

Level I

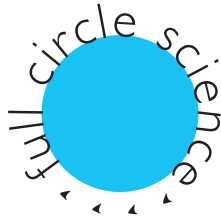
Science and Me

Book I

IMPLEMENTATION MANUAL
FOR TEACHERS

Jen Seron
“Science Jen”

Royal Fireworks Press
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Full Circle Science by Jen Seron

Level 1, Book 1, Implementation Manual for Teachers

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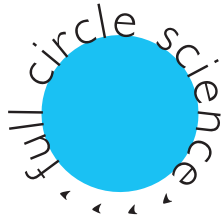
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WELCOME TO FULL CIRCLE SCIENCE

Dear Participants in Full Circle Science,

Full Circle Science (FCS) lessons exist to provide the most personally relevant fun that can be had while learning science. This curriculum is, for everyone at all levels, play-based, intense, concentrated, and action-packed. These lessons should inspire you as an instructor, complement your teaching style, and extend your prowess—whatever your strengths and interests might be and whatever your environment. Teachers, parents, and caregivers are collaborators and deserve to have fun and learn, too!

Full Circle Science provides young people with inspiring experiences in the natural world, a strong science background, and opportunities to utilize the scientific framework in everyday life across subject areas in collaboration and conversation with others, via hands-on real life experiences that will cultivate individual interests, skills, and talents across fields.

Full Circle Science objectives:

- Learn science joyfully and use the scientific framework in everyday life
- Observe closely, appreciate, and connect personally to our beautiful natural world
- Promote lifelong learning within a respectful, positive, inclusive environment
- Find, develop, apply, optimize, and actualize interests, skills, and talents through science

This brief Teacher Implementation Manual exists to facilitate the use of two other books: a Young Person Book intended for children and an Instructor Book intended for instructors. The purpose of this Teacher Implementation Manual is to explain briefly how teachers can get the most out of the curriculum and use the other books together, as well as ways to apply the curriculum in daily life. The Parent Implementation manual is not included here because that book is solely for use by parents, independently.

The Instructor Book contains the actual lesson plans and related content available to the instructor, as well as experiments, poems, stories, history, glossary, at-home activities, tangential activities in all subject areas, and “Did you Know” pages for children to see and do. In contrast, the Young Person Book is intended to represent the natural world and to be held in the hands of a child and interactively experienced and read two pages at a time both in group settings and again at home with a caregiver. Family involvement is key.

In the background the Full Circle Science focus is always on each child’s perceptions and interests and how the current lesson can excite individuals. In the foreground of each lesson is the Instructor Book and Young Person Book content as well as the natural world inside and outside. Full Circle Science children should spend time each week outdoors observing, playing, and interacting with the natural world in both structured (related to their interests and what they’re learning) and unstructured ways (free play).

I hope you enjoy using these lessons to teach science as well as to meet the unique needs and to develop the talents, skills, and interests of your diverse young people.

Scientifically yours,

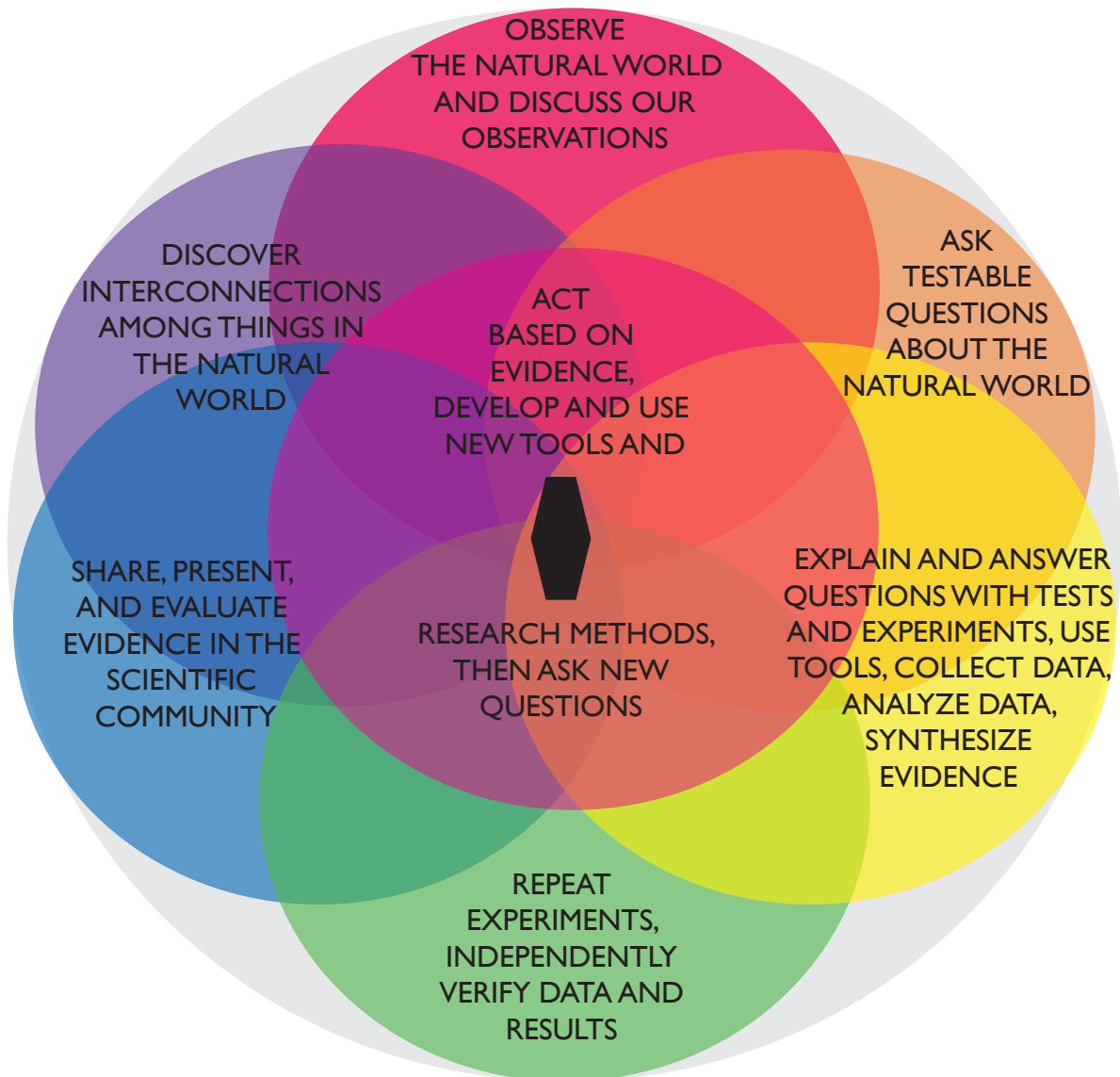
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WHAT IS THE SCIENTIFIC METHOD?

The scientific method is a process by which people answer questions about the natural world with evidence obtained through repeated collection and analysis of data. The diagram below illustrates how the main activities of scientists overlap and come full circle.

A hypothesis is a testable question that not only explains the natural world, but also predicts what will happen under specific conditions.

A scientific theory is an explanation of some aspect of the natural world that reputable scientists accept because it has been repeatedly and independently verified by evidence.





LESSON 1: WHAT IS SCIENCE?

OBJECTIVES OF LESSON I

Get excited about science and set a positive, exuberant tone! Discover diverse aspects of science and nature. Connect science and the scientific framework directly to our lives. Explore diverse aspects of the natural world. Define science via play with objects of nature and science. Have fun!

QUESTIONS FOR CHILDREN AND ADULTS

How do you perceive and experience the world? How does each individual child perceive and experience the world? What do you value? What does each child value? How can you customize this science lesson to inspire and engage each child, even outside of science time? What can you do to teach science joyfully, or with more joy?

CONTENT OF LESSON I

LEARN ABOUT THE SCIENTIFIC FRAMEWORK: During Lesson I, which begins on page 24 of the Instructor Book, children will experientially learn about science through telling about their favorite aspects of science or the natural world, reading and singing a book, sorting science and technology objects into groups, creating Venn diagrams using different colors of yarn, and finally, either having unstructured free-play with the science toys they sorted earlier, or playing independently in their choice of one of three stations (read and use technological toys, play with model animals and people, or blow bubbles).

The content of Lesson I in both the Instructor Book and the Young Person Book pertains to the scientific framework and provides an introduction as to how children can enjoy making science part of their everyday lives.

BE AWARE OF FOREGROUND AND BACKGROUND: Although in the background the Full Circle Science focus is always on each child's perceptions and interests, in this lesson in the foreground the instructor will define science, introduce key aspects of the scientific framework, and reinforce basics of science-related skills like reading, mark-making, math, social studies, and more.

NOTICE SCIENCE IN DAILY LIFE: By the end of Lesson I, children should be asked to look for science in their everyday lives so they can share their observations and questions about the natural world and science at the start of the next science session. This request should be made at the end of every session. At the start of each session the instructor should set aside 5–15 minutes of time to ask the children what they observed since last time in the natural world or related to science.

SUGGESTIONS FOR TEACHING LESSON I

Begin with either the content on the first two-page spread of the Young Person Book or with Lesson I in the Instructor Book (p. 24). The lesson plan (p. 30–34) in the Instructor Book covers about an hour of high-intensity science. The Young Person Book could take from 5 to 20 minutes

per two-page spread. Afterward, during the week, discuss “Science is . . . “ on p. 3 in this Teacher Implementation Manual, p. 5 of the Young Person Book, and p. 7–14 of the Instructor Book.

If you are teaching in a classroom environment, please copy and send home page 42 in the Instructor Book as well as sending the Young Person Book home each science day, so that caregivers can read that day’s two-page spread with their children. At home, caregivers and children should check off what they’ve done using the checklist at the end of the Young Person Book (p. 78–79).

USE THE LESSON PLAN: On page 6 of this Teacher Implementation Manual is a one-page lesson plan copied directly from page 30 of the Instructor Book.

USE THE CHART: On page 7 of this Teacher Implementation Manual is a chart you can use to help you coordinate the Young Person Book with the Instructor Book.

USE THE YOUNG PERSON BOOK: Lesson 1 spans pages 2–17 of the Young Person Book. On the first day of science, let the child examine the outside of the Young Person Book and ask the child what s/he thinks the book is about. Then let the child sign his or her book and look at the book from the beginning only through pages 2 and 3. If you can, only do two pages (one spread) at a time. If your child is motivated, then do more, but please make sure that before you go to the next two-page spread your child has a chance to go out into the world and apply the information on those pages somehow in his or her own life. Also take groups outside after each spread.

USE THE INSTRUCTOR BOOK: Lesson 1 spans pages 24–47 of the Instructor Book. The lesson plan for Lesson 1 in the Instructor Book is on pages 30–34. Before you start the lesson you will need to find both a fun book (see book list p. 29 & 180) and the materials on the supply list (see supply lists p. 30 & 178). Get everything ready and then follow the one-page outline (p. 30) or the detailed word-for-word lesson plan (p. 31–34). Customize to your own young people and environment. For example, you could teach outside using natural objects children find on-location.

GO OUTSIDE INTO NATURE TO APPLY LESSONS AND TO PLAY: Lesson 1 is fun to apply in the real world. Take your child or children outside to a neighborhood park or other location with mud, sand, sticks, rocks, or open areas children can explore. Although it is good to have some instructor-time with tie-ins to lessons, please allow children to play freely until they are tired.

RECORD DATA: Children’s drawings and writing in the Young Person book are qualitative data; the Young Person Books are intended to provide parents and teachers with documentation in-book of adequate progress over time by individual students. Also, caregivers and children can document the date they did each two-page spread in chart at the back of the Young Person Book (p. 78–79).

Hi! I’m Science Jen and when I have something to say you’ll see my comments in a text box like this. These boxes exist to provide additional information that relates, however tangentially, to the topic at hand. On the next page is the one-page lesson plan from the Instructor Book.



LESSON 1

WHAT IS SCIENCE?

LESSON PLAN

Goal: Discover diverse aspects of science and nature! Get excited about and set positive, exuberant tone for science sessions. Connect science directly to our lives. Explore diverse aspects of the natural world and define science via play with objects of science. Have fun!

Overview: Children actively sing a book about the natural world, reflect, express preferences, sort, classify, analyze, and then play with various fun scientific objects: plastic animals and plants, real rocks and shells, tools, simple machines—whatever you think will engage your young people.

Time: Around 60 minutes

Outline:

Introduction — 20 minutes

1. Introduce yourself and introduce science
2. Read Actively: Engage diverse children in this lesson, read actively, sing, reflect on own experiences, verbalize, role-play, write letters and draw in air during reading
3. Share: Children tell their favorite aspects of the natural world or favorite science topic
4. Make rules as occasions arise
5. List favorite natural world things each child chooses

Activities — 30 minutes

6. Pick and Sort Toys: Analyze, select, sort toys into categories, count, add, subtract toys
7. List and Evaluate: Write list of properties, make and fill Venn diagrams with sorted toys
8. Free Play: Children play with toys or move among three stations

Conclusion — 5-10 minutes

9. Conclude: summarize, acknowledge children, thank helpers, connect to next lesson

Materials: Big pile of science objects, many initially hidden inside a big piece of fabric (green, preferably), to be sorted by children include: plastic animals of all types from dinosaurs and humans to insects and whales, plastic flowers or plastic plants, real rocks and shells, slinky, magnifying glass, prisms, kaleidoscope, mini microscope, pulley, a few blocks, cars, toy train, juggling balls, kite or wand with streamers (to illustrate wind), child-safe thermometer or weather station, flashlight, rechargeable hand-crank radio (including some technology is fine). technology-based objects like percussive musical instruments and color paddles.

- Dry-erase board and colorful markers
- String in four or more different colors to make large round Venn diagrams on floor
- Soap bubbles to blow, magnifying glasses to look closely at the bubbles
- Russian nesting doll, otherwise known as matryoshka doll

Book: *What a Wonderful World* illustrated by Ashley Bryan or a different natural-world book that illustrates variety in humans and other organisms as part of the natural world. You must be able to sing the first book you read with children during science class.

Advance Preparation: Get all the materials ready ahead of time, including cut string.

LESSON 1: WHAT IS SCIENCE? HOW TO USE CHILD AND INSTRUCTOR BOOKS TOGETHER

The instructor teaches the following Instructor pages around the same time that the child is learning each of the following two-page spreads in the child's book.

Pages and Content in Child's Book	Pages in Instructor Book	Content in Instructor Book	Related Questions or Ideas to Link Content and Extend Full Circle Science into Everyday Life
Pages 2–3 Introductory collage	Pages 24–34 Lesson and page 42 Take Home	Scientists study and try to explain only the natural world (p. 24–34). Copy and distribute the Take Home activities for families (p. 42).	Name some things in the natural world you saw outside today. Go look now if you don't remember.
Pages 4–5 Observations, Science is ...	Pages. 7–14 Scientific method	Scientists use the scientific framework, including observation (p. 7–14).	Observe closely with all your senses a few natural-world things, both inside and outside, and tell about them with details.
Pages 6–7 Data and outliers	Pages 35 Data and page 47 Glossary	How do scientists learn? They observe, collect data (p. 35) & use words to describe what they learn. See Glossary (p. 47).	Collect data, right now, wherever you are: find and count squares and other rectangles. Or, collect data of interest to young people.
Pages 8–9 Science is ... and opposites	Pages 38–41 Tangents	Tangents (Life Skills and Practical Arts, p. 41, especially).	Tell about an old person that you know. How do you know that old person?
Pages 10–11 Nesting dolls and scale	Page 36 Experiment	Experiment and observe things breaking down into compost (p. 36). Set up experiment and make 1st observation.	Tell about what you see with a magnifying glass looking at things indoors and outdoors.
Pages 12–13 Flowers, scale, distance in space	Page 36 Experiment	Experiment and observe things breaking down into compost (p. 36). Make additional observations on experiment.	Go somewhere to smell real flowers of different types. Describe how the smells make you feel.
Pages 14–15 Words and matter: Alpha-bet, Periodic Table	Page 37 History	Historical tie-in: Democritus was the first to discuss "atoms" as the smallest matter (p. 37).	Collect data: find, count, and tell about all the circles and ovals you can find outside of the book, in the environment, right now.
Pages 16–17 Draw shapes and make patterns	Pages 42–45 Science-related story and page 46 Assessment	Science-Related Story about patterns of behavior (p. 43–45) and Assessment (p. 46).	Collect data: find, count, and tell about shapes on pages 16–17 that you can find inside or outside. Are there patterns?