

BPRI225- Everyday Science for the Primary Classroom

ECTS Value: 5 ECTS
Self-Study Hours:60

Contact Hours: 25
Assessment Hours: 40

Overall Objectives and Outcomes

The aim of this module is to develop course participants' knowledge and understanding of the basic principles of physics, chemistry and biology as appropriate to the Primary Science curriculum. The focus is to present the science as a series of themes (the human body; the solar system; the nature of matter; rocks and minerals; energies and forces; light and sound; and electricity and magnetism) through which the basic sciences are covered in a holistic, interlinked manner. Throughout this module, the emphasis is to maintain links and connections to everyday scientific phenomena as well as to focus on the local context. This will include an analysis of both the primary science syllabus and the current primary science textbooks which are utilised locally.

By the end of this module, the learner will be able to:

Competences

- a. Explore the scientific method by observing, reading, hypothesising, investigating and discussing what has been observed and present the results;
- b. Identify everyday phenomena and associate them with science concepts to be explored as part of the science curriculum;
- c. Synthesize concepts in science and apply these concepts to the teaching of science in the primary;
- d. Create diverse resources to support effective teaching of science;
- e. Design effective classroom and outdoor activities that engage students to be involved in science;
- f. Devise suitable investigations related to topics in Primary Science;
- g. Identify and discuss common science misconceptions held by children and be able to utilize strategies to minimize and remove such misconceptions.

Knowledge

- a. Explore and grasp the scientific method;
- b. Relate everyday life happenings and connect them with the bigger picture of systems;
- c. Describe and show scientific understanding of the human body: including cells, tissues, organs & systems, main body organs and systems, eating a balanced diet, teeth structure and health.
- d. Develop an appreciation the beginnings of the universe, galaxies, stars, planets and the solar system.
- e. Systematically understand key aspects of the nature of matter and important chemical equations.
- f. Critically evaluate classification of rocks and minerals, their everyday use in devices and their chemical and physical properties.
- g. Expand understanding of Energy and Forces including potential, kinetic, chemical, solar, wind, nuclear and Renewable and non-renewable sources of energy
- h. Critically analyse the basic principles of light and sound.
- i. Interpret readings of the speed of sound through air.
- j. Systematically understand electricity and magnetism including
- k. static and current electricity and parallel and series circuits.
- l. Systematically carry out experiments focusing on temporary and permanent magnets.

Skills

Applying knowledge and understanding

The learner will be able to:

1. Utilise scientific skills and scientific instruments and make them accessible to all students;
2. Organise, plan and develop science-based lessons with the covered content.
3. Plan activities which engage students with the dynamic nature of science and its scientific method.
4. Use a variety of scientific instruments and experiments to maximise student understanding.
5. Associate scientific concepts to everyday phenomena to develop an understanding that science does not only happen in a lab.

Assessment Methods

This module will be assessed through: Project.

Suggested Readings

Core Reading List

1. DeRosa D., Abruscato J. (2014)., Teaching Children Science: A Discovery Approach, Enhanced Pearson eText with Loose-Leaf Version -- Access Card Package/Edition 8
2. Martin R., , Franklin T., Gerlovich J., McElroy D., (2014)
3. Teaching Science for All Children: An Inquiry Approach (5th Edition)

Supplementary Reading List

1. Abrahams, I., & Reiss, M. J. (2012). Practical work: Its effectiveness in primary and secondary schools in England. *Journal of Research in Science Teaching*, 49(8), 1035–1055. <https://doi.org/10.1002/tea.21036>
2. Alake-Tuenter, E., Biemans, H. J., Tobi, H., & Mulder, M. (2013). Inquiry-based science teaching competence of primary school teachers: A Delphi study. *Teaching and Teacher Education*, 35(2), 13-24.
3. Allchin, D. (2011). Evaluating knowledge of the nature of (whole) science. *Science Education*, 95(3), 518-542. doi:10.1002/sce.20432
4. Andersson, K., & Gullberg, A. (2014). What is science in preschool and what do teachers have to know to empower children. *Cultural studies of science education*, 9(2), 275-296.
5. Diamond, B. S., Maerten-Rivera, J., Rohrer, R., & Lee, O. (2013). Elementary teachers' science content knowledge: Relationships among multiple measures. *Florida Journal of Educational Research*, 51, 1-20.
6. Fuentes, S. Q., Blooms, A. M., & Peace, H. (2014). Teaching science and mathematics: Preservice teachers' perceptions of knowledge needs. *Journal of College Science Teaching*, 43(3), 30-35.
7. Hoffman, P., & Ralph, M. A. L. (2013). Shapes, scents and sounds: Quantifying the full multi-sensory basis of conceptual knowledge. *Neuro-psychologia*, 51(1), 14-25.
8. Harlen W., Qualter A, (2009), *The Teaching of Science in Primary Schools*, London: David Fulton Publishers.