



# THE DESIGN OF LESSON ON MULTIPLICATION OF INTEGER BY APPLYING THE MATHEMATICS PROFESSIONAL LEARNING COMMUNITY (PLC) APPROACH FANG DISTRICT, MAE AI DISTRICT AND CHAIPIRAKAN DISTRICT, CHIANG MAI PROVINCE

**SITTICHA PONGSAI**  
Fangchanupatham School,  
Chiang Mai, Thailand

## INTRODUCTION

The study was to apply the process of Lesson Study and Professional Learning Community (PLC) Approach of mathematics teachers in order to discuss the efficient teaching techniques in terms of the multiplication of the same integer: two positive integers, two negative integers or the multiplication of different integer: a positive and a negative integer or vice versa. The study was targeted to eleven students in the 7th Grade of eleven schools in three districts: Fang, Mae Ai and Chaiprakan in Chiang Mai Province.

## OBJECTIVES

This study aimed to explore the outcomes of applying the process of Lesson Study and the model of Mathematics PLC in designing the technique of multiplication in Fang District, Mae Ai District and Chaiprakan District in Chiang Mai Province.

## STUDY METHOD AND DATA ANALYSIS

Eleven mathematics teachers from targeted middle schools have been working together to study this topic. The study time was the 1st semester of 2017 academic year. There were three following research instruments:

1. The meeting agenda of Mathematics PLC
2. Lesson Plan Template
3. Informal interview form together with the qualitative methodology

7th Network	8th Network
1. Ban Long Orr School	1.San Sai Kong Noi School
1. Ban Mae Kah School	2.Ban Mon Pin School
2. Wat Sri Dong Yen Community School	3.Chao maeluang Uppatam I School
3. Wat Pa Dang School	4.Ban Muangrae School
4. Prapriyatham Watpamaidang School	5.Mae-ai Wittayakom School
5. Fangchanupatham School	

- Identify the students' needs and the importance
- Teachers collaborate in planning and implementing the lessons
- Assessment of the plan and the process
- Improve the plan based on data collected from the assessment
- Study the teaching guideline and try the new method
- Evaluate the outcomes and consider other methods appropriate to the students.



## CONCLUSION AND DISCUSSION

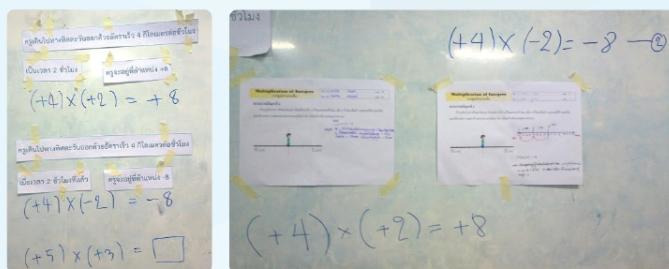
The guideline in designing the mathematics lesson plan began with the gathering of mathematics teachers in the vicinity to discuss the concepts. The discussion of this study was on "the multiplication of the integer" by applying the studying process and Professional Learning Community (PLC) aiming at scaling up the teaching for effective outcome as initiated by the Chevron Enjoy Science Project. The objectives of this project were (1) more effective lesson structure, (2) selection of tasks with appropriate cognitive demand, (3) appropriate use of group/partner-based instruction, (4) effective use of formative assessments/adaptive instruction, (5) engage/facilitate student centered discussion and discourse, (6) frequent writing inside and outside of class and (7) inquiry and project learning. This is the beginning of designing the lesson plan based on the PLC in the group of mathematics teachers and will be developing to other topics in the future.

### References

- Hord, S.M. (1997). Professional Learning Communities : Communities of inquiry and improvement. Austin : Southwest Educational Development Laboratory. [journal.oas.psu.ac.th/index.php/asj/article/view-File/125/688](http://journal.oas.psu.ac.th/index.php/asj/article/view-File/125/688)
- Luis, K.S. & Kruse, S.D. (1995). Professional and Community : Perspectives on reforming urban schools. Thousand Oaks, CA : Corwin Press.
- TOKYO SHOSEKI. Mathematics International Grade 7 Section 3 Multiplication. (TOKYO SHOSEKI CO.,LTD.) , JAPAN

## STUDY OUTCOMES

1. The meeting agenda for Professional Learning Community (PLC) - The mathematics PLC team was formed for planning a lesson by:
  - 1.1 Setting the goal aiming at designing the multiplication lesson plan
  - 1.2 Designing a lesson plan
  - 1.3 Setting up other meetings by marking the date, venue and topic for further discussion
2. The creation of lesson plan template – It comprised of the lesson title, goals, key questions, nature of student work and materials.
3. According to the informal interview, it was found that using accurate words in communication, the variation of questioning levels to support students' learning, providing mathematics situations related to the local context and familiar to the students' working group were key shared points and discussed issues related to multiplication topic. Designing on a lesson plan through mathematics PLC resulted in sharing teaching experiences on multiplication and the awareness of critical focal points. Moreover, the reinforcement of applying a lesson plan created through their instructions was more effective implementation and reflection.

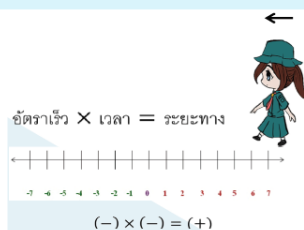


## EXPLANATIONS FROM THE ILLUSTRATIONS

- Present the problems, discuss how to teach the topic of the multiplication of integer and join in designing the lesson plan.
- The teacher representative demonstrated the teaching techniques. Other teachers observed the teaching in the mathematical classrooms.
- Reflected the teaching outcomes and criticized the work of students.
- The picture showed the process in developing the mathematics PLC to discuss the topic of the multiplication of the integer.
- The picture showed the teacher's teaching technique planned with other teachers.
- The picture showed the students' reaction to the teacher's activity.
- The picture showed the teacher's conclusion and the presentation of concepts in solving the problem.

Speed x Time = Distance (Position on the number line)  
[-4] x [-2] = [+8]

If walking to the west with the speed of 4 km./hr. in two hours ago, the distance would be marked on the [+8] on the number line.



The pictures showed the activities engaged by mathematics teachers during the pedagogical planning.

The concept was taken from the textbook of TOKYO SHOSEKI, Japan.