5. Empirical Study for the Development of an Education System Enabling Children to Learn Independently and Gain a Liking for Science

Leader: GOTO Masakazu, Senior Researcher, Department for Curriculum Research, Curriculum Research Center

(1) Purpose and Aim of Study

This study is being conducted over a period of four years. Grounded in the findings of research to date, it entails the following tasks:

(a) Developing a scheme for earth systems education tailored to the Japanese context—that is, one that can be used effectively under Japan's Courses of Study—and to use local human resources and facilities to create an education system (a system that integrates teaching methods, curriculum, assessment methods, instructional materials and aids, teacher education, collaboration with bodies within and outside the school to support study, etc.) that enables children to learn actively and independently and gain a liking for the study of science, and deploying this system on a national scale;

(b) Establishing the above education system as a system for lifelong learning;

(c) Developing a program to train teachers to cultivate independent learning among children, and organizing that program systematically in collaboration with university teacher training courses, professional development programs for practicing teachers, and teacher training activities in museums.

The significance of this research lies in its use of applied research to codify an education system that cultivates children's capacity to learn actively and independently, gain a liking for science, and continue to study it throughout their lives.

(2) Outline of Research Results

(a) Developed a revolutionary new curriculum and teaching materials/aids to boost the number of students who like studying science.

(b) Developed instructional methods to advance independent, exploratory learning.

(c) Developed a program to train teachers to cultivate independent learning among children, and organized that program systematically in collaboration with university teacher training courses, professional

development programs for practicing teachers, and teacher training activities in museums.

(d) Developed a program that integrates university teacher training courses and professional development for practicing teachers and trains teachers to cultivate a liking for science among children.

(e) Developed systems for science education curriculum development, teacher training etc. in museums.

(f) In collaboration with UNESCO and other bodies, developed a revolutionary new curriculum and teacher training program applicable not only in Japan but also in other countries.

(g) Translated an English-language text on earth systems education and Teaching Materials for Environmental Education for use in education in Japan (published in 2008 by NIER).

(h) Produced teaching materials for use in earth systems education, including “earth systems education idea cards,” “science class mystery bag,” “Sagamihara earth science teaching materials (instructional resource for elementary school science classes),” “Stony Ken Explores the Toyosawa River,” and “Miura-ology.”