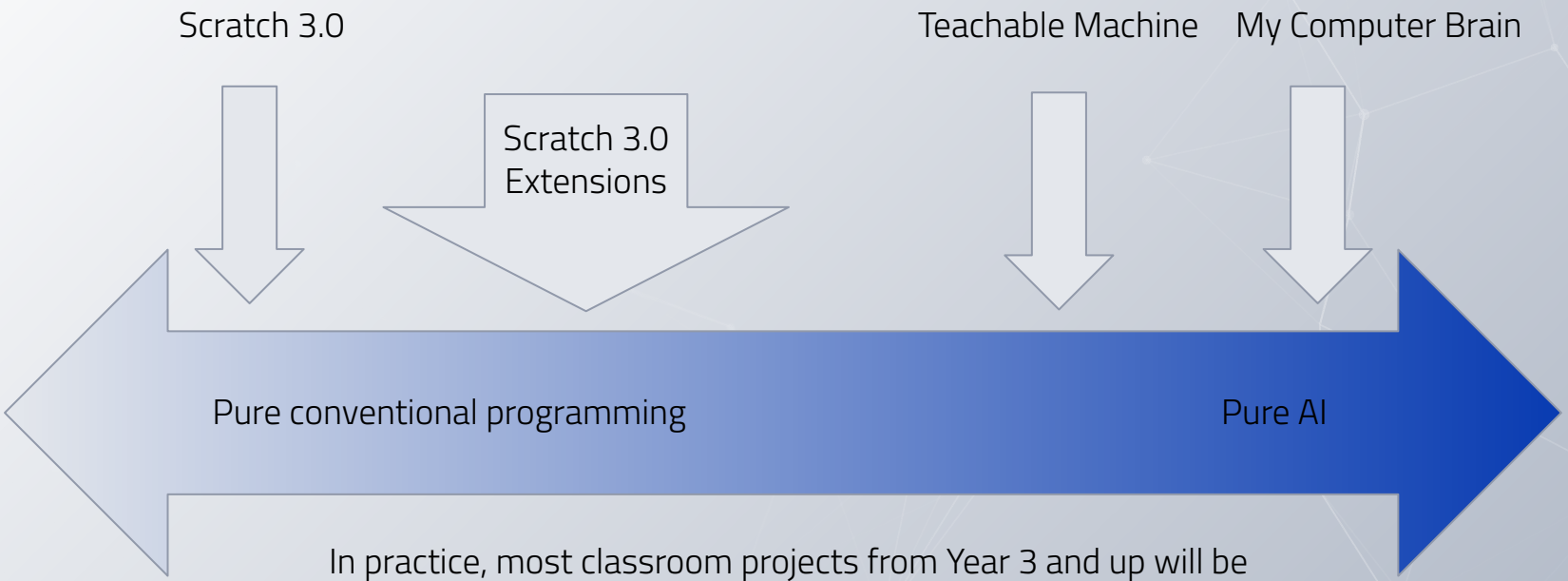
Considerations when teaching the curriculum

What questions you might ask yourself ...

What does covering Artificial Intelligence add to my teaching and learning program?

When and how to can I combine AI and conventional programming?

Student projects



In practice, most classroom projects from Year 3 and up will be somewhere on the spectrum between pure conventional programming and pure AI.

For F-2, pure AI projects are highly engaging and require no implementation (coding)

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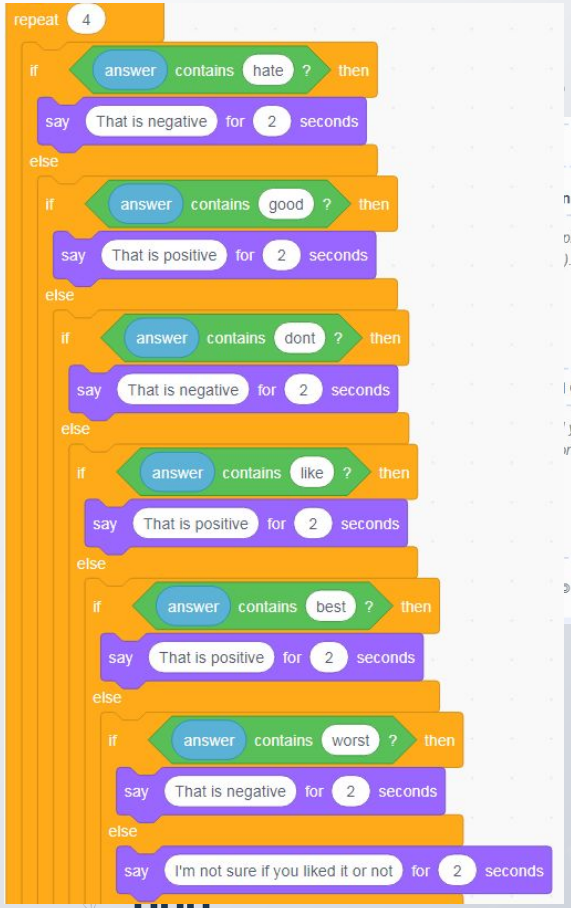
Conventional programs: an AI context



A real AI

LESSON: CAN A COMPUTER RECOGNISE YOUR SENTIMENT? (Years 5-6)

VIDEO: Artificial Intelligence Explainers: Video 2: AI in our everyday life

Conventional programming +AI

Using Scratch 3.0 to create computer program

And starting to add extensions

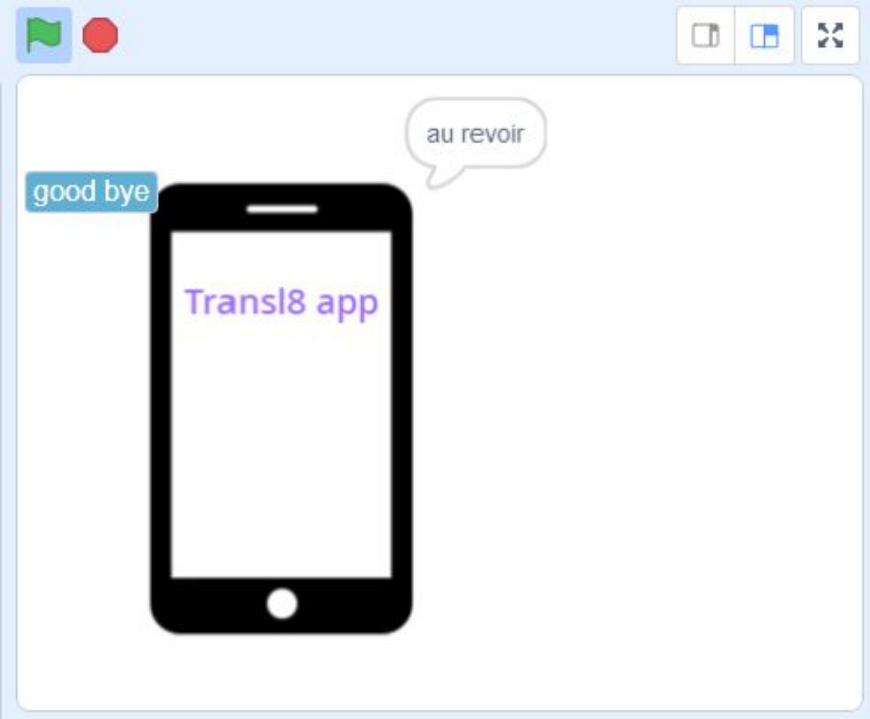
Programs: low entry/high ceiling

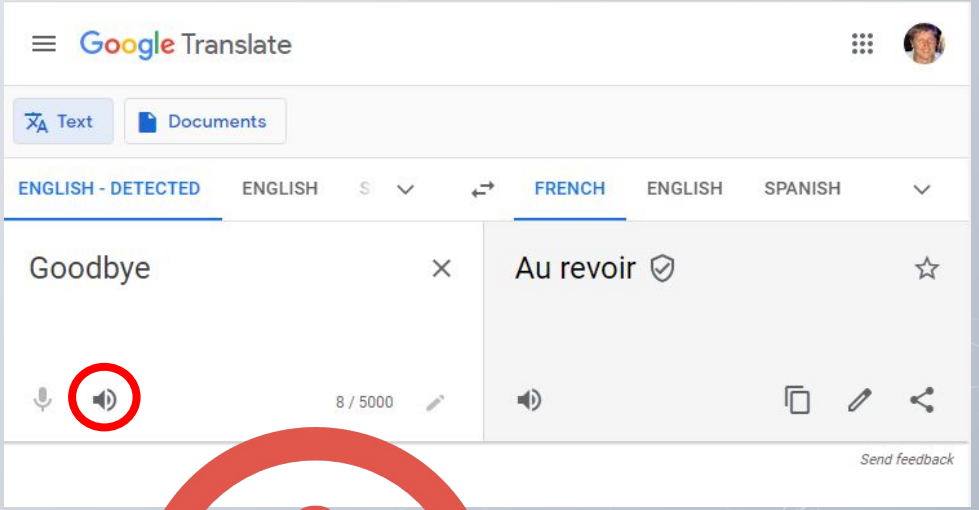
Translator program

Investigate examples

LESSON: Fun projects with language translation (Years 3-6)

Creator vs consumer





Google translate

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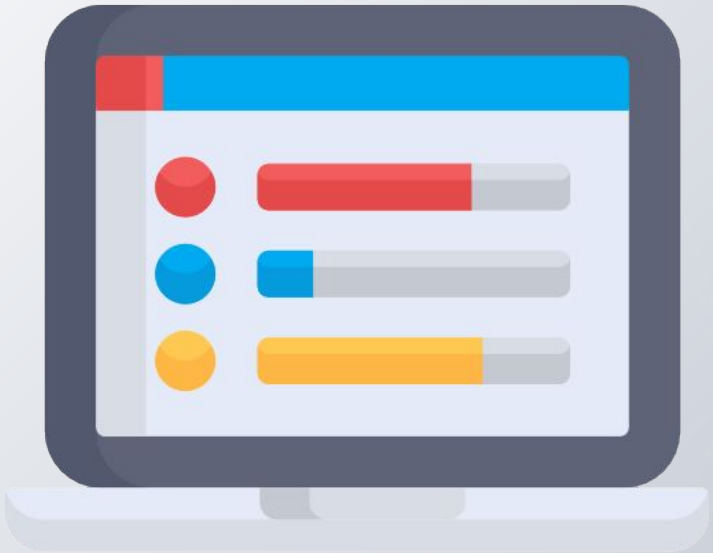
Poll



Martin Richards created a poll
Poll: Not anonymous | Results shared

How long would it take students to create a program that mirrors Google Translate?

- ○ Too long: An impossible task
- ○ As long as they have left in primary school
- ○ At least 4 weeks working non stop
- ○ About 10-15 min

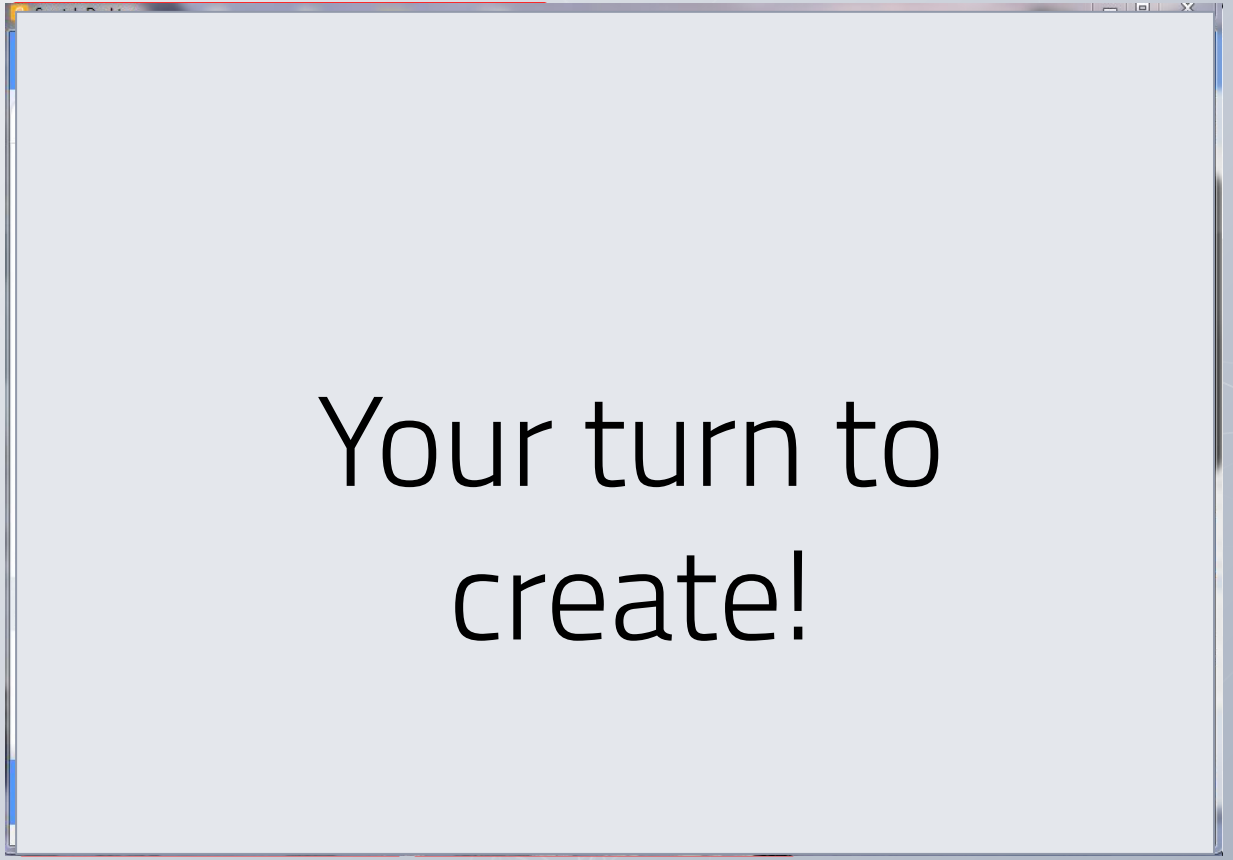
Submit Vote

Too long: An impossible task	0% (0)
As long as they have left in primary school	0% (0)
At least 4 weeks working non stop	0% (0)
About 10-15 min	0% (0)

0 responses

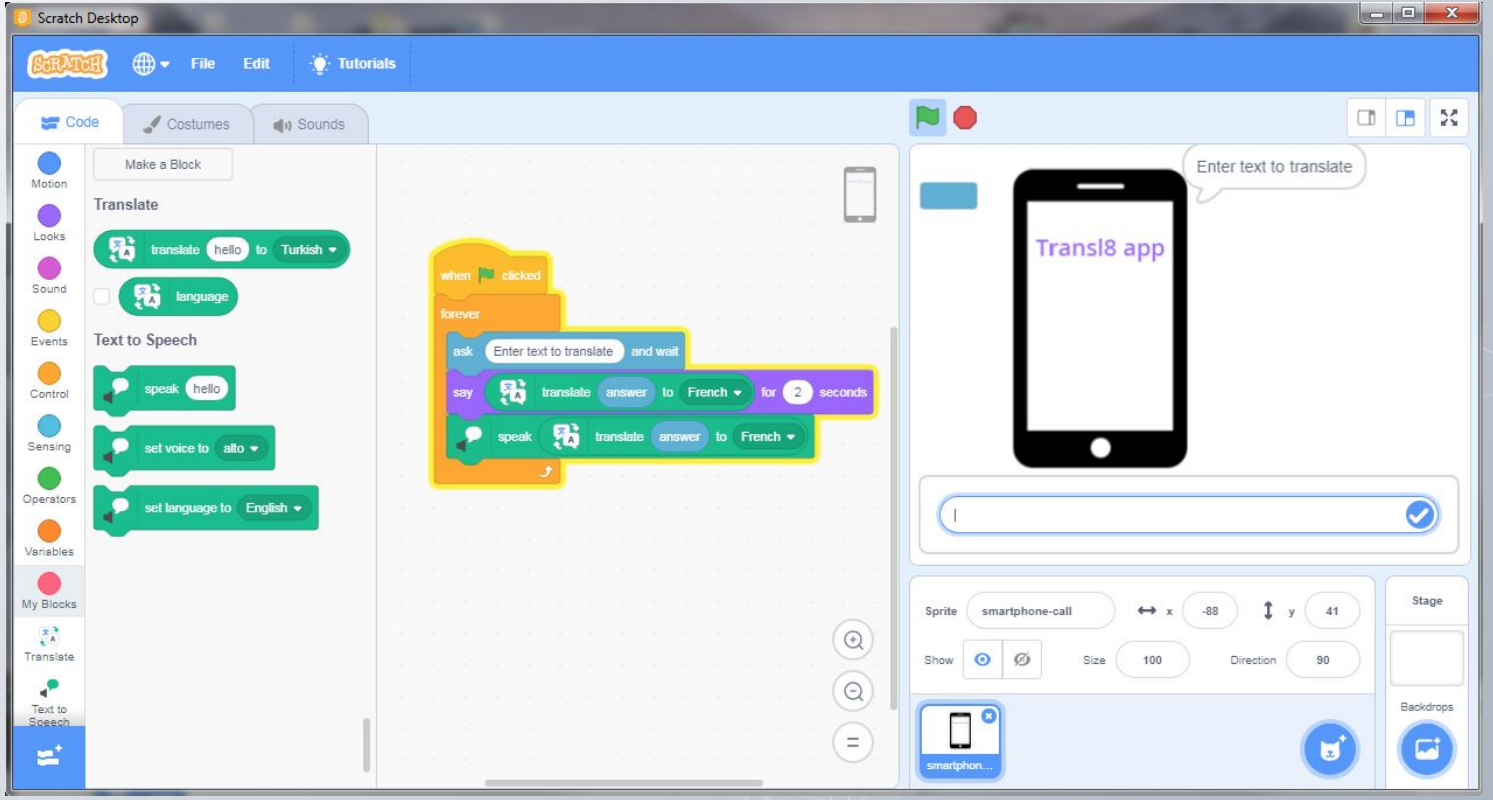
Text to speech recognition & Translation

For our test program you can use browser-based version of Scratch 3.0



Speech to Text blocks and Translate blocks accessed in the additional blocks available in Scratch 3.0

Sample code



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Remixing

In each programming lesson, sample code is provided.

Isn't that just giving students the answer?

This is an evidenced-based approach.

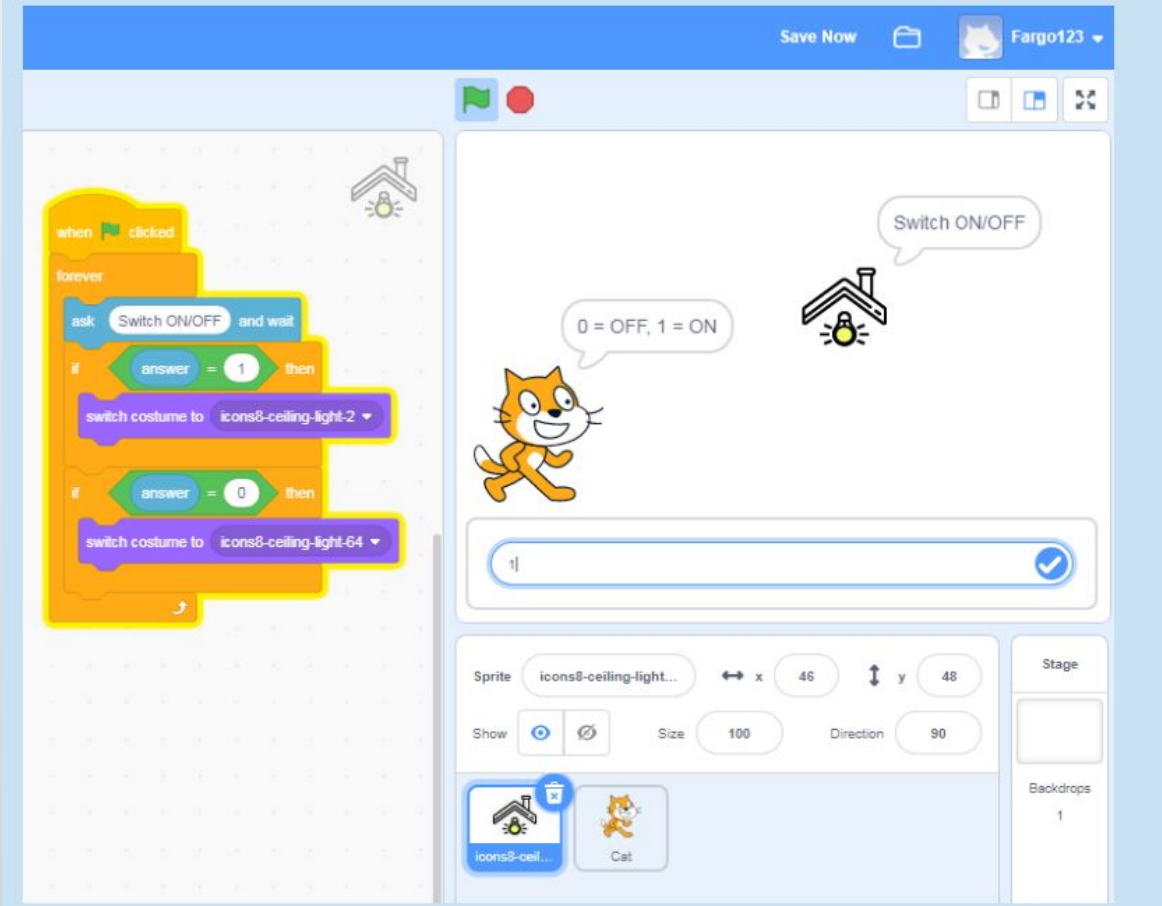

Image: Screen capture of Scratch 3.0 program showing if/then blocks based on user input answer (1), to turn light on

For sample code, see Binary switch light on/off.

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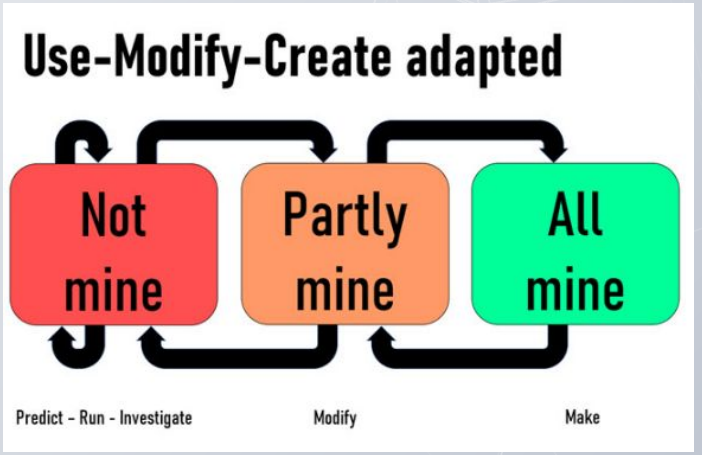
Image credit: United Kingdom Department of Education

PRIMM is one approach that can help teachers structure lessons in programming. PRIMM stands for Predict, Run, Investigate, Modify, Make.



Exploring pedagogies for teaching programming in school

This approach expands on the approach Use-Modify-Create. This is when a learner runs (uses) an existing program to see what it does, then modifies it, and then when able, creates a new project of their own.

Remixing :Teaching tips

Using the sample code

1. Select link from the lesson plan which opens a Scratch File.
2. Select ‘See inside’.
3. Save to a folder on your network.
4. Students open Scratch and ‘Load from computer’
5. Save their own version.

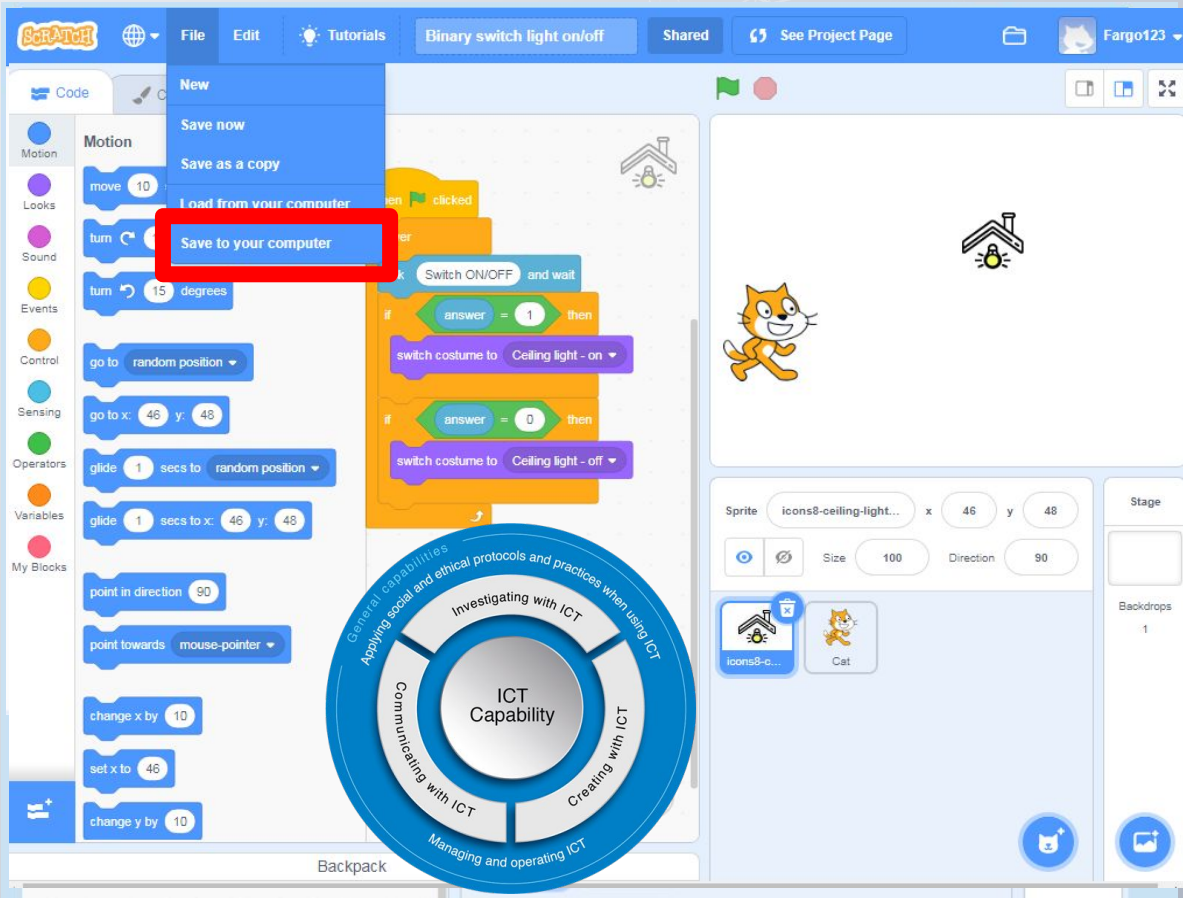


Image: Screen capture of Scratch 3.0 program showing if/then blocks based on user input answer (1), to turn light on

For sample code, see Binary switch light on/off.

Scratch 3.0

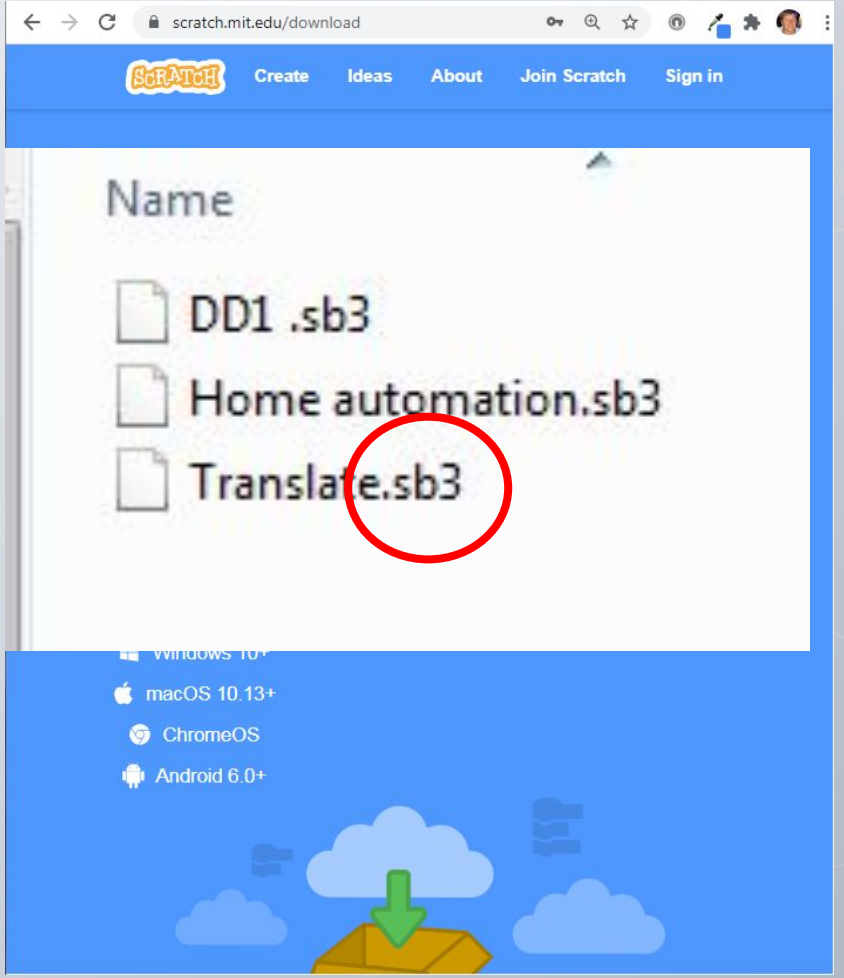
Desktop version

1. Text to speech blocks
2. Translate blocks

To operate and test blocks requires internet.

Risk assessment (Privacy)

- No sharing/No comments section
- No log-in



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A chance to ask questions ...

Use the chat...

How can you incorporate these teaching ideas?

How would your students handle the programming task?

What would you need to consider?

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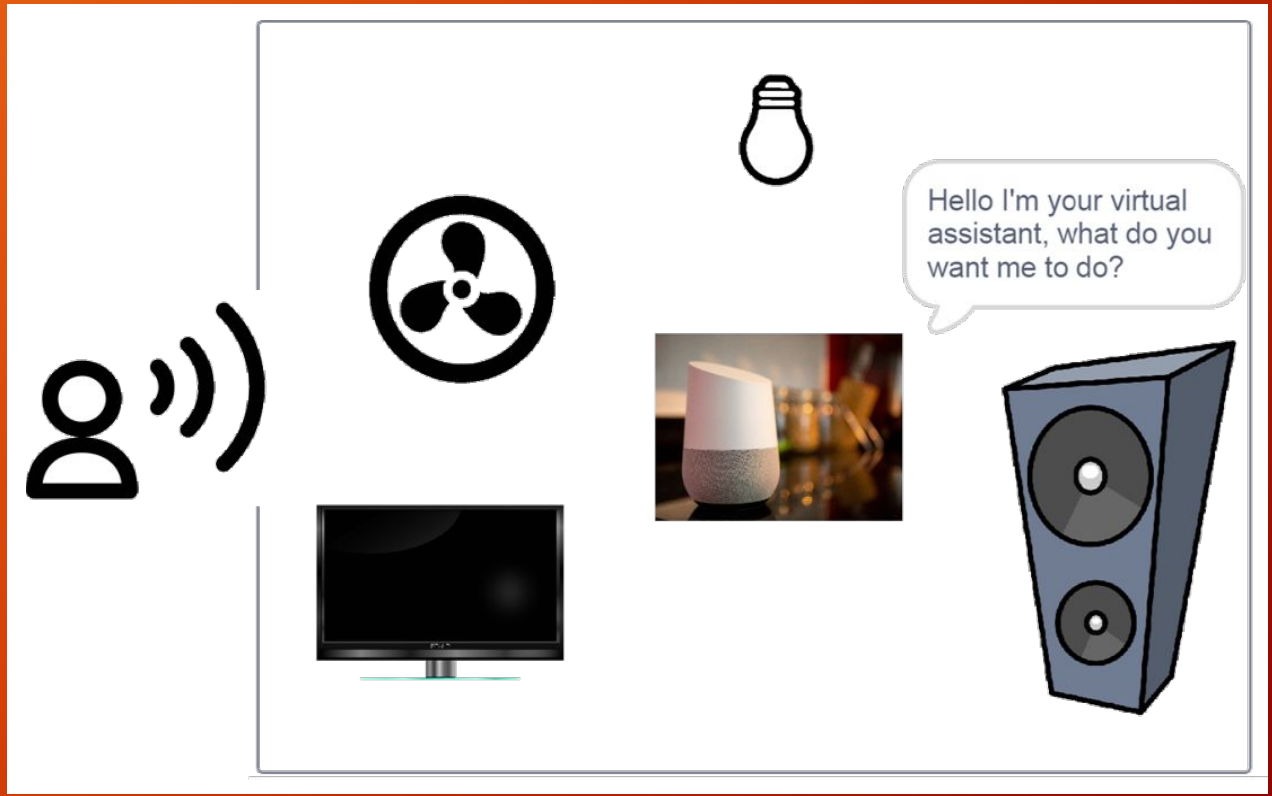
Privacy considerations when using AI tools in the classroom

E-safety: risk assessment

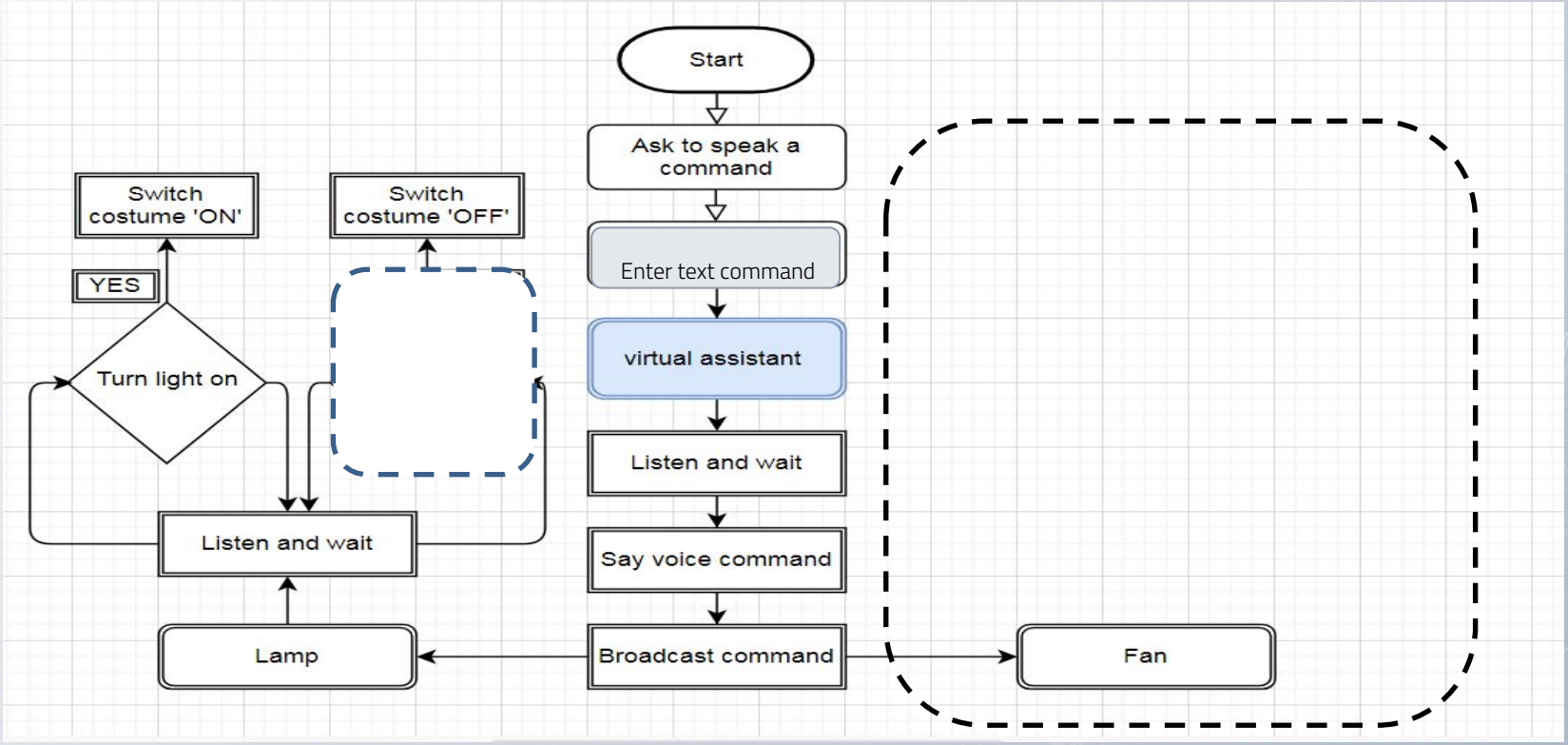
Consider	Yes	No	Suggestions to mitigate risks
Have minimum age requirements for the technology or platform been adhered to?	☐	☐	• Check age appropriateness prior to use. • Teach students about age recommendations and the reasons behind them.
Does the platform promote privacy and security for students and their accounts?	☐	☐	• Empower students to protect their privacy and explain how to adjust security settings.
Have parents/carers consented to their child using this technology or platform?	☐	☐	• Ensure appropriate consent has been provided by parents/carers. Some schools request consent to use a broad range of platforms at the start of the school year to avoid having to ask for consent each time a new platform is used. It's important to be as clear as possible about what this consent includes, as well as providing information on any possible risks to users and how the school mitigates them.
Are staff comfortable and confident using the platform?	☐	☐	• Provide access to professional learning so staff are skilled in the platforms/technologies they use.
Is there a staff member moderator for chat or comment functions?	☐	☐	• A staff member (or team) would ideally be appointed to moderate chat or comment functions, to encourage safe and positive interactions and to take down and investigate inappropriate posts.
Does the platform have capacity to report problems or misuse?	☐	☐	• All platforms should have terms of use that clearly identify inappropriate content or behaviour, and how to report problems or misuse. • Visit The eSafety Guide for more information.
Do all users know how to set the platforms' privacy settings?	☐	☐	• Share The eSafety Guide with staff. This has links to the latest games, apps and social media, with tips on how to set privacy settings.
Have you identified how data is stored and used by the platform?	☐	☐	• Privacy issues arise when data is collected and not stored securely or shared inappropriately. Good practice is to find out how data will be stored and who has access. • Check education department or sector policies to see if there are any standard protocols schools should follow, as well as advice about privacy legislation and data storage.

Programming a virtual assistant

Apply
Computational thinking



An algorithm represented as a flowchart



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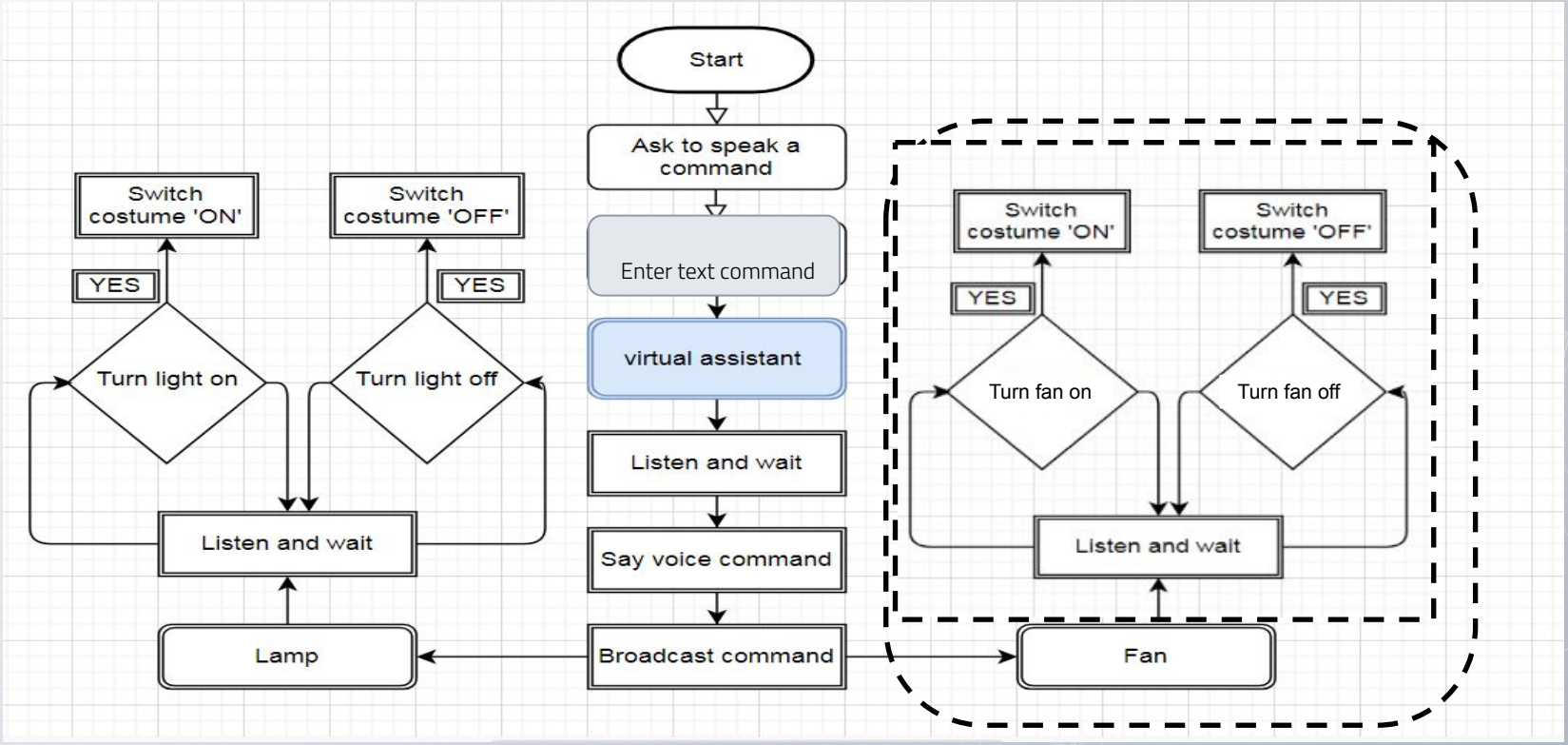
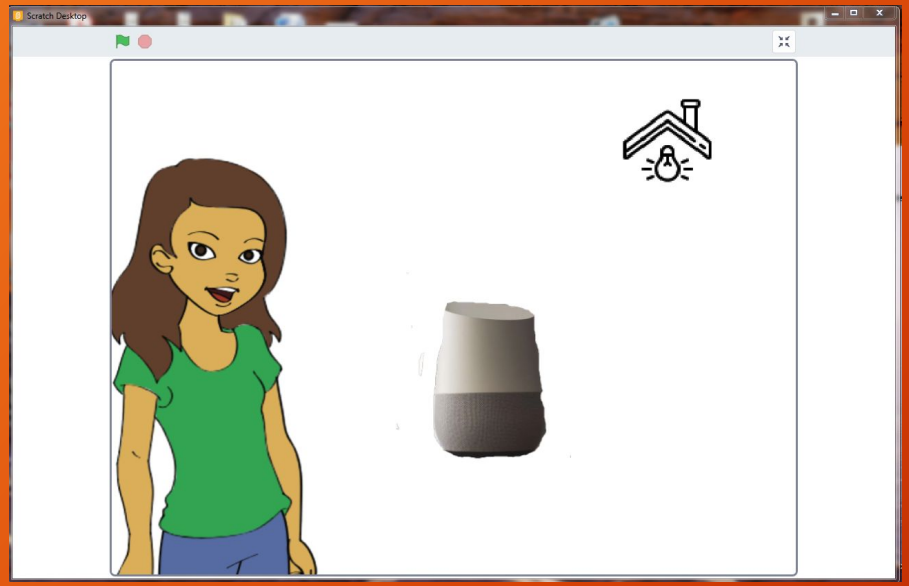
An algorithm represented as a flowchart

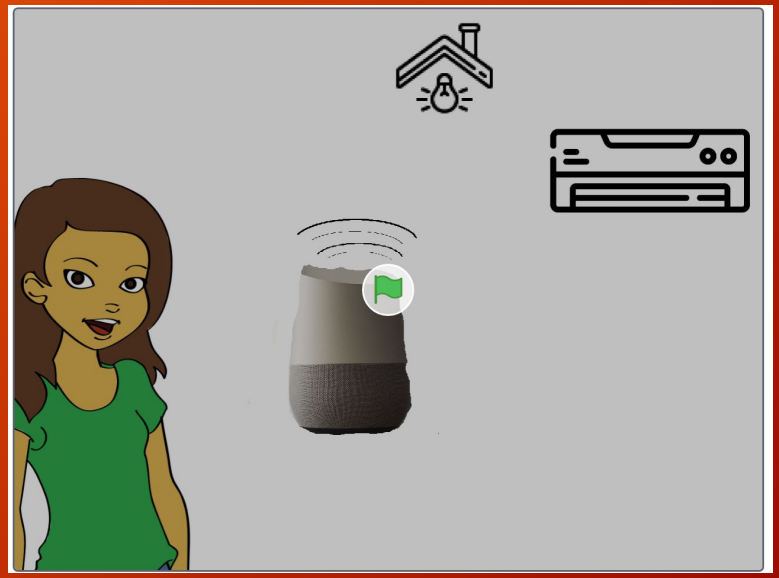


Spot the difference

Open each program and find as many differences as you can.

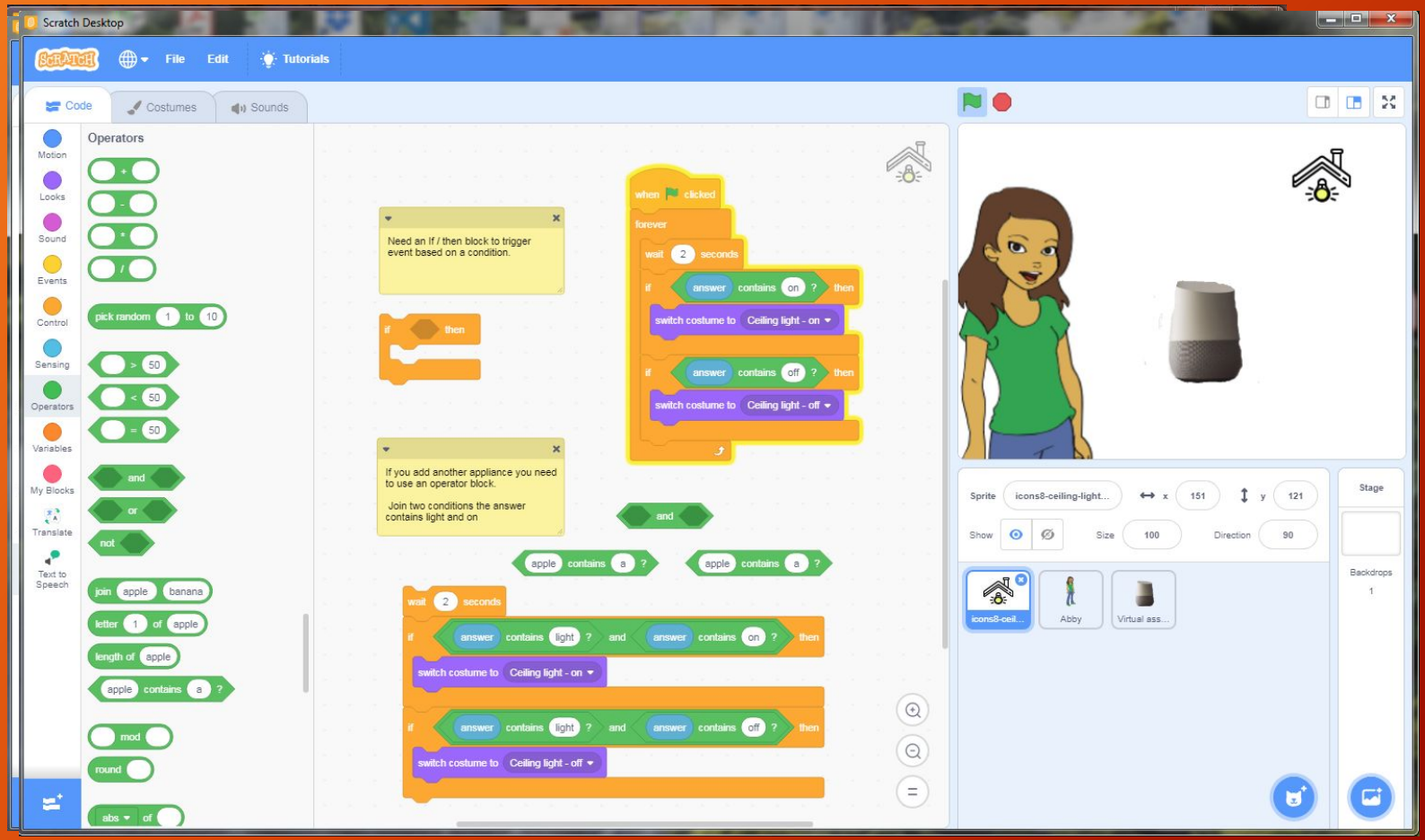


Sample code:
https://scratch.mit.edu/projects/559150293

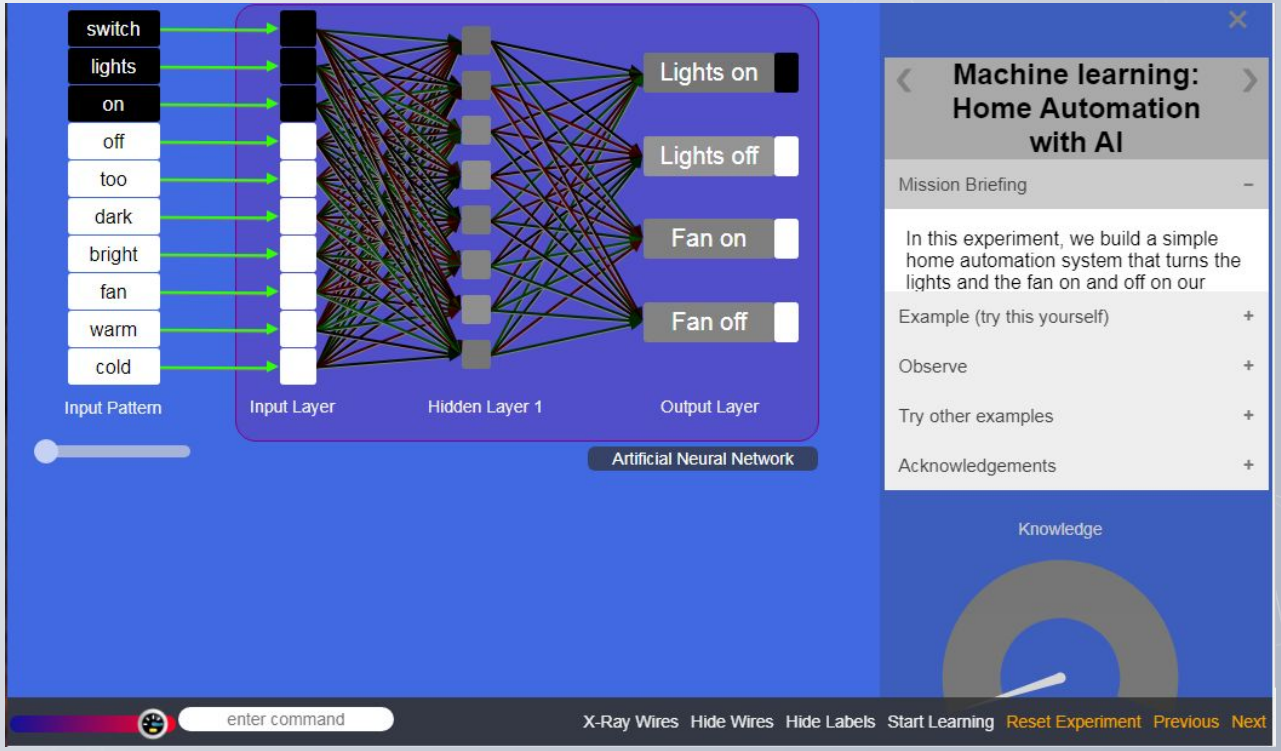


Sample code:
https://scratch.mit.edu/projects/559169857/editor/

Programming a virtual assistant



An AI in action: virtual assistant



LESSON: [Home automation with AI](#) (Years 5-6)

A chance to ask questions ...

Use the chat...

How can you incorporate these teaching ideas?

How would your students handle the programming task?

What would you need to consider?

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Assessment

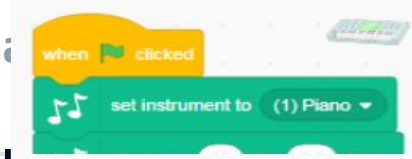
Artificial Intelligence is a rich field for assessment opportunities.
Here are a few examples in the core concept areas of data, algorithms and implementation

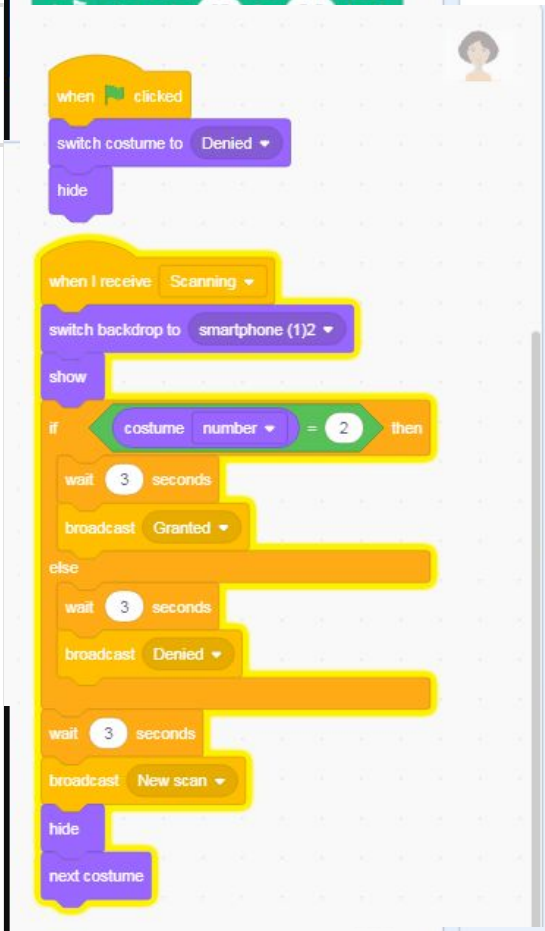
How do I know if a student's program contains input, branching and repetition?

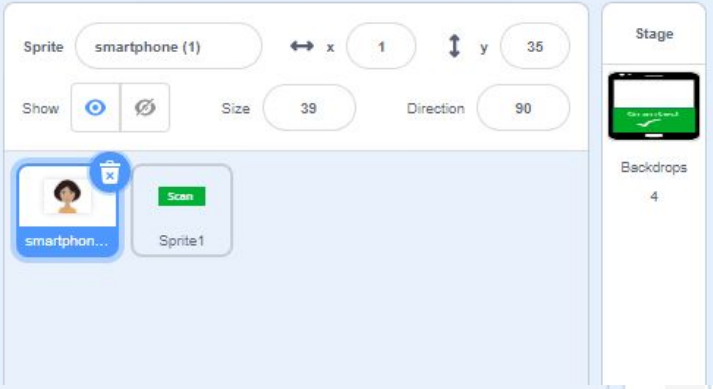
Years 3-4
Implement simple digital solutions as visual programs with algorithms involving **branching (decisions)** and **user input**

Years 5-6
Implement digital solutions as simple visual programs involving **branching, iteration** (repetition), and **user input**.

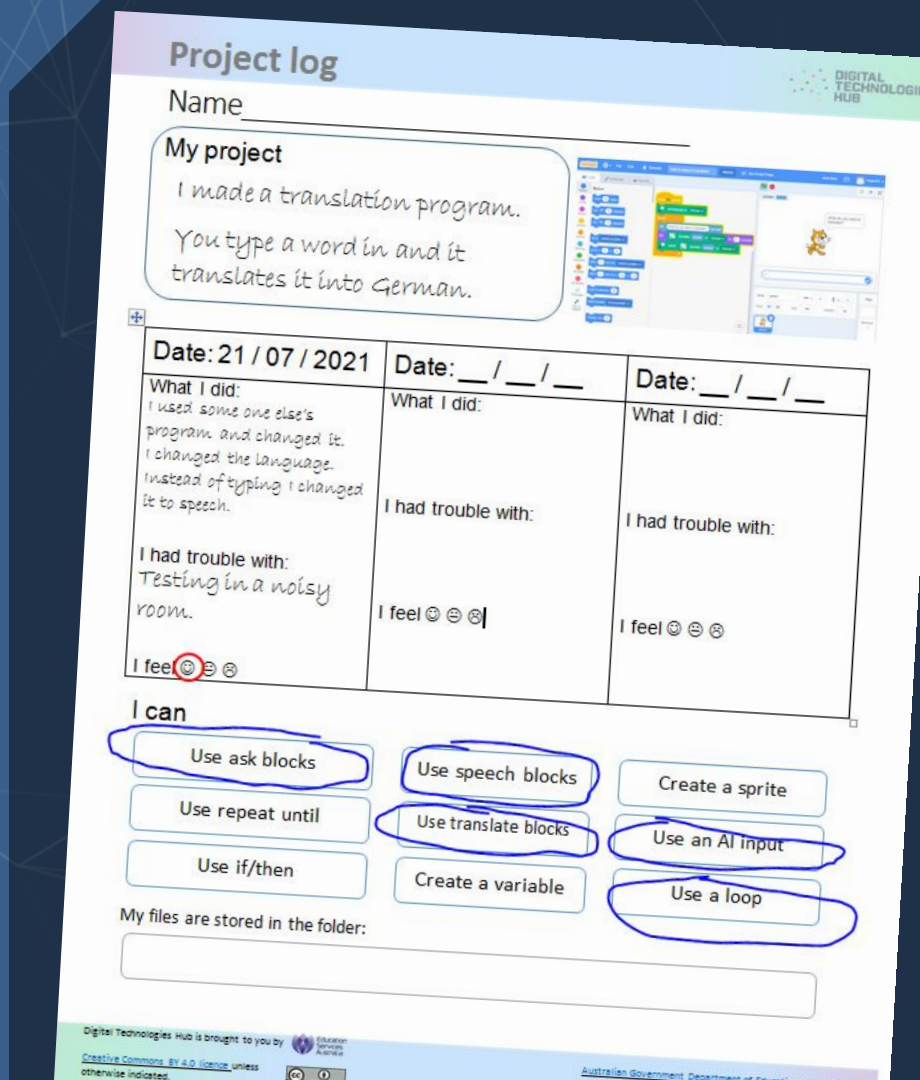
	Functiona
Score (max. 40)	0-10
Designing a digital solution that requires user input using visual programming language.	A sequence that **does not** include an option for user input.







Project logs



Project log

Name_____

My project

I made a translation program.

You type a word in and it translates it into German.

Date: 21 / 07 / 2021	Date: __ / __ / __	Date: __ / __ / __
What I did: I used some one else's program and changed it. I changed the language. Instead of typing I changed it to speech.	What I did:	What I did:
I had trouble with: Testing in a noisy room.	I had trouble with:	I had trouble with:
I feel ☺ 😐 ☹	I feel ☺ 😐 ☹	I feel ☺ 😐 ☹

I can

- Use ask blocks
- Use repeat until
- Use if/then
- Use speech blocks
- Use translate blocks
- Create a variable
- Create a sprite
- Use an AI input
- Use a loop

My files are stored in the folder:

Selected Lesson Plans

An assorted selection of the many lesson plans available on the DT Hub

Specifically made for you

https://www.digitaltechnologieshub.edu.au/teachers/lesson-ideas/ai-lesson-plans

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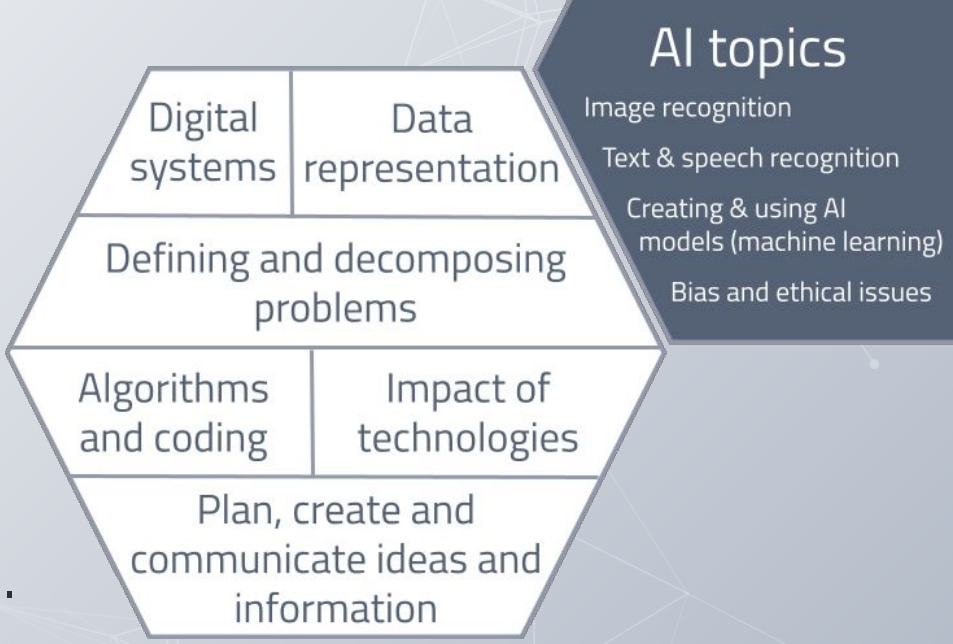
Next steps

Making a commitment to implementing AI in your classroom

Use the chat to **write your idea** of where you will include AI as part of your teaching and learning program.

Connecting and sharing with the group.

email:
digitaltechnologieshub@esa.edu.au



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