Ecological and social footprint

Unit 4 · Common specialist technical principles · matches the "Ecological and social footprint" lesson slides (about 60 minutes)

Teacher notes for someone teaching this lesson without a Design and Technology background, including a cover or supply teacher standing in for the usual class teacher.

IF YOU ONLY DO ONE THING (RUSHED COVER LESSON)

If you only do one thing: make sure every pupil can say what "Carbon footprint" means in their own words before the lesson ends. Greenhouse-gas emissions associated with a product or activity, usually expressed as CO2 equivalent. Ask two or three pupils to explain it back to you - do not just ask "does that make sense?".

Key facts in plain language

These are the facts this lesson depends on. They are written in plain English, not subject jargon, so you can say them in your own words while you teach.

Carbon footprint:
Greenhouse-gas emissions associated with a product or activity, usually expressed as CO2 equivalent.

Deforestation:
Removal of forest cover, which can damage habitats and carbon stores.

Ecological footprint:
A way of considering demand placed on natural resources and ecosystems.

Social impact:
Effects on people including workers, users and communities.

Common misconceptions

Drawn from the wrong answers pupils pick in this lesson's own question bank, paired with the explanation that is already written for the right answer.

Pupils may think: "Ship parts by air to save time" is correct.
Why it is wrong: the correct answer is "Use lower-carbon or renewable electricity". Lower-carbon energy can reduce emissions associated with manufacture.

Pupils may think: "Reduced carbon emissions overall" is correct.
Why it is wrong: the correct answer is "Habitat loss, waste and water pollution". Extraction and processing can disturb land, generate waste and cause pollution if poorly managed.

Pupils may think: "Melting point of a polymer" is correct.
Why it is wrong: the correct answer is "Factory working conditions". Social impact includes conditions experienced by workers and communities.

Pupils may think: "They are made without any glues or resins" is correct.
Why it is wrong: the correct answer is "They come from responsibly managed, certified forests". FSC certification covers responsible forest management and chain-of-custody standards, which is more than simply saying trees are replanted.

Pupils may think: "Only the distance travelled matters" is correct.
Why it is wrong: the correct answer is "Modes differ greatly in emissions per unit moved". Distance, load and transport mode all influence distribution impact.

Talking points to follow the slide deck

The slide deck for this lesson follows the usual DT Classroom shape: a retrieval starter, then each key term below in turn, worked examples, exam-style practice, then an exit ticket. Use these lines as you reach each part - they are the same facts as above, just phrased as something you can say out loud.

When the deck reaches "Carbon footprint": say — Greenhouse-gas emissions associated with a product or activity, usually expressed as CO2 equivalent. Ask: "can someone give me an example?"

When the deck reaches "Deforestation": say — Removal of forest cover, which can damage habitats and carbon stores. Ask: "can someone give me an example?"

When the deck reaches "Ecological footprint": say — A way of considering demand placed on natural resources and ecosystems. Ask: "can someone give me an example?"

When the deck reaches "Social impact": say — Effects on people including workers, users and communities. Ask: "can someone give me an example?"

Worked answers to this lesson's questions

The same question bank used for this lesson's knowledge organiser self-check and worksheet exam practice. Use this page as the answer key, or cover the right-hand explanation and hand out the questions as a silent task (see the cover lesson box below).

1. Which change can reduce manufacturing emissions where the electricity supply allows it?

a) Ship parts by air to save time, b) Use more packaging to protect goods, c) Use lower-carbon or renewable electricity, d) Design products so they are replaced sooner by users

Answer: c) Use lower-carbon or renewable electricity. Lower-carbon energy can reduce emissions associated with manufacture.

2. Mining metal ores can cause…

a) Reduced carbon emissions overall, b) Habitat loss, waste and water pollution, c) Lower energy use than recycling the same metal, d) Increased forest cover near the mine

Answer: b) Habitat loss, waste and water pollution. Extraction and processing can disturb land, generate waste and cause pollution if poorly managed.

3. Which is a social-impact issue?

a) Melting point of a polymer, b) Hardness of the material, c) Recyclability of packaging, d) Factory working conditions

Answer: d) Factory working conditions. Social impact includes conditions experienced by workers and communities.

4. What does FSC certification indicate about timber or forest products?

a) They are made without any glues or resins, b) They have been treated to be waterproof, c) They are always the cheapest timber on the market, d) They come from responsibly managed, certified forests

Answer: d) They come from responsibly managed, certified forests. FSC certification covers responsible forest management and chain-of-custody standards, which is more than simply saying trees are replanted.

5. Why should transport method be considered in a life-cycle decision?

a) Only the distance travelled matters, b) Modes differ greatly in emissions per unit moved, c) Transport has no real environmental effect, d) All freight modes use about the same energy per tonne

Answer: b) Modes differ greatly in emissions per unit moved. Distance, load and transport mode all influence distribution impact.

READY-TO-RUN COVER LESSON

Project the existing lesson slides as normal; read the key facts and talking points above before the lesson starts.

Low-prep silent task (needs no workshop tools or machinery): write or display the numbered questions above without the "Answer:" line, and have pupils answer them in silence on paper. Mark from the answers above at the end, or next lesson.

If the lesson plan calls for tools, machinery, heat or anything hands-on, do not run that part as a non-specialist cover teacher - set the silent task above instead and leave the practical for the subject teacher. See the general workshop safety guide in the Teachers hub.