



**Scottish
Water**

Always serving Scotland

Water safety

Third and fourth level

Description of module

This module begins with a pre-topic assessment to discover how much the class knows already. Which activities are chosen thereafter depend on the outcome of the assessment.

Main experiences and outcomes

Health and wellbeing

I understand that my feelings and reactions can change depending upon what is happening within and around me. This helps me to understand my own behaviour and the way others behave.

[HWB 3-04a](#) / [HWB 4-04a](#)

I make full use of and value the opportunities I am given to improve and manage my learning and, in turn, I can help to encourage learning and confidence in others.

[HWB 3-11a](#) / [HWB 4-11a](#)

I am learning to assess and manage risk, to protect myself and others, and to reduce the potential for harm when possible.

[HWB 3-16a](#) / [HWB 4-16a](#)

I know and can demonstrate how to keep myself and others safe and how to respond in a range of emergency situations.

[HWB 3-17a](#) / [HWB 4-17a](#)

Numeracy and mathematics

I can solve problems by carrying out calculations with a wide range of fractions, decimal fractions and percentages, using my answers to make comparisons and informed choices for real-life situations.

[MNU 3-07a](#)

I can work collaboratively, making appropriate use of technology, to source information presented in a range of ways, interpret what it conveys and discuss whether I believe the information to be robust, vague or misleading.

[MNU 3-20a](#)

Having investigated the practical impact of inaccuracy and error, I can use my knowledge of tolerance when choosing the required degree of accuracy to make real-life calculations.

[MNU 4-01a](#)

I can evaluate and interpret raw and graphical data using a variety of methods, comment on relationships I observe within the data and communicate my findings to others.

[MNU 4-20a](#)

I can select appropriately from a wide range of tables, charts, diagrams and graphs when displaying discrete, continuous or grouped data, clearly communicating the significant features of the data.

[MTH 4-21a](#)

Sciences

I have explored the structure and function of organs and organ systems and can relate this to the basic biological processes required to sustain life.

[SCN 3-12a](#)

I can explain how biological actions which take place in response to external and internal changes work to maintain stable body conditions.

[SCN 4-12a](#)

Technologies

I enhance my learning by applying my ICT skills in different learning contexts across the curriculum.

[TCH 3-04a](#)

Throughout my learning, I can make effective use of a computer system to process and organise information.

[TCH 4-04a](#)



Water safety

Activity 1

Learning intention

- Pupils discover how much they do, or do not, know about water safety and decide which aspect(s) to investigate

Success criterion

- A topic for investigation is selected

Suggestions for teachers

1 How much do pupils know?

It is likely that the class will have done at least some aspects of water safety at some stage in their school careers. Before proceeding with the module it will be necessary to find out how much the pupils know already.

- If very little is known, it is recommended that the Water Safety module for Level 2 is used, or adapted, as a start
- If one area emerges as needing a lot of attention, then activities 2 and 3 could be used to develop it. At the moment they are set out for exploring safety on lochs
- If two areas emerge, then activity 2 could be used for one and activity 3 for the other

2 Pre-topic assessment

A simple form of pre-topic assessment might be to simply ask groups to list 5 hazards that might reasonably be expected at each of the following locations:

- swimming off a beach
- beside a river or stream
- beside a loch, pond or reservoir

In summer and winter the dangers are different, so pupils could be split into sub-groups (summer and winter dangers). A simple vote could determine which the pupils found most difficult.



Mandatory action -
life jackets to be worn



No swimming



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Activity 2

Learning intention

- Pupils revise what they know about the dangers of playing by a reservoir or loch, and explore the idea of risk

Success criterion

- Pupils are able to complete the risk assessment form

Suggestions for teachers

Filling in risk assessment forms is a part of life these days; asking pupils to complete one is a very good way of developing their ability to think about their non-structured outdoor activities and decide – sensibly – what is safe and what is not. Here is an excerpt from an Authority's policy: "There is a strong case for involving participants in risk management. So, whenever possible, establishment heads will encourage group leaders to allow all party members to contribute to the compilation of risk assessments. Not only might this instil a sense of party discipline and co-operation, but it may also assist in overall risk management strategies."

The activity here is based on risks at a reservoir, but the same activity could be carried out for any situation.

1 Plan an expedition

Pose the scenario to pupils that they are planning a Duke of Edinburgh expedition, and will be camping overnight beside a reservoir. They will not have adults with them. Ask the pupils to brainstorm possible dangers if they were to play beside and in the reservoir. That can be done easily by giving groups of pupils a large sheet of paper and felt tips and asking them to list everything they can think of. It is allowable for pupils to imagine such things as building a raft, swimming, climbing trees near the reservoir and making a swing, and so forth – anything that they might do in reality.

2 Hazards

Ask pupils to star the 5 most realistic of the hazards (this will weed out the potential shark attacks, death from shock at seeing the Loch Ness Monster, and the like) and share these with the rest of the class. Groups then decide which hazard they will risk assess, which could mean opting for one suggested by other groups.

3 Risk assessment

Introduce the risk assessment forms. These vary from establishment to establishment. Here is part of an example for a cycle ride:

Hazard	Likelihood 1 (low) to 10 (high)	Seriousness 1 (low) to 10 (high)
Puncture	1	1
Head Injury	1	10
Losing Way	3	2

(This is resource sheet 1)

Pupils need to distinguish clearly between the likelihood and seriousness (the potential harm). Once they are familiar with this method of assessment, ask them to complete the risk assessment form as on resource sheet 2. Since this is going to be displayed to the rest of the class later, it should either be as large as possible, for example drawn out on a poster, or done on computers so that it can be shown on the interactive whiteboard.



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Activity 3

Learning intention

- To extend and develop the ideas in activity 2

Success criterion

- Pupils complete a presentation, either PowerPoint or paper

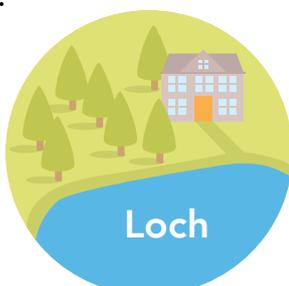
Suggestions for teachers

1 Be a health and safety officer

The pupils could be asked to imagine that they are health and safety officers working for the local authority. A local business has built a hotel on the banks of the loch and is asking advice about how to make the activities on offer as safe as possible for the guests. The activities are:

- water skiing
- canoeing
- swimming
- rowing
- water aerobics
- fishing

In groups, the pupils could draw an imaginary loch, with the hotel situated at a suitable point (or a map of a real loch could be used, preferably local). On this, the pupils decide where to place the activities so that they do not interfere, or endanger, each other. Pupils could write and assess four associated risks for each activity.



2 Devise a briefing

In their capacities as health and safety officers, they devise a briefing on PowerPoint or paper, which should mention such things as:

- signs showing the way to each area
- signs warning of hazards (detail)
- lifeguards
- instructors
- warning flags for when/where it is unsafe for each activity
- good manners towards other loch users
- what to do in an emergency
- lifesaving equipment

There is helpful material on Glow, such as Orkney's Activity and Safety Guidelines, as well as on the internet generally, such as the RoSPA site. Pupils could research these and present their findings in an accessible form.

<http://www.rospa.com/>



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Activity 4

Learning intention

- Pupils explore the relative dangers of various bodies of water

Success criterion

- Pupils are able to interpret drowning statistics and justify their ideas

Suggestions for teachers

These activities are based on recent figures for accidental drownings in the UK, given by RoSPA.

1 Resource sheet 3

Use resource sheet 3. Ask pupils to graph these figures, either by converting to percentages, then drawing the chart on paper, or by entering the figures into a suitable software package, such as Excel, and converting them into a column chart.

2 Answer the questions

Discuss these briefly: what is meant by coastal (beach, in a harbour, from cliffs, from moored boat) and by at home (bath, garden pond, swimming pool, floods). Give out resource sheet 4 to groups of pupils and ask them to answer the following questions. Stress that these are accidental drownings. The text on resource sheet 3 gives a clue to some answers.

- Why are there so few drownings at swimming pools?
- Why are there so few drownings out at sea, compared with near the shore?
- Why are rivers and streams so much more dangerous than lakes or canals?
- Why might drownings occur even when people can swim?
- Where might other water users be a hazard?
- How could drownings in garden ponds or baths happen?
- Where is ice likely to be a factor?
- Where are underwater hazards, like barbed wire, ropes and old metal likely to be a factor?
- How might some of these accidents be prevented?
- What emergency services might have been involved in attempted rescues?

These questions could be given out one to each group, or all groups might be asked to consider them all, with feedback at the end.

3 Answer the questions

Using figures in tables on RoSPA website, pupils could create pie charts to illustrate percentages of drownings.

4 Main dangers

The plenary should bring out some of the main dangers such as:

- the effect of cold in causing panic, and then hypothermia leading to loss of consciousness and/or loss of ability to move properly.
- the slippery nature of banks, or ice, which may prevent getting out of the water.
- the need to learn to swim.
- the need to avoid areas where there may be rubbish in the water, such as old canals and disused quarries.
- the way some bodies of water get deep very quickly (and thus very cold as well).
- the way currents in the sea and in rivers can sweep people away. These people may be on surfboards, lilos, pedalos and the like at the beach.
- hazards such as speedboats, which can hit swimmers or people on surfboards, for example.

5 Main dangers

In this country, ice is seldom thick enough to walk on. Even if it will support a person's weight near the shore, the ice will probably be thinner further out. This makes a good basis for some research: pupils could find accurate figures for the load-bearing properties of various thicknesses of ice. A Google Images search will find some figures that can be converted into line graphs using Excel or another data handling package.



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Activity 5

Learning intention

- Pupils use their creative skills to explore how water safety can be communicated to the public

Success criterion

- Pupils are able to demonstrate how they would monitor and evaluate the success of their communication campaign

Suggestions for teachers

1 Water safety

Pupils could design/create posters/produce video or launch an entire campaign based on water safety. First, they choose whether they're focusing on Winter water safety, or Summer water safety. Consider the most important dangers and the risks, and the people who are more vulnerable. Encourage pupils to be creative with their slogans and not simply state 'Don't Walk on Frozen Ponds', and be imaginative in ways of getting their message across. Why and how would they develop these communication materials?

2 Budget

To help pupils plan their campaign, they can be given a resource sheet with possible ways of getting their message across and costs for each method. Pupils are given a set budget and have to decide how they will promote the campaign within budget. How would they monitor success of the campaign? Perhaps focus on the fall in accidental drowning figures.





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Activity 6

Learning intention

- Pupils explore some assumptions about water

Success Criterion

- Pupils are able to come to a conclusion and justify it

Suggestions for teachers

1 Water safety statements

It is good for pupils to realise that not everything they believe is true, and that diligent research and experimentation can give surprising results. In the context of water safety, pupils can be asked to look at some statements:

- 'warm water (15-20C) is safe to stay in for as long as you want'
- 'wait at least half an hour after a meal before going swimming'
- 'cloudy water in a lake is as safe to swim in as clear water'

If you wish to widen the scope beyond purely safety, add:

- 'we need to drink 8 glasses of water a day to stay healthy'.

2 Crib notes

Some crib notes:

- The body loses heat about 30 times faster in water than in air, so it is possible to contract hypothermia in apparently comfortable temperatures. A simple experiment could show this, in which two beakers of warm water as left, one in air and one in cold water; temperatures could be taken at 5 minute intervals and graphed. Alternatively, there is information on the Internet.

- Whether to wait after a meal before swimming is a widespread belief.
- Cloudy water is more dangerous because the cloudiness could be due to toxic material, or microorganisms; cloudiness may conceal dangers at the bottom of the water; cloudiness may mean that the water is considerably colder just below the surface, whereas clear water tends to warm through.
- The belief that we need to drink 8 glasses of water a day has recently been challenged, although it is still stated by many official bodies. Pupils could look at the evidence.

It is instructive to conduct surveys of pupils before and after research is done in order to find if opinion has been changed. The class could be divided so that some pupils are investigating each statement. Each pupil could prepare a report designed to be persuasive, and which presents evidence. Some pupils could read out their reports, and any contradictory reports read in debate. Pupils may also like to conduct wider surveys of opinion with their peers, and produce graphs to show the results.



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Resource sheet 1

Risk assessment

An example of a risk assessment sheet showing the possible hazards during a cycle ride.



Hazard	Likelihood 1 (low) to 10 (high)	Seriousness 1 (low) to 10 (high)	Overall 'score' L x S
Puncture	1	1	1 low hazard
Head Injury	1	10	10 high hazard
Losing Way	3	2	6 medium hazard



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Resource sheet 2

Risk assessment form

Description of the activity

Comment							
Overall 'score' L x S							
Seriousness 1 (low) to 10 (high)							
Likelihood 1 (low) to 10 (high)							
Hazard							



Water safety

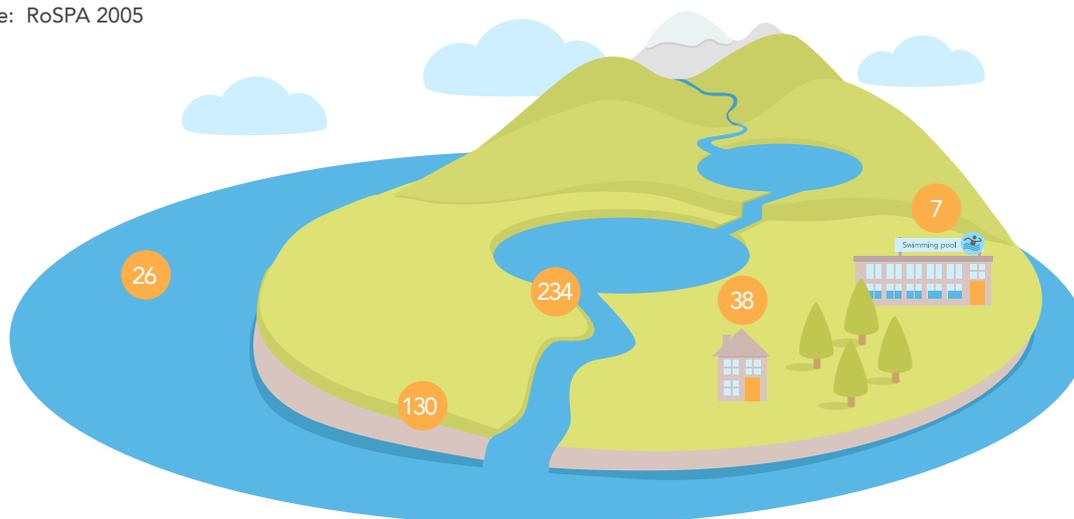
Resource sheet 3

Drowning

Sadly, there is only a small chance of survival for those who get into difficulties in water, especially water that is deep or fast flowing, and cold. Most of those who cannot swim will drown within a matter of seconds. Even many who can swim may drown quickly once they become exhausted and hypothermic. We need to take safety seriously.

Location of drownings	Number of drownings
Inland (rivers, lochs etc.)	234
Coastal zone	130
At home	38
Open sea	26
Swimming pool	7

Source: RoSPA 2005





Water safety

Resource sheet 4

Where does drowning happen?



At home

Bath	25	6%
Garden Pond	6	1%
Other	3	0.7%
* Swimming Pool	2	0.5%
Floods	2	0.5%

* **Note** - 'swimming pool' here means a domestic one; the reference on resource sheet 3 is to public pools.



Inland

Rivers and streams	137	31%
Lakes and reservoirs	50	11%
Canal	44	10%
Other	3	0.7%



Coastal

Inshore	76	17%
Other	25	6%
Harbour	18	4%
Cliff	11	3%