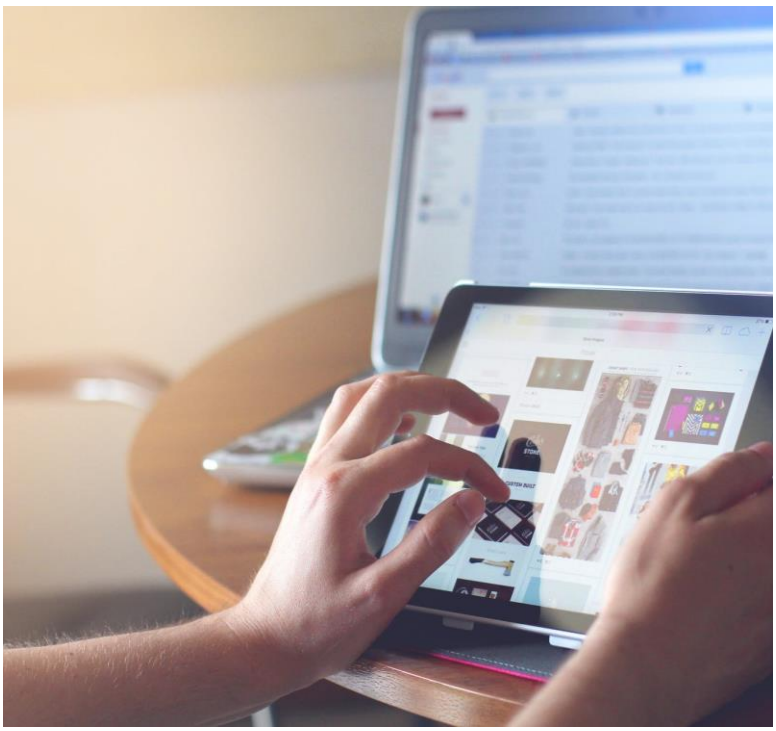
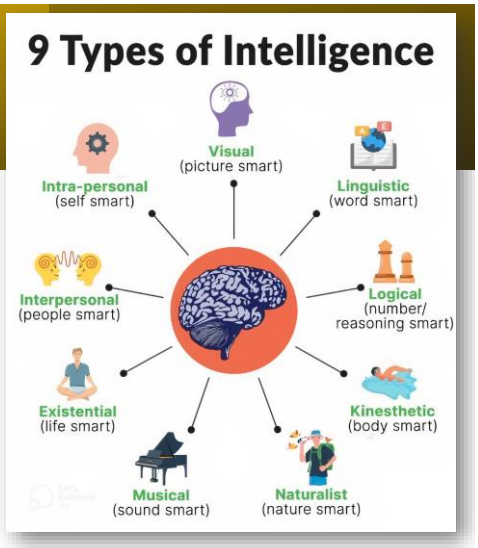
DIGITAL SKILLS COURSE

CHAPTER 3 :UNDERSTANDING ARTIFICIAL INTELLIGENCE (AI)

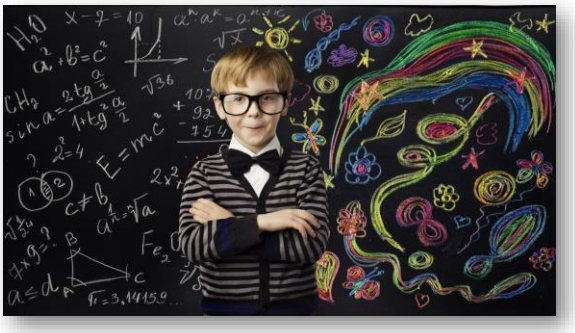
CONTENTS



What is Intelligence?



Intelligence is the capacity for abstraction, logic, understanding, self-awareness, learning, emotional knowledge, reasoning, planning, creativity, critical thinking, and problem-solving.

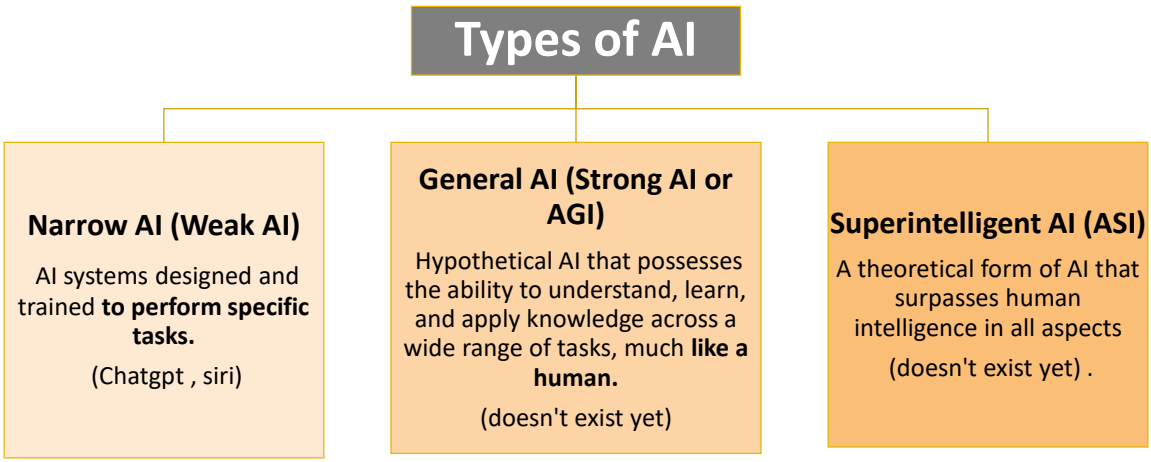


Human intelligence is unique because it involves self-awareness, consciousness, intuition, and creativity.

What is Artificial Intelligence (AI) ?

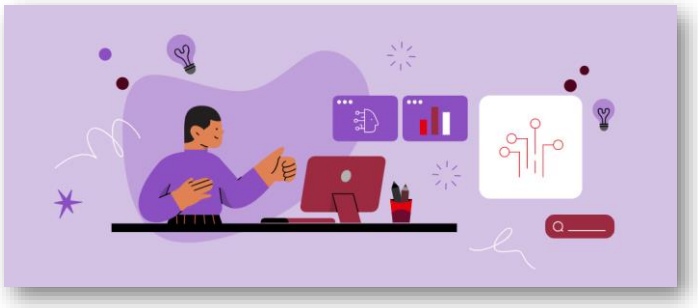
Artificial Intelligence (AI) is a branch of computer science, and it refers to the **simulation of human intelligence** in machines, enabling them to perform tasks that typically require human intelligence.

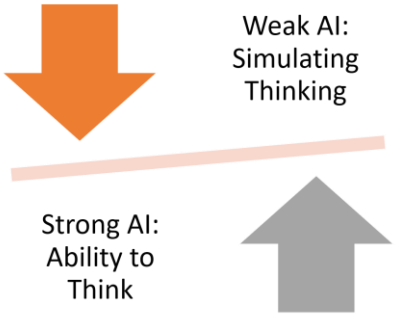
Types of AI



Weak AI

- Artificial intelligence today is called **weak AI** because it simulates thinking and did not reach to the level of human intelligence yet.





Weak AI tasks

- Weak AI can only perform **specific tasks** such as:

•Learning

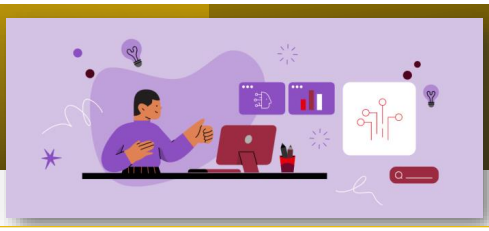
problem-solving

Perception

Reasoning

Natural Language processing

Weak AI tasks



•Problem solving:
- an act of defining a problem; determining the cause of the problem; identifying, prioritizing, and selecting alternatives for a solution; and implementing a solution. *(example: Google maps)*

Logical Reasoning:
- deriving new information from existing information using logical rules and principles. *(example: Computer Chess game)*

Learning:
- It is the acquisition of information, knowledge, and skills resulted from experience. (example: social media algorithms)

Perception:
- is the process of interpreting the environment to produce a meaningful experience of the world. Intelligent agents can perceive their environment, learn from experience, and take actions to achieve specific goal (example: self driving cars)

Natural language processing (NLP):
- the ability to interpret, manipulate, and comprehend human language (example: ChatGPT)

Some benefits and applications of AI

Benefits of AI

- **Faster Work:** AI can do tasks much quicker than humans, like solving problems or analyzing data.
- **Helps in Daily Life:** AI powers things like voice assistants (Siri, Alexa), which make our lives easier by answering questions or helping with tasks.
- **Better Decisions**: AI can help people make better decisions by giving useful suggestions, like showing us what to watch or buy based on our interests.

Applications of AI

- **Healthcare:** AI helps doctors find diseases earlier and suggest better treatments
- **Pharmacy**: AI can help in the medication discovery process.
- **Customer Service**: Chatbots powered by AI can answer our questions and solve problems online, day or night.
- **Education:** AI automates the grading process.

Ethical Considerations in AI

Misinformation & Hallucination:

There is a great potential for generating false or misleading information.

AI can generate convincing fake text, images, and videos.

Educational challenges:

Concerns about **cheating** and **plagiarism** using AI tools.

The question is: "How can we engage AI tools with the educational system?" No agreement yet!

Job displacement:

AI could automate many tasks, leading to widespread unemployment in certain sectors.

Concern that AI might replace good workers, not just manual labor.

The Future of AI

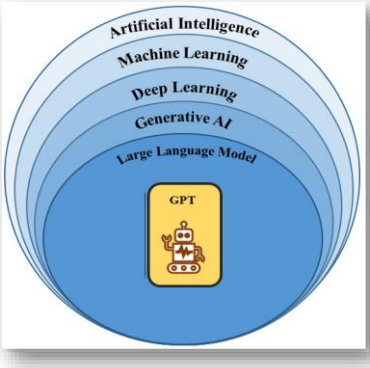
AI is increasingly influencing daily life, and it will lead to breakthroughs in various fields.

1. **Ethical guidelines**: We need to develop global standards and frameworks for the ethical guidelines for using AI.
   - These ethical guidelines should be based on **moral values** that are broadly accepted across societies, ensuring an unbiased and equitable approach.
2. **Human and AI:**
   - Humans should understand that AI will never replace them except when they decide to be replaced.
   - Humans should understand that they are unique and should not depend on AI in all tasks.
   - The future involves collaboration between humans and AI.

Current state of AI

Deeper Look to AI

Term	*Definition*
Artificial Intelligence	**Artificial Intelligence (AI):** Teaching machines to act like humans.
Machine Learning	**Machine Learning (ML):** This is a type of AI where machines learn from data. they analyze data to find patterns and make decisions using algorithms.
Deep Learning	**Deep Learning :** advanced type of Machine Learning .



Current state of AI

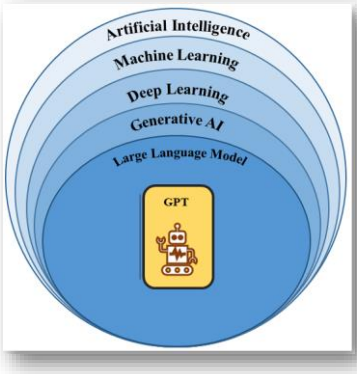
Important Terms

Term	*Definition*	*Examples*
Generative AI (Gen AI)	**Generative AI:** This is a type of AI that can create new content, like images, text, or music. It learns from existing data and then generates something similar but new, often using techniques from deep learning.	✓ GPT ✓ DALL-E (specialized for images) ✓ LLMs (specialized for generating text
Chatbots	**Chatbots:** AI tools that use Generative AI to mimic human conversation and answer questions automatically.	✓ ChatGPT (OpenAI) ✓ Gemini (Google) ✓ Copilot (Microsoft) ✓ Poe Assistant (Anthropic) ✓ Claude (Anthropic)
Prompt **Prompt Engineering**	A **prompt** is the input or question given to a chatbot for a response. **Prompt Engineering** involves writing prompts to get the best answers.	

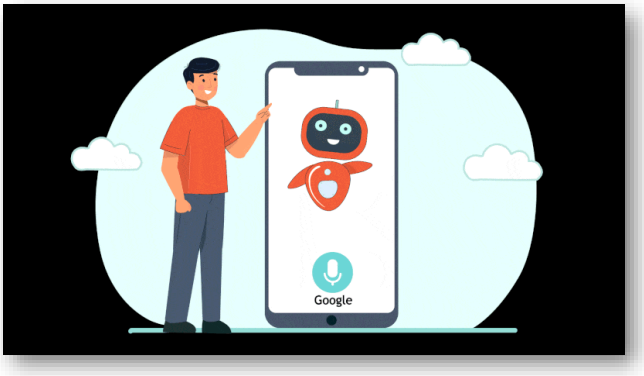
Current state of AI

Example

- **Artificial Intelligence :** We want the computer to recognize **a cat picture**, we **use AI techniques** to help the computer to understand what a cat by programming.
- **Machine Learning (ML):** With machine learning, we take a **large number of cat pictures** and let the computer analyze them. It learns to recognize patterns, like the shape of a cat's ears or the texture of its fur, and eventually can decide whether a new picture is likely to be a cat or not.
- **Deep Learning:** For deep learning, we would use a complex structure called **a Neural Network** to analyze the cat pictures
- **Generative AI:** we want the computer **to *create* new cat pictures** instead of just recognizing them, we'd use generative AI. It learns from a large dataset of cat images and then can produce entirely new, unique pictures of cats that didn't exist before. So instead of just saying, "Yes, this is a cat," it can actually draw you a picture of one!



Current state of AI:
Generative AI



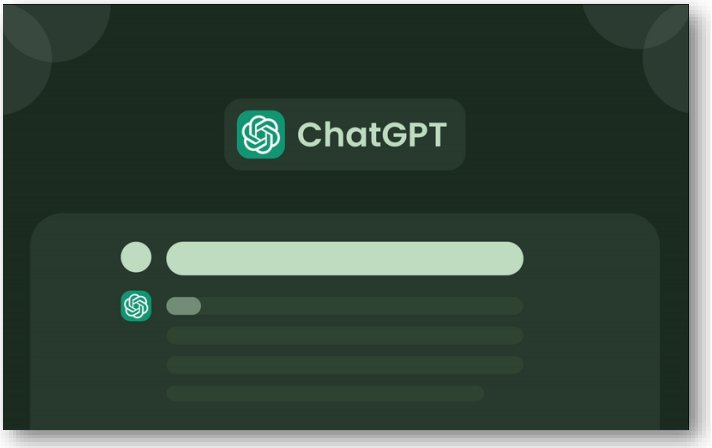
AI

Generative AI example
ChatGPT chatbot

ChatGPT uses:	Offering information on various topics.
	helping with writing like summarizing and paraphrasing
	Helping in brainstorming and problem-solving.
	Preparing plans and presentations
	Giving information about images and files
	Content creation
	Translation

Generative AI example
Start using ChatGPT

- Visit chat.openai.com or download the mobile app or open https://chatgpt.com/
- Sign up for a free OpenAI account.
- Click 'New Chat' to start a conversation.
- Type your message or question into the chat interface.
- ChatGPT will generate a response in real-time.
- Continue the conversation or ask follow-up questions.



Generative AI example
Chatbot: prompt examples (ChatGPT, Copilot, Gemini, Claude)

- Use the following prompts:

1. **Translate this paragraph to Arabic (use ChatGPT, Copilot, Gemini):**
   Deep learning is a subset of machine learning that uses neural networks with many layers (hence "deep") to model and understand complex patterns in large datasets. These neural networks are inspired by the structure and function of the human brain, with interconnected nodes (neurons) working together to process information. Deep learning algorithms excel in tasks such as image and speech recognition, natural language processing, and game playing, by automatically learning to extract relevant features from raw data. This approach reduces the need for manual feature engineering, making it highly effective for solving complex problems. Its success is largely due to advances in computational power, the availability of large datasets, and improvements in training algorithms.
2. **Summarize this article**: https://www.edutopia.org/article/5-blended-learning-strategies-middle-high-school/
3. **Explain the concept** of Artificial Intelligence
4. (**Enhanced prompt**) Explain the concept of Artificial Intelligence in simple terms suitable for a high school student, and use headings
5. **Prepare a presentation** of 6 slides about Healthy life
6. **Generate a diagram for water cycle in nature (Use ChatGPT, Claude)**
7. **Generate a picture for water cycle in nature (Use Gemini)**
8. **Explain the following image (use Claude, ChatGPT)**