

Feedback Lesson

Do Now:

1. State the name of the positive electrode in electrolysis.

The positive electrode is the anode.

2. List the ions in molten beryllium oxide.

Be^{2+} and O^{2-} .

3. Why do ionic substances need to be melted or dissolved for electrolysis to work?

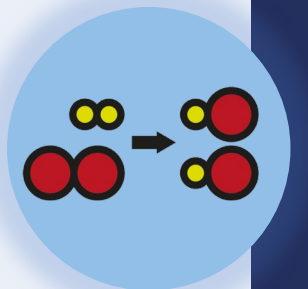
So that the ions can move and carry charge through the electrolyte.

4. What ions does water form?

H^+ ions and OH^- ions

5. Explain the difference between renewable and non-renewable energy resources.

Renewable energy resources can be replenished as they are used but non-renewable resources cannot.



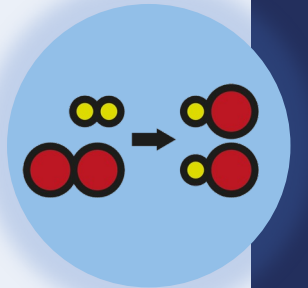
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Drill:

1. State the SI unit of energy.
2. State the SI unit of power.
3. State the equation used to calculate gravitational potential energy.



Feedback Lesson

C4.2.16

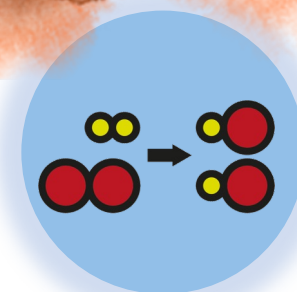
Science
Mastery



C4.2.1 PKR: Reactions of Metals
C4.2.2 Extracting Less Reactive Metals
C4.2.3 PKR: Ions, Ionic Bonding and Deducing Ionic Formulae
C4.2.4 (HT) Ionic Equations and Displacement Reactions
C4.2.5 (HT) Writing Half Equations
C4.2.6 (HT) Ionic Equations for the Reactions of Acids and Metals

C4.2.7 Introduction to Electrolysis
C4.2.8 Extracting Metals by Electrolysis
C4.2.9 Electrolysis of Molten Ionic Compounds
C4.2.10 Electrolysis in Solutions
C4.2.11 RP: Electrolysis of Aqueous Solutions
C4.1.12 RP: Electrolysis of Aqueous Solutions
C4.1.13 TIF: Corrosion and its Prevention
C4.2.14 (HT) Obtaining Raw Materials
C4.2.15 Recycling Metals

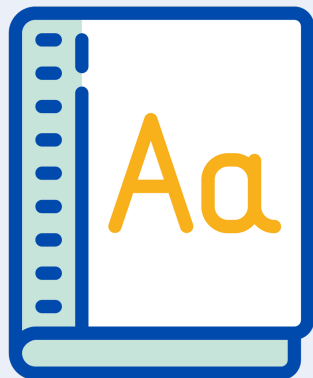
➤ **C4.2.16 Feedback Lesson**



Following this lesson, students will be able to:

- [Teacher to edit objectives based on mastery quiz outcomes]
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Key Words:



electrolysis

electrolyte

half equation

ionic equation

phytomining

This is the fix-it portion of the lesson

The **fix-it** is an opportunity to respond to gaps in knowledge, especially those identified by the previous lesson's exit ticket.

- The teacher should customise this slide as needed, to facilitate
 - **reteach, explanation, demonstration** or **modelling** of ideas and concepts that students have not yet grasped or have misunderstood.
 - **practise** answering specific questions or of key skills.
 - **redrafting** or **improving** previous work.

Answer the questions below.

1. Choose which describes a method used to recycle metals.
 - ☐ A. Reforming then melting
 - ☐ B. Recasting then reformed
 - ☒ C. Melting then recasting
2. Steel cans should not be disposed of in landfill because...
 - ☒ A. the metal can be recycled instead
 - ☐ B. the iron can form iron ore
 - ☐ C. the landfill costs more than recycling
3. Which of the following is a **social** advantage of recycling metals?
 - ☐ A. Recycling metals is less costly than extracting metals from ores
 - ☒ B. Recycling metals provides jobs for people
 - ☐ C. Recycling metals preserves valuable natural ores.

The Big Idea: Reactions Rearrange Matter



Structure and Bonding

How are metals extracted? Are all metals obtained in the same way?

Some metals are more reactive than others. Some metals are found in ores, and some are found as pure metals in the Earth's crust. Different metals require different chemical processes to extract them from their ores. In order to conserve natural resources, we can recycle metals.

This is the **sixth** unit we are studying as part of the big idea: **Reactions Rearrange Matter**.

In this unit we will learn about some of the common reactions of metals. We will be able to represent these reactions with word and balanced chemical equations.

We will be able to describe displacement reactions, which are one type of reaction used to extract a metal from an ore. Some students will be able to represent these reactions with new types of chemical equations: ionic equations and half equations.

You will study a technique called electrolysis. This is used to extract the most reactive metals from their ores. You will carry out your own electrolysis reactions, and be able to explain how this works by referring to the movement of ions.

Finally, we will study the corrosion of metals and how this can be prevented. We will learn about recycling metals, and the advantages and disadvantages of this.

TASKS:

What subject will this unit focus on? BIOLOGY CHEMISTRY PHYSICS
(circle the correct subject)

There are lots of keywords underlined above. List these into the two columns:

Words I know	Words I haven't seen before

To answer before the unit:

1. What are you most excited to learn about in this topic?



2. What do you already know about this topic?

3. Why do you think it's important to learn that structure determines properties?

4. What knowledge from previous science lessons might help us?

5. What questions do you have about this topic?

To answer at the end of the unit:

1. Tick off any words in the 'words I haven't seen before' column that you are now confident with. Circle any you still need more practice to use.

2. What have you most enjoyed about this unit?

3. What more would you like to learn about extracting metals as part of the big idea: 'Reactions Rearrange Matter'?

Teacher guidance:

Answers

Can you explain why your answer was wrong?

Question	Answer
1	B
2	B
3	B
4	A
5	B
6	C
7	B
8	A
9	A
10	A
11	B

Question	Answer
12	C
13	C
14	A
15	A
16 (HT)	A
17 (HT)	B
18 (HT)	C
19 (HT)	A
20 (HT)	A
21 (Chemistry only)	C
22 (Chemistry only)	C

Answers

1. 2+ [1]

2.
It has gained electrons [1]

3.
Gold is very unreactive [1]

(so it found as pure metal in the Earth because it)will not easily react
with other substances [1]

Answers

4.

Magnesium ions (in the molten magnesium chloride) [1]

are attracted to the negative electrode/cathode (because they are positively charged). [1]

(At the negative electrode,) magnesium ions gain electrons [1]

Or

are reduced

2 electrons are gained [1]

(HT only) Allow 3 marks for the correct half equation

$\text{Mg}^{2+} + 2\text{e}^- \rightarrow \text{Mg}$ (HT only)

Answers

5.

Phytomining

[1]

uses plants to absorb metal compounds

[1]

(The plants are harvested and) then burned to produce ash that contains metal compounds

[1]

Bioleaching

[1]

uses bacteria

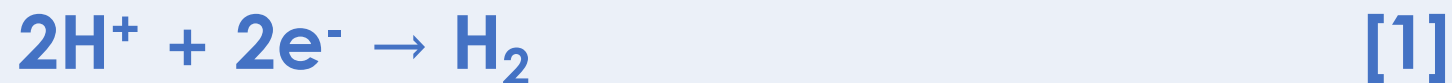
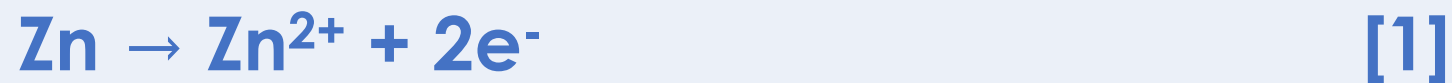
[1]

to produce leachate solutions (that contain metal compounds)

[1]

Answers

6.



7. Chemistry only

By reacting with substances in the environment. [1]

Lesson C4.2.16

What was good about this lesson?

What can we do to improve this lesson?

[Send us your feedback by clicking this link](#)
or by emailing sciencemastery@arkonline.org
Thank you!