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(a) The marine environment would have firstly rusted the metal strips around the top and bottom of the artefact. Being submerged under sea water for 150 years, the wood would have a high level of basic salts (around a pH of 8) absorbed leading to the artefact being brittle and possibly have already started to crack when retrieved.

(b)

(c) Steel 4, containing the least amount of Iron (75%) but higher amounts of Nickel (10%) and Chromium (15%) show that it is less likely to ~~rust~~^{corrode}. This is because ~~it~~ Chromium is a passivating metal and forms layers over scratches as they appear by displacing other metals. (such as Nickel).

The high percentage of Iron in steels 1, 2, 3 determine that it will corrode quicker if exposed to salty water and therefore ~~not~~ is ~~not~~ the best candidate for industrial items on land rather than industrial items ~~being~~ immersed in water.

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(d)

(i) Three environmental factors that could be tested in a school laboratory are:

1. Whether acidic, basic or neutral water conditions affect the rate of corrosion (speeds up or slows down).

2. Whether the rate of corrosion is changed (faster or slower) due to an increase or decrease in oxygen.

3. Whether a waterproof paint slows down or speeds up the rate of corrosion.

This experiment could be done in test tubes. For experiment 1, three test tubes would be needed with ~~an~~ each tube having either an acidic, basic or neutral solution. For experiment 2, two test tubes would be used, one with a stopper on it to prevent excess oxygen entering. Painting a nail with waterproof paint and leaving another nail untouched would be experiment 3.

Nails would be immersed into the liquid water or solution and kept there for a period of time.

(ii) Pollution from industrial factories into water ways ~~in~~ makes the ~~the~~ marine environment slightly acidic in some areas. The use of greener fuels and less

polluted waste could reduce the rate of corrosion by ~~sustaining it~~ ~~it~~ in the ocean by ~~it~~ sustaining its basic pH of around 8.

(e) For wooden artefacts, the techniques used to conserve ~~them~~ involve saturating the object with pure water to extract all of the salts that have been absorbed. ^{This is called saturation} These salts need to be removed so that they do not crystallise inside the wooden artefact and crack the object. Electrolysis is then used to remove the remaining bacteria and rust. Electrolysis is also used in the process of ~~new~~ restoring copper artefacts so that the object is not damaged. These methods are an appropriate way of restoring artefacts as they do not damage the object ~~but~~ but also prevent it from ~~the~~ further corrosion.

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