

TOPIC OVERVIEW: 9.1 AI and Ethics

What **BIG IDEAS** will you cover in this topic?

In this topic, you'll explore Artificial Intelligence (AI) and how computers can perform tasks that normally require human intelligence. You'll investigate how machine learning uses data to recognise patterns and make predictions, including how AI can recognise images. You'll also consider the ethical questions AI creates, such as bias, privacy, fairness and who should be responsible when AI gets something wrong. Finally, you'll explore whether machines can appear to think like humans through chatbots and the Turing Test.

What important **prior knowledge** will you use from your prior learning?

You'll build on your understanding of data, algorithms and digital technology from earlier Computing topics. Your work on Digital Literacy and Cyber Security will help you think about personal data, privacy and how technology affects people. You'll also use your problem-solving skills to explain how computer systems make decisions and evaluate whether those decisions are fair.

What is the key **vocabulary** that you will need to know in this topic?

Artificial Intelligence (AI), Machine Learning, Algorithm, Data, Training Data, Pattern, Prediction, Model, Image Recognition, Classification, Bias, Ethics, Privacy, Fairness, Automation, Chatbot, Turing Test, Human Intelligence

What other **key concepts, knowledge and skills** will you learn in this topic?

- **What is AI?** – Identify examples of AI and explain what makes a system intelligent.
- **Machine Learning** – Understand how computers learn patterns from training data rather than simply following fixed instructions.
- **AI & Data** – Explore why the quality and quantity of data can affect an AI system's decisions.
- **Ethics of AI** – Consider issues such as bias, privacy, fairness, jobs and responsibility.
- **Image Recognition** – Investigate how AI can identify and classify images and why mistakes can happen.
- **Turing Tests & Chatbots** – Explore how we might judge whether a computer can behave intelligently.

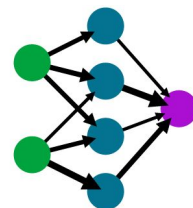
Assessment:

How and when will you be assessed on this topic?

- **Retrieval quizzes** – Short questions to check your understanding of important AI concepts.
- **Class activities** – Analyse examples of AI and explain how they work.
- **Practical investigations** – Test machine-learning and image-recognition systems and evaluate their results.
- **Ethical scenarios** – Give an opinion about an AI issue and justify your decision using evidence.
- **End-of-topic assessment** – Questions covering the knowledge and skills from the whole unit.

What is the structure of learning/lessons in this topic?

- 9.1.1 – What is AI?
- 9.1.2 – Machine Learning
- 9.1.3 – Ethics of AI
- 9.1.4 – Image Recognition
- 9.1.5 – Turing Tests and Chatbots



TOPIC OVERVIEW: 9.2 PROGRAMMING [PYTHON]

What BIG IDEAS will you cover in this topic? In this topic, you'll unlock the creative power of programming with Python — one of the most widely used and beginner-friendly coding languages in the world. Whether it's drawing colourful patterns, composing your own music, creating an interactive chatbot, or designing a workout tracking app, you'll see how code brings ideas to life.	What other <u>key concepts, knowledge and skills</u> will you learn in this topic? • Python Turtle – Create shapes and art with code, learn about loops, colours, and nested patterns • EarSketch – Make music using Python code by combining beats, loops, and tempo changes • Chat Bot – Write a text-based adventure story where the user makes choices using input() and if statements • Workout Tracker – Develop a program that uses lists, loops, and user input to build and log a full workout session
What important <u>prior knowledge</u> will you use from your prior learning? You'll use your basic understanding of how computers work and your familiarity with using technology. If you know how to use a computer and understand basic logic and instructions, you're ready to start coding. Where does this topic fit into the <u>curriculum plan</u> for this subject? In Year 9, from January to April. This topic introduces fundamental programming concepts using Python, setting a strong foundation for more advanced programming. It helps you understand how to create interactive programs and apply coding skills to various creative projects.	Assessment: How and when will you be assessed on this topic? • Quizzes: Short quizzes to check your understanding of programming concepts like if statements and loops. • Practical Exercises: Hands-on activities using Python Turtle and Ear Sketch to apply what you've learned in real coding tasks. • Projects: Create simple programs that involve drawing shapes, composing music, handling input/output, and using loops and if statements. • Assessment: On the computer, there will be an end of term assessment.
What is the key <u>vocabulary</u> that you will need to know in this topic? Python, Turtle, Ear Sketch, Input, Output, If Statements, Loops, Code, Algorithm, Variable, Syntax, Programming, Debugging, Conditional Statements, Iteration and Sequence	What is the structure of learning/lessons in this topic? • 9.2.1 – Python Turtle: • 9.2.2 – EarSketch: • 9.2.3 – Chat Bot: • 9.2.4 – Workout Tracker:

```

name = input("Enter Name") #A
age = 14                    #B
users = ["John", "Jane"]   #C
length = len(users)        #D
valid = False              #E

for i in range(length):    #F
    if name == users[i]:    #G
        valid = True       #H
                                #I

if valid == True:          #J
    print("Valid user")
else:                      #K
    print("Invalid user")

```

- A: Stores user inputted text to a variable called name.
- B: Stores an integer value 14 to a variable called age.
- C: Creates a list which contains 2 string values.
- D: Calculates the length (how many items are in) of users.
- E: Stores the Boolean value False to variable valid.
- F: Use of white space to make code clearer.
- G: Creates a loop that will iterate for every element in
- H: Use of selection to determine if the entered value match with any values from the list. users[i] looks up the current value from the list based on the given index.
- I: If the name is in the list users, valid is changed to True.
- J: Selection based on whether valid was changed to True.
- K: Runs alternative code if the criteria from J is not met.

TOPIC OVERVIEW: 9.3 BINARY DATA

What BIG IDEAS will you cover in this topic? Imagine every picture, video, or game you see on a computer or smartphone is made up of tiny pieces of data. Binary data is like the secret code behind all these digital things, using only 0s and 1s. By learning about binary data, you'll understand how your favorite apps and games work under the surface. It's like uncovering the magic trick behind a cool illusion, revealing how computers turn simple 0s and 1s into everything you see and use every day.	What other <u>key concepts, knowledge and skills</u> will you learn in this topic? • Units of Data: Understand bits and bytes, the basic units for storing information like letters and numbers. • Binary Conversion: Convert numbers between decimal and binary systems, showing how computers process data. • Binary Addition: Learn to add binary numbers, similar to math but with 0s and 1s. • Binary Images: See how images are represented with binary data and create simple pixel art. • Logic Gates: Explore basic logic gates (AND, OR, NOT) and their role in computer circuits for decision-making.
What important <u>prior knowledge</u> will you use from your prior learning? You'll build on your basic understanding of numbers and how digital devices work. If you know how to use technology and understand regular numbers, this topic will show you how binary, a special number system, is used to process and store all the digital information in your devices. Where does this topic fit into the <u>curriculum plan</u> for this subject? This topic is crucial for understanding how data is managed in computers and digital devices. It provides a foundation for more advanced topics in computing and helps you grasp how digital systems operate from the ground up, making sense of the technology you interact with daily.	Assessment: How and when will you be assessed on this topic? • Quizzes: Quick quizzes to test your knowledge of binary numbers and conversions. • Practical Exercises: Hands-on activities like converting decimal numbers to binary and adding binary numbers. • Projects: Create a pixel art image or design a simple logic gate circuit to apply what you've learned about binary data and logic operations. • Assessment: On the computer, there will be an end of term assessment.
What is the key <u>vocabulary</u> that you will need to know in this topic? Binary, Bit, Byte, Units of Data, Binary Conversion, Binary Addition, Binary Images, Logic Gates, 0s and 1s, Hexadecimal, Digital Data, Pixel, Data Representation and Boolean Algebra.	What is the structure of learning/lessons in this topic? • 9.1.1 Units of Data • 9.1.2 Binary Conversion • 9.1.3 Binary Addition • 9.1.4 Binary Images • 9.1.5 Logic Gates

