

Construction of correlation through making Memory Tree in the class of chemistry

Tomomi Samejima (鮫島朋美)

Tokyo Gakugei University International Secondary School

5-22-1 Higashioizumi Nerima-ku, Tokyo 178-0063, Japan

(81)3-5905-1326

sametomo@u-gakugei.ac.jp

Abstract

We teach chemistry at high school in units such as organic chemistry, inorganic chemistry and chemical equations. So, most of the students don't understand the correlation between past learning and present learning. They are forced to add the new knowledge to the past knowledge. In other words, the effect of the new learning on the old learning is low. I carried out a practice report for the second and third grade of high-school. It is a report of a study method that we use to construct a relationship to past learning for chemistry. So-called Mind Maps are diagrams that are used to represent words, ideas, tasks or other items linked to and arranged radially around a central key word or idea. In Japan this study method is known as the Memory Tree, because of a cartoon. It is possible to remember chemicals that are different through their similarities. When one student makes a Memory Tree, it becomes an incentive to other students, and there is a learning effect.

INTRODUCTION

A mind map is a diagram used to represent words, ideas, tasks or other items linked to and arranged radially around a central key word or idea. It is used to generate, visualize, structure and classify ideas, and as an aid in study, organization, problem solving, and decision making. This method is famous worldwide. This study method is called Memory Tree in Japan. It is the established study method for preparatory students in Japan. This report was carried using students that plan to study science at university level.

METHODOLOGY AND RESULTS

First of all, each one of the students should understand the study method of expression through illustration. Half way through their time at High School, I set them a challenge to make a memory using one of the keys they had already studied. How to make Memory Tree is shown as follows.

- 1) Everything comes from the key word at the center.
- 2) The key word is written only one keyword is written in for each branch.
- 3) Using as much colors and, as many illustrations and keywords, as possible help the students to remember.
- 4) Students use creative imagination and association.

Table 1 shows the key word given to the student.

Table 1. The key words given to the students.

| Theoretical chemistry | Inorganic chemistry | | Organic chemistry |
|--------------------------------------|-----------------------------|-------------------------------------|------------------------------|
| Basic law of chemistry | Periodic table | Aluminium | Isomer |
| Atomic structure | Rare gas | Transition metal | Aliphatic hydrocarbon |
| Chemical bond | Halogen | Heavy metal | Alkane |
| Allotrope | Oxygen | Iron | Alkene |
| Molar | Sulfur | Copper | Alkyne |
| Reactive heat | Nitrogen | Zinc | Ether |
| Acid and base | Phosphorus | Lead | Alcohol |
| Neutralizing titration | Carbon | Silver | Aldehyde |
| Ionization potential of metal | Silicon | Complex ion | Ketone |
| Oxidation and reduction | Alkaline metal | Empirical preparation of gas | Carboxylic acid |
| Battery | Sodium | Chemical industry | Ester |
| Electric appliance resolution | Alkaline earth metal | Detection of metal ion | Oils ,hats and soap |
| | Calcium | Precipitation reaction | Aromatic hydrocarbon |
| | Magnesium | | Benzene |
| | Amphoterism | | Phenol |
| | | | Aromatic compound |

Actual Memory Trees that students made are shown in Figures 1 and 2.

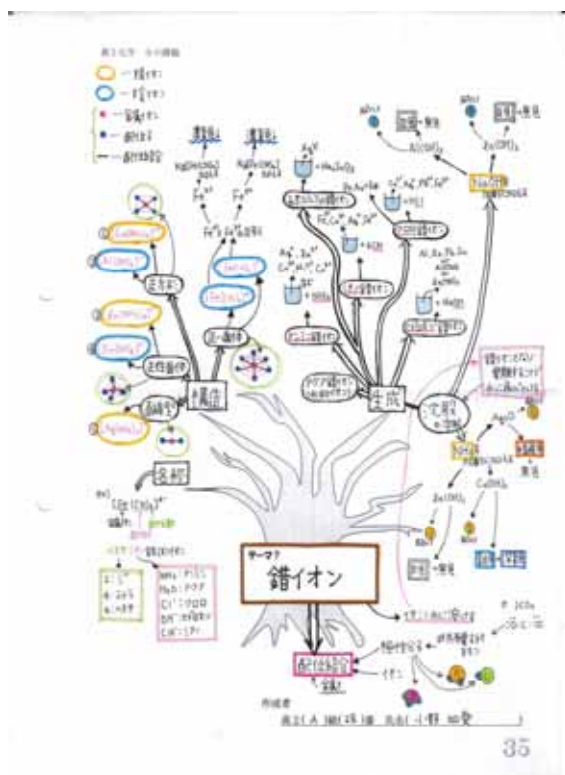


Figure1. Memory Tree about Complex ion that the student made

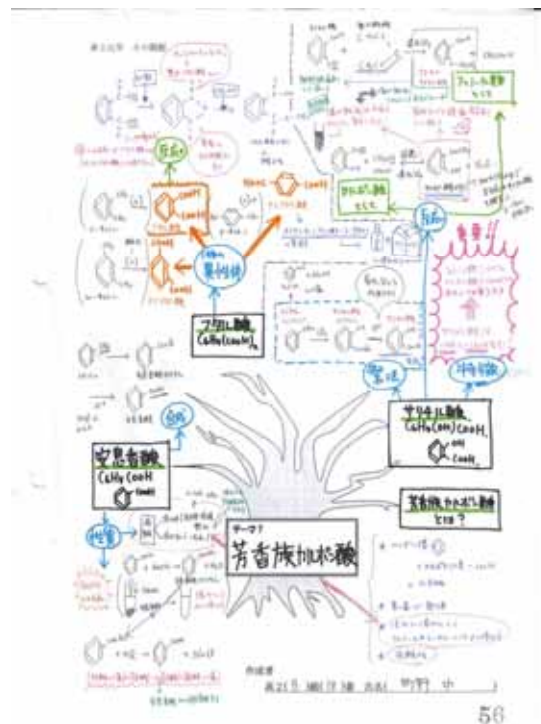


Figure2. Memory Tree about Aromatic compound that the student made

Memory Tree that the students made were bound and the book given to all the class. They used it like a textbook. If there was a related matter when a new field was studied, they wrote and added it to the text. Thus, they learn how to make and use Memory Trees.

Finally, a Memory Tree was made using the student's remarks in the class. The only word that the teacher originates in the class is the key word at the center. After that, students usually make their own memory trees. They make memory trees in areas of chemistry that they are good at. It is made by the forward remark of the student. There is that an active student holds the leadership of the class, but it is that each person has the field that oneself is good at, and the progress of the class did not need to stop.

These are opinions and impressions from the students who participated in the class.

- It is easy to make oblong paper from lengthwise paper. Therefore students prefer square paper.
- It is easy to learn one that I wrote by myself, but it takes a lot of time if I make all fields. I think that I should make only a weak field themselves.
- About the weak field, I think that the method that we discuss together and make is good. My knowledge increased.

- It is good not to be it by the one-sided guidance from a teacher. Each students also has different characteristics, remarks are good. This method improves experiments.
- Relations were easy to understand by branching off. Because everyone's knowledge contributed to the tree, the feeling was that of a parent.
- All relations were shown visually and were easy to understand. Because a relationship is clear, I remember that it was related to one keyword.
- Because we tested it after having learned it through memory tree, an experiment result and the consideration were easy to think of.
- This is the best method to review. It was pleasant that I participated in the class. I easily learned various connections.
- Unless I participate positively, it is not interesting, and there is no meaning.
- It goes without saying that Memory-tree is the best way to straighten the memory. Till now, the knowledge was separated in my head. But to finish the Memory-tree connects it one after another. I'd like to continue using this way of learning.
- It's difficult for people who don't have knowledge of chemistry, but they can develop it by memorizing many contents in a "memory tree". For example, in my case, I used it and memorize many contents in the field of inorganic chemistry which is my weakest area. As a result, I was able to solve problems. Probably the way that we memorize contents and relate them to other contents is good. And the way that students make the "memory tree" is good too. So not only students but adults should use this way.

CONCLUSION AND IMPLICATION

Using Memory Trees that each student made in the class gave birth to solidarity. Moreover, the chemistry was able to be studied systematically by relating the study of old times to topics currently being studied. A student theoretically thinks about a scientific phenomenon by relating it to past study and other units. This study method is effective because the character of a theoretical phenomenon and an individual chemical are related