

# MY\_LOUPE KIT: A tool to enhance enjoyment while learning science!

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**Highlights:** From the findings, it is revealed that problems arise when children use microscope in terms of insufficient handling skills and lack of accessibility which leads to poor understanding of deeper conceptual knowledge. To overcome these problems, My\_Loupe Kit was designed and developed. This kit will act as an alternative teaching tool that may help the science teachers in their classroom teaching. This kit is also ideal for parents to foster their pre-school aged children's early observation skills. The idea to design My-Loupe kit is based on Jerome Bruner's Inductive reasoning method. Bruner believed that students must be active learners in order to construct knowledge through discovery learning. Therefore, My\_Loupe Kit is designed to enhance observation skills and curiosity among children. The satisfactory responses from five users revealed that this product has helped to solve the problem stated earlier and enhance their understanding in tiny structures of leaves, minerals and insects.

**Key words:** *microscope, active learning, science, education*

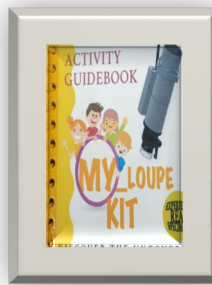
## Introduction

Children learn Science through observing systematically and experimenting. Active learning, exploration and discovery of the real world by integrating it with critical thinking skills are the important elements involved in teaching natural sciences (Ruščić, Vidović, Kovačević, & Sirovina, 2018).

Observing is the basic of science process skills. The ability to make good observations is also essential to the development of the other science process skills. In nature science studies, it is important for students to be able to observe the structure of samples or objects around them clearly. For instance, in order to describe the processes carried out in a leaf, students should be able to understand the structure of the leaf. The common problem that present among students is they are unable to visualize the tiny parts or structures of plants or other specimens whenever needed and depend on microscopes where their accessibility is limited. Therefore, My\_Loupe kit will be an alternative educational magnifying tool which is: accessible all the time, light and portable and able to enhance students' or children's curiosity which will trigger them to discover more to gain deeper conceptual understanding.

## My\_Loupe Kit

My\_Loupe Kit comes with three main components: the loupe, activity guide book and objects or specimens kit. In developing the loupe, three PVC pipes were used and stick together using solvent cement. Magnifying lens with (25x) magnification located at the bottom of the loupe together with a light bulb for a clearer image if needed. The loupe has a detachable camera that can be connected with wireless connection, for the image to be screened in smartphone and can be captured. Since the camera should be charged from time to time, a pocket casing is built to keep the camera's battery together while using the loupe.



The complete My-Loupe Kit with specimen kit and activity guide

## **Content**

### Problems Background

In order to make good observations of tiny details of specimens and other objects like mineral rocks, it is important for students to be able to use microscope properly. Unfortunately, students fail to make good observations most of the time, due to the following factors:

- Lack of skills handling the microscope
- Limited accessibility
- Lack of understanding of the tiny structure

### Methodology

1. Identify the goals or problems to be solved.
2. Analysis the possible solutions.
3. Idea development and design.
4. Conversion the idea of solution into the prototype.
5. Develop the innovation product for testing and improvement.

### Findings

- All the respondents agree/strongly agree that loupe is light and portable enough
- 60% respondents agreed that they can see specimens clearly.
- 80% respondents gave positive feedback by agreeing that this kit has increased their understanding. Again, this fulfils the aim of the

### Advantages

- Develop observation skills
- Lead to HOTS thinking
- Inductive reasoning
- Handy and ideal for fieldwork
- Enhance curiosity
- Can be assessed anytime

### Important to education

- **Teachers:** As an alternative educational tool to teach science lesson instead of using the textbook alone especially for field work.
- **Students:** Help in visualizing the specimens and new way to attract student's attention and curiosity by learning in a fun way.
- **Schools:** Provide the schools with a new tool which may help the process of teaching and learning which later may improve students' performance.
- **Other User:** Attract users to know and learn science in a simple and fun way.

### Commercial Value

- Can be commercialize by promote to the school for their learning especially for the science class.
- Can be commercialized among parents with pre-school aged children as an educational activity kit to foster their children's observation skills.

### Suggestion

- The loupe can be provided with different magnifying lens in the kit and there can be slots to slot-in them.
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### **References**

- Abungu, H. E., Okere, M. I., & Wachanga, S. W. (2014). The effect of science process skills teaching approach on secondary school students' achievement in chemistry in Nyando district, Kenya. *Journal of Educational and Social Research*, 4(6), 359.
- Azubuiké, A., & Azubuiké, A. S. (2014). Students' Common Difficulties in Manipulating Microscope Selected Schools in Kano State, Nigeria. *Creative Education*, 5(13), 1125.
- Bogar, Y., Kalender, S., & Sarikaya, M. (2012). The effects of constructive learning method on students' academic achievement, retention of knowledge, gender and attitudes towards science course in "matter of structure and characteristics" unit. *Procedia-Social and Behavioral Sciences*, 46, 1766-1770.
- Cook, M. P. (2006). Visual representations in science education: The influence of prior knowledge and cognitive load theory on instructional design principles. *Science Education*, 90(6), 1073-1091. doi:10.1002/sce.20164
- Demircioğlu, G., & Çağatay, G. (2014). The Effect of Laboratory Activities based on 5e Model of Constructivist Approach on 9th Grade Students' Understanding of Solution Chemistry. *Procedia - Social and Behavioral Sciences*, 116, 3120-3124. doi:<https://doi.org/10.1016/j.sbspro.2014.01.719>
- Gultepe, N., & Kilic, Z. (2015). Effect of Scientific Argumentation on the Development of Scientific Process Skills in the Context of Teaching Chemistry. *International Journal of Environmental and Science Education*, 10(1), 111-132.
- Ruščić, M., Vidović, A., Kovačević, G., & Sirovina, D. (2018). The use of microscope in school biology teaching. *Resolution and Discovery*, 1-4.
- Yun, S. M., & Kim, H.-B. (2015). Changes in Students' Participation and Small Group Norms in Scientific Argumentation. *Research in Science Education*, 45(3), 465-484. doi:10.1007/s11165-014-9432-z

