

Let's examine trilobites: a learning program for experiencing fun of postulating and verifying hypothesis.

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One of the goals of science education in elementary to high schools is to stimulate the children's spirit of scientific inquiry. The guideline recently introduced by the Ministry of Education emphasizes the importance of giving children scientific training in postulating and verifying hypothesis. There are, however, very little teaching stuff for such training. We developed a learning program: Let's examine trilobites, which provide children with an interesting experience of postulating and verifying hypothesis.

Postulating hypothesis is an act of giving a reasonable inference about new observation not experienced before, using all the knowledge acquired before one encounters the observation concerned. Trilobites belong to the phylum Arthropoda, which includes insects, crustaceans, Armadillidium, etc., all of which are familiar and favorite items of children. It is therefore easy for children to make reasonable guess about the morphological features like compound eyes, or their mode of life like growth with molting, without any knowledge about trilobites, which are extinct since 250 Ma.

Our program consists of two parts. The first is drawing a sketch of a trilobite specimen. Drawing a sketch compels children to observe their studying material, which make it easier for them to make reasonable inference about trilobites in answering questions in the second step of the program. The second step consists of giving children questions about trilobites. For each question, children should give a reasonable inference. In fact the first question: To what group of animals the trilobites belongs, contains hints for answering the later questions. Children postulate the hypothesis that trilobites are related to arthropod, which of course will be positively verified. In the later questions, when children give inferences, tutors may sometimes give false alternatives and argue with children, so that children will be trained to express their idea more precisely and more or less on firm ground, rather than basing on lucky guess.

At the beginning of our program, children give their idea, i.e., postulate their hypothesis with hesitation. But after a few questions, which they can answer correctly, they realize the fun of postulating reasonable hypothesis with logical reasoning, which they can verify with the fossil evidences. At the end of the program children acquire the basic training on scientific method of postulating and verifying the hypothesis. In the field of geo-science, there may be similar suitable teaching or learning material for not only stimulating their mind of scientific inquiry, but also training their logical way of thinking up to a level of postulating and verifying hypothesis. Effort should be done to provide children with similar interesting learning programs using such material, which will surely contribute to bring up more talented and motivated successors for our branch of science, i.e., geo-science.