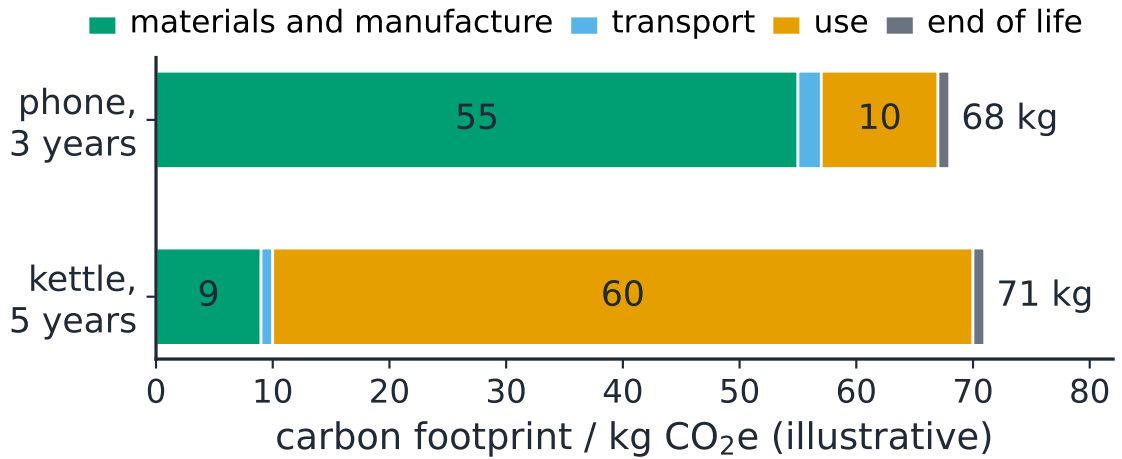
Exercise walk-through

3.3
Innovation, cost, intellectual property and ethics

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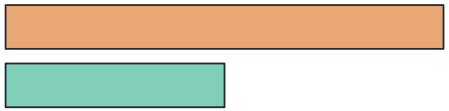
Where is the footprint?



- Phone, 81 % from materials and manufacture.
- Kettle, 85 % from use.

Kettle costs, drawn

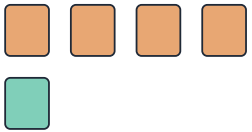
cost per year of service



A: $120 \div 2 = ¥60$ per year

B: $(200 + 40) \div 8 = ¥30$ per year

kettles used over 8 years



A: 4 kettles

B: 1 kettle, 1 repair

Dearer in the shop, half the cost per year and a quarter of the waste

> The dearer, repairable kettle costs half as much per year

Check yourself

Try these

Toaster A costs ¥90 and lasts 3 years; B costs ¥240 plus a ¥30 repair and lasts 10 years. Compare the cost per year.

A bag sells for ¥150; fixed costs ¥45 000, variable ¥60. Find the break-even.

Evaluate a bottle labelled eco-friendly because it has 30 % recycled plastic.

Exercise 2.1

2.1 Distinguish between an **invention** and an **innovation**. [2]



Exercise 2.1

2.1 Distinguish between an **invention** and an **innovation**. [2]



2.1

an invention is a new idea, product or process; an innovation is an invention that has been brought to market and is used

Exercise 2.2

2.2 Identify the form of intellectual property that would protect:

(a) a new mechanism for a folding pushchair; [1]

(b) the logo of the pushchair company. [1]



(a)



(b)

Exercise 2.2

2.2 Identify the form of intellectual property that would protect:

(a) a new mechanism for a folding pushchair; [1]

(b) the logo of the pushchair company. [1]



(a)



(b)

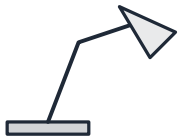
2.2

(a) patent

(b) trademark

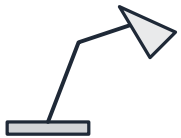
Exercise 2.3

2.3 A desk lamp sells for ¥60. Fixed costs are ¥12,000 and the variable cost is ¥20 per lamp. Calculate the break-even number of lamps. [2]



Exercise 2.3

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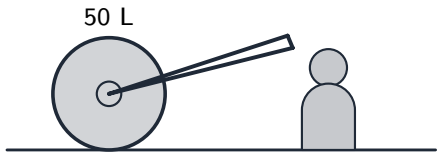
2.3

$12\,000 \div (60 - 20) = \mathbf{300}$ lamps

Exercise 3.1 (a)

3.1 A design team has developed a rolling water container for villages where people carry water a long way by hand. It holds 50 litres and is pushed with a handle.

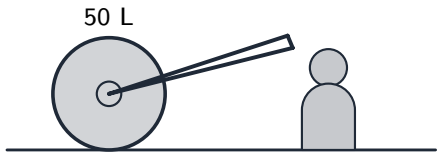
(a) Outline **two** features that make this an example of appropriate technology. [4]



Exercise 3.1 (a)

3.1 A design team has developed a rolling water container for villages where people carry water a long way by hand. It holds 50 litres and is pushed with a handle.

(a) Outline **two** features that make this an example of appropriate technology. [4]



(a) any two, outlined: affordable for families with low incomes; simple, so it can be repaired with local skills and tools; needs no fuel or electricity; made from tough local or easy-to-get materials, e.g. polyethylene

Exercise 3.1 (b)

3.1 A design team has developed a rolling water container for villages where people carry water a long way by hand. It holds 50 litres and is pushed with a handle.

(b) The team could patent the design or share it as open source. Explain **one** advantage and **one** disadvantage of a patent. [4]

Exercise 3.1 (b)

3.1 A design team has developed a rolling water container for villages where people carry water a long way by hand. It holds 50 litres and is pushed with a handle.

(b) The team could patent the design or share it as open source. Explain **one** advantage and **one** disadvantage of a patent. [4]

(b) advantage: protects the invention for about 20 years, so the team can earn money / license it to pay for development; disadvantage: applying is costly and makes the design public; other makers cannot freely make cheap copies, so fewer people may get it