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Activity Worksheet for the class on

Environmental Footprint of a Manufactured Product

POLITÉCNICO DE LEIRIA

ACTIVITY WORKSHEET:
Analysing the Life Cycle of a T-Shirt

This activity builds on the class 'Environmental Footprint of a Manufactured Product' and aims to consolidate your understanding of Life Cycle Thinking by analyzing a short TED-Ed video available on Youtube: Angel Chang (2018) – *'The Life Cycle of a T-Shirt'*

The exercise connects to the three footprint indicators studied in class:
• Carbon footprint (kg CO_2e) – GWP100 indicator, climate change contribution.
• Water footprint (m^3 water eq) – freshwater consumption and degradation.
• Energy footprint (MJ) – cumulative primary energy demand.

1. Watch and Observe

Watch the 4-minute video available on Youtube: Angel Chang (2018) – *'The Life Cycle of a T-Shirt'*. Pay attention to the different stages the T-shirt goes through – from cotton farming to its end-of-life.

Link: https://www.youtube.com/watch?v=BiSYoeqb_VY

2. Map the Life Cycle

Draw (by hand or digitally) a simplified Life Cycle map of the T-shirt. Include the main stages: Raw Material Extraction → Manufacturing → Distribution → Use → End-of-Life.

You can attach or upload an image of your diagram.

3. Attribute Environmental Footprints

Complete the table below, identifying which type(s) of footprint dominate each stage, and explain briefly why.

Life Cycle Stage	Dominant Footprint(s)	Reasoning / Evidence from the Video
Cotton farming		
Spinning / weaving		
Dyeing / finishing		
Sewing / assembly		
Transport / distribution		
Use / washing / drying		
End-of-life / disposal		

4. Reflection Questions

1. Which life cycle stage seems to contribute most to the overall environmental burden of the T-shirt? Why?

2. Which footprint category (carbon, water, or energy) appears most critical across the product's life cycle?

3. What trade-offs can you identify? (For example, does reducing water consumption increase energy use?)

4. How could consumers influence the T-shirt's total footprint during the use phase?

5. Redesign Proposal

Choose one life cycle stage (e.g., cotton cultivation, dyeing, transport, or use) and suggest two realistic improvement measures that would reduce the T-shirt's environmental footprint.

Stage Selected	Improvement 1	Improvement 2	Expected Effect (↓ CO_2e / ↓ Water / ↓ MJ)

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