

Who really pays a tax on sugary drinks?

Teacher guidance and answers | Original TBS classroom practice

Use this lesson after students have met supply and demand shifts and price elasticity of demand. Students read a tax diagram, work out the incidence of the tax and the government's revenue, link the incidence to elasticity, then draw a subsidy themselves. The tasks are planned to take about 55 minutes and have not been trialled in a classroom. The minutes include brief answer checking but not handing out materials or a full plenary; allow about 65 minutes in the timetable. Suited to Year 12 or Year 13 classes studying Edexcel 9EC0 Theme 1.

Curriculum fit

Pearson Edexcel Level 3 Advanced GCE in Economics A (9EC0), Specification Issue 2, October 2016, Theme 1, section 1.2.9 Indirect taxes and subsidies (printed page 8): supply and demand analysis and elasticities, the impact of indirect taxes on consumers, producers and government, the incidence of indirect taxes on consumers and producers, the impact of subsidies, and the areas that represent the producer and consumer subsidy. Checked against the archived Issue 2 specification; please confirm the specification for your cohort with your exams officer. This is a TBS lesson, not a Pearson resource; it is not endorsed by Pearson and uses no Pearson exam questions or mark schemes.

The diagrams use straight-line curves (demand $P = 10 - Q/10$, supply $P = 1 + Q/20$, both in £ and million litres) so that every point is exact; students do not need the equations. All figures are fictional. The answers are indicative teaching guidance only. There is no official mark tariff, level descriptor or AO allocation for these tasks and no grade claim is made.

Lesson plan (about 55 minutes of tasks, estimated)

Stage	Minutes	What happens
Starter: true or false?	5	Three statements about taxes and subsidies.
Task 1: read the diagram	10	Producer price and the split of the tax.
Task 2: the areas	10	Areas X and Y, tax revenue, producer revenue.
Task 3: elasticity	8	PED between E1 and E2 and the incidence.
Task 4: a subsidy	10	Draw the subsidy; cost and split.
Task 5: judge the claim	8	Written judgement.
Exit ticket	4	Two quick questions.
Total	55	

45-minute version: starter 4, Task 1 8, Task 2 8, Task 3 6, Task 4 8, Task 5 7, exit ticket 4. Ask for about 60 words in Task 5. This timing has not been trialled. The 45 minutes are task time only, so in a real 45-minute period, with handing out and feedback, move the exit ticket to homework.

Answers: starter, Task 1 and Task 2

Indicative guidance for teachers. This is not an exam board mark scheme and carries no marks or grades.

Starter: (i) true; (ii) false - who hands the money to the government does not decide who bears it, because the price consumers pay can rise; (iii) true.

Task 1a: $\text{£}4.40 - \text{£}0.60 = \text{£}3.80$ per litre (the point on the original supply curve at 56 million litres). Page 3 repeats the figures students need, including $\text{£}3.80$, so check Task 1 before students turn over.

Task 1b: consumers pay $\text{£}4.40 - \text{£}4.00 = \text{£}0.40$ per litre, which is $0.40 / 0.60 = 66.7\%$ of the tax; producers bear $\text{£}4.00 - \text{£}3.80 = \text{£}0.20$ per litre, which is 33.3% .

Task 2	Answer	Working
a. Area X	Consumers' share of the tax: $\text{£}22.4\text{m}$ a week	$(4.40 - 4.00) \times 56 = 0.40 \times 56 = 22.4$
a. Area Y	Producers' share of the tax: $\text{£}11.2\text{m}$ a week	$(4.00 - 3.80) \times 56 = 0.20 \times 56 = 11.2$
b. Tax revenue	$\text{£}33.6\text{m}$ a week (X + Y)	$0.60 \times 56 = 33.6$
c. Producer revenue	$\text{£}240\text{m}$ before, $\text{£}212.8\text{m}$ after: down $\text{£}27.2\text{m}$	$4.00 \times 60 = 240$; $3.80 \times 56 = 212.8$; $240 - 212.8 = 27.2$

Teaching point: consumers spend more in total after the tax ($4.40 \times 56 = \text{£}246.4\text{m}$, up from $\text{£}240\text{m}$) even though they buy less, because demand is price inelastic in this range.

Answers: Task 3, Task 4 and Task 5

Task 3a: quantity $-4 / 60 = -6.7\%$; price $+0.40 / 4.00 = +10\%$; PED = $-6.7 / 10 = -0.67$ (exactly $-2/3$), so demand is price inelastic between E1 and E2.

Task 3b: because demand is inelastic, consumers keep buying almost as much when the price rises, so producers can pass most of the tax on in a higher price without losing many sales. The more inelastic demand is relative to supply, the larger the share consumers bear.

Task 4a: the new supply curve is parallel to S and £0.30 lower. It crosses demand at E3 (£3.80, 62 million litres). The subsidy area is the rectangle between the price consumers pay (£3.80) and the price producers receive (£4.10), from 0 to 62 million litres.

Task 4b: cost to government $0.30 \times 62 = £18.6\text{m}$ a week. Consumers gain $£4.00 - £3.80 = £0.20$ per litre (two thirds of the subsidy); producers receive £4.10, gaining £0.10 per litre (one third).

Task 5: indicative guidance

A well supported answer judges the claim with figures and elasticity. Example response (not a mark scheme): I mostly disagree. Firms hand the £0.60 per litre to the government, but the price shoppers pay rises from £4.00 to £4.40, so consumers bear £0.40 (two thirds) and firms only £0.20. Consumers pay £22.4m of the £33.6m raised each week. This is because demand is price inelastic (about -0.67): shoppers keep buying, so firms can pass most of the tax on. Firms do lose, though: their revenue falls by £27.2m a week. If demand were more elastic, firms would bear more.

Look for correct figures, a clear use of elasticity and a judgement that depends on the evidence. Do not award a grade or percentage from these tasks.

Answers: exit ticket

a. Consumers pay £0.70 of the £1.00 tax, so they bear 70% and producers 30%. b. Consumers would bear the whole tax, because the quantity demanded does not fall at all, so producers can raise the price by the full amount of the tax.

Sources and limits

Curriculum source: Pearson Edexcel Level 3 Advanced GCE in Economics A specification, Issue 2, October 2016, Theme 1, section 1.2.9 (printed page 8). The specification verifies the topic scope only. The market, curves, figures, timings and guidance are original TBS teaching design.