



# Can Lake Water Be Made Safe?



## Assessment

This guide to assessment strategies is put forward from different perspectives. In part A the assessment is based on the skill to be developed in the student. Part B is based on the assessment strategies to use in each lesson, whereas part C illustrates the assessment by the 3 different approaches which a teacher may use for formative assessment – observation, by oral communication, or by marking of written work. Summative assessment strategies are not shown, but these could relate to viva type oral communication and/or to the marking of written tests/examination questions.

### Able to award a social values grade (objective 1)

The teacher listens to the students putting forward their points of view during class discussion

- x Student unable or unwilling to put forward useful points for evaluation of the system and how to decide on whether the lake water can be made safe.
- √ Student is able to put forward useful evaluation points and able to reach a decision on whether the lake water can be made safe.
- √√ Student is able to lead the discussion and put forward important evaluation points to be considered. The student is able to make an appropriate decision with justification, unaided and suggest a suitable meaning of safe water.

### Able to award a science method grade (objectives 2 and 3)

Teacher observes the students and notes their plan and observations

- x Student not able to takes part in carrying out the experiments.
- √ The student is able to contribute to carrying out the experiments as given on the worksheet. The student is able to make appropriate observations with the aid of the teacher.
- √√ The student is able to undertake the experiments given, leading to meaningful observations and analysis.

### Able to award a personal skills grade (objectives 4 and 5)

Teacher observes the students in their groups

- x Student is neither cooperative, leaving the work to others and not joining in the discussions in a meaningful way

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- √ Student cooperates as a member of a team and is able to discuss the procedures to adopt and put forward useful suggestions
- √√ Student is able to cooperate and help other students to join in the work of the group. The student is able to put forward useful suggestions to the group and encourage others to put forward their ideas.

### Able to award a science concept grade (objectives 6 and 7)

Teacher marks the students report

- x Student is unable to explain the formation of chlorine, nor distinguish between bacteria and viruses.
- √ Student can explain the formation of chlorine and distinguish between bacteria and viruses.
- √√ Student fully understands the formation of chlorine from a number of sources and is able to explain the differences between bacteria and viruses and the manner in which they can be treated.

## Part B Assessment by Lesson

### Lesson 1

	Dimension	Criteria for evaluation The student:	Mark/grade given (x,√,√√)
1	Functioning in the group during experimentation or discussion	Contributes to the group discussion putting forward the problems of the lack of purity of lake water and how this can be tackled	
		Illustrates leadership skills – guiding the group by developing the chart	
		Shows tolerance with, and gives encouragement to, the group members.	
2	Draws charts illustrating causes of unclean water	Able to provide graphical representation as required	
3	Problem solving	Illustrates creative thinking/procedures in solving problems.	
		Gives suitable ideas on tackling the problem.	

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## Lesson 2

	Dimension	Criteria for evaluation The student:	Mark/grade given (x,√,√√)
1	Functioning in the group during experimentation	Cooperates with others in a group and fully participates in the work of the group.	
		Illustrates leadership skills – guiding the group by thinking creatively and helping those needing assistance (cognitive or psychomotor); summarising outcomes.	
		Shows tolerance with, and gives encouragement to, the group members.	
2	Performing the investigation or experiment	Understands the objectives of the investigation/experimental work and knows which tests and measurements to perform.	
		Performs the investigation/experiment according to the instructions/plan created.	
		Uses lab tools and the measurement equipment in a safe and appropriate manner.	
		Behaves in a safe manner with respect to him/herself and to others.	
		Maintains an orderly and clean work table.	
3	Records experimental details and observations	Presents the activity in a clear and practical manner.	
		Shows understanding of the subject.	
		Uses precise and appropriate scientific terms and language.	

## Lesson 3

	Dimension	Criteria for evaluation The student:	Mark/grade given (x,√,√√)
1	Makes conclusions	Deduce reasons for the effects of chlorine or bleach on lakewater.	
		Draws appropriate conclusions related to the research/scientific question.	

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2	Answers questions	Explains the meaning of micro-organisms and bacteria.	
		Able to distinguish between bacteria and viruses.	
3	Draws diagrams.	Able to provide appropriate diagram of a micro-organism as seen through a microscope.	

## Lesson 4

	Dimension	Criteria for evaluation The student:	Mark/grade given (x,√,√√)
1	Answers questions	Able to give a suitable explanation of what might be meant by safe water	
2	Scientific or socio-scientific reasoning	Illustrates creative thinking in suggestion action that could be taken by students to help make lakewater safe.	
		Gives a justified socio-scientific decision as to whether lake water can be made safe, correctly highlighting the scientific components.	

## Part C Assessment by Teacher Strategy

### Assessment by Teacher Observation

	Dimension	Criteria for evaluation The student:	Mark/grade given (x,√,√√)
1	Functioning in the group during experimentation or discussion	Contributes to the group discussion during the inquiry phases (raising questions, planning investigation/experiment, putting forward hypotheses/predictions, analyzing data, drawing conclusions, making justified decisions).	
		Cooperates with others in a group and fully participates in the work of the group.	

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		Illustrates leadership skills – guiding the group by thinking creatively and helping those needing assistance (cognitive or psychomotor); summarising outcomes.	
		Shows tolerance with, and gives encouragement to, the group members.	
2	Performing the investigation or experiment	Understands the objectives of the investigation/experimental work and knows which tests and measurements to perform.	
		Performs the investigation/experiment according to the instructions/plan created.	
		Uses lab tools and the measurement equipment in a safe and appropriate manner.	
		Behaves in a safe manner with respect to him/herself and to others.	
		Maintains an orderly and clean work table.	
3	Presenting the investigation or experiment orally	Presents the activity in a clear and practical manner with justified decisions.	
		Presents by illustrating knowledge and understanding of the subject.	
		Uses precise and appropriate scientific terms and language.	
		Presents with clarity and confidence using an audible voice.	

### Student Assessment Tool based on Teacher Marking of Written Material

	Dimension	Criteria for evaluation The student:	Mark/grade given (x, √, √√)
1	Writes a plan or report of an investigation	Puts forward an appropriate research/ scientific question and/or knows the purpose of the investigation/experiment	

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		Creates an appropriate investigation or experimental plan to the level of detail required by the teacher	
		Puts forward an appropriate prediction/hypotheses	
		Develops an appropriate procedure (including apparatus/chemicals required and safety procedures required) and indicates variables to control	
2	Record experimental data collected	Makes and Records observations/data collected appropriately (in terms of numbers of observations deemed acceptable/accuracy recorded/errors given)	
3	Interpret or calculate from data collected and making conclusions	Interprets data collected in a justifiable manner including the use of appropriate graphs, tables and symbols	
		Draws appropriate conclusions related to the research/scientific question	
4	Answers questions	Provides correct written answers to questions given orally or in written format	
		Provides answers in sufficient detail especially when called upon to give an opinion or decision	
5	Draws charts/ diagrams/tables/ models/symbolic representations.	Able to provide graphical representation as required	
		Able to present graphical representations of a suitable size and in suitable detail	
		Able to provide full and appropriate headings for diagrams, figures, tables	
6	Scientific or socio-scientific reasoning	Illustrates creative thinking/procedures in solving problems	
		Gives a justified socio-scientific decision to an issue or concern, correctly highlighting the scientific component	