

Corrosion: All at Sea: Overview

Summary

In this activity, students will simulate and test which environmental conditions influence the rate corrosion of different metals and describe the observed changes.

Curriculum Outcomes: Australian Curriculum F-10

Level 9

Science as a human endeavour

- People use scientific knowledge to evaluate whether they accept claims, explanations or predictions, and advances in science can affect people's lives, including generating new career opportunities (ACSHE160)
- Values and needs of contemporary society can influence the focus of scientific research (ACSHE228)

Science Understanding: Chemical sciences

- Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed (ACSSU178)
- Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer (ACSSU179)

Level 10

Science as a human endeavour

- People use scientific knowledge to evaluate whether they accept claims, explanations or predictions, and advances in science can affect people's lives, including generating new career opportunities (ACSHE194)
- Values and needs of contemporary society can influence the focus of scientific research (ACSHE230)

Science Understanding: Chemical sciences

- The atomic structure and properties of elements are used to organise them in the Periodic Table (ACSSU186)
- Different types of chemical reactions are used to produce a range of products and can occur at different rates (ACSSU187)

Curriculum Outcomes: Victorian Curriculum F-10

Levels 9 and 10

Science as a human endeavour

- The values and needs of contemporary society can influence the focus of scientific research (VCSSU116)

Science Understanding: Chemical sciences

- The atomic structure and properties of elements are used to organise them in the periodic table (VCSSU123)
- Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed (VCSSU124)
- Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations (VCSSU125)
- Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer (VCSSU126)

Contents

Corrosion: All at Sea: Overview	1
--	----------

Summary	1
Curriculum Outcomes: Australian Curriculum F-10	1
Science as a human endeavour	1
Science Understanding: Chemical sciences	1
Science as a human endeavour	2
Science Understanding: Chemical sciences	2
Curriculum Outcomes: Victorian Curriculum F-10	2
Science as a human endeavour	2
Science Understanding: Chemical sciences	2
Contents	2
Corrosion: All at Sea	7
Introduction	7
Key ideas	8
Equipment and materials	9
Optional	10
Hazards	10
Lesson plan organisation	10
Part A1: Investigation Instructions	11
Part A2: Scientific questions	11
Part A3: Testing our scientific question	15
Part B: Analysis of results	17
Part C: Drawing conclusions (discussion prompts)	17
Part D: Extension 1	20
Part E1: Extension 2 - Instructions	21
Part E2: Extension 2 - Scientific questions	22
Part E3: Extension 2 - Testing our scientific question	24
Part E4: Extension 2 - Analysis of results	26
Part F: Scientific poster	26
Acknowledgements	27
Copyright and Creative Commons	27
Corrosion: All at Sea	29
Introduction	29
Key ideas	30
Equipment and materials	31
Optional	32
Hazards	32
Lesson plan organisation	32
Part A1: Investigation Instructions	33
Part A2: Scientific questions	33
Part A3: Testing our scientific question	37
Part B: Analysis of results	39
Part C: Drawing conclusions (discussion prompts)	39
Part D: Extension 1	42
Part E1: Extension 2 - Instructions	43
Part E2: Extension 2 - Scientific questions	44
Part E3: Extension 2 - Testing our scientific question	46
Part E4: Extension 2 - Analysis of results	48

Part F: Scientific poster	48
Acknowledgements	49
Copyright and Creative Commons	49
Corrosion: All at Sea: Teacher Notes	51
Overview/Introduction	51
Curriculum Outcomes: Australian Curriculum F-10	52
Science as a human endeavour	52
Science Understanding: Chemical sciences	52
Science as a human endeavour	52
Science Understanding: Chemical sciences	52
Curriculum Outcomes: Victorian Curriculum F-10	53
Science as a human endeavour	53
Science Understanding: Chemical sciences	53
Key Knowledge and Skills	53
Key Science Inquiry Skills	55
Background information	55
General background information	55
Industry links	55
Contemporary science research	56
Science and engineering concepts	57
Other naturally occurring corrosive environments	57
Pedagogy	58
Inquiry Skills	58
Additional inquiry questions for extension investigations	60
Conceptual development	61
Representation construction approach.....	61
Teaching notes	61
Calculating percentage mass per volume (%m/v)	61
Calculating percentage change in mass.....	62
Demineralised, deionised or distilled water?	62
Rusting of iron	63
Weighing and fair testing	63
Equipment and materials	64
Optional	64
Risk management	65
Suggested lesson plan organisation	65
Suggested classroom organisation of activity	66
Approximate time indications to complete activity	67
Communication	67
References	68
Suggestions:	69
Acknowledgements	69
Copyright and Creative Commons	69
Corrosion: All at Sea: Technical Notes	71
Equipment and materials	71
Optional	71
Hazards	72

Sourcing materials.....72
Suppliers73
Suggestions:73
Acknowledgements.....73
Copyright and Creative Commons73

