

How would you Survive? — an exercise in simple technology

Contents: A problem-solving exercise designed to introduce the idea of basic technology.

Time: 2 periods or more, depending on amount of discussion.

Intended use: Could be used with most students of secondary-school age. Relevant to Physics, Chemistry, Integrated Science and Technology courses. Links with work on change of state, fuels and energy changes.

Aims:

- To introduce the idea of basic technology, and to compare it with higher level technology
- To encourage respect for the technological skill of people in less developed countries
- To explore the relation between science and technology and the importance of both to development
- To provide opportunities to practise problem-solving skills.

Requirements: Students' worksheets No. 404. Students will need plenty of paper or card, preferably large sheets, for Tasks 1 and 2, and also coloured pens.

Part 1 Tasks 1 and 2 are best tackled by students working in pairs. It is useful if all the results can be put on a single, large sheet of paper or card. Stress that only *simple* sketches and notes are required, otherwise students may spend too long on presentation of results at the expense of creative thinking.

Pairs could be brought together into larger groups for Task 3. They could be asked to give a brief talk on their solutions.

Part 2 is a discussion activity which is best tackled in small groups.

Further activities

- 1 As an introductory or follow-up activity, students could be asked to think about how they would prepare for a night spent on open ground somewhere in Britain. They are allowed to use only disposable materials and they can spend no more than, say, a pound on food. Such an exercise has the advantage of being closer to students' own experience.
- 2 *Experimental work* The following tasks could be set as open-ended problem-solving exercises:
 - (a) Test methods of starting a fire and keeping it going
 - (b) Find the best way of melting ice to produce drinking water, keeping evaporation losses to a minimum.

Project work Use library sources to find out about the technology used by Inuit (Eskimo) people.

HOW WOULD YOU SURVIVE? — an exercise in simple technology

Part 1 Shipwrecked in the Arctic

Imagine that you have been shipwrecked on the north coast of Canada inside the Arctic Circle (Figure 1). You are with one other person and the long winter is about to begin. The ground is covered with hard snow to a depth of nearly half a metre. There are no plants or trees. The animals have migrated south for the winter. The average temperature is -30°C and most of the sea is beneath a layer of ice.

Could you survive?

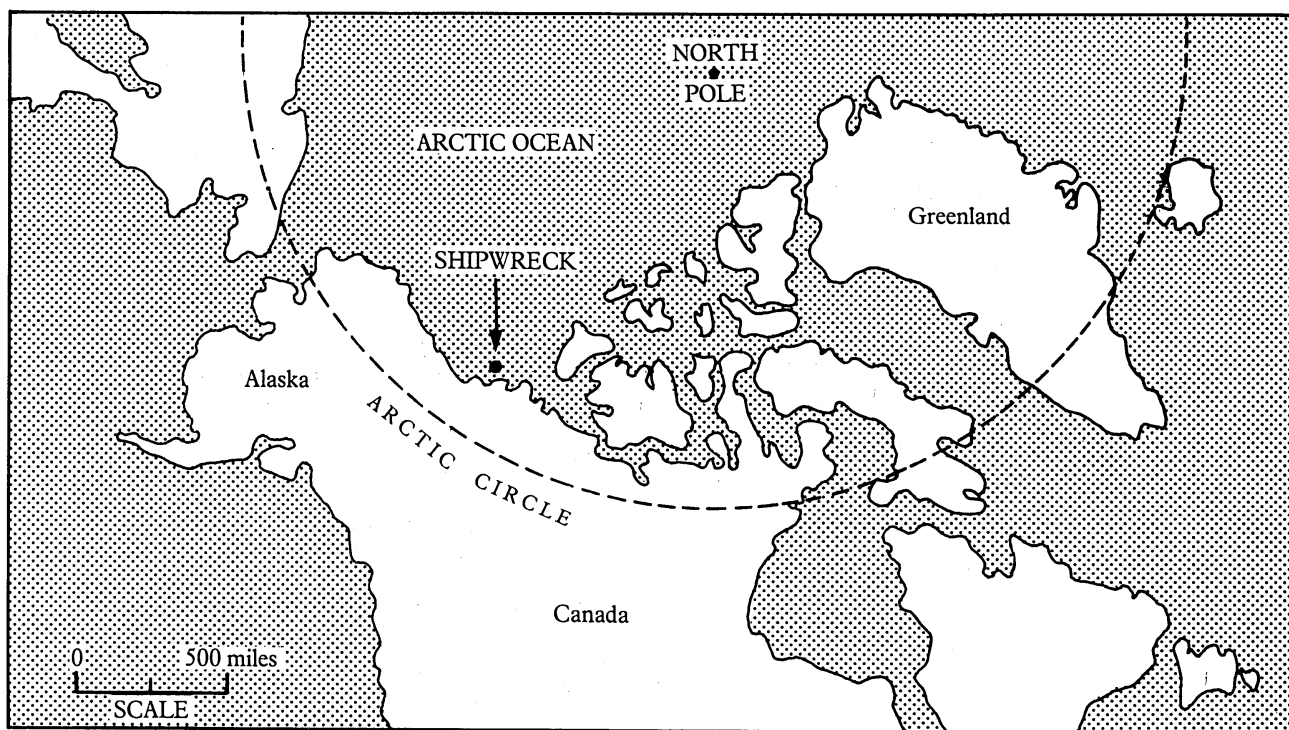


Figure 1 Shipwrecked in the Arctic

The ship went down without your being able to save anything apart from your two dogs. They lead you to the carcass of a caribou deer that died of old age before the winter migration. On the frozen ground beneath the snow are different types of stones. Some are hard but others are easily broken. You also find a few lumps of copper metal. In a frozen river bed you find some driftwood up to eight feet long.

The dogs have sniffed out a small hole in the ice on the frozen sea. It is about three centimetres across and could be the breathing hole of a seal. There might also be some fish in the sea below the ice.

Whatever happens you are stuck here until help arrives or the summer comes.

How would you survive?



Figure 2 An Arctic landscape

Task Sheet

Work in pairs on these tasks.

Humans use **technology** to provide the things they need for survival and comfort.

Humans are intelligent enough to develop new technologies to cope with the changes in the environment in which they live. Until relatively recently the Inuit (Eskimo) people lived quite successfully in the far north of Canada with a technology that might have been familiar to our ancestors in the Ice Age 20 000 years ago.

Would you be able to use this technology to survive?

Task 1

List all the *resources* available to you.

Task 2

Using these resources, what *technology* would you use to ensure your survival? Illustrate your answers with simple sketches.

- *Food* What would you eat? How would you catch it? If it needs cooking, how would you cook it?
- *Water* How would you obtain enough drinking water? How can you turn ice or snow to water without losing large amounts through evaporation or storage problems? How might you use sea water?
- *Shelter* What kind of shelter would you build, and from what materials? What tools might you have to make to help build it?
- *Clothing* How would you make clothing and bedding?
- *Fire* If you need a fire, how could you start it and how would you keep it going?

Task 3

Compare your solutions with those of other class members.

- Which solutions would have worked and which not?
- Which were the best solutions?
- What experiments could you do in the laboratory to decide which solutions would work best?
- The exercise is about *technology*, but what *scientific knowledge* was needed to carry it out?
- What has the exercise made you think about the knowledge and skill of the Inuit people, who lived all their lives in these conditions?

Part 2 Thinking about technology

In this exercise you used simple, basic technology. Developed countries such as Britain often use higher-level technology. For example, a camp fire is basic technology, gas-fired central heating is higher-level technology. An abacus or counting frame is basic technology, a computer is high technology.

- 1 Compare and contrast basic technology and high-level technology. For example, you might discuss these points:

What examples are there of each?

Do they use a lot of resources and materials?

Are local resources used?

What is the impact on the environment?

Is there a pollution risk?

Do they lead to a high or low productivity of labour?

How much skill is needed to make the technology?

How much skill is needed to operate the technology?

How much skill is needed to maintain and service the technology?

How much scientific knowledge is needed to make the technology?

How much scientific knowledge is needed to operate the technology?

How much scientific knowledge is needed to maintain and service the technology?

- 2 What might happen if high-level technologies are suddenly introduced into a less developed country?
- 3 Do developed countries *always* need to use high-level technology? Can you think of examples of where basic technology could replace high-level technology in Britain?
- 4 Is it possible for countries to develop *without* high-level technology?