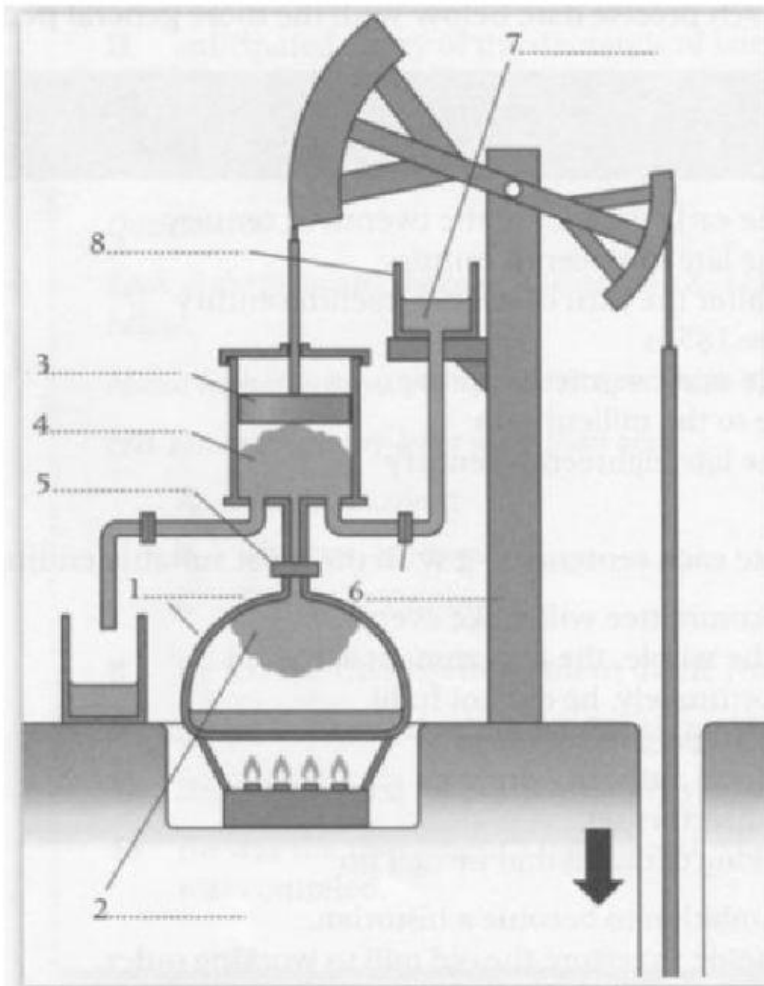


LABELLING A DIAGRAM AND COMPLETING FLOW CHART

A. Read the passage, and try to label the diagram USING NO MORE THAN TWO WORDS for each blank space



2 Look at the diagram and answer questions a and b.

- a What does the diagram show?
- b What types of words are needed to label the diagram? Make some predictions.

3 Label the diagram using no more than TWO words from the passage below for each blank space.

Thomas Newcomen's steam engine was one of the first devices to use the power of steam for mechanical work. It was originally used to pump water from mines. A boiler, encased in brick and sitting over a coal fire, generated steam, which drove the

piston in the open top cylinder above the boiler. When the steam built up, the pressure opened a valve allowing the steam to fill the cylinder and push the piston up. When the piston reached the top of the cylinder, the first valve was closed and the second valve opened. This second valve sprayed cold water into the cylinder from a cistern, condensing the steam and creating a vacuum. The air pressure from the open-top cylinder pushed the piston down again, thus pulling the rod down with it. The cycle then repeated itself all over again.

B. TABLE COMPLETION

1. Scan the passage to find the words with similar meanings

- a. Downside
- b. Benefit
- c. Drawback
- d. Stumbling block
- e. Problem
- f. Upside
- g. Plus
- h. Handicap

The future of energy sources

- A** The future for petroleum use at the moment looks rather uncertain, despite enjoying the major benefit of a very advanced infrastructure already in place. The downsides from the environmental point of view are patently obvious: harm to public health through carbon dioxide emissions in exhaust fumes, which are linked to respiratory problems, and to precious ecosystems from oil spills and seepage. But the most significant weakness is that oil is a finite resource.
- B** The picture for natural gas is similarly mixed. While its main strength lies in its being a relatively clean fuel involving little processing and being easily transportable via pipelines, natural gas requires compression or low temperatures if it is to be used for cars or other vehicles. Thus, it has not previously been a serious contender to provide private transportation. There are now signs, however, that this obstacle may have been overcome.
- C** Yet there is another problem with natural gas. It may produce less carbon dioxide than other fossil fuels, but the major stumbling block to its use is that the methane released lives for a long time in the atmosphere. In addition, as it is a non-renewable energy source like petroleum, in coming years natural gas will not be in use. But in the short term at least, the situation looks rosy.
- D** Ethanol, despite the drawback of a dearth of commercial outlets, heralds a new dawn for the energy market. But, before we consider ethanol in depth, let us look at hydrogen. It is perhaps the most attractive of all renewable fuels. Its greatest appeal is that it is readily available everywhere in the form of water (H₂O). Solar energy is used to split the water into hydrogen and oxygen and then recombine it, with water being the waste by-product in the form of steam in vehicles. Perhaps its main drawback is making the hydrogen production units small enough to fit cars. But once this happens, the future of hydrogen is bright indeed.

2. Read and complete the table below. Use **NO MORE THAN TWO WORDS** from the passage to fill in the table.

Types of fuel	Main advantage	Main disadvantage	Future
Petroleum	Very advanced infrastructure	1	Uncertain
Natural Gas	Relatively clean	Produces 2	3
Ethanol	None given	Lack of 4	Signals a 5
Hydrogen	6	Hydrogen production units for cars not small enough	7

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C. COMPLETING FLOW CHART

1. Read the passage and find all linking phrases or words that related with a stage

5 10	The production of fuel-ethanol or 'grain spirit' from grain is relatively straightforward. It is made from harvested crops. As the demand for alternative 'clean' fuels increases, farmers are switching from planting crops for consumption to fuel crops like corn, barley, wheat, or others that produce oil like palm oil and rape seed. The growing process is no different from that of any crop. A farmer simply plants a field of corn, which is then harvested. Instead of being taken to a mill to produce flour, the corn is delivered by lorry to a distillery where it goes through four	15 20	main stages before it can be used as fuel. First, during a preparation phase, the grain is ground and then cooked prior to the fermentation process commencing. Then, before the distillation of the liquid to produce the ethanol takes place, solid matter has to be removed by filtration. At a fuel-ethanol plant, the blending of ethanol and petroleum is carried out to produce E-10, a mix of 10 per cent ethanol and 90 per cent petroleum, or E-15, which is 15 per cent ethanol and 85 per cent petroleum. The liquid is then put into storage and the distribution process is ready to begin.
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2. Now complete the flow chart below using NO MORE THAN TWO WORDS from the passage

