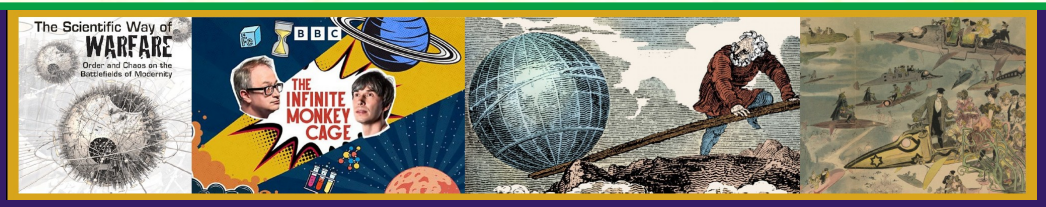
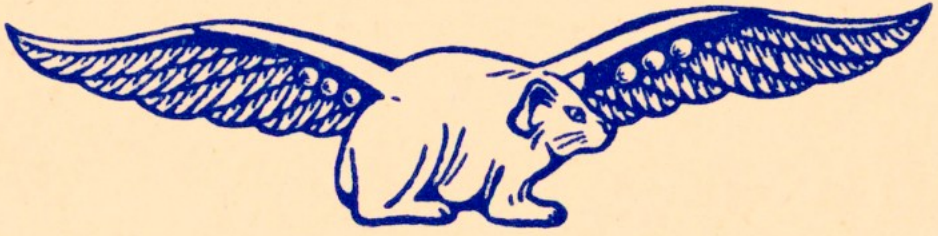
Does Science Need War ? Case Studies





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How should the three planes coordinate so the professor can fly continuously for the whole trip, without anyone running out of fuel and crashing?

1. The professor's plane must make a single continuous trip around the world without landing or turning around.

2. Each plane can travel exactly 1 degree of longitude in 1 minute for every kiloliter of fuel. Each can hold a maximum of 180 kiloliters of fuel.

3. Any plane can refuel any of the others in mid-air by meeting at the same point and instantly transferring any amount of fuel.

4. Fugori and Orokana's planes can turn around instantaneously without burning fuel.

5. Only one airport is available for any of the planes to land, take off, or refuel.

6. All three planes must survive the experiment, and none may run out of fuel in mid-air.

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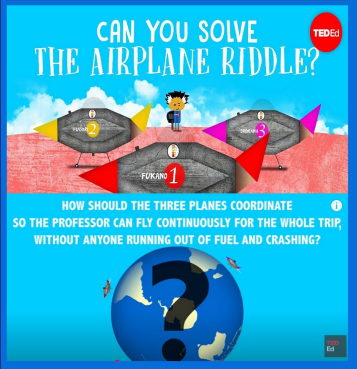
The Airplane Riddle

00:00-01:37



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Vocabulary	Stress Placement
un huitième:	coordinate
un voyage:	calculate
atterrir:	calculations
décoller:	permission
atteindre:	located
être plein de:	continuously
contenir:	professor
se ravitailler (en carburant):	identical
une jauge:	experiment
invariablement:	
à condition que:	
être à court de, venir à manquer de:	
de justesse, de peu, à un cheveu près:	
réussir, y arriver:	

Hypotheses :

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Clues:

1. **Think symmetrically, dividing the trip in half.**
2. **There's a good reason why there are two extra planes. Make sure the help each supporting plane can provide is maximized: each must help the professor more than once – which means they must be able to go back at some point to the airport.**
3. **Do not forget they can also fly in various directions.**

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Vocabulary

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se ravitailler (en carburant): .....
une jauge: .....
invariablement: .....
à condition que: .....
être à court de, venir à manquer de: .....
de justesse, de peu, à un cheveu près: .....
réussir, y arriver: .....

Stress Placement

coordinate
calculate
calculations
permission
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professor
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experiment

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Vocabulary

un huitième: one eighth
un voyage: a journey
atterrir: to land
décoller: to take off
atteindre: to reach
être plein de: to be loaded with
contenir: to hold
se ravitailler (en carburant): to refuel
une jauge: gauge (pronunciation [gei])
invariablement: consistently
à condition que: provided
être à court de, venir à manquer de: to run out of
de justesse, de peu, à un cheveu près: by a hair
réussir, y arriver: to pull it off

Stress Placement

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What do those pictures show?
What do they have in common?

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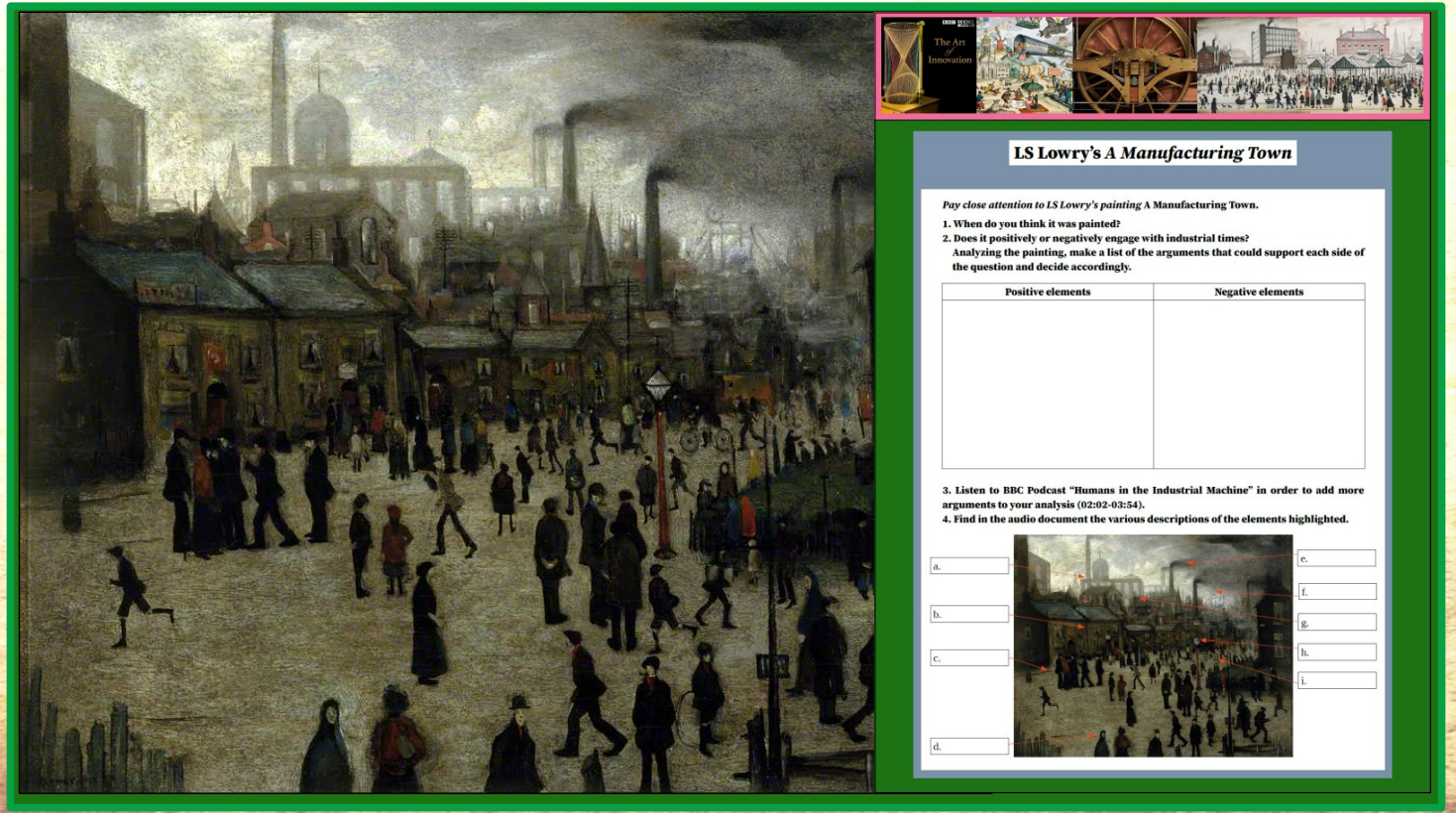
11 motion study photographs showing ways to operate a hand press
National Institute of Industrial Psychology, 1920-1930

In the USA in the 1890s, a new approach to worker productivity emerged. Scientific management practices broke down industrial tasks into their component actions, to be timed and rearranged for maximum efficiency. Part of this was motion study photography, such as this British example that compares a woman using 'old' and 'new' methods of operating a hand press. The latter removed one of the steps, increasing productivity by 40%. Critics objected that scientific management techniques curbed the skill and initiative of workers, turning them into machines without agency in their activities.

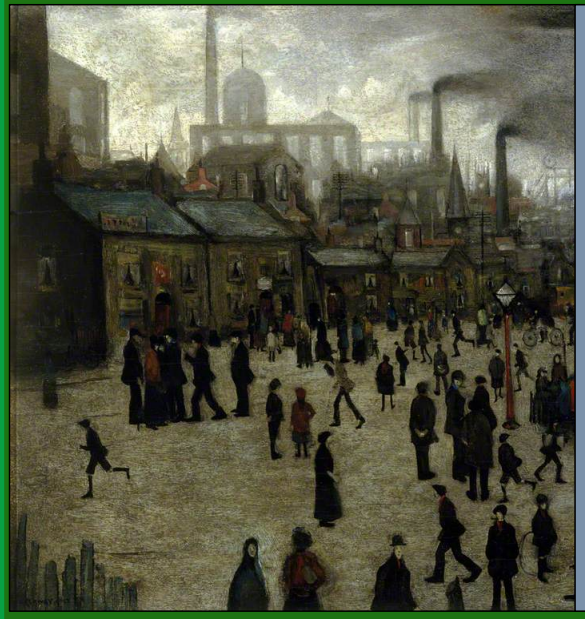
Moores formboard used at Rowntree's chocolate factory

Industrial psychology became popular in Britain in the 1920s and 1930s, aiming to study workers as humans rather than machines. In 1922 Rowntree's Cocoa Works was the first British company to employ an industrial psychologist, named Victor Moores. He designed 'formboards' with cut-out coloured shapes to test prospective workers' aptitude for packing chocolates into boxes. Although these psychological approaches considered workers as individuals, they still ultimately sought to increase productivity.

From scientific to social progress ?



From scientific to social progress ?



LS Lowry's *A Manufacturing Town*

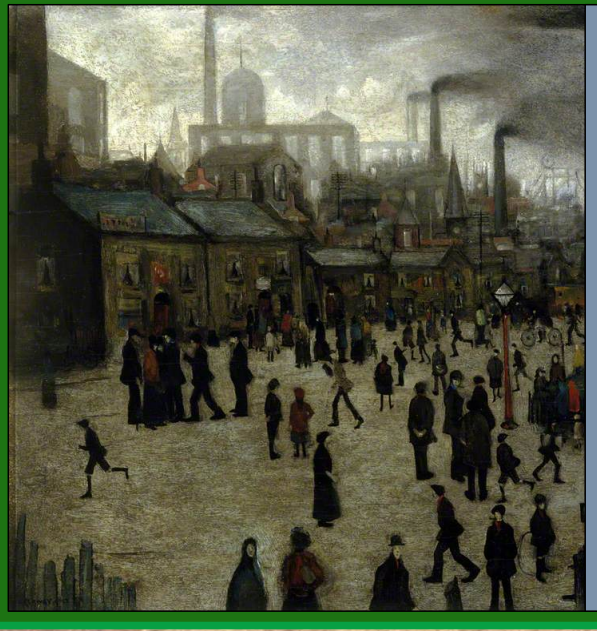
***Pay close attention to LS Lowry's painting* A Manufacturing Town.**

1. When do you think it was painted?

2. Does it positively or negatively engage with industrial times?
Analyzing the painting, make a list of the arguments that could support each side of the question and decide accordingly.

Positive elements	Negative elements

From scientific to social progress ?



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Positive elements	Negative elements
Heroic image of working-class pride (painted at last) Modern technologies, modern infrastructures > development and comfort for more people Ex. electric telegraph wires strung over the rooftops, electric or gas-mantle lighting, sewers. A bicycle > a marker of freedom for many people Liberation through modern technologies	Failure A political commentary on the social impact of industrialization Fog of the chimneys Largely faceless workers as elements of that industrial machine > dehumanization Trapped in modern technologies Repetition, routine and regularity of workers' lives > reflect the mechanisms, as workers are enslaved to the machine Uniform rows of mill windows and terraced houses > reflect the workers' loss of identity and individuality Time like a master dictating their lives > they do not own their own time

From scientific to social progress ?

3. Listen to BBC Podcast "Humans in the Industrial Machine" in order to add more arguments to your analysis (02:02-03:54).

4. Find in the audio document the various descriptions of the elements highlighted.

a. Textile mills. b. Rows of identical terraced houses. c. Sewers. d. Largely faceless workers. e. Fog from the chimneys. f. Factory clock. g. Electric telegraph wires strung over the rooftops. h. Gas-mantle lighting. i. Bicycle.