SCIENCE LABORATORY: POLICY FOR USE

PURPOSE

To ensure that teachers using the Science Laboratory receive appropriate guidance and training, and that suitable procedures are followed.

SCOPE

This Policy applies to all teachers using the science laboratory for demonstrations and experiments.

CONTENTS

1. DEFINITIONS AND ABBREVIATIONS

CSA

Camphill School Aberdeen

Teacher

Anyone working at CSA, and designated as a class teacher.

Designated Laboratory Supervisor

The person nominated by the Teachers College to supervise the use of the Science Laboratory and equipment.

Record of Approval					
2	*August 2015*	*Evgueni Chepelin Richard Keys Ivan Bousfield*	*Executive and Management Team*		*August 2018*
Rev	***Date***	***Author***	***Recommended***	***Approved***	***Review***

Class Helper
Any co-worker or class assistant providing regular assistance to the class teacher in the classroom setting.

Laboratory
The CSA Science Teaching Laboratory and associated preparation room and chemical store.

Science curriculum
An outline of the general aims and content of teaching for Chemistry, Physics and Life Sciences, including suggested practical experiments and demonstrations.

Experiment
Practical testing or demonstration of scientific principles, either by a teacher alone or involving pupil participation.

COSHH
Control of Substances Hazardous to Health Regulations

2. RESPONSIBILITIES

2.1 TEACHERS

a) To be familiar with the Documents for Science Teaching Preparation (section 6).
b) To select experiments from the science curriculum that meet the needs of their class.
c) To discuss their teaching plans and undertake a Health and Safety briefing with the Designated Laboratory Supervisor.
d) To prepare a written risk assessment for the planned lessons.
e) To instruct class assistants and class helpers on safety and emergency procedures in the Laboratory, and explain any specific issues arising from planned experiments.
f) To be thoroughly familiar with the written descriptions of the experiments they plan to perform, the risks involved, and actions to be taken in case of accident.
g) To explain to pupils relevant safety and emergency procedures in the Laboratory.
h) To explain to pupils the risks presented by the experiments they witness, or take part in.
i) To conduct teaching and experiments in a safe and responsible manner.
j) To ensure that Personal Protective Equipment is worn by all who need it.
k) To advise the Designated Laboratory Supervisor of any accident or near accident that occurs in the Laboratory.
l) To advise the Designated Laboratory Supervisor of any defective or inadequate equipment.

Teachers are expected to co-operate with the Designated Laboratory supervisor.

2.2 DESIGNATED LABORATORY SUPERVISOR

a) To brief teachers on health and safety in the Laboratory before each main lesson block from the science curriculum.
b) To discuss the experiments to be conducted in each main lesson block with the teacher, with particular reference to health and safety issues.
c) To prepare a plan with a description of risks for any experiment that a teacher wishes to conduct, where such an outline is not already available.
d) To advise teachers on health and safety aspects of experiments included in the science curriculum.

e) In matters where the class teacher and the designated Science Supervisor disagree about safety, the decision of the Designated Science Supervisor is final. Breaches of procedure will be brought to the attention of the Teachers College, and the CSA Health and Safety Officer.
f) To advise the CSA Health and Safety Officer of all accidents and near misses in the Laboratory, and of serious or intentional breaches of procedure.
g) To maintain the Laboratory in a safe and useable condition.

2.3 HEALTH & SAFETY OFFICER

To support and advise the Designated Laboratory Supervisor.

2.4 CLASS HELPERS

a) To be thoroughly familiar with the risks presented by the class they are assisting with in the Laboratory.
b) To be familiar with the safety features of the Laboratory.
c) To assist the Teacher in demonstrations and teaching in the Laboratory, as required.

3. POLICY

3.1 INTRODUCTION

Life Sciences, Chemistry, and Physics are important curriculum subjects for all pupils at Camphill. The Life Sciences play a part in teaching throughout the curriculum. Man and the animal kingdom are studied in class 4, laying a foundation for making comparative observations. Plants and the animal kingdom are studied in class 5, laying a foundation for understanding cause and effect. The subject is developed to enable pupils to explore the relationship between what a scientific approach to the natural world can offer, and their development as human beings. Physics as a subject is introduced in class 6, and chemistry in class 7. Both subjects are continued through to class 12, and are taught in 3/4 week block periods.

In the middle school years, classes 6-8, the science lessons are usually taught by the Main Class Teacher, under the direction and supervision of the appointed Designated Laboratory Supervisor. In the upper school, the use of guest teachers is encouraged.

3.2 LABORATORY HEALTH & SAFETY

It is the policy of CSA that the Laboratory should be used with proper regard for health and safety. In particular:

a) Use and maintenance of the laboratory and equipment, and ordering and supply of chemicals will be controlled by a suitably trained or experienced Designated Laboratory Supervisor.

b) Scientifically unqualified teachers will not use the Laboratory without first having received an appropriate briefing from the Designated Laboratory Supervisor.

c) Hazardous substances will only be used, in minimal amounts, when necessary to demonstrate a valid teaching point. Such substances will be used in accordance with the relevant COSHH assessments and with any other appropriate guidelines for their safe handling.

d) Written descriptions of proposed experiments and assessments of the risks that they present must be prepared in advance by the Designated Laboratory Supervisor, who will make use of an online database of Material Data Sheets (see also Appendix 5).

e) A risk assessment (Appendix 1) must be completed by the teacher and approved by the Designated Laboratory Supervisor prior any teaching in the Laboratory. .

3.3 CLASSROOM HEALTH & SAFETY

CSA recognises that some simple experiments do not require laboratory training or facilities and can be conducted safely in the classroom. Therefore, the following are permitted for classroom use:

a) **Sources of heat** - electric stove, electric kettle, lighter, candle. There are printed descriptions of the risks, which can be referred to by teachers in drawing up a risk assessment.
b) **Chemicals** - 'kitchen chemistry', e.g. foodstuffs, sugar, salt, vinegar, yeast, bread, also limewater. However, more hazardous substances which may be purchased in shops, such as sodium hydroxide and bleaches, are banned from use in the classroom.
c) **Borrowing Equipment** - equipment may be borrowed from the Laboratory, with the permission of the Designated Laboratory Supervisor.

4. PREPARATION PROCEDURE FOR LABORATORY TEACHING

a) A teacher taking a science block will refer to the science curriculum outline and decide on the demonstrations and experiments to be conducted during that block of science teaching. Detailed descriptions of the chosen demonstrations and experiments are available. These descriptions include health and safety considerations and references to the guidance for using the Laboratory safely (see Appendix 2).

b) The teacher will receive a briefing on the use of the Laboratory from the Designated Laboratory Supervisor. This will include familiarisation with

- parts of the guidance for safe use of the Laboratory relevant to the planned experiments
- general instructions and health & safety rules for the Laboratory, including guidance on what to do in the event of an accident in the Laboratory, and guidance on first aid.
- Description of Experiment that incorporate data from the online database of Material Data Sheets.

The Designated Laboratory Supervisor will also advise the teacher on setting up experiments in the Laboratory or in the classroom.

c) The teacher will prepare a written risk assessment for conducting planned experiments (see Appendix 1). This will include considerations of particular hazards during the experiments and pupils' reactions and behaviour that can present risks to them and to others. The teacher will present a written risk assessment to the Designated Laboratory Supervisor, who will sign it off.

d) The teacher will receive required chemicals and equipment from the Designated Laboratory Supervisor only after fulfilling steps a to c.

e) Before the science block teaching commences, the teacher will give an outline of the subject to be taught to class assistants and class helpers and will instruct them on: -

- Good practice, safety features and emergency procedures in the Laboratory
- Particular risks and hazards of teaching the science block identified in the risk assessment (see above)
- Assistance that will be required from co-workers during the lessons.

f) The teacher will explain to pupils the relevant safety and emergency procedures in the Laboratory and the risks presented by the experiments they witness, or take part in. Pupils will be informed about the rules for using the Laboratory (see Appendix 3).

5. DOCUMENTS FOR LABORATORY TEACHING PREPARATION

1) An outline of the Science curriculum.
2) A compendium of demonstrations and experiments, which includes a description of the risks presented by each experiment, and safety precautions.
3) Using the Science Laboratory Safely.
4) Rules for Pupils Using the Science Laboratory.
5) Immediate Remedial Measures (what to do in the event of an accident).
6) Handling Chemicals In Science Experiments
7) A template of risk assessment.

6. DECLARATION

I confirm that I have read and understood the policy on the use of the Science Laboratory

Name…….

Signature……**Date**……

7. APPENDICES

Appendix 1 Template of Risk Assessment

Appendix 2 Using the Science Laboratory Safely

Appendix 3 Rules for Pupils Using the Science Laboratory

Appendix 4 Handling Chemicals In Science Experiments

Appendix 5 Points to be Covered in Description Of the Experiments To Ensure It Is A COSHH Assessment

APPENDIX 1

Risk assessment and Briefing form for conducting demonstrations and experiments during a Science block teaching

Class

Dates of teaching

Science block

Outline of lessons with planned demonstrations and experiments, including required assistance of co-workers and participation of pupils.

Please add sheets if required

APPENDIX 1 (cont.)

Risks and hazards during demonstrations and experiments, including anticipated behaviour of pupils, with mitigating safety measures.

Please add sheets if required

APPENDIX 1 (cont.)

I confirm that teacher

has received from me a briefing for the Science block teaching and that I am satisfied with the risk assessment presented above.

Designated Laboratory

Supervisor

Date

APPENDIX 2

Using the Science Laboratory Safely

1. Teachers have a duty to take reasonable care for the health and safety of themselves, of other co-workers and of pupils. They should be familiar with this safety policy.

2. Teachers must set a good example to pupils and act consistently with pupil laboratory rules. On the first occasion in the Science Laboratory time should be spent explaining the rules, with appropriate demonstrations. Teachers should remind pupils of them often enough for them to be familiar.

3. Teachers must ensure that Co-workers are familiar with emergency drills and know the location of: the fire door; fire-fighting equipment; the nearest first-aid box; the main gas cock and the main electricity switch.

4. The laboratory must be left safe, and chemicals returned to the locked preparation room. All gas taps should be completely turned off and all mains-operated apparatus switched off. At the end of the lesson, gas should also be turned off at the laboratory main gas cock.

5. Eating, drinking and smoking must not take place in the laboratory or the preparation rooms. Experiments involving the tasting of substances must be conducted in the classroom.

6. A teacher must think very carefully before conducting any practical operation in the laboratory when alone. Nothing should be done which could lead to an accident needing a remedial measure.

7. The Science laboratory must be locked by the teacher before he or she leaves.

8. Pupils must not be left unsupervised in the laboratory.

9. If for any reason safety cannot be maintained during practical work, that work must be modified or abandoned.

10. The class teacher is responsible for the safety of a class taken by a student or guest teacher

11. Lesson preparation must include checking on risk assessments and other safety precautions where necessary. These must be provided by the Designated Science Supervisor; experiment descriptions obtained from the internet should be regarded as being unsafe. Time should be allowed for consultation where there is any doubt and to try out experiments, particularly those involving hazards. Teachers should explain precautions to pupils as part of their safety education.

12. Teachers are responsible for ensuring that class helpers are familiar with the safety features of the laboratory, any hazards, and the appropriate precautions needed.

13. If pupils are allowed to use a Bunsen burner, it is the teacher's responsibility to ensure that hair, scarves, ties and any other loose item of clothing are tied back or tucked in to keep them well away from the flame.

14. Always point the mouth of a test-tube or flask away from both yourself and others when doing experiments. Sometimes their contents can shoot out suddenly, especially when the

test tubes are heated. Solutions should be heated in a flat bottomed flask; pupils should not heat substances in test tubes.

15. Disposal of Chemical Residues. The guidance included in the description of the experiment should be followed. When chemicals are left for the Designated Laboratory Supervisor to dispose of, he or she should be informed and the residue labelled with the name of the experiment as given on the Description of Experiment sheet.

16. Nothing will be added to what is in the Science laboratory without the express approval of the designated Science Supervisor.

17. Any user who discovers a hazardous defect in any item of equipment must take it out of use and report it to the Designated Laboratory Supervisor.

18. The laboratory should be clean and tidy at all times. Bins should be emptied and the laboratory cleaned for the next user.

APPENDIX 3

Rules for Pupils Using the Science Laboratory

1. *Wait outside until your teacher asks you to go in.*

2. *Walk to your place, never run; avoid knocking into equipment or the fume cupboard.*

3. *Wait until your teacher tells you before touching any equipment or materials. You will be safe if you follow instructions.*

4. *Wear goggles, gloves and laboratory coats when told to do so. Keep them on until asked to remove them.*

5. *Always stand up when working with liquids or heating a substance. Then you can move out of the way quickly if anything is spilt.*

6. *Never rub your eyes or your put your hand to your mouth if you are working with chemicals.*

7. *Never taste anything or put anything in your mouth when in the laboratory. This includes sweets, fingers and pencils which might have picked up poisonous chemicals from the bench. Never taste or smell chemicals unless instructed to do so.*

8. *If chemicals get on your hands or any other part of the body, wash them off immediately. After handling chemicals, equipment, plants or animals, always wash your hands.*

9. *Report any burns and cuts. Report if any chemicals are spilt, go into your mouth, your eyes or onto your skin.*

10. *Keep your bench clean and tidy, with bags out of the way.*

11. *Follow the teacher's instructions on dealing with all waste substances.*

Appendix 4

Handling Chemicals and Dealing with Accidents in Science Experiments

(Applying the COSHH Regulations)

No eating, drinking or smoking in the Laboratory.

Most chemicals can be hazardous to health, including many common chemicals in everyday use. Many apparently harmless chemicals have proved to be a danger to health if misused, or where there is repeated exposure. The main risks from chemicals are by: -

- **Inhalation (breathing in).**
- **Ingestion (taking into the mouth or swallowing)**
- **Contact with the eyes, skin or clothing**
- **Some chemicals are flammable or explosive at all times.**
- **Some chemicals are flammable or explosive under certain conditions.**
- **Some chemicals easily give off toxic fumes, as do many reactions.**
- **Some chemicals cause burns, or set fire to otherwise harmless chemicals. These are labelled "oxidising".**
- **Some chemicals that cause serious long term effects appear to be harmless. Do not be misled into ignoring very serious risks.**

Storage

All chemicals are stored in the Chemistry cupboard, which is locked. Some chemicals are stored in metal storage chests within the Chemistry cupboard, because they may be: -

- Flammable, or cause other substances to ignite.
- May explode if mistreated or exposed to air or water.
- Are corrosive (highly acidic or alkaline) or otherwise damaging to the skin.
- May give off toxic fumes.

The following rules for handling chemicals will eliminate most risks. Where extra precautions are needed, they will be detailed in the *descriptions of the experiments*. No chemical may be used except in an experiment for which a *description of the experiment* sheet is available.

- ❖ Gloves and a laboratory coat will always be worn when handling chemicals.
- ❖ A mask must be worn when dealing with any powdered chemical likely to cause dust.
- ❖ Never smell any chemicals unless suggested in the outline of the experiment.
- ❖ Goggles must be worn when dealing with liquids, chemicals that are in fine powder form, or labelled with a hazard symbol.

- ❖ A clean, dry spatula will be used to dispense each chemical, to prevent unwanted reactions with water or other chemicals.
- ❖ Only one container will be opened at a time, and the lid will be replaced as soon as the chemical is dispensed. (Very important)
- ❖ A minimum quantity of each chemical should be used.
- ❖ The room must be adequately ventilated.
- ❖ All spillages must be dealt with properly, using the procedures in place, and the designated laboratory supervisor notified. Any clothing that is contaminated must be changed immediately, the skin washed, and new gloves put on.
- ❖ The *description of the experiment* will be followed, and especially the measures to minimise or avoid the described risks. All safety measures detailed must be implemented, for example conducting the experiment in a fume cupboard to avoid inhalation of fumes or dust.

Most chemicals that are used in Science experiments, or produce by chemical reaction, fall under the Control of substances Hazardous to Health (COSHH) regulations. A COSHH assessment seeks to answer four questions:

- What adverse health effects could occur and at what exposure levels? (the hazards)
- What is the likely exposure? (in specific work activities)
- What is the chance of harm? (the magnitude of the risk)
- What needs to be done? (to prevent or control the risk).

These questions are answered in detail in the *description of the experiment*

Chemicals will be placed in the preparation room ready for use in the morning's experiments.

Accidents Involving Pupils

If a pupil is involved in an accident with chemicals, they should be given immediate help to ensure that

- **They do not put contaminated hands to their eyes or mouth (change gloves)**
- **Their clothing is not contaminated – if in doubt, shower and change clothes.**
- **They do not breathe in any chemical.**
- **They do not cut themselves.**
- **They are removed from the area of contamination, and if necessary from the laboratory.**

Appendix 5

Points to be Covered in Description of the Experiments to Ensure It is A COSHH Assessment.

- **Chemicals** Give the names of the chemicals, and common names if widely used.
- **Procedure** Outline what will happen during the experiment. Be specific.
- **Chemical Hazards** List all significant chemical hazards, such as flammability, potentially dangerous fumes, etc. Include the products of reactions, and any residues.
- **Health Hazards** List all significant health hazards, such as "harmful if inhaled", "causes severe burns," etc., for primary chemicals and the products of the reactions. Material Data Sheets must be consulted: chemicals which pose serious long-term risks to health, where risks cannot be safely controlled, or which cannot be disposed of safely must not be used.
- **Control measures to be adopted** This is the central section of a COSHH assessment, and explains what procedures must be adopted to ensure the chemicals can be used safely. Measures must be **explicit, clear, comprehensive, and practical.** e.g. Use only in a fume cupboard, wear protective gloves, wear goggles.
- **Checks on control measures** List any checks that are required before work can begin with the chemical.
- **Disposal** Give detailed instructions on how used or unwanted chemicals should be disposed of. This may involve disposal by the teacher (e.g. flush down the sink using plenty of water), or storage for later disposal by the designated laboratory supervisor.
- **Emergency** Give brief and explicit instructions for dealing with an emergency involving the chemical (e.g. evacuate area immediately; mop up spills using plenty of water, open windows).
- **First Aid** Outline relevant first aid treatment. State clearly if professional medical aid should be called in the case of skin contact, ingestion, contact with eyes or inhalation
- **Comments** Any other information relevant to the safe use of the material.
- The *Description of the Experiment* must be reviewed by the designated laboratory supervisor before it is issued, and immediately any fault in the description becomes apparent.