

My First Science

Chemistry and Physics

Conversations



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My First Science: Chemistry and Physics Conversations

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The Story of Archimedes was taken from *Stories of the Ancient Greeks* by Charles D. Shaw and The Story of Sir Isaac Newton was taken from *Famous Men of The Modern Times* by John Haaren. They are both in the public domain and were slightly edited to reflect modern language.

Achievement standards and stage statements have been taken from the Australian Curriculum Website Version 8.

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Introduction

The purpose of this resource is to help you introduce the topics of the Australian Curriculum for Science in the Physical and Chemical World from Foundation to Year Two.

The Australian Curriculum divides science into three strands: science understanding, scientific skills, and science as a human endeavour. These three strands do marry well with a Charlotte Mason approach. She believed in developing scientific skills through observation, understanding science through quality science based literature, and through studying biographies of scientists and learning about their human endeavours.

The Australian curriculum has been written for all Australian schools to follow. NSW and WA are currently the only states to have their homeschool registration linked to the Australian Curriculum. NSW, VIC and WA all have their own particular version of the Australian Curriculum. All other states and territories follow the curriculum as shown on the [Australian Curriculum website](#).

This resource uses the framework of the Australian Curriculum for its lessons. For those studying in NSW who are worried that the NSW Board of Studies syllabus has not been used exactly, do not fret. Here is a quote taken from the NSW Home Schooling Registration Package 2013, “the educational program identifies the intended learning outcomes **BASED ON** the relevant Board of Studies syllabus and relevant content.” Since the NSW syllabus is based on the Australian Curriculum, differences are minimal and your program only needs to be **based on** the NSW Board of Studies syllabus which is, as mentioned, **based on** the Australian Curriculum anyway.

Australian Curriculum Checklists for Chemistry and Physics have been provided at the beginning of the first two chapters. This can be used for your records to indicate you have covered the appropriate content. The Kitchen Chemistry chapter covers the Chemical World Science strand from

Foundation to Year Two. The Physical World chapter covers the Physical World Science strand from Foundation to Year Two.

The Australian Curriculum uses a spiral approach to teaching science, teaching a little bit of biology, chemistry, physics, earth and space science—each year. However Charlotte Mason science lessons use an immersion approach—this is where you focus on one topic at a time and cover it in depth, possibly over a year. This resource has been prepared with more of an immersion approach in mind.

Do not worry that all three years have been grouped into one. These topics flow well together, and flexibility is allowed when deciding when to teach them. This resource was written to be taught over a period of one year. You may choose to teach this resource over three but it is not necessary. The Australian Curriculum content and outcomes per year are suggested guidelines but the learning is grouped into one early learning framework—Foundation to Year 2 (or Stage One in NSW). During these years it is considered appropriate to teach “and then to select the most appropriate content (possibly from across several year levels)”. The teacher has autonomy here, “The order and detail in which the content descriptions are organised into teaching and learning programs are decisions to be made by the teacher.” ([Australian Curriculum: implementing](#)).

For this age group the concepts introduced are quite simple, and it would be easy to introduce too much too soon. In an attempt to keep things uncomplicated for the parent and the children, I have made this resource free of the extra padding designed to keep children busy. I've not suggested dancing like an ice cube turning into steam, or made experiments just for the sake of it. My desire is to make this doable and so I have removed the frills. However some children love to move and if you have extra ideas that will help your child understand the concepts being discussed, please do so.

Your child has probably already observed much of what is covered. This resource is giving them an opportunity to consider and discuss their deductions.

Consider and Discuss

Many homeschoolers today believe that Charlotte Mason's ideas on teaching science are perfect for home education especially in the early primary years. Not only are her methods enjoyable, creative and academically sound, they are also extremely suitable for accomplishing the state requirements many of us are expected to follow.

Charlotte Mason wanted children to be given the skills of the scholars, starting simply yet with intention. She respected the mind of the child and developed a teaching philosophy that encouraged good quality science education.

Charlotte Mason suggests we ask children questions about what they are seeing. She discourages lecturing but prefers the casual pointing out of things found in the natural world.

This resource aims to use her ideas of conversational learning. Children are encouraged to ask why!

"He must be accustomed to ask why — Why does the wind blow? Why does the river flow? Why is a leaf-bud sticky? And do not hurry to answer his questions for him; let him think his difficulties out so far as his small experience will carry him" (Charlotte Mason Series Volume 1, p. 264).

Asking them to explain what they see is the beginning of forming a framework of reporting findings. Not all lessons need to have an attached worksheet to prove they learnt something. When a child makes a revelation through observation this is a worthy outcome. Enjoy it with them!

"One of the secrets of the educator is to present nothing as stale knowledge, but to put himself in the position of the child, and wonder and

admire with him” (Charlotte Mason Series Volume 1, p. 54).

When you answer their questions give your answers with as much “life” as you can. Not a simple boring answer from a text book.

“Above all, when you come to the rescue, let it not be in the ‘cut and dried’ formula of some miserable little text-book; let him have all the insight available, and you will find that on many scientific questions the child may be brought at once to the level of modern thought” (Charlotte Mason Series Volume 1, p. 264).

Some of the pre-digested science content offered to young children in textbooks is too much, too soon, too random or too boring. The wonder of science is taken from their lessons and it’s been stripped down into lesson objectives with complicated or oversimplified ideas.

“Do not embarrass him with too much scientific nomenclature. If he discover for himself (helped, perhaps, by a leading question or two), by comparing an oyster and his cat, that some animals have backbones and some have not, it is less important that he should learn the terms vertebrate and invertebrate than that he should class the animals he meets with according to this difference” (Charlotte Mason Series Volume 1, p. 265).

Learning From Living Books

Charlotte Mason also saw that books played an important role in the sequential study of science. However she believed that the type of literature used was just as important as the content being covered.

Textbooks were discouraged.

“Books dealing with Science...should be of a literary character, and we would probably be more scientific as a people if we scrapped all the text books. Where science does not teach a child to wonder and admire, it is perhaps of no educational value” (Charlotte Mason Series Volume 6 p.218).

Avoiding textbooks especially in the early years is far more interesting and valuable in your child's scientific education. Research has shown this to be superior in giving children a science foundation. An educational study on top science students in American schools found the best schools didn't use set textbooks but rather used a variety of books and resources. (*You can teach your child successfully* ©1999 cited Ruth Beechick p.321).

Charlotte Mason believed the abstract nature of textbooks often prevented children from making a connection with the items learnt about. So she handpicked books for her students that had passionate authors who were enthusiastic about their topic and wrote in an engaging literary style. She called these living books; books with ideas!

A few books have been suggested to complement your science lessons. They are not essential but will enhance the topic and improve understanding. The final chapter of this resource is a lightly edited version of the biography of Sir Isaac Newton written by John Haaran. This great scientist is known for his work on gravity. This biography will also help you meet the criteria that *science is a human endeavour*.

A list of suggested books has been given at the beginning of each chapter.

Where Are The Worksheets?

This resource has no worksheets. I know you will want to keep a record of learning and you can use your outcome checklists for that. You may also like to keep a booklist of the science books you read while doing this course.

Nearly all lessons are oral and the few experiments do not require you to write up a scientific notebook for them. The Chemical and Physical World are only two of the five strands covered in science from Foundation to Year Two and there are plenty of opportunities for science notebooks and nature journaling through biology, earth science and nature study.

The science taught in these early years focuses on a child's observation skills and their natural curiosity. It is my hope that this resource encourages that.

I trust you will find this resource useful and your child will be eager to learn more about these topics.

Michelle Morrow

Physical World

Suggested Reading

- “Sound is Never Still” by Nuri Mass - The Wonderland of Nature (Page 224-228)
- [Sound Video](#) - 20 minute YouTube Video
- [All about Waves](#) - 20 minute YouTube Video
- [Forces and Gravity](#) - 20 minute YouTube Video
- “Light the Fastest Thing There is” by Nuri Mass - The Wonderland of Nature (Page 216-223)
- “Air and Weather “ by Nuri Mass - The Wonderland of Nature (Page 245-246)
- *Gravity Is a Mystery* by Franklyn M. Branley

Australian Curriculum Checklist

Stage 1 - Foundation to Year Two

Physical World Science

ACHIEVEMENT STANDARDS -- OUTCOMES

- students describe the properties and behaviour of familiar objects
- students describe objects and events that they encounter in their everyday lives, and the effects of interacting with materials and objects
- students identify that certain materials and resources have different uses and describe examples of where science is used in people's daily lives.

SCIENCE UNDERSTANDING - CONTENT

The way objects move depends on a variety of factors, including their size and shape - Foundation

Light and sound are produced by a range of sources and can be sensed - Year 1

A push or a pull affects how an object moves or changes shape - Year 2

SCIENCE AS A HUMAN ENDEAVOUR

Science involves observing, asking questions about, and describing changes in, objects and events

People use science in their daily lives, including when caring for their environment and living things

SCIENCE INQUIRY SKILLS

Pose and respond to questions and make predictions about familiar objects and events

Participate in guided investigations and make observations using the senses

Engage in discussions about observations and represent ideas

Use informal measurements to collect and record observations, using digital technologies as appropriate

Use a range of methods to sort information, including drawings and provided tables and through discussion, compare observations with predictions

Compare observations with those of others

Represent and communicate observations and ideas in a variety of ways

Completed By:

Date:

Lesson 1 - What is Movement?

Consider and discuss how you can move and stand still.

- Have your child name 5 items that don't move and 5 items that do.
- Discuss different moves your child can make. Have them show you. Run, hop, sit and bend (cartwheel).
- Describe and show how things in nature move. e.g. A fish, a rabbit, a horse.
- What items roll well? What is their shape?
- What things move themselves?
- What things are moved by something else?

Lesson 2 – What is Sound?

Consider and discuss the following ideas about sound:

- Have your child be still and listen. Ask them to name as many sounds as they can hear. Try this outside and inside.
- How could they stop themselves from hearing a sound?
- From where in their body do they hear?

Note: Sound is a vibration.

Suggest reading "Sound is Never Still" by Nuri Mass - The Wonderland of Nature (Page 224-228)

Lesson 3 – What are Sound Waves?

Consider and discuss the following ideas about how sound is made in waves.

- Make some sound waves. Ping the crystal, buzz some gum leaves, or play an instrument.
- Have your child feel their throat as they talk. Can they feel the vibrations?
- Make sound waves. Fill a large bowl with water. Drop one by one pieces of cereal into the centre of the bowl. See how the waves spread out from the centre. This is a simple demonstration of sound waves.

Note: A piano or guitar would also be great for illustrating this lesson.