Dream Space TV: The brAIin_waves Series Episode 1
By the end of this episode, students should be able to

1. Outline what Artificial Intelligence (AI) is and its history.
2. Distinguish between what AI can and cannot do.
3. Compare human intelligence with AI.
4. Explain how AI technology is used in our everyday life with examples.
5. Name three components of AI technology.
6. Explain what a dataset is.
7. Outline how data can be collected and utilised by humans and/or machines.
8. Organise and analyse a dataset.
9. Make predictions from a dataset and communicate about them.

UNESCO: K-12 AI Curricula

Artificial Intelligence (AI) refers to machines that imitate some features of human intelligence.

Artificial Intelligence, is a rapidly growing field that has the potential to impact many aspects of our lives. To prepare students for this future, UNESCO, the United Nations Educational, Scientific and Cultural Organization, has included AI as part of their K-12 curriculum. This series has used the UNESCO K-12 AI curricula to curate lessons on AI to help students understand what AI is, what it can do, and how it might impact society. The goal is to equip students with the knowledge and skills they need to navigate a world where AI is increasingly prevalent.
UNESCO K-12 AI Curricula - Knowledge

Data Literacy
- Understand the principles and processes of data collection and simple analysis.
- Understand how to collect, process, analyse, and report using data.
- Understand data trends.

AI Definitions and Components
- Understand what AI is and is not.
- Understand the parts of AI.
- Describe basic features of AI.
- Know the history of AI and its development over time.
- Can compare human and computer intelligence.
- Explains how data is used to make predictions.

UNESCO K-12 AI Curricula - Values

Interests in ICT
- Explores existing AI tools

Reflection
- Explores emerging technologies that have the potential to disrupt the way people live, learn and work

Collaboration
- Works as part of a team

UNESCO K-12 AI Curricula - Skills

Data Literacy
- Saves, changes and sorts simple databases

AI Applications
- Uses algorithms to produce art, music, etc
Episode 1: Timestamps

00:00 – 01:25: Introduction and learning outcomes
01:25 – 03:35: History of Artificial Intelligence
03:35 – 08:53: Human intelligence and AI capabilities
08:53 – 16:30: Creativity with AI
16:30 – 18:23: Components of AI
18:23 – 21:55: Data in sport
21:55 – 26:10: Data in music
26:10 – 27:29: Episode closure

Episode One: Lesson Plan

Curriculum Links

**Junior Cycle Coding**

My Digital World: 1.1 present and share examples of what computers are used for and discuss their importance in modern society and in their lives.

**Junior Cycle Digital Media Literacy**

My Digital Life: 1.1 describe how students use digital technologies, communication tools and the internet in their lives.

**Leaving Certificate Computer Science**

Turing Machines: 1.13 identify important computing developments that have taken place in the last 100 years and consider emerging trends that could shape future computing technologies.

**Lesson Duration**

1 hour and 12 minutes, including video and activity time.
Not including extension activities.

**Materials Needed**

- Worksheets provided in this teacher guide
- Pens and paper
Episode One: Lesson Plan

Lesson Procedure 🧑‍🏫

History of Artificial Intelligence (5 minutes): Students are introduced to the brAI n_waves series with a brief explanation of the history of AI.

Intelligence Comparisons (15 minutes): During this section students are encouraged to think about the skills we have as humans and how they relate to different AI technologies.

Activity 1: Human Creativity (17 minutes): Students will have the opportunity to get creative in this challenge. They will have five minutes to list, draw or write something in which their partner has prompted them to do. Once completed, teachers can use https://www.bing.com/chat to showcase how AI has created this same prompt. Use the time to compare the human and AI answers and see how they differ.

The components of AI: What is Data? And Data in Sports (5 minutes): During this section of episode one students are introduced to the idea that there is three main components that make up AI. Data, algorithms and machine learning. There is then a short interview with Colin who manages a female league of Ireland soccer team, who explains how he uses data to ensure his team is successful.

Activity 2: Data in the music industry (15 minutes): Students will complete a music dataset from a popular music streaming service, on this dataset they are expected to draw five conclusions from the information they see in front of them.
### Warmup Activity: Human Skills

Which AI technologies are imitating human intelligence?

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<tr>
<th>HUMAN</th>
<th>ARTIFICIAL INTELLIGENCE</th>
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<td>Language (speaking and listening)</td>
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### Warmup Activity: Sample Answers

- **Speaking and Listening**: Translation Tools and Voice Assistants
  - Teachers can showcase examples of these AI technologies by using
    - Microsoft Translator (or similar)
    - Siri, Cortana, Alexa (or similar)

- **Vision**: Facial/Object/Image Recognition
  - Teachers can showcase examples of these AI technologies by using
    - Seeing AI (used in the episode)
Teachers can showcase examples of these AI technologies by using:
- Netflix (or similar)
- Spotify (or similar)
And asking students to draw conclusions from what these services have learnt about them.

Teachers can showcase examples of these AI technologies by using:
- Bing Maps (or similar)

ChatGPT or DALL-E
Warmup Activity: Human Skills Worksheet  Name_________

Brainstorm and share some examples of artificial intelligence and human intelligence you use in your everyday life.

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What are some of the benefits and challenges of AI and human collaboration?

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How can you use your human skills and intelligence to complement and enhance AI?

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Episode 1 Activity 1: Human Creativity

1. Students should write a question for the person they are sitting beside. They should use verbs like “create”, “write”, “draft”, “illustrate”.
2. Once their question is complete, they should swap this with their partner and start a 5-minute timer.
3. When students are done, ask for volunteers and teachers should input their answers into ChatGPT/BingChat, read the answers out loud to the class.
4. Sample Bing Chat response below:

Create a 3 verse poem about a dog that loved marshmallows.

Hello, this is Bing. I can try to create a poem for you. 😊

Here is a 3 verse poem about a dog that loved marshmallows:

There once was a dog named Fluffy
Who had a sweet tooth for marshmallows
He would beg and plead for a treat
Whenever he saw the white pillows
He loved to roast them on the fire
And watch them turn golden brown
He would gobble them up with delight
And then chase his tail around

But one day he ate too many
And felt a pain in his tummy
He learned his lesson the hard way
That too much sugar is not yummy
Activity 1: Human Creativity Worksheet
Name___________________

Write a question for the person you are sitting beside. Remember to use words like “create”, “draft” or “write”. For example, “Create a poem about a dog that liked marshmallows”.

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The person sitting beside you should use this space to answer the above question.

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Episode 1 Activity 2: Datasets in Music

Congratulations, you’ve been promoted to music producer. Your job is to analyse and draw basic conclusions from a music streaming dataset.

Answer the following questions:
1. How is the data collected?
2. What 5 conclusions can you make from the dataset?
3. Which techniques did you use to draw those conclusions?
4. Which artist would sing your next big hit?

Episode 1 Activity 2: Sample answers

1. Students should access the data set through the link https://aka.ms/DSdataset
2. Once on the dataset students should think about and answer the following questions
   - **How is the data collected?** Spotify uses algorithms and machine learning to analyse this data and identify the most popular songs among its users.
   - **What 5 conclusions can you make from the dataset?** Examples might include, what the most or least popular song is, what was the most popular genre, which song has the most danceability etc.
   - **Which techniques did you use to draw those conclusions?** Some techniques might include, filtering the data, sorting the data in alphabetical order or from largest number to smallest number.
   - **Which artist would sing your next big hit?** Personal preference but students should be looking for the artist that is showing up the most in the charts.
Activity 2: Datasets in Music Worksheet
Name___________________

How is the data collected?

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What 5 conclusions can you make from the dataset?

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What techniques did you use to draw those conclusions?

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Which artist would you get to sing your next big hit and why?

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The "Turing Test" can be tested out with students in class, see the extension activities for a lesson plan on how to do this.
1990: AI defeats chess world champion, highlighting advancements in AI and game-playing

2005: The field of machine learning sees significant progress, including advancements in neural networks and deep learning
Extension Activity 1: Turing Test

To introduce students to the concept of the Turing test and its implications for artificial intelligence and human identity.

1. Preparation (5 minutes):
Divide the class into groups of three. Assign each student a role: judge, human, or computer. Give each student a paper and a pen. Explain that the judge will ask 7 questions to the human and the computer, who will write their answers on the paper. The judge will then try to guess who is the human and who is the computer based on their answers. The computer will try to imitate a human as much as possible but will use a chatbot to get their answer (i.e. BingChat or ChatGPT), while the human will try to be honest and natural. The judge will not know who is who until the end of the test.

2. Test (15 minutes):
Give each judge a list of 7 questions to ask the human and the computer. You can use the list below or create your own. Tell the judges to read each question aloud and give the human and the computer 30 seconds to write their answers. Tell the judges to collect the papers after each question and keep them separate. Repeat until all 7 questions are asked.

3. Evaluation (5 minutes):
Tell the judges to review the answers and decide who is the human and who is the computer. Tell the judges to explain their reasoning and reveal their guesses. Tell the human and the computer to confirm or deny their identities. Discuss the results and the accuracy of the guesses.

Question
1. What day is it?
2. What is your favourite hobby?
3. What is the capital of France?
4. What is the weather like today?
5. What is something that you are curious about?
6. What year did Barack Obama become president?
7. What is your favourite thing about Space?

This lesson plan was created by BingChat and quality controlled by the teaching team.
Extension Activity 2: The ELIZA Program

Introduce the ELIZA chatbot program, its history, and its significance in the development of AI and natural language processing.

The ELIZA chatbot program was developed in the mid-1960s by Joseph Weizenbaum at the Massachusetts Institute of Technology (MIT). It was one of the earliest examples of natural language processing and is considered a pioneering program in the field of AI. ELIZA used simple pattern matching and substitution techniques to simulate conversation and was able to engage users in a seemingly intelligent dialogue. Its significance lies in its ability to demonstrate the potential of AI and natural language processing, and it paved the way for further research and development in these fields. Despite its limitations, ELIZA remains an important milestone in the history of AI and continues to be studied and discussed today.

Hands-on with ELIZA (10 minutes)

1. Provide students with access to the ELIZA chatbot program and allow them to interact with it.
2. Encourage students to experiment with different inputs and observe ELIZA’s responses.
3. Ask students to try and identify patterns in ELIZA’s responses and discuss their observations.

Group Discussion (15 minutes)

- After students have had a chance to interact with ELIZA, lead a group discussion about their experiences.
- Ask students to share their thoughts on ELIZA’s capabilities and limitations.
- Discuss the implications of ELIZA’s responses and what they reveal about the challenges of natural language processing and AI.

This activity was created by BingChat and quality controlled by the teaching team.