INTRODUCTION TO CODING AND AI

AI in Action

1. Define Artificial Intelligence (AI) in your own words.

2. Match the AI Tool to Its Use

Voice Assistant	Suggesting videos or songs you might like
Recommendation System	Giving directions to a new place
Navigation App	Answering questions or setting reminders

3. How does AI learn? Put the steps in the correct order (1–5):

_____ Train the AI using examples
_____ Collect lots of data
_____ Improve the AI with feedback
_____ Test the AI with new data
_____ Label the data so the AI knows what it is

4. Tick all the examples that use machine learning:

☐ A toaster heating bread
☐ YouTube recommending a new video
☐ Gmail moving spam emails to a spam folder
☐ A pencil sharpener
☐ Google Maps suggesting a faster route

5. What is one limitation of machine learning?

Hint: Think about what happens if the data is unfair or missing.

A Application Based Questions

6. **What does a map application need to know to help you get somewhere? (Choose all that apply)**

   ☐ Previous travel history

   ☐ Starting point or precise location data

   ☐ How many stops do you plan to make

   ☐ Destination's street address or recognised place name

   ☐ The number of turns on the route

   ☐ Your selection of route preferences

7. **Tick all the types of data a smart map app might use to help you:**

   ☐ Traffic speed

   ☐ Roadblocks or construction

   ☐ Your favourite colour

   ☐ Weather conditions

   ☐ Location of nearby places

   ☐ Time of day

8. **Why is AI useful in self-driving cars?**

   Choose the best answer:

   - It helps the car play music.
   - It helps the car recognise roads, signs, and people.
   - It makes the car look cooler.
   - It helps the car fly.

9. **Digital Age Mapping: Match the term to its meaning.**

Location	Information about roads, traffic, and places
Geographical Data	Where something is on Earth
Navigation	Using a map or app to find your way from one place to another

10. What is a sprite?

☐ A type of drink

☐ A character or object in your program

☐ A sound effect

11. What is an event in coding?

☐ A party

☐ Something that triggers an action in your code

☐ A background image

12. Look at this code block:

When Sprite clicked:

Say Hello!

- **What is the event?** _____
- **What is the action?** _____

13. Code Editing in Sprite Lab

- **How do you delete a block of code in Sprite Lab?**

  ☐ Press the delete key ☐ Drag it to the trash can

  ☐ Click it twice

- **How can you undo a mistake in your code?**

  ☐ Refresh the page ☐ Use the undo button

  ☐ Ask a friend to fix it

14. In the Map activity in code.org, you control a guide (character) using code.

- **What blocks do you use to move the guide?**

  ☐ Sound blocks

  ☐ Movement blocks like move forward or turn left

  ☐ Colour blocks

- **What happens when the guide reaches the destination?**

  ☐ The game ends

  ☐ The guide disappears

  ☐ A message or animation plays

15. Imagine you are training an AI bot to recognise healthy snacks.

- **What kind of training data would help the AI learn?**
  - ☐ Pictures of fruits, vegetables, and nuts
  - ☐ Pictures of video games
  - ☐ Pictures of junk food only
- **What pattern should the AI learn?**
  - ☐ Healthy snacks are colourful and natural
  - ☐ Healthy snacks are always round
  - ☐ Healthy snacks are always cold
- **What could go wrong if your training data only includes apples and bananas?**
  - ☐ The AI will think all healthy snacks are fruits
  - ☐ The AI will become too smart
  - ☐ The AI will stop working

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Mastering Search Using AI

This worksheet will help you learn how to use search engines to find the information you need and explore AI tools to create and understand things in new and fresh ways.

To find what you are looking for, you need to be a clever explorer. When you type words into a search engine, you are giving it directions.

Section A. Keywords - Your Detective Clues

Keywords are the most important words that tell the search engine what you are looking for.

1. **Your teacher wants you to find out about different kinds of ocean animals.**
   - **What keywords would you start with?** Circle the best answer:
     - **a.** ocean animals cartoons fun
     - **b.** ocean animals facts
     - **c.** blue water fish swimming
   - **Now, imagine your search results show a lot of cartoons about ocean animals. What is one way you could change your keywords to get *real facts* about ocean animals?**

Hint: Think about adding a word that means information.

2. **You need to study how plants grow for your science test.**
   - **Circle the best starting keywords:**
     - **a.** green things that grow tall
     - **b.** plant growth
     - **c.** flowers and trees everywhere
   - **If you wanted to find out specifically about sunlight's role in how plants grow, how could you refine your search by adding or changing words?**

Section B. Quotation Marks – Hunting for Exact Phrases

When you put words in quotation marks, you are telling the search engine: Find these exact words, in this exact order. This is like looking for a secret code phrase.

3. **You heard someone say: Practice makes perfect. How would you type this into the search engine to get only that exact phrase?**

4. **You are researching the book Charlotte's Web on the Internet but keep finding results about spiders and websites. How can you fix this prompt?**

Section C. The OR Operator

Using the word **OR** (always in **CAPITAL** letters) between two keywords tells the search engine to show you results that have *this word* OR *that word* (or both!). It is like casting a wider net.

5. **You are curious about either frogs or toads. You want to find information that covers both.**
   - **How should your search look like?**
     a. frogs and toads
     b. frogs OR toads
     c. frogs, toads
   - **If you just searched frogs toads (without OR), what might the search engine assume you are looking for? How is frogs OR toads different?**

Section D. The Minus Sign (–) Excluding Unwanted Information

Putting a minus sign (–) right before a word tells the search engine to not show you results that include this word. It helps you filter out distractions.

6. **You want to learn about the animal jaguar, but you keep getting results for the Jaguar car brand.**
   - **How would you search for the animal and avoid the cars?**
   - **Can you think of another time you might use the minus sign to get rid of confusing results? Give an example of a search you would do.**

7. **You are looking for recipes for cookies, but you want to make sure the recipes do *not* use nuts.**
   - **Your search:**
   - **Why is the minus sign helpful when you have very specific preferences or dislikes in your search?**

Section E. The Site: Operator – Targeting Specific Websites

If you want to find something from a certain website, like a museum or your school, you can type site: and then the website name. It's like going straight to the right shelf in a library to find what you need.

8. **You need to learn about dinosaurs from the American Museum of Natural History website: amnh.org.**
   - **How would you type this in the search bar?**
   - **Why is using 'site:' a more efficient way to find information than just searching for dinosaurs and then clicking through many links?**

9. You want to find articles about outer space on the NASA Kids' Club website: www.nasa.gov/kidsclub.

- **What will your search look like?**
  - **a.** Site:bbc.com outer space
  - **b.** Site:nasa.gov/kidsclub
  - **c.** Site:nationalgeographic.com outer space
- **When might you choose to use 'site:' instead of a general search?**

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AI Prompts

The better your prompt, the more effectively AI can help you.

AI tools are like smart helpers. They can write stories, answer questions, or help you think of new ideas. But to do that, they need clear directions. These directions are called prompts.

Section A. Keywords

Just as with search engines, clear keywords are the starting point when writing an AI prompt..

1. **Ask an AI to tell you about sharks.**
   - **What is a simple a clear prompt you would use?**
   - **If the AI gives you very long and complicated answers, what is the one word you could add to your prompt to make it simpler?**
2. **Ask an AI to write a short story about a talking dog.**
   - **Your prompt:**
   - **If the story is boring, what is the one detail you could add to your prompt to make it more interesting?** (Example: where the dog lives, what kind of dog, etc.)

Section B. Adding Specific Details

The more specific details you give an AI, the more precisely it can follow your instructions. Think about *who, what, where, when, why, how, and how much*.

3. **You want a short story (3–4 sentences) about a brave knight in a magical forest.**
   - **How would you write a prompt that includes these specific details?**
   - **How does telling the AI the *length* of the story (3-4 sentences) help you?**

4. **You want to know how clouds form, but in a way that's easy for a 4th grader to understand, using a fun comparison.**
   - **Your prompt:**
   - **Why is asking for a fun comparison helpful for understanding a new concept?**

Section C. Requesting Specific Formats:

You can also tell the AI how you want the answer to be organised (like a list, a poem, a paragraph, a table, etc.).

5. **You want five cool space facts in a bulleted list.**
   - **Your prompt:**

- **Why is a bulleted list better than a long paragraph for facts?**

6. **Write a short, rhyming poem about the ocean with four lines.**
   - **Your prompt:**
   - **What happens if you just ask for a poem about the ocean?**

Section D. Combining Techniques!

Now, let's combine all your skills to create highly effective prompts for AI.

7. **You want a short, happy story about a talking animal who helps someone. It should not be about sadness or problems.**
   - **Your prompt:**
   - **What search trick is like telling the AI to leave out sadness and problems?**

8. **Your Goal: Ask the AI to give three good things or three not-so-good things about having a pet. Make sure it's written in bullet points, easy for a 4th grader to read, and about dogs or cats.**
   - **Your AI prompt:**
   - **Why is using OR helpful in your prompt?**

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Debugging

Section A: Spot the Mistake!

Read each code snippet carefully. Circle the bug, then write how to fix it.

1. Direction Confusion

Code

```
When [UP ARROW] is pressed
Move sprite LEFT
```

- **What's wrong with the code?**

- **Fix it:**

2. Mixed-Up Greetings

Code

```
Sprite says Bye!
Sprite moves forward
Sprite says Hi!
```

- **What's wrong with the code?**

- **Fix it:**

3. **Missing Animation Step**

Code

```
When [SPACE] pressed:
Sprite jumps
Sprite lands
```

- **What's wrong with the code?**

The sprite jumps and lands, but nothing shows it's in the air.

- **Fix it:**

4. **Wrong Reaction**

Code

```
If sprite touches fire:
Say Yum!
```

- **What's wrong with the code?**

- **Fix it:**

5. **Conditional Confusion**

Code

```
If score > 10:
Say You lost!
Else:
Say You win!
```

- **What's wrong with the code?**

- **Fix it:**

6. **Event Not Triggering**

- **What's wrong with the code?**

The sprite never says anything, even when touching blue.

Code

```
When sprite clicked:
If touching color [blue]:
Say Water!
```

- **Fix it:**

7. **Loop Logic Error**

Code

```
Repeat 5 times:
Move forward
Turn left
Say Done!
```

- **What's wrong with the code?**

The sprite says Done! five times.

- **Fix it:**

Section B: My Own Bug.

Write your own short code with a bug in it. Then explain the bug and how to fix it.

- **My Buggy Code.**

Code

- **What's wrong with the code?**

- **Fix it:**