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Preparation of an experiment tool for energy conversion to be used in high school physics classes

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Lack of interests for learning physics has become a major problem in recent Japanese science education. It has been often said that actual experiences of physics phenomena through experiments will be effective for attracting or stimulating students' interests towards learning physics. However, in present actual situations of high school education scene, experiments are not sufficiently conducted in daily classes.

From another perspective, the research results by American National Training Institute indicate that learning retention rates can be expressed in the form of a learning pyramid, and conventional classroom-style lectures exhibit the lowest effectiveness. The learning pyramid model indicates that the learning retention rates can increase when more actual activities and teaching experiences are involved.

In view of the above background situations, in this study, Joule's experiment, which converts mechanical energy into thermal energy, was picked up, as one of experiments that are not likely to be actually conducted in classrooms although being famous and found in textbooks. An experiment tool for realizing the Joule's experiment was provided for allowing to actually experience the energy conversion. About 10 minutes work with the tool realized certain temperature rise.

Primary author: Mr TANAKA, Ryo (Chitose Institute of Science and Technology)

Co-author: Prof. HASEGAWA, Makoto (Chitose Institute of Science and Technology)

Presenters: Mr TANAKA, Ryo (Chitose Institute of Science and Technology); 田中, 凌 (Chitose Institute of Science and Technology)

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