**Science:**

Adapted from Diane Lopez (1988)

## **Recommended Methods & Resources - Charlotte Mason Style:**

## The study of science is approached with the understanding *"that science and religion cannot, to the believer in God, by any possibility be antagonistic."* New areas of understanding and wonder are explored. Facts are learned, ideas are dealt with, and answers to questions are sought *"so that the child can enjoy and understand his relationship with the world and the universe he lives in."* (Lopez, 1988)

Observation of the natural world is a vital part of a Charlotte Mason science program. Charlotte found that by observing nature a child was stimulated to want to know more and to view science as an exciting subject. The wrong approach to the teaching of science can quickly kill any excitement for the subject. Observing and experimenting to discover answers and increase understanding are the most effective ways to acquire scientific knowledge.

All areas of science (Biology, Chemistry, Physics, Earth-Science and Astronomy) will be included at every grade level. However, the emphasis placed on each will vary from grade to grade. Children will learn to use and understand the scientific method which will involve the use of reading and math skills- developing a scientific vocabulary, noticing likenesses and differences, classifying, sequencing, drawing conclusions, making generalisations, making inferences, noting cause and effect, measuring, and making graphs, charts, and diagrams. In addition, hypothesising will be introduced.

As with all subject areas you should give yourself permission to occasionally branch off into individual interests and novel side-tracks. Also, don’t just rely on reading the text. Children should retell what they have learnt (‘narration’) and explore/experience hands-on learning, trying the experiments in the suggested texts, and allow time to play in nature, garden, and constructing projects in the work-shed.

The Homeward Curriculum will encompass these aspects of science integrated into the thematic unit-studies based on the flow of ideas through history alongside the character training themes; however, the following ‘Procedure’ could be used with other programs.

First, we will give you a procedure that is not locked into a particular science text or program, but can be used with a vast array of resources. Then we will list some specific Science curriculum resources that many home-educators prefer to use as they have the lessons planned out for the teacher or parent.

**Procedure:**

1. Nature walks and nature notebooks

a. It is recommended that the children take a nature walk once a week to become familiar with the changing seasons, flora and fauna.

b. In some urban areas there may not be a park or other area that is accessible. In that case field trips to an area beyond the city should be planned during the year. Plants, flowers, and insects brought into the classroom/learning-centre, clouds viewed from the windows or playground, etc., are some ways that will give the children opportunity to observe if nothing else is available.

c. During the nature-walk the children keenly observe all that they see- this is a time for observation, not instruction. The teacher should give the name of a plant, tree, or flower, and any other information only when asked to do so by the children.

The children should be allowed to see things for themselves.

Flowers, twigs, leaves, insects, etc., can be collected.

d. Each child should have a nature notebook. The date of the walk should be recorded and anything else the child desires to record (what is seen, felt, or heard, drawings of what is seen, etc.). The recording can be done during and/or after the walk. How the notebook is done should be left up to the child. The child’s Nature Notebook should not be corrected or graded.

e. Any specimens that were collected can be displayed or made into collection displays. Flowers or leaves can be pressed and saved, etc.

f. The challenge for the school-teacher (and homeschool parents) is to facilitate spontaneity by being aware of any checklist-mandated information as a background filter for answering spontaneous questions and conversation, without the need to have chalk-and-talk lectures on each topic. In a natural and life-giving way, the children’s own observations and enthusiastic curiosity will allow opportunity for many fruitful lessons to grow out of the walks- the parts of a flower or plant, how the wings of a bird function, classifications of plant and animal species and families, different types of clouds, weather, seasonal changes, etc.

g. Textbooks and supplementary books should be used as an adjunct to the nature walk and observation.

2. Use the Scientific Method to train children to think for themselves...ie.,

a. Ask a question- identify the problem.

b. Seek to find the answers- investigate the problem.

c. Form a hypothesis- a hunch or possible answer to the question.

d. Collect data: ie., experiment and make observations to discover if the hypothesis could be correct- does it provide a satisfactory answer to the question?

e. Continue to explore- gather information, observe, and experiment to test the solution in light of any new conclusions.

**Popular Science Programs:**

Years K-2:

“Australian Nature Study Guide” by Marie Viljoen (for all ages)

Plus our CM-Australia Booklist gives recommended nature story books suitable for this age; plus looking up topics of interest.

Years 1 – 6:

*The 'Young Explorer Series'* (from Apologia) has been written specifically with a Charlotte Mason philosophy in mind. They have a main text and an accompanying Note-booking Journal that provides a creative way for the child to present what they have been learning. For some of the books in the series, there is a Lower Primary level Note-booking Journal separate from an upper middle school Note-booking Journal. Make sure you get the right one for your child's age.

Young Explorer Series = Flying Creatures of the Fifth Day; Swimming Creatures of the Fifth Day; Land Animals of the Sixth Day; Astronomy; Botany; Earth Science; Chemistry & Physics; Anatomy & Physiology.

...or...

The *Berean Builders series* has a series of books that begin every lesson with a hands-on science experiment, mostly using resources you will have around the home. This series of books also deals with topics in a Chronological sequence, so you could use the books roughly in line with your history cycle of topics. The books in the series include: Science in the Beginning (K-6); Science in the Ancient World (Yr 1-6); The Scientific Revolution (Yr 1-6); Science in the Age of Reason (Yr 1-6); Science in the Industrial Age (Yr 1-6); Science in the Atomic Age (yr 7).

Years 7-12: Both the Berean Builders series and Apologia High School have a text for each area of applied science (Earth Science, Biology, Chemistry & Physics) plus an accompanying Student Workbook.

**Extra Ideas - Science for Natural Learners or …**
**What to do if I don't have any curriculum resources yet:**

(i) Make a vegetable garden. Study an organic gardening book. Keep a log of all the information that interests you. Ask neighbours for advice. Do a soil test (obtained from local nursery) & keep records. If not rushed, do some 'experiments' to test which soils are most productive: mulch versus no-mulch; manure as a soil additive versus manure as a ‘liquid tea’ to pour on the garden.

As parents, our goal of developing balanced children, can be achieved through training their ‘head’, ‘heart’ and ‘hands’. Much can be learned and enjoyed from a humble vegie patch. Soil preparation, seed germination and fertilisation is gaining academic (head) knowledge. Watering, weed control, pest control and mulching encourages diligence (hands). Providing food for the family’s table, friends and neighbours, trains our children to serve (heart).

(ii) Make a weather station: (using thermometer and rain-gauge.) There are many books on this in the library or contact the Meteorological Society for information.

*“Our family made a Monthly Calendar to record the family's news. Beside the month in question, we recorded the weather as it happens. We used ideas from Dyna Zykes’ ‘The Big Book of Books’ (Shutter-fold Calendar Book) You can custom-design it to your own family.”*(Karen McNeice)
[Note: The ‘Big Book of Books’ will be useful for learning activities in many subjects, at virtually any age.]

(iii) Learn the months of the year, days of the week, locate the birthdays of family and friends. Find out about ‘seasons’ in relation to times of year. Locate the map of Australia, and the state you live in on a globe, if available. Then look at climate, rainfall and weather patterns in relation to areas on the map. Locate other countries and compare further (eg tropical, sub-tropical zones, etc.)

(iv) Physics & maths principles can be learnt through building and repairing things (eg general home and car maintenance; woodworking projects, craft activities, etc.)