

ARTIFICIAL INTELLIGENCE



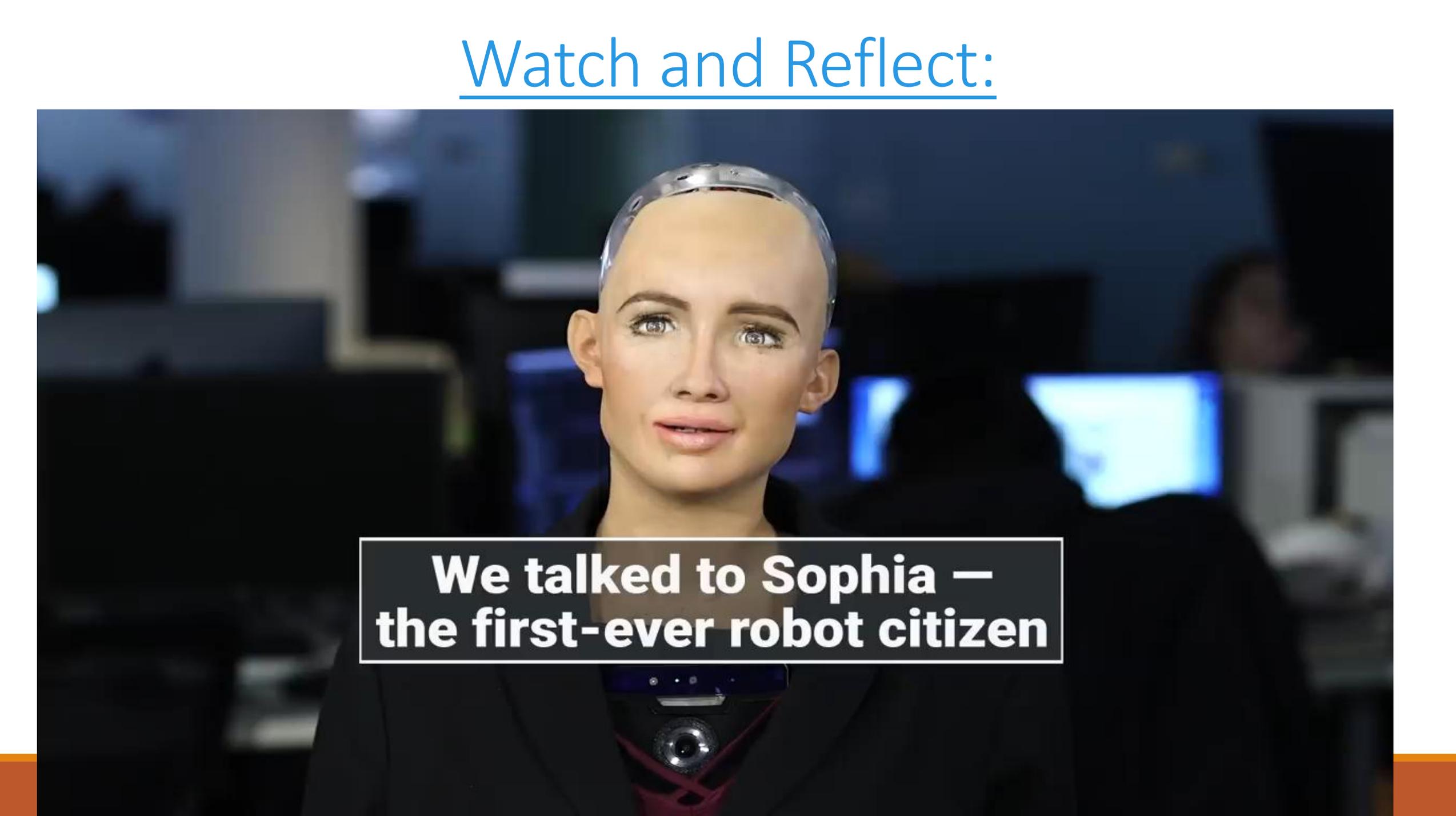
Learning Objective:

Describe spheres where artificial intelligence is applied:
industry, education, medicine, gaming industry, society

Lesson Objectives:

Define	define the term AI;
Discuss	discuss the sphere where AI is used;
Explain	explain the benefits and limitations of using AI.

Watch and Reflect:

A close-up shot of Sophia the robot, a humanoid AI with a realistic human-like face, wearing a dark suit. She is looking slightly to the right of the camera. The background is a blurred office or lab setting with computer monitors and people.

**We talked to Sophia —
the first-ever robot citizen**



Students in pairs *create a mind map* for following questions. 15 min

Discussion questions:

- what is “Intelligence”?
- what is Artificial Intelligence?
- what tasks are easy for computers and difficult for human?
- what tasks are easily solved by people and difficult for computers?
- what makes human intelligent?

NOTE: You can add other points of your own.

Summary:

What is intelligence?

- Intelligence is the ability to use thinking and problem-solving skills to reach goals in the real world.
- Intelligence is the computational part of the ability to achieve goals in the world

What is artificial intelligence?

- Artificial Intelligence (AI) refers to the simulation of human intelligence in machines.
- AI can be thought of as a machine with cognitive abilities such as problem solving and learning from examples.
- The automation of activities that we associate with human thinking, activities such as decision-making, problem solving, learning... (Bellman)
- AI is the science of creating machines or computer programs that can think, learn, and make decisions like humans.

what tasks are easy for computers and difficult for human?

- Mathematical tasks for addition/multiplication/division
- Searching for item from list
- Sorting items based on a particular attribute (numbers, letters, words, etc.)

What tasks are easily solved by people, and are difficult for computers?

- Voice recognition-sarcasm
- Voice recognition - context and semantics of language
- Image recognition - search for objects in images
- Face Recognition - Face Recognition in the photo

In groups, Create posters about use or applications of AI in different spheres:

- Industry;
- Education;
- Medicine;
- Gaming industry;
- Society;
- Other



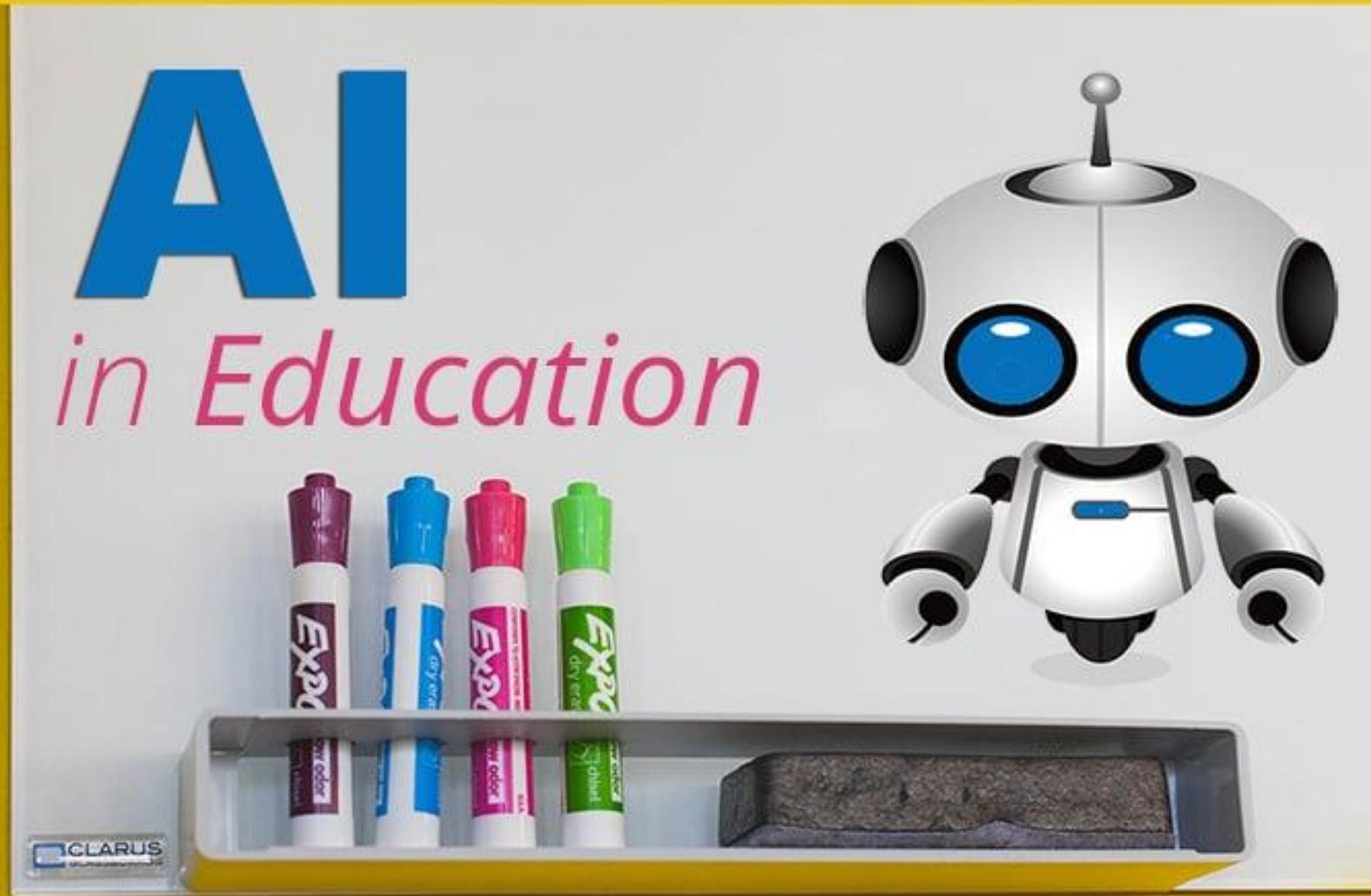
Evaluation by criteria:

- identify specific AI used in that domain and problems addressed;
- describe its attributes and what it does;
- advantages of using AI in the sphere (2 minimum)
- disadvantages of using AI in that sphere (2 minimum).

INDUSTRY



EDUCATION



MEDICINE



GAMING INDUSTRY



GROUPS PRESENT THEIR
DIFFERENT MIND MAPS
TO CLASS

Class presentation

Summary: **Education:**

Personalized Learning:- AI is used to create personalized learning experiences for students. It analyzes individual learning patterns, adapts content, and provides recommendations for customized study plans.



Assessment and Grading:- AI can assess and grade assignments, quizzes, and exams, reducing the workload for educators and ensuring consistency in evaluations.

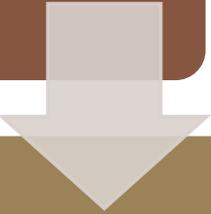


Chatbots:- AI-powered chatbots are used for answering student queries and providing 24/7 support, enhancing student engagement and support services.

Manufacturing Automation: AI-powered robots and machines automate tasks on production lines, enhancing efficiency and reducing errors. AI also enables predictive maintenance to reduce downtime.



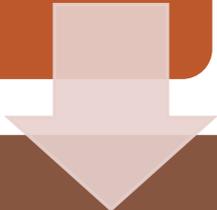
Quality Control: AI-driven vision systems inspect and identify defects in manufactured products, ensuring high-quality standards.



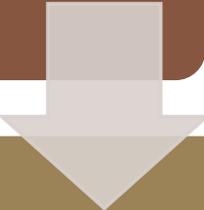
Supply Chain Optimization: AI optimizes supply chain operations, predicting demand, managing inventory, and reducing logistics costs.

Industry:

Diagnosis and Disease Prediction: AI algorithms analyze medical images (e.g., X-rays, MRIs) to aid in the diagnosis of diseases. It can also predict disease outcomes based on patient data.



Drug Discovery: AI accelerates drug discovery by simulating chemical interactions and identifying potential drug candidates.



Personalized Medicine: AI tailors treatment plans to individual patients by considering genetic, environmental, and lifestyle factors.

Medicine:

Gaming Industry

Game AI: AI is used to create non-player characters (NPCs) with realistic behaviors, making games more challenging and engaging.

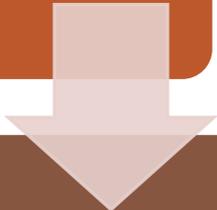


Procedural Content Generation: AI generates game levels, maps, and content dynamically, providing endless gameplay possibilities.

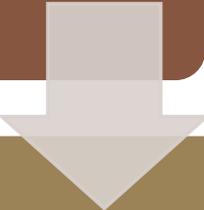


Player Behavior Analysis: AI analyzes player behavior to improve game design, optimize in-game advertisements, and prevent cheating.

Natural Language Processing (NLP): AI powers virtual assistants (e.g., Siri, Alexa) and chatbots for various tasks, from answering questions to controlling smart home devices.



Social Media Moderation: AI algorithms detect and remove harmful content, hate speech, and fake news from social media platforms.



Predictive Policing: AI is used in law enforcement to analyze crime data and predict areas where crimes are likely to occur, aiding in resource allocation.

Society:



Some limitations of AI

- **High implementation cost** (AI systems, maintenance, skilled staff).
- **Job displacement** due to automation.
- **Over-reliance** on technology can reduce critical thinking.
- **Equity issues** – not all students have equal access to AI-powered tools.
- **Diagnostic errors** if AI is trained on biased or incomplete data.
- **Data privacy** risks with sensitive patient information.
- **Over-predictability** – AI can make games too easy or too hard.
- **Unethical use** – AI-driven addictive designs can harm players.

Key concepts:



Artificial intelligence



Domains/ spheres where Artificial intelligence is used



Advantages and disadvantages of AI in different spheres





Learning Objectives:

- ▶ describe spheres where artificial intelligence is applied: industry, education, medicine, gaming industry, society

Lesson Objectives:

- ▶ analyze and evaluate the previous state, current state and future state of AI;
- ▶ describe types of AI (strong, super and weak);

BRAINSTORMING/DISCUSSION - VIDEO

- ▶ CAN MACHINE BECOME SMARTER THAN HUMAN?





ONLINE AI TOOLS

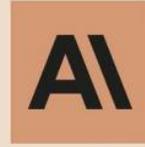
- ▶ ChatGPT, GPT
 - ▶ Copilot
 - ▶ Alisa
 - ▶ Google AI
- 

Top AI Tools for Work

Chatbots



ChatGPT



Claude



Bing Chat

Audio Editing



Descript



Adobe Podcast

Content Generation



Jasper



Writer



Notion AI

Image Generation



Midjourney



Adobe Firefly

Spreadsheets



Numerous

Slide Decks



Gamma



Tome

Meeting Recording

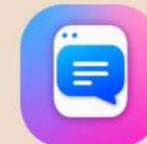


Vowel



Fireflies

Chat with PDF



ChatPDF

Personal Productivity



Rewind



Mem

Synthetic Voices



ElevenLabs



Play.ht



STATE OF AI

25MIN

Group discussion about the evolution of AI

- ▶ previous state
- ▶ current state
- ▶ future state

Criteria:

- Underlying technology
- Examples
- Challenges

Students can create a poster in AI Art program, a presentation (3-5 slides) or a video (max 3 mins) using online AI.

PRESENTATIONS





AI - Previous State

- ▶ Early conceptualizations in the 1950s
- ▶ AI began with pioneers like Alan Turing, who proposed the **Turing Test** to measure a machine's ability to exhibit intelligent behavior.

“If a person talks to both a computer and a human without knowing which is which, and can't tell the difference between them, the computer is considered to have passed the test and shown human-like intelligence.”

decision tree (true/false)

- ▶ Periods in the 1970s and 1980s when AI research faced reduced funding and interest due to unmet expectations and limited progress. – **AI winter**
- ▶ The development of **expert systems** in the 1980s, which were programs designed to mimic the decision-making abilities of a human expert, marked significant progress.

Rule-based, Fuzzy logic, Neural Network

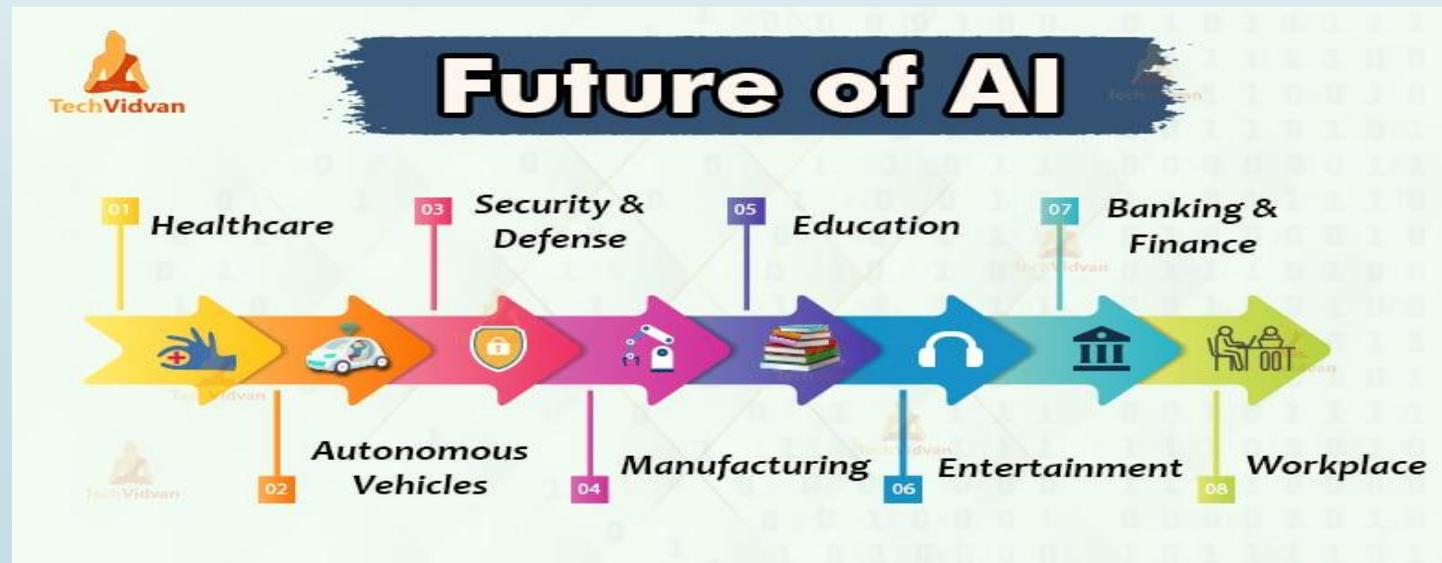
- ▶ There were some limitations - Primitive computing power, limited data availability, and understanding of AI

current state

- ▶ **Machine learning, Natural Language Processing** and **deep learning** are data-driven methods dominating AI research, utilizing large datasets and advanced algorithms.
 - * **Machine Learning(ML)** is subset of AI where systems learn from data to make predictions or decisions without being explicitly programmed.
 - * **Deep Learning** is type of ML involving neural networks with many layers, enabling advanced tasks like image and speech recognition.
 - * **Natural Language Processing (NLP)** is AI's ability to understand and generate human language, seen in applications like chatbots and language translation.
 - Examples: ChatGPT, Self-driving cars, and AI in healthcare
 - Advancements in Technology: High-performance computing, availability of big data, and breakthroughs in neural networks (GPT models).
 - Challenges and ethical considerations: Data privacy, Bias, Ethical AI development

Future state

- AI Integration in **Daily Life**, AI becoming more embedded in everyday activities, from smart home devices to personal assistants.
- Advancements in AI Capabilities leading to AI's ability to understand and interact with the world, including advancements in robotics and autonomous systems.
- **Future of Work**, AI transforming job roles, creating new opportunities, and necessitating reskilling of the workforce.
- AI in Education will lead to more personalized learning experiences, intelligent tutoring systems, and administrative automation.
- AI applications in climate modeling, resource management, and conservation efforts.

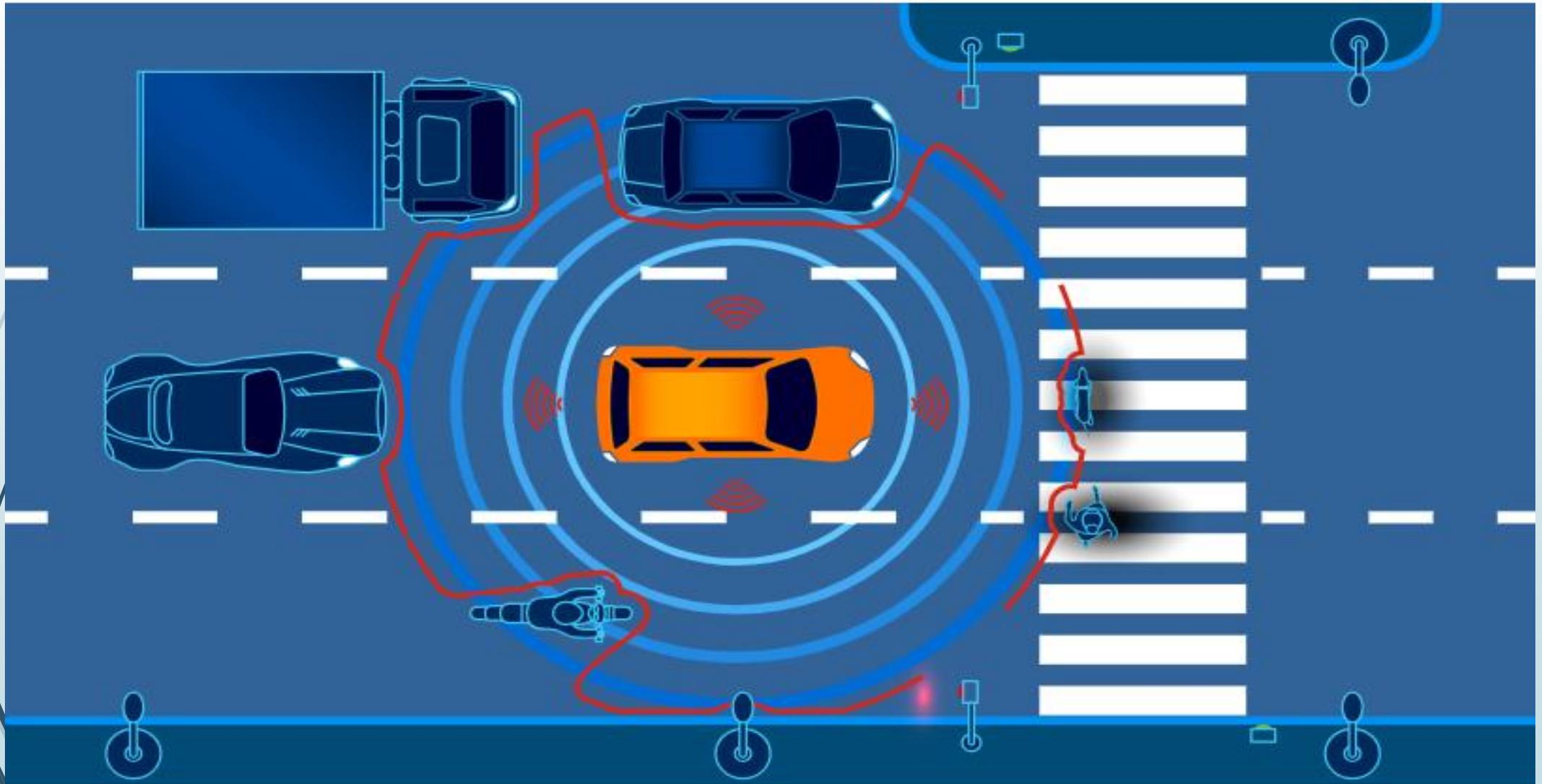


ROLEPLAY:



SCENARIO:

- ▶ AN Autonomous AI driven car crashed or hit on someone. Who is responsible? Car industry? Owner of the car? Government, or the programmer?
- ▶ We will have two sides: **Car industry and Car owner.**



Can countries
use AI driven
cars? For the
judge.



REFLECTION ON THE CLASS





Group research

Types of AI – Activity 15 min

- ▶ Narrow AI (Weak AI):
- ▶ General AI (AGI):
- ▶ Strong AI (Superintelligence AI):



Criteria	Narrow AI	General AI	Super AI
Purpose	Works within a set of predefined rules to perform specific tasks.	Capable of performing any intellectual task that a human can.	Achieve intelligence in AI systems that surpasses human intelligence.
Example	Virtual assistants, recommendation systems, chess-playing AI.	Currently hypothetical, advanced robotics.	Currently Hypothetical, far beyond human capabilities.
Learning Capability	Typically uses narrow data sets and limited to specific problems.	Can learn and adapt like humans across various fields.	Learns and improves autonomously, exceeding human learning speed.
Cognitive Abilities	Mimics specific human abilities (e.g., visual recognition, language processing).	Replicates general human intelligence and understanding across a wide range of tasks.	Far exceeds human cognitive abilities, potentially including creativity and emotional intelligence.
Type of AI Model	Fixed programming models tailored for specific domains.	Self-learning AI capable of adapting and reasoning in its environment.	Self-learning AI model capable of continuous learning and evolution.
Data Processing Mechanisms	Uses machine learning, neural networks, and natural language processing.	Clustering and association with advanced machine learning, deep learning, and NLP.	Data processing systems modeled after the human brain to achieve behavioral intelligence.

Summery

► Narrow AI (Weak AI):

- Task-Specific
- Superhuman performance in limited scope
- No general intelligence

Examples: Voice assistants like Siri or Alexa, recommendation algorithms(Netflix), facial recognition

► General AI (AGI):

- AGI can understand, learn, and apply knowledge across a wide range of tasks, much like a human being
- Learning and adaptability
- Human-like Understanding

* Theoretical concept

A dark blue arrow points to the right at the top left. Below it, several thin, curved lines in shades of blue and grey sweep across the left side of the slide.

Summary cont.

- ▶ Strong AI (Superintelligence AI):
 - would surpass the best human brains in practically every field, including scientific creativity, general wisdom, and social skills.
 - Superhuman Abilities
 - Self-Improvement
 - Broad Applicability
- Theoretical concept



VIRTUAL REALITY AND AUGNMENTED REALITY

Learning Objective:

- Explain the **purpose** of virtual and augmented reality.

Lesson objectives:

- Describe AR technology
- Describe VR technology
- Identify components of AR and VR
- Evaluate applications of VR and AR
- Discuss the purpose of VR and AR



ACTIVITY 1

- **WATCH THE VIDEO:**

What are the differences between AR and VR?

GROUP DISCUSSION

- **Group 1: Virtual Reality**
- **Group 2: Augmented Reality**
- **Group 3: Demonstrate applications of AR**

Evaluation by criteria for:

Group 1 and 2:

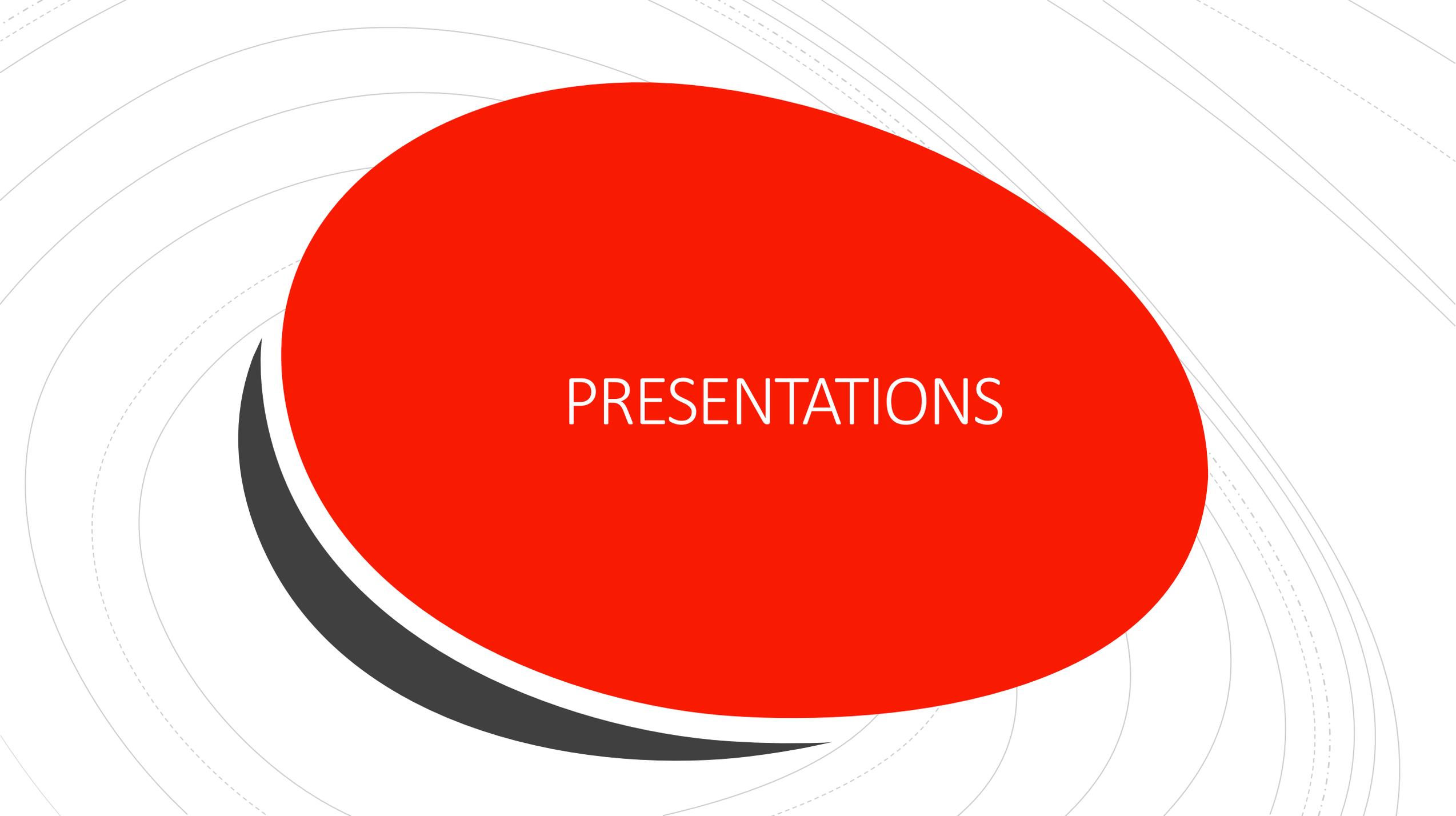
- - **Definition**
- - **Examples**
- - **Benefits and limitations**
- - **Purpose and application of VR and AR**

Group 3:

- **Find and demonstrate at least 2 AR applications**
- **Install Quiver app on your phone**

Use provided diagrams (color them) to create AR experience with Quiver APP



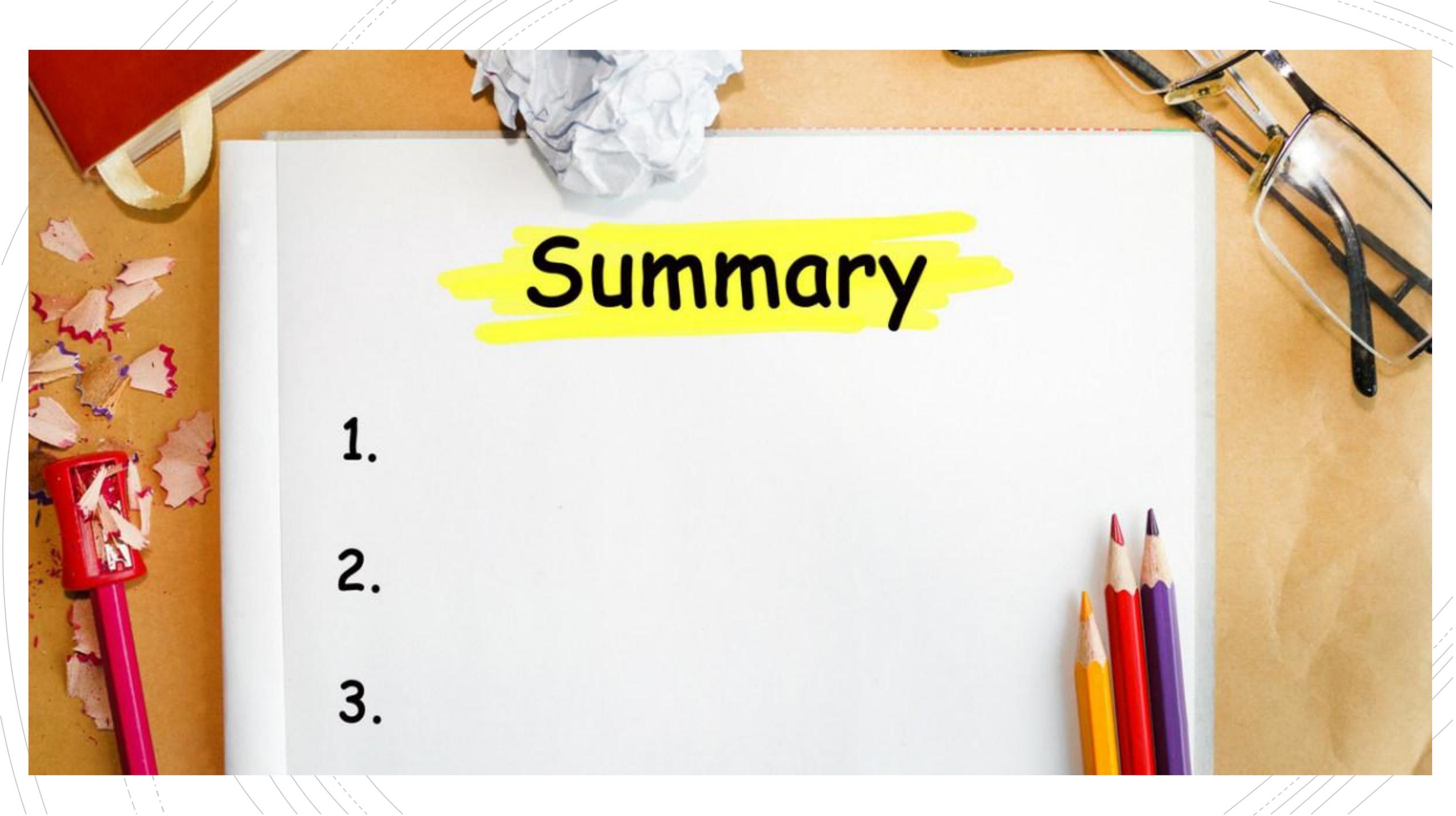


PRESENTATIONS

Q & A



- Based on the presentations, each group creates 6 multiple choice questions.
- Group 1 asks group 2, Group 2 asks group 3, and group 3 asks group 1.

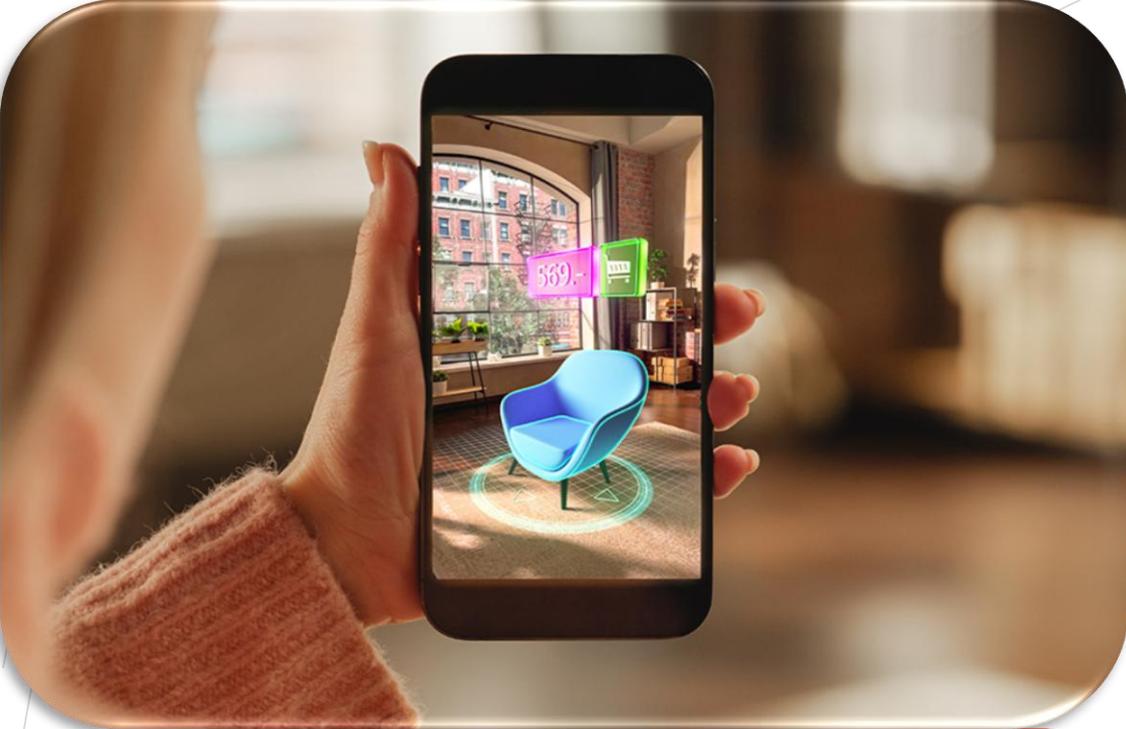
A top-down view of a desk with a white notebook. The word 'Summary' is written in black and highlighted with a yellow brushstroke. To the left of the notebook is a red pencil sharpener with a pile of shavings. To the right are three colored pencils (yellow, red, purple) and a pair of glasses. A crumpled piece of paper is at the top of the notebook.

Summary

1.

2.

3.



Augmented Reality (AR) is a perfect blend of the digital world and the physical elements to create an artificial environment



Virtual Reality (VR) is a computer-generated simulation of an alternate world or reality.

EXAMPLES

AR

- Pokémon GO
- Google Glass



VR

- Oculus Rift
- PlayStation VR



Key Features of Augmented Reality

Real World Integration - Digital objects appear in the real world.

Device Requirement - Uses cameras, smartphones, tablets, smart glasses.

Interaction Level - Users can interact with digital elements while staying in the real world

Accessibility - More accessible; typically requires only a smartphone or AR-enabled device.

Key Features of Virtual reality

Immersive Environment - Creates a completely virtual world.

Device Requirement - Requires VR headsets

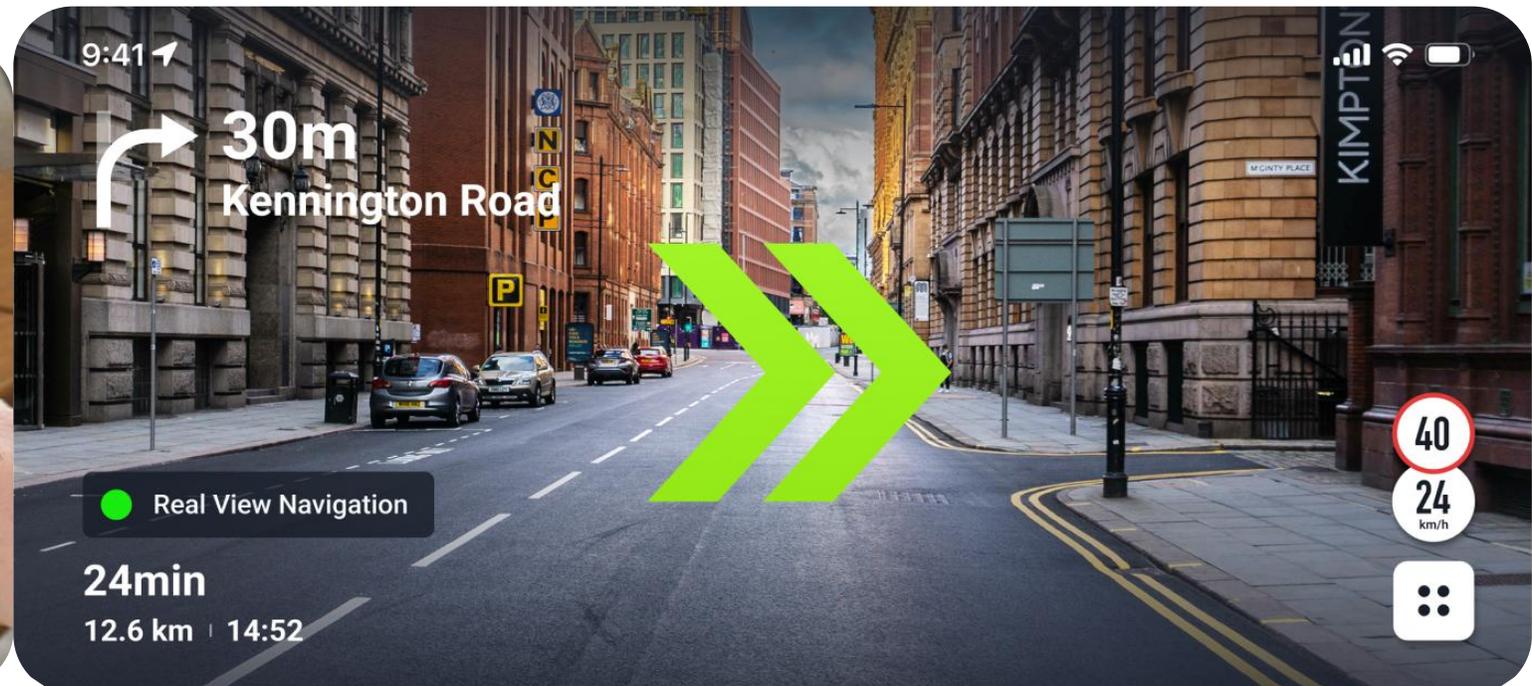
Interaction Level - Full immersion; users can interact with the virtual environment.

Sensory Involvement - Engages multiple senses (sight, sound, sometimes touch).

AR

- **Education** - Interactive learning experiences (anatomy apps).
- **Retail** - Virtual try-ons for clothing and furniture (IKEA).
- **Navigation** - Real-time overlays for directions (Google Maps Live View).
- **Entertainment** - Games (e.g., Pokémon GO), interactive storytelling.

APPLICATION





APPLICATION

VR

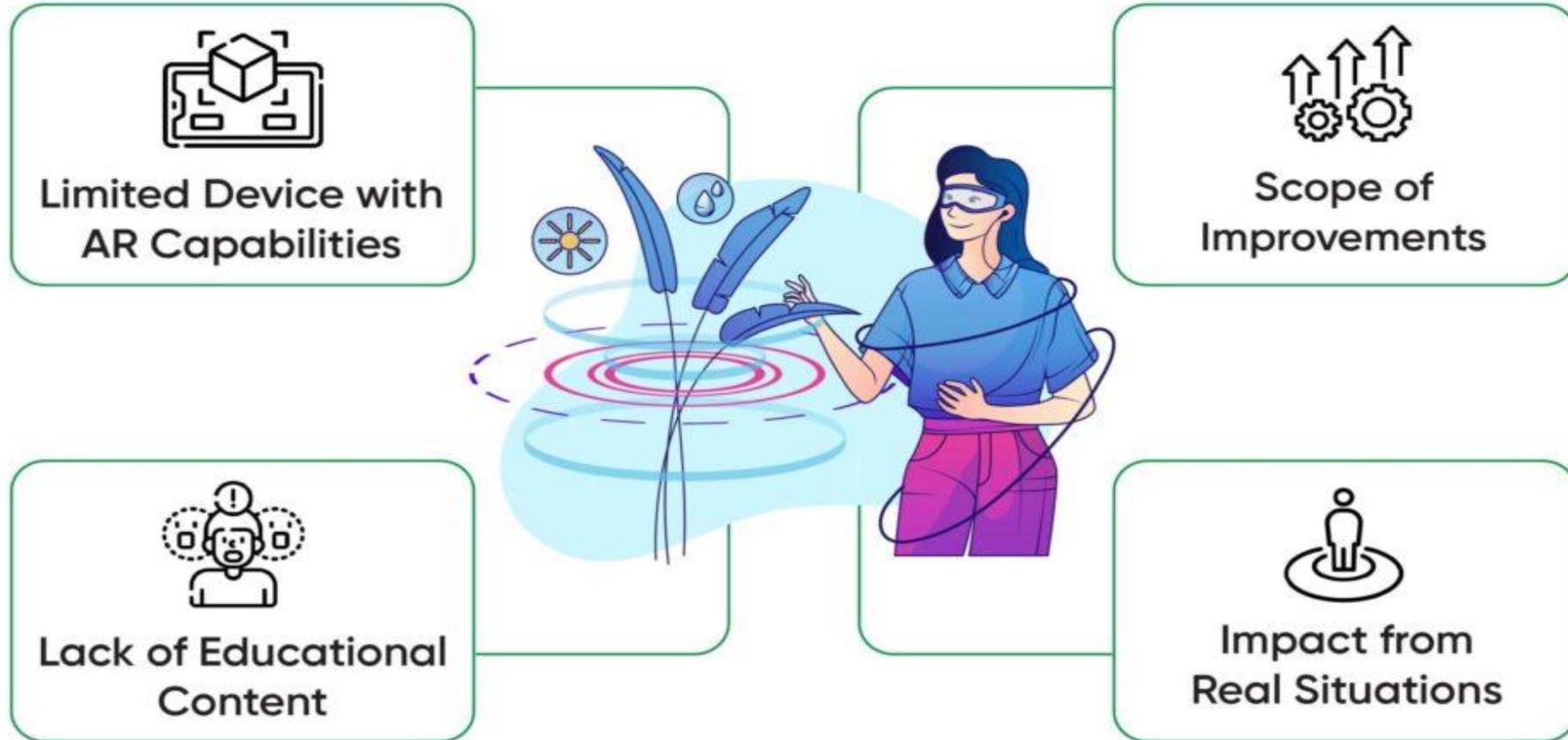
- **Training and Simulation** - Flight simulators, military training.
- **Gaming** - Fully immersive video games.
- **Healthcare** - Virtual reality therapy, surgical simulations.
- **Architecture and Real Estate** - Virtual walkthroughs of properties.



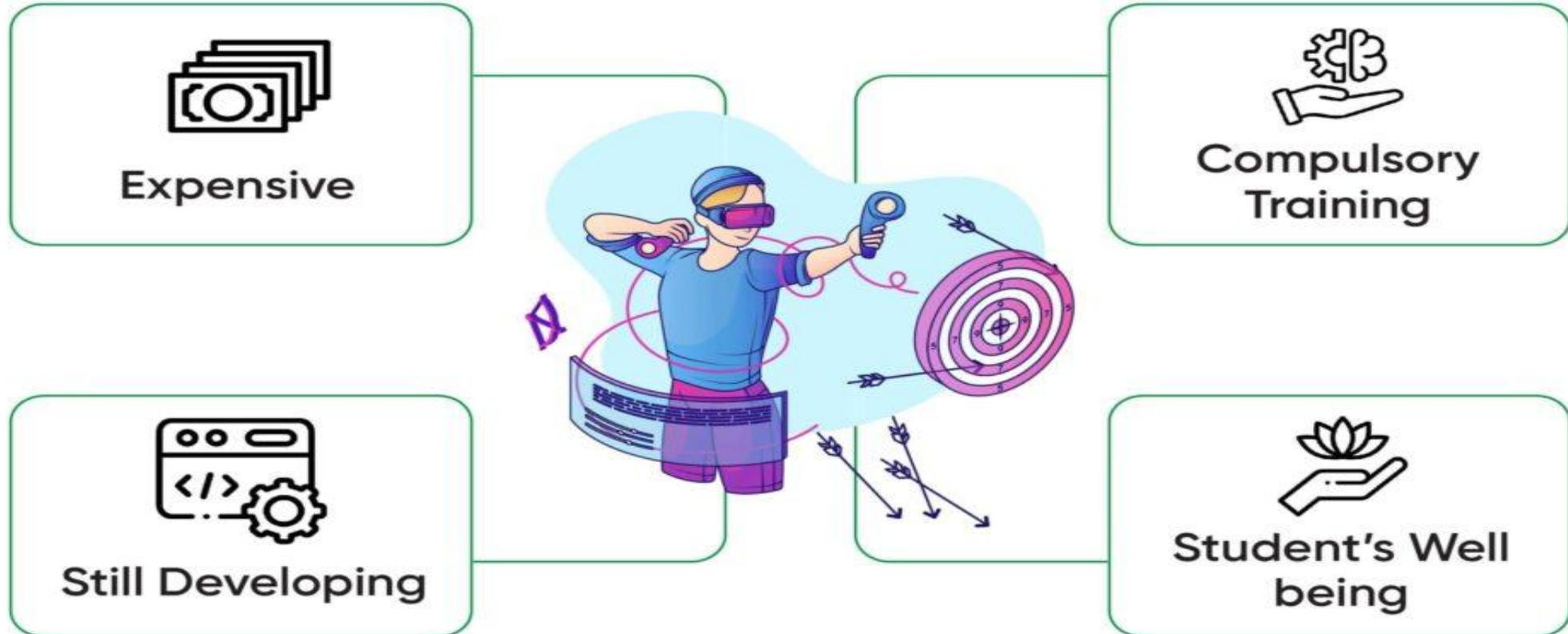
AR	VR
The system augments the real-world scene	Completely immersive virtual environment
In AR User always have a sense of presence in the real world	In VR, visual senses are under control of the system
This technology partially immerses the user into the action	This technology fully immerses the user into the action
No AR headset is needed.	Some VR headset device is needed.
With AR, end-users are still in touch with the real world while interacting with virtual objects nearer to them.	By using VR technology, VR user is isolated from the real world and immerses himself in a completely fictional world.
It is used to enhance both real and virtual worlds.	It is used to enhance fictional reality for the gaming world.

Main differences

Challenges with AR in Education

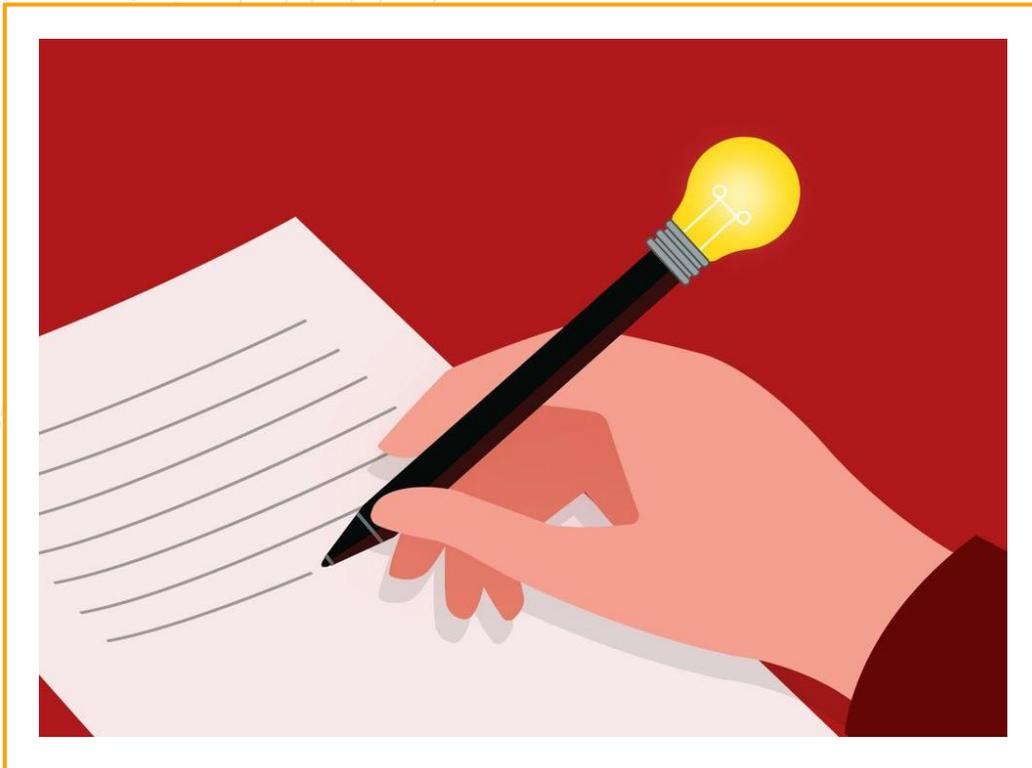


Challenges with VR in Education





EXAM STYLE QUESTIONS



Respond to the following in your copy books:

- What is the difference between AR and VR? [2]
- Describe the purpose of AR in the following spheres:
Education and retail [2]
- Describe the purpose of VR in the following spheres:
Gaming industry and Health care [2]

NOTE: Purpose refers to the reason or intended function of something—why it exists or is used.

Possible responses!

- In education, AR purpose is to provide **visualization of concepts** [1], to **boosts engagement** via interactive learning [1]
- In retail, AR purpose is to **show virtual products in real spaces** [1], to **enhance shopping experience** with try-ons [1]
- In Gaming, VR provides **immersive worlds** [1], **natural interaction via motion controls** [1]
- In Healthcare, VR **provides therapy** (PTSD) [1], **Rehab** (stroke recovery) [1], **surgical training simulations** [1]

A red speech bubble graphic with a white outline, containing the text 'Feedback from class'. The bubble has a tail pointing downwards and to the left.

Feedback from class

- Are you able to differentiate between AR and VR?
- Can you identify applications of AR and VR?