

Endangered elements of the periodic table

Education in Chemistry

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Teacher notes

It is a common myth among students that longer questions require them to answer in full sentences and paragraphs. In this lesson students practise selecting and organising information to answer a question.

Required materials: Powerpoint slides of lesson activities, lined paper.

Answers to student activities

Use the information in the article to answer the following questions.

Discuss the impact of car technology on the future availability of the metals platinum and lithium.

Platinum	Lithium
<ul style="list-style-type: none">• Oxides of platinum are in short supply since they are catalysts in catalytic converters.• Electric cars are reducing the demand.	<ul style="list-style-type: none">• Electric cars are powered by batteries dependent on lithium.• Lithium is common in the Earth's crust but demand is soaring.• Safety and supply concerns about lithium are leading scientists to look for alternatives, so demand may decrease.

Discuss the threats to the supply of phosphorus and the innovations scientists are researching to overcome them. Include discussion of environmental considerations.

Threat	Innovation
<ul style="list-style-type: none">• Widespread use as phosphates in crop fertilisers.• Reserves of rock phosphate are likely to be exhausted before the end of the century.	<ul style="list-style-type: none">• Phosphorus could be extracted from agricultural runoff.• This could then be recycled onto the fields.• This would have an added benefit of reduce the environmental damage caused by algal blooms.• Phosphorus can also be recovered from sewage (as human urine is rich in phosphorus).

The article makes an analogy between fossil fuels and helium. Discuss the accuracy of this analogy using the information in the article and your own knowledge.

Similarities between fossil fuels and helium	Differences between fossil fuels and helium
<ul style="list-style-type: none">• Finite supply, cannot be replaced.	<ul style="list-style-type: none">• Fossil fuels are used up when burned and converted into other substances.• Helium is lost because it is a light gas that escapes easily.• Resources of helium are small-scale, eg trapped in small quantities in petroleum.