

## "Introductory Science Experiments" for first-year students in science and humanity courses at Tohoku University

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Tohoku University provides an opportunity to experience a laboratory work "Introductory Science Experiments" to first-year students in science courses (Medical, Dentistry, Science, Engineering, Pharmacy, Agriculture) since 2004, and also to experience a "Basic Scientific Work" to first-year students in humanities courses (Arts and Letters, Economics, Law, Education) since 2007. Through Introductory Science Experiments, students in science courses learn about scientific logical thinking, basic academic writing skill and willingness to challenge and understand the fundamental concepts of natural phenomena. Students in humanities learn about knowledge of scientific process towards improved scientific literacy by using their own hands in basic laboratory work. More than 19,000 students in scientific courses attended the science laboratory classes during the last twelve years since 2004. About 600 students in humanities courses attended the classes during the last nine years since 2007. We designed five interdisciplinary experiment topics that combined physics, chemistry, biology and earth science for science course students (Earth and Environments, Materials, Energy, Science and Culture, and Life). For humanities students, five topics have been designed (Earth and Environment, Energy, Life, science in our daily life, Science and Culture, and Mathematics as the backbone of natural science). Tohoku University welcomes 2,500 first-year students every year (1,800 students for science courses and 700 for humanity courses). Tohoku University requires all science course (except mathematics and nursing) students to take the laboratory class (compulsory subject), so we open six laboratory classes in a year: three classes in the first and second semesters. Students take time for three hours in pairs to do the laboratory work and then students are required to submit a scientific report based on their own work in a week. About 80 teachers and 180 teaching assistants manage the classes in a year. For humanities students, about 70 students are assigned to the Basic Scientific Work because of its elective subject. Class evaluation by students showed that 62% of the scientific course students found the Introductory Science Experiments were interesting, and 90% of the humanities course students found the Basic Scientific Work were interesting. In the presentation, we introduce an instructional design of the laboratory classes (both science and humanity courses), the detail contents of the classes, their evaluation and future prospect.