



# Scope & Sequence

**A Reason For® Science**

Published by **The Concerned Group**

## A NEW PARADIGM

**A Reason For® Science** is designed for children — young minds created by an infinite God with an unlimited capacity to think, to learn, to explore, and to discover!

Because of its emphasis on how children really learn, **A Reason For® Science** uses a different paradigm from traditional textbooks. Why? In an effort to address standards and accountability, many of today's science

textbooks get learning backwards. They focus primarily on building a knowledge base, assuming students will later attach meaning to memorized facts. The problem is that very few elementary students master information that is presented this way because they never become engaged with the material.

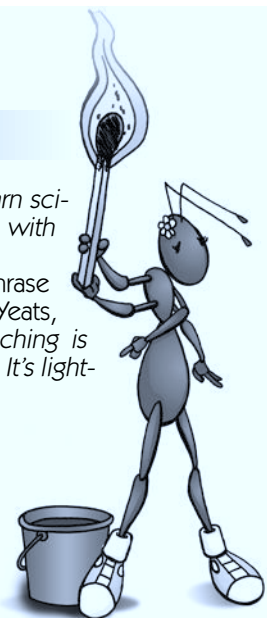
By contrast, **A Reason For® Science** is based on the premise that

learning science is an ACTIVE process. It is “something children do, not something done to them.”<sup>1</sup>

According to the **National Science Education Standards**, “. . . active science learning means shifting emphasis away from teachers presenting information and covering science topics. The perceived need to include all the topics and information . . . is in direct conflict with the central goal of

having students learn scientific knowledge with understanding.”<sup>2</sup>

Or to paraphrase William Butler Yeats, “Great science teaching is not filling up a pail. It's lighting a fire!”



## INQUIRY-BASED LEARNING

**A Reason For® Science** is designed to teach basic Life, Earth, and Physical Science concepts through fun, hands-on activities. Its focus is to make learning both fun and meaningful.

But hands-on activities by themselves are never enough. In order to truly master a concept, students must have “minds-on” experiences as well! This means actively engaging the material through a variety of methods

such as group discussion, problem solving, and journaling. It also requires thought-provoking questions that help develop higher-level cognitive skills. The weekly format of **A Reason For® Science** is designed to reflect this inquiry-based model.

According to the **National Science Education Standards**, “Inquiry is central to science learning. When engaging in inquiry, students describe

objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others . . . In this way, students actively develop their understanding of science by combining scientific knowledge with reasoning and thinking skills.”<sup>3</sup>

Since different students achieve understanding in different ways and

to different degrees, the flexible format of **A Reason For® Science** also encourages multiple learning styles and allows for individual differences. Each activity challenges students to develop their own unique skills, and encourages them to think of creative solutions.

## NATIONAL STANDARDS

The “National Standards” referred to in this Scope & Sequence are from the **National Science Education Standards**<sup>1</sup>. More specifically, they reflect the “K-4 Science Content Standards” (p.121 - 142) and “5-8 Science Content Standards” (p. 143 - 172).

Teacher Guidebooks include a list of the content standards that relate to each individual lesson. References are based on the NSES alphabetic format, plus a numeric code to indicate the bulleted sub-topic.

For example, **C1** in a fourth grade

lesson, would indicate Content Standard **C** and sub-topic **1**. (A detailed description of the **C1** content standard is found on pages 127 - 229 of the **Standards**.)

As noted above, lower grade and upper grade standards are found in

different sections. A **C1** reference for a third grade lesson, for example, would be found on page 127 (characteristics of organisms). By contrast, a **C1** reference for a seventh grade lesson would be found on page 155 (“structure and function of living systems”).

<sup>1</sup> National Science Education Standards, 1999. Washington, D.C.: National Academy Press. (p. 2); <sup>2</sup> Ibid. (p. 20); <sup>3</sup> Ibid. (p. 2)

## Level H (Grade 8)

Lesson	Category	Topic/Focus	Objective	National Standards
1	Life Science	Life Cycles	To conduct a controlled experiment	A1, A2, C2, C3, C5, G1, G2
2	Life Science	Plant Preservation	To explore how plants are preserved for future study	A1, A2, C1, C5, G1, G2
3	Life Science	Classification	To explore grouping by characteristics	A1, A2, C1, C2, C4, C5, F2, G1, G2
4	Life Science	Genetics	To examine a sample of DNA	A1, A2, C1, C2, C3, C5, F1, G1, G2
5	Life Science	Mitosis	To explore how chromosomes stay constant when cells divide	A1, A2, C1, C2, C3, C5, F1, G1, G2
6	Life Science	Meiosis	To explore how cell division creates gametes, determining gender	A1, A2, C1, C2, C3, C5, F1, G1, G2
7	Life Science	Fertilization	To explore how fertilization restores the right # of chromosomes	A1, A2, C1, C2, C3, C5, F1, G1, G2
8	Life Science	Biological Uniqueness	To explore human differences by observing fingerprints	A1, A2, C1, C2, C5, F1, F5, G1, G2
9	Life Science	Genetics	To explore how gene combinations create unique individuals	A1, A2, B1, C1, C2, C5, F1, F4, G1, G2
10	Physical Science (Forces)	Scientific Models	To explore changes in our understanding of the atom	A1, A2, B1, B2, E1, E2, F5, G1, G2
11	Physical Science (Forces)	Surface Tension	To explore how water molecules attract each other	A1, A2, B1, B2, G1, G2
12	Physical Science (Forces)	Energy Conversion	To explore converting kinetic energy to potential energy	A1, A2, B1, B2, B3, G1, G2
13	Physical Science (Forces)	Forces and Energy	To explore the energy efficiency of a force	A1, A2, B1, B2, B3, E1, E2, F5, G1, G2
14	Physical Science (Forces)	Energy Conversion	To explore converting kinetic energy to potential energy	A1, A2, B1, B2, B3, F5, G1, G2
15	Physical Science (Forces)	Gravity	To explore an object's center of gravity	A1, A2, B1, B2, B3, G1, G2
16	Physical Science (Forces)	Buoyancy	To explore how density affects buoyancy	A1, A2, B1, B2, G1, G2
17	Physical Science (Forces)	Transfer of Forces	To explore how structure can transfer forces	A1, A2, B1, B2, B3, E1, E2, F4, F5, G1, G2
18	Physical Science (Forces)	Inertia	To explore how design affects force	A1, A2, B1, B2, B3, E1, E2, F4, F5, G1, G2
19	Earth Science	Air Pressure I	To explore the balance of forces	A1, A2, B1, B2, D1, G1, G2
20	Earth Science	Air Pressure II	To explore how heat affects air pressure	A1, A2, B1, B2, D1, G1, G2
21	Earth Science	Global Magnetism	To explore magnetic fields	A1, A2, B1, B2, D1, D2, G1, G2
22	Earth Science	Geosynchronous Orbit	To explore ways objects move in space	A1, A2, B1, B2, D3, G1, G2
23	Earth Science	Topography	To explore topographic maps	A1, A2, B1, D1, F2, G1, G2
24	Earth Science	Identifying rocks & minerals I	To explore testing methods for rocks and minerals	A1, A2, B1, D1, D2, G1, G2
25	Earth Science	Identifying rocks & minerals II	To explore more testing methods for rocks and minerals	A1, A2, B1, D1, D2, G1, G2
26	Earth Science	Natural Resources	To explore the challenges of recovering natural resources	A1, A2, D1, D2, E1, E2, F2, F4, F5, G1, G2
27	Earth Science	Fossils	To explore how scientists map a "dig"	A1, A2, C4, C5, D1, D2, G1, G2
28	Physical Science (Energy/Matter)	Ultraviolet Light	To explore properties of ultraviolet light	A1, A2, B1, B3, E1, E2, F1, F3, F4, F5, G1, G2
29	Physical Science (Energy/Matter)	Refraction	To explore how refraction affects light	A1, A2, B1, B3, E1, E2, F5, G1, G2
30	Physical Science (Energy/Matter)	Sound	To explore sound using homemade instruments	A1, A2, B1, B2, B3, E1, E2, F5, G1, G2
31	Physical Science (Energy/Matter)	Density	To explore how displacing matter creates buoyancy	A1, A2, B1, B2, B3, E1, E2, F5, G1, G2
32	Physical Science (Energy/Matter)	Electricity	To explore circuits and conductivity	A1, A2, B1, B2, B3, E1, E2, F5, G1, G2
33	Physical Science (Energy/Matter)	Laws of Matter	To explore two primary laws of matter	A1, A2, B1, B2, E1, E2, F5, G1, G2
34	Physical Science (Energy/Matter)	Types of Energy	To explore how energy converts to motion	A1, A2, B1, B2, B3, E1, E2, F5, G1, G2
35	Physical Science (Energy/Matter)	Changes in Matter	To explore chemical and physical change	A1, A2, B1, E1, E2, F5, G1, G2
36	Physical Science (Energy/Matter)	Indicators	To explore how indicators work	A1, A2, B1, E1, E2, F1, F5, G1, G2