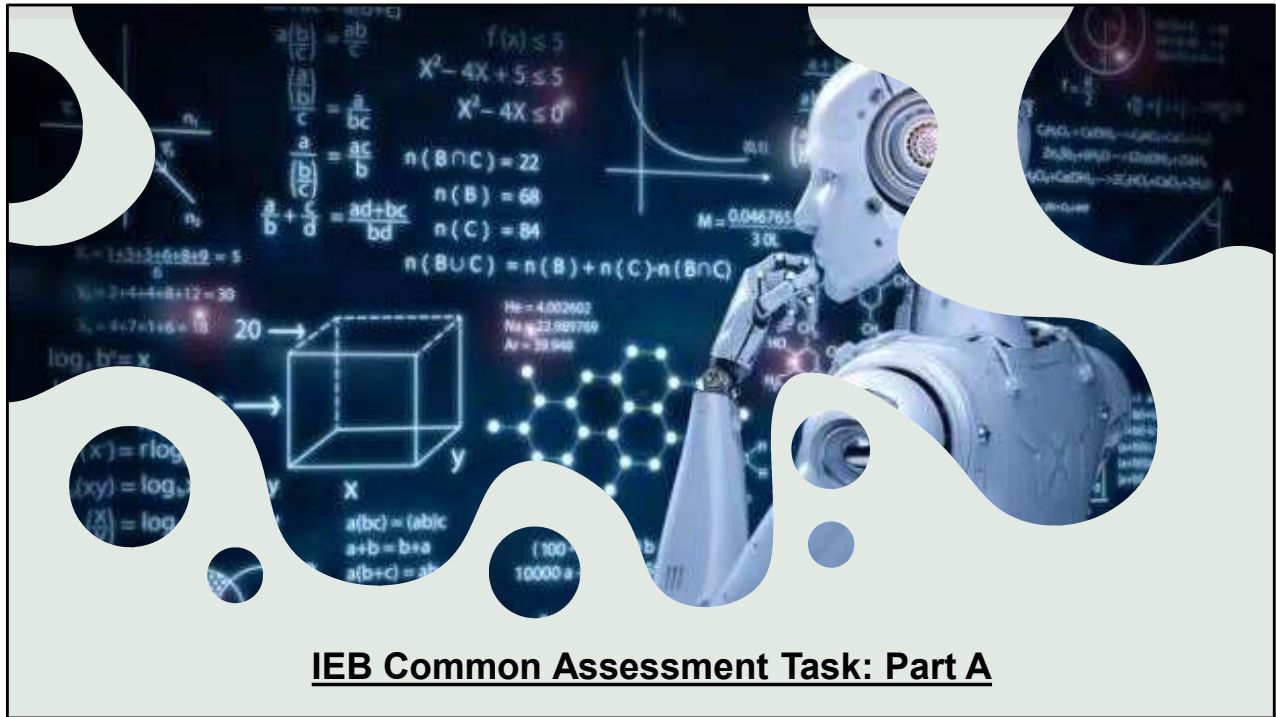




IEB Common Assessment Task: Part A

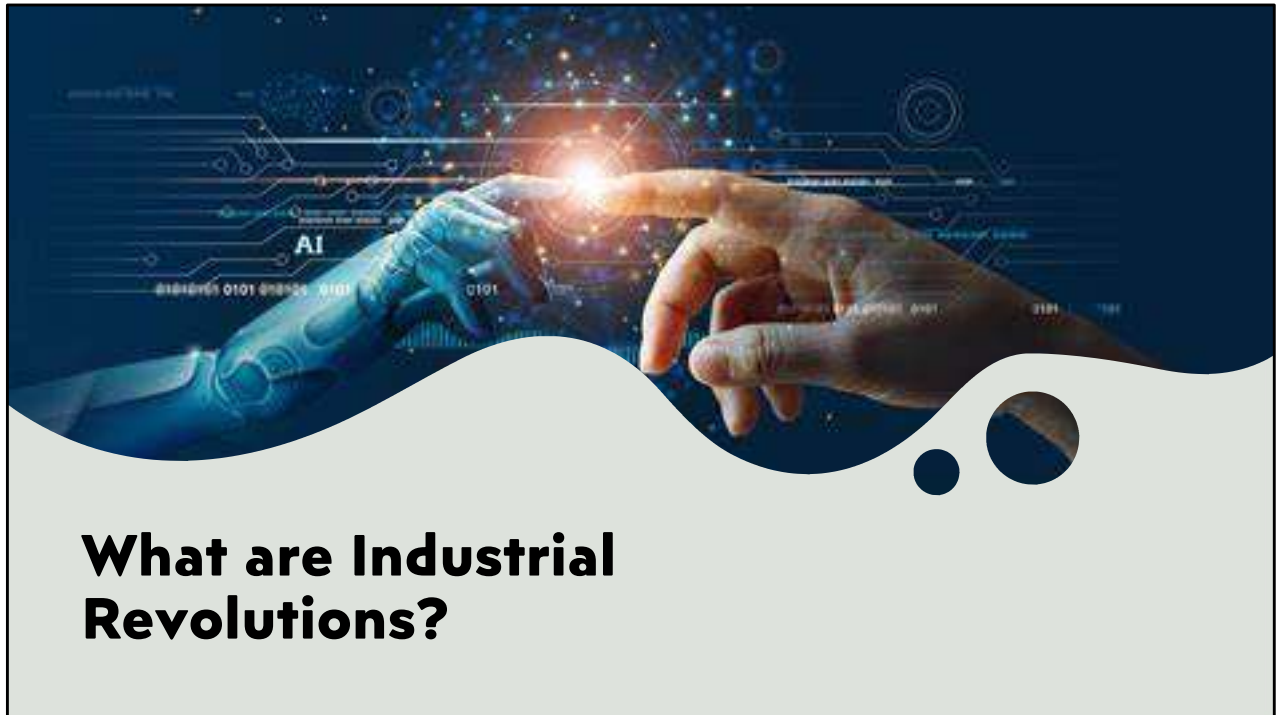
The CAT will explore the following:

- Previous Industrial Revolutions and their impact on our current way of life.
- How Industry 4.0 is changing and shaping our world.
- What the emerging Industry 5.0. is.
- The knowledge, skills, values, and attitudes which will ensure success in this rapidly changing landscape.
- Areas of concern with regard to emerging technologies.
- The need for current systems, or ways of living to be revolutionised to fit better into our changing world, and what this might look like.

ASSESSMENT REQUIREMENTS

Questions 3 (20 marks) and 4 (60 marks) are compulsory questions for assessment.

We will work through Question 1 and Question 2 and you must take careful notes of the comments and observations made. These will give you insight into the multiple perspectives of each contextual source that you may not have previously considered. This will aid you in providing quality responses in the CAT A and B. Regarding your responses in both CAT A and CAT B – please ensure that you provide sufficient detail in your answers. You are required to think deeply about each question and to ensure that your opinions and thoughts are supported by valid reasoning



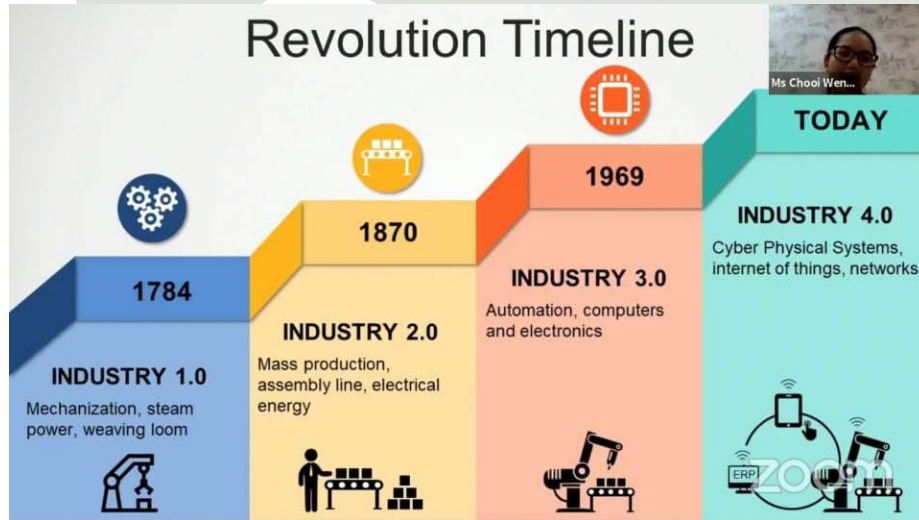
What are Industrial Revolutions?

Let's start with what we mean by Industrial Revolutions.

An industrial revolution has two components. The first is the creation of new technology – for example, the invention of the steam engine. The second is a change in production brought about by the technology – for example, steam-driven weaving looms. Each time a new technology is created, the manufacturing (making) process goes up a notch. As the revolutions become more complicated, multiple new technologies are discovered, and the process accelerates.

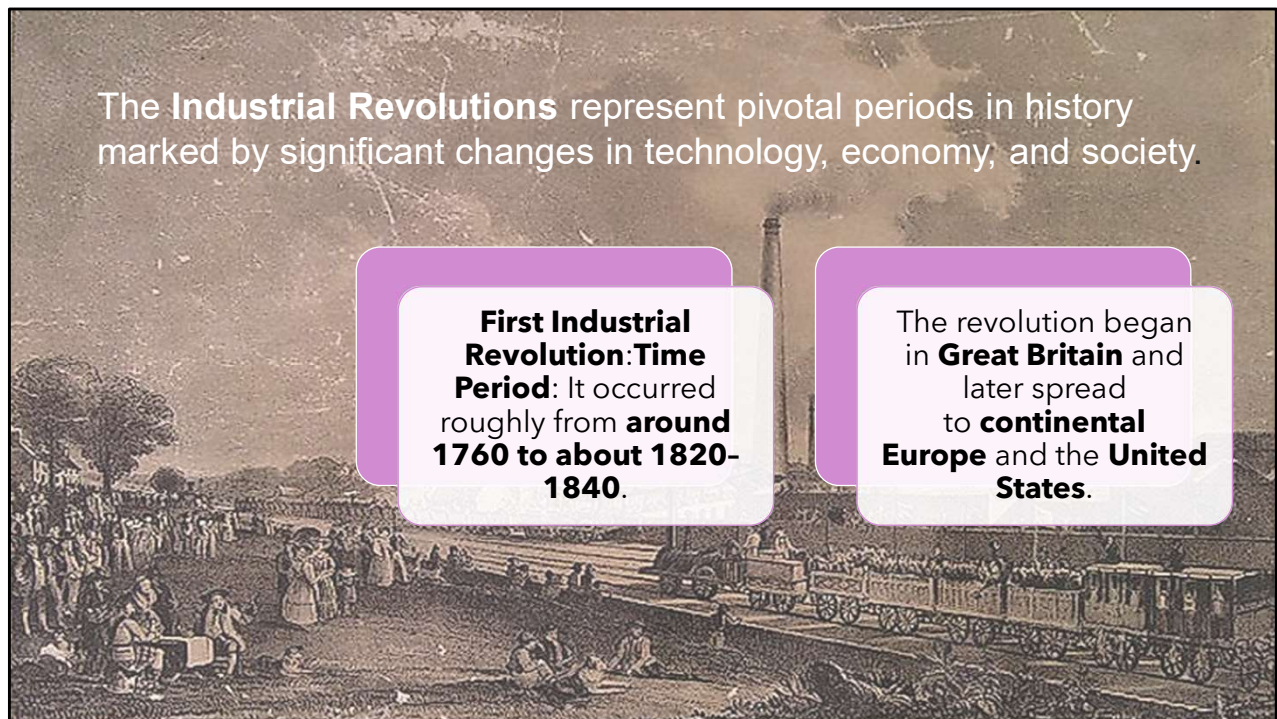
Previous Industrial Revolutions and their impact on our current way of life

Question 1.1 – A brief exploration of the 4 Industrial Revolutions



Question 1.1: A brief exploration of the 4 industrial revolutions.

We are going to explore the previous Industrial Revolutions and how they impacted/impact how we live, work, and interact with our world.



Key Changes:

- Transition from **hand production methods** to **machines**.
- Introduction of **new chemical manufacturing** and **iron production processes**.
- Growing use of **water power** and **steam power**.
- Development of **machine tools**.
- Rise of the **mechanized factory system**.

Impact:

- **Population growth** due to increased output.
- The **textile industry** led the way, becoming the dominant industry in terms of employment, output value, and capital investment.
- **British origin:** Many technological and architectural innovations originated in Britain.
- **Global Influence:** The Industrial Revolution significantly impacted almost every aspect of daily life.
- **Economic Growth:** It marked the beginning of sustained **economic growth** in capitalist economies.

Historical Significance: Comparable to humanity's adoption of agriculture, the Industrial Revolution was a major turning point in history

Pros

- Advancements in production
- Growth in innovations and inventions
- Workers earned higher wages
- Improvements in transportation networks

Cons

- Deplorable working conditions and child labour
- Unsanitary living conditions and pollution
- Food shortages



Following the First Industrial Revolution, there were subsequent waves of technological and economic change:

Second Industrial Revolution:
Late 19th and early 20th centuries - innovations like electricity, steel, and mass production.

Third Industrial Revolution:
Mid-20th century - digital technology and automation.

Fourth Industrial Revolution:
Ongoing - artificial intelligence, robotics, and interconnected digital systems.

The Four Industrial Revolutions Explained in Under 4 Minutes!
<https://youtu.be/NDTvCO5ifKo>

[Watch the video clip.]

The Four Industrial Revolutions Explained in Under 4 Minutes!

<https://youtu.be/NDTvCO5ifKo>

1st Industrial Revolution	2nd Industrial Revolution	3rd Industrial Revolution	4th Industrial Revolution	5th Industrial Revolution
Mechanisation	Electrification	Automation and Globalisation	Digitalisation	Personalisation
Occurred during the 18 th and 19 th centuries, mainly in Europe and North America	From the late 1800s to the start of the First World War	The digital revolution occurred around the 1980s	Start of the 21 st century	2 nd decade of the 21 st century
Steam engines replacing horse and human power	Production of steel, electricity and combustion engines.	Computers, digitisation and the internet,	AI, robotics, IoT, blockchain and crypto.	Innovation purpose and inclusivity.
Introduction of mechanical production facilities driven by water and steam	Division of labour and mass production, enabled by electricity.	Automation of production through electronic and IT systems	Robotics, artificial intelligence, augmented reality, virtual reality	Deep, multi-level cooperation between people and machines. Consciousness.

This table shows the sequence of the five industrial revolutions. Can you see how each revolution sets the scene for the next one. Note also the time period of each revolution.

The first revolution mechanised the textile industry.

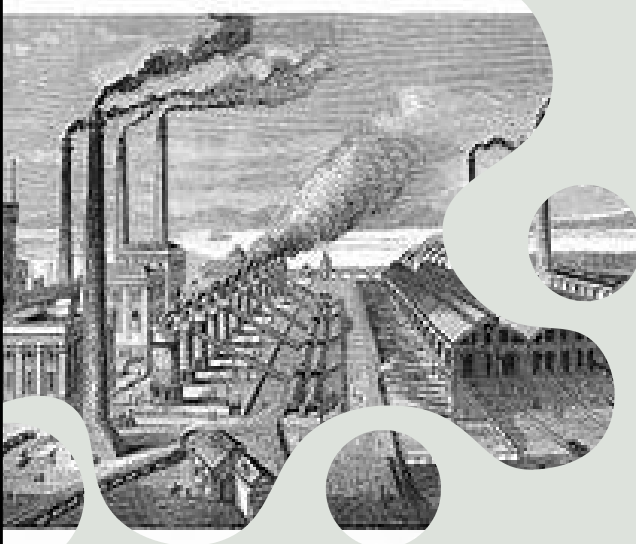
The second industrial revolution gave us the assembly line, high volume industrial production and high mass consumption.

The third allowed information to be captured in digital format and to be cost-effectively transformed, manipulated and transmitted.

The fourth industrial revolution has provided us with robotics, artificial intelligence, augmented reality, and virtual reality.

There were nearly two centuries between the first and second industrial revolutions.

[Learners to complete Question 1.1/class discussion]



Question 1.2 – How Industrial Revolutions changed the world

Impacts of the Industrial Revolution - Video Infographic
<https://youtu.be/qLHHH7B8foQ>

Question 1.2 – How Industrial Revolutions changed the world

(Retrieved from Copilot)

[Watch the video clip. Learners to complete the questions/class discussion.]

Let's explore the industrial revolution's **advantages** and **disadvantages**:

1. Advantages:

- **Goods Became More Affordable and Accessible:** Factories and machines produced items faster and cheaper than manual labor. As a result, goods like shoes, clothing, household items, and tools became more common and less expensive. Foreign markets also opened up, benefiting producers and contributing to economic growth¹.
- **Rapid Evolution of Labour-Saving Inventions:** The Industrial Revolution led to the development of new tools, vehicles, and communication infrastructure. Innovations like the spinning jenny, telegraph, and later electricity-driven appliances improved efficiency and connectivity¹.
- **Enhanced Wealth and Quality of Life:** The availability of affordable goods and increased wealth from trade boosted the average person's quality of

life. Specialist professions emerged, leading to a more diverse workforce¹.

2. Disadvantages:

- **Overcrowding of Cities and Industrial Towns:** Urbanization occurred rapidly, leading to overcrowded living conditions, inadequate sanitation, and social challenges¹.
- **Pollution and Environmental Damage:** The rise of factories and mass production resulted in pollution, deforestation, and habitat destruction. The long-term effects on the environment were not fully understood at the time¹².
- **Poor Working Conditions:** Factory workers endured long hours, hazardous conditions, and low wages. Child labor and exploitation were prevalent².
- **Gender Inequality:** Women and children faced exploitation and harsh working conditions in factories².

In summary, the Industrial Revolution brought both progress and challenges, shaping the modern world in profound ways.

The Impact of the Industrial Revolution (3,42 mins):

[\[https://www.youtube.com/watch?v=hv2JdhMc144\]](https://www.youtube.com/watch?v=hv2JdhMc144)

Question 1.3 – Lessons learned from previous Industrial Revolutions.

Question 1.4 – How Industrial Revolutions impacted the job market.

The impact of the 4th Industrial revolution on the workforce (1.24:13)

<https://youtu.be/QlhLMnullBE>



Question 1.3

Lessons learned from previous Industrial Revolutions

[Learners to work through the questions after watching the video clip: The Impact of the Industrial Revolution (3,42 mins):

[\[https://www.youtube.com/watch?v=hv2JdhMc144\]\]](https://www.youtube.com/watch?v=hv2JdhMc144)

The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited. And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.

Question 1.4

How Industrial Revolutions impacted the job market.

The four industrial revolutions have significantly impacted jobs and the global economy. Let's explore how each of these revolutions influenced employment:

1. First Industrial Revolution (Late 18th to early 19th century):

- **Technological Shift:** This revolution marked the transition from agrarian and handicraft-based economies to machine manufacturing. Innovations like the steam engine and mechanized textile production transformed industries.
- **Impact on Jobs:** Initially, there were concerns about job losses due to automation. However, over time, new jobs emerged in factories, transportation, and other sectors. Living standards improved, and overall employment increased.

2. Second Industrial Revolution (Late 19th to early 20th century):

- **Key Developments:** Electricity, mass production, and assembly lines were central to this revolution. Industries expanded, and urbanization accelerated.
- **Job Effects:** While some traditional jobs declined, new roles emerged in manufacturing, transportation, and administration. The rise of skilled labor and managerial positions contributed to overall job growth.

3. Third Industrial Revolution (Mid-20th century):

- **Technological Advances:** The advent of computers, automation, and digital technologies characterized this era. Industries became more efficient and interconnected.
- **Job Transformations:** Routine tasks were automated, impacting low-skilled jobs. However, the demand for skilled workers in technology, finance, and services increased. Overall, employment continued to rise.

4. Fourth Industrial Revolution (Present and ongoing):

- **Disruptive Technologies:** Artificial intelligence, robotics, blockchain, and 3D printing are reshaping economies and societies.
- **Job Challenges:** Automation threatens certain roles, especially repetitive tasks. However, jobs are now bundles of various tasks. As long as some tasks remain non-automatable, jobs persist. Human interaction, creativity, and adaptability remain essential.
- **Predictions:** Over 800 million workers across 42 countries could be displaced due to the Fourth Industrial Revolution. However, history shows that technological advancements ultimately lead to job creation and improved living standards.

In summary, while each industrial revolution brought changes and challenges, it also fostered innovation, new opportunities, and overall job growth. The key lies in adapting to evolving technologies and skills demands.

[<https://youtu.be/QlhLMnullBE>. This video clip is over an hour long. Go through the clip and select what you would like to share with your learners. Learners are then to read the article, *How Industrial Revolutions impacted the job market*, and work through the questions.]

QUESTION 2 THE FOURTH INDUSTRIAL REVOLUTION

Question 2.1 Delving into Industry 4.0

What is Industry 4.0?

<https://youtu.be/yKPrJJSv94M>



Question 2 The fourth Industrial Revolution

Question 2.1: Delving into Industry 4.0.

[Watch the video clip: What is Industry 4.0? <https://youtu.be/yKPrJJSv94M>]

[Read the article, *The Fourth Industrial Revolution: What It Means and how to respond*, and then get the learners to complete Questions 2.1.1 to 2.1.3.]



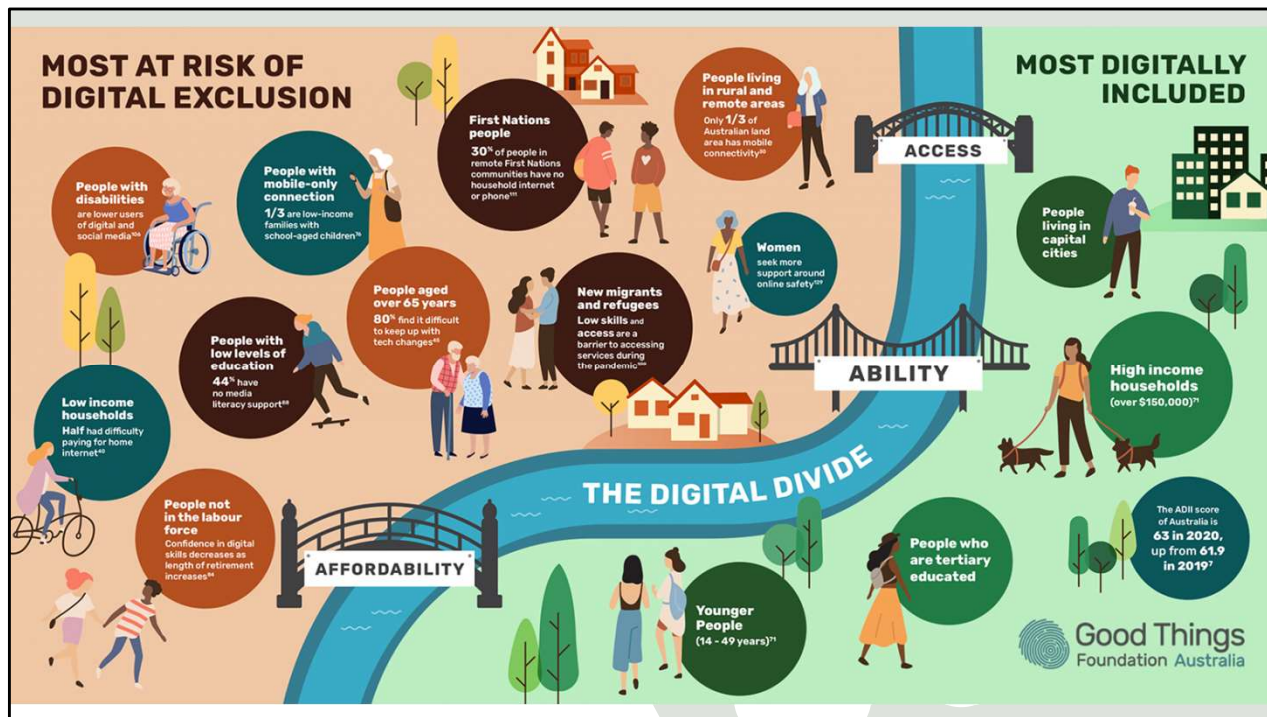
Question 2.1: Delving into Industry 4.0.

[Learners to complete Question 2.1.4.]

"The article mentioned that one of the biggest challenges around the rapid innovations in technology is that the current levels of inequality are set to become wider. The article mentions that one of the main reasons is due to unskilled workers losing their jobs due to automation.

- To what extent do you think this is/will be true in South Africa?
- Another cause of this inequality is the digital divide. Consider this divide and refer to the infographic and answer the questions that follow"

[Learners to complete Question 2.1]



Question 2.2 – The biggest concerns around the Fourth Industrial Revolution

What is the Fourth Industrial Revolution? | CNBC Explains (4,17 mins)
[<<https://www.youtube.com/watch?v=v9rZOa3CUC8>>]

- Job Displacement
- Inequality
- Privacy and surveillance
- Cybersecurity Risks
- Ethical Dilemmas
- Environmental Impact
- Education and Reskilling
- Geopolitical Tensions



Question 2.2 – The biggest concerns around the Fourth Industrial Revolution

[Watch *What is the Fourth Industrial Revolution? | CNBC Explains* (4,17 mins)
[<<https://www.youtube.com/watch?v=v9rZOa3CUC8>>]]

(Taken from Copilot)

The **Fourth Industrial Revolution (4IR)** brings forth transformative changes driven by technological advancements. Here are some significant concerns associated with this revolution:

1.Job Displacement: Automation, artificial intelligence, and robotics may lead to job losses in certain sectors. While new jobs will emerge, the transition can be challenging for workers.

2.Inequality: The 4IR could exacerbate existing inequalities. Those without access to digital technologies may fall further behind, creating a wider digital divide.

3.Privacy and Surveillance: Increased connectivity and data collection raise concerns about privacy. Balancing innovation with individual rights is crucial.

4. Cybersecurity Risks: As reliance on digital infrastructure grows, so do cyber threats. Protecting critical systems and personal data becomes paramount.

5.Ethical Dilemmas: The 4IR introduces dilemmas related to AI ethics, autonomous vehicles, and biotechnology. We must navigate these responsibly.

6.Environmental Impact: While technology can address environmental challenges, it also contributes to e-waste and energy consumption.

7.Education and Reskilling: Preparing the workforce for 4IR requires lifelong learning and reskilling programs.

8.Geopolitical Tensions: Technological dominance can lead to geopolitical tensions and competition.

In navigating the 4IR, a balance between innovation, ethics, and inclusivity is essential.

[Learners to complete Question 2.2/class discussion]

Question 2.3 – How to best prepare for the emerging world of work. Video Clip: <https://youtu.be/Azm6Tr4LUYg>

Top 10 skills of 2023

WORLD
ECONOMIC
FORUM

- | | |
|--|--|
| 1.  Analytical thinking | 6.  Technological literacy |
| 2.  Creative thinking | 7.  Dependability and attention to detail |
| 3.  Resilience, flexibility and agility | 8.  Empathy and active listening |
| 4.  Motivation and self-awareness | 9.  Leadership and social influence |
| 5.  Curiosity and lifelong learning | 10.  Quality control |

Type of skill

■ Cognitive skills
 ■ Self-efficacy
 ■ Management skills
 ■ Technology skills
 ■ Working with others

Source
World Economic Forum, Future of Jobs Report 2023.

Note
The skills judged to be of greatest importance to workers at the time of the survey

Question 2.3 – How to best prepare for the emerging world of work.

[Take a look through these two documents in preparation for this question:]

1. Impacts of the Industrial Revolution - Video Infographic

<https://youtu.be/qLHHH7B8foQ>

2. Future of jobs 2023: These are the most in-demand skills now - and beyond

<https://www.weforum.org/agenda/2023/05/future-of-jobs-2023-skills/>

[Watch the video clip: <https://youtu.be/Azm6Tr4LUYg>]

10 Skills for future work:

- Creativity
- Emotional Intelligence
- Critical Thinking
- Active Learning with a growth mindset
- Judgement and decision making
- Interpersonal Communication Skills
- Leadership Skills
- Diversity and Cultural Intelligence
- Technology Skills
- Embracing Change

Top 10 skills on the rise



- | | |
|---|---|
| 1.  Creative thinking | 6.  Systems thinking |
| 2.  Analytical thinking | 7.  AI and big data |
| 3.  Technological literacy | 8.  Motivation and self-awareness |
| 4.  Curiosity and lifelong learning | 9.  Talent management |
| 5.  Resilience, flexibility and agility | 10.  Service orientation and customer service |

Type of skill

■ Cognitive skills
 ■ Self-efficacy
 ■ Management skills
 ■ Technology skills
 ■ Working with others
 ■ Engagement skills

Source
World Economic Forum, Future of Jobs Report 2023.

Note
The skills judged to be increasing in importance most rapidly between 2023 and 2027

Businesses' top 10 skill priorities for 2027



- | | |
|--|--|
| 1.  Analytical thinking | 6.  Curiosity and lifelong learning |
| 2.  Creative thinking | 7.  Technological literacy |
| 3.  AI and big data | 8.  Design and user experience |
| 4.  Leadership and social influence | 9.  Motivation and self-awareness |
| 5.  Resilience, flexibility and agility | 10.  Empathy and active listening |

Type of skill

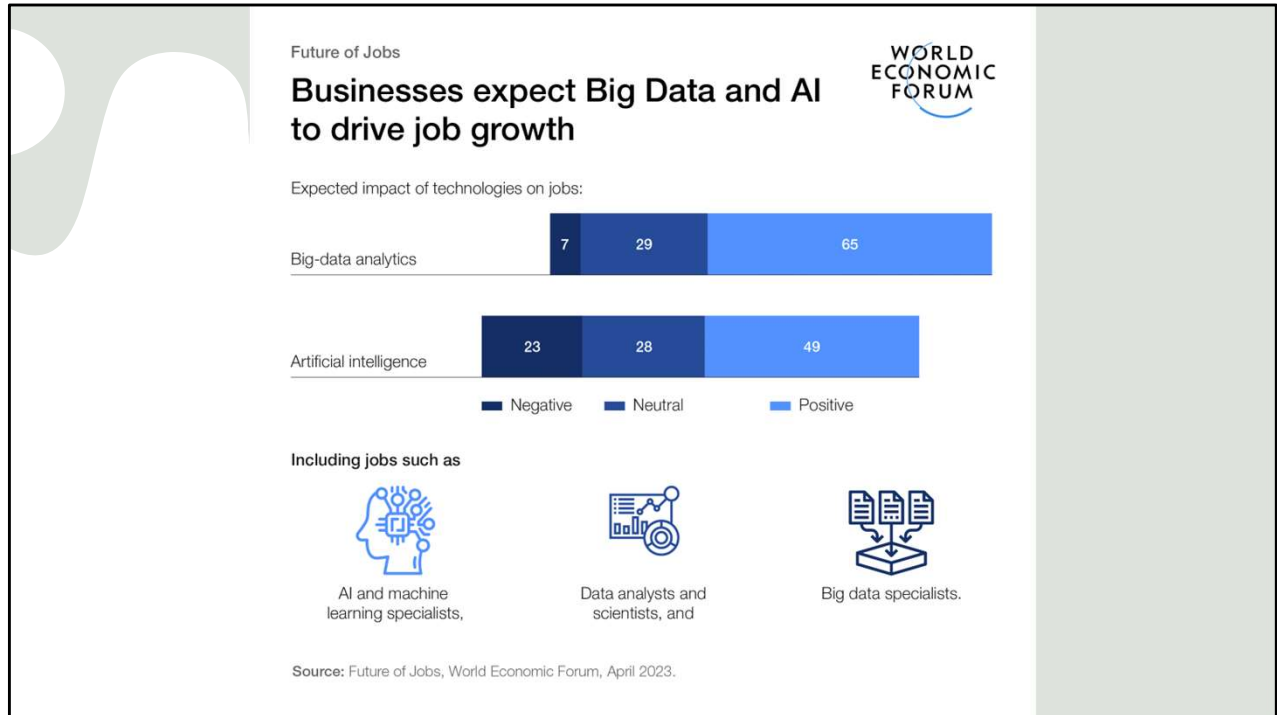
■ Cognitive skills
 ■ Self-efficacy
 ■ Technology skills
 ■ Working with others

Source

World Economic Forum, Future of Jobs Report 2023.

Note

The skills which organizations will prioritize in workforce development initiatives from 2023 to 2027



[Learners to complete Question 2.3/class discussion]

Question 2.4 – Industry 5.0

What is Industry 5.0? (2,30 mins)

[<<https://www.youtube.com/watch?v=QFH0H21PaJs>>]

Industry 5.0, which is expected to focus on the human aspect of work, is set to create an environment where creativity, critical thinking, and social intelligence are the main skills needed to be successful.

From Industry 4.0 to 5.0 | Angelo Wijaya | TEDxUNPAR

https://youtu.be/KH5T_-SDodg

Industry 5.0 Unveiled: Embracing Tomorrow's Technological Revolution

https://youtu.be/sGI2FFm_8tw

INDUSTRY 5.0



Human-centric



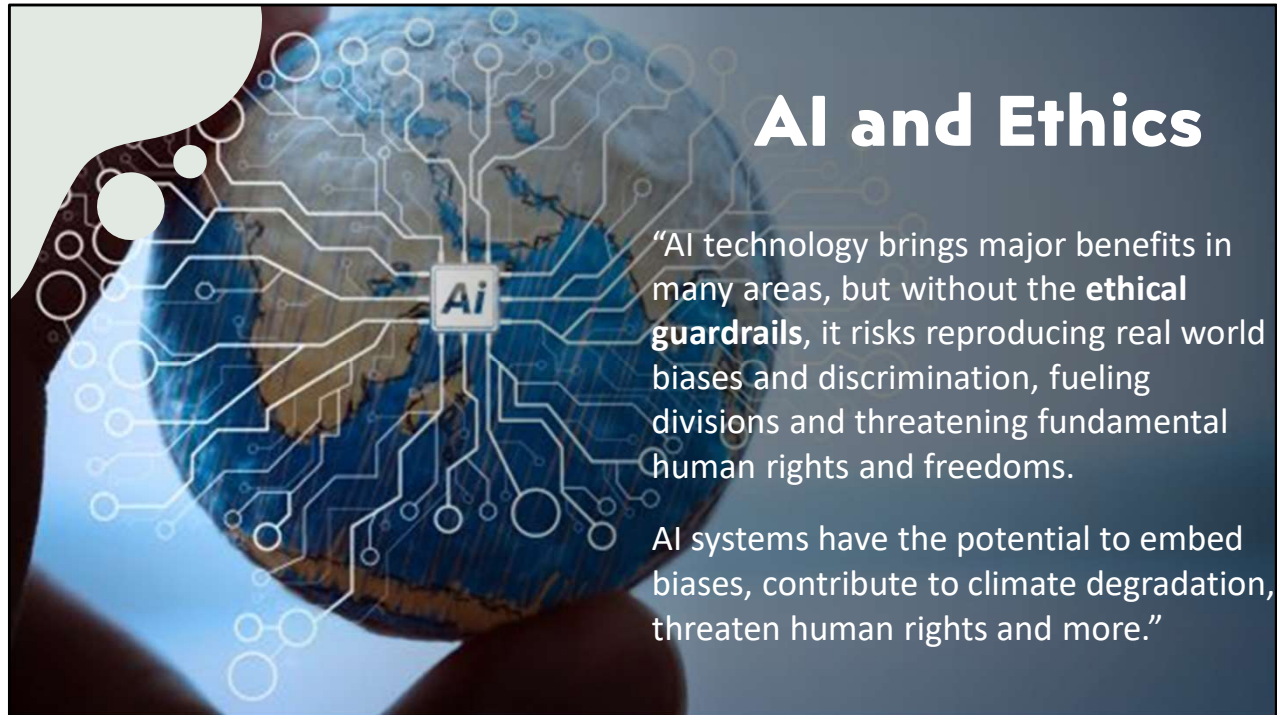
Sustainable



Resilient

Question 2.4 – Industry 5.0

[Learners to complete Question 2.4/class discussion]



[For the teacher: For your information, see Source 6: *Ethics of Artificial Intelligence*. Read through *UNESCO recommendation on the Ethics of Artificial Intelligence*.]

The rapid rise in **artificial intelligence (AI)** has created **many opportunities globally**, from facilitating healthcare diagnoses to enabling human connections through social media and creating labour efficiencies through automated tasks. However, these rapid changes also raise **profound ethical concerns**. These arise from the potential AI systems have to embed biases, contribute to climate degradation, threaten human rights and more. Such risks associated with AI have already begun to compound on top of existing inequalities, resulting in further harm to already marginalised groups.

[Learners can now do Question 3 under controlled conditions]



Time for a Revolution

QUESTION 4

Compulsory - 60 Marks:
REVOLUTIONISING OUR WORLD

AIM: Through research, you will be required to identify an area of society / business that you feel needs to be revolutionised. The skills of analysis, evaluation, and critical thinking will be required to respond adequately to this section.

Work through Question 4 and the rubric with your learners ensuring that they understand what is required.