

Subject : Feel for the way of developing mathematical lessons in which the little changes between the “goals” are conscious

**1. Unit: Connection to secondary school (extension of the unit of proportion and inverse proportion)**

**2. About the subject**

**<restoration of lessons which centre on students’ “question”>**

Where should we place the “goal” and “summary” in a lesson, and could they really help the students? These questions request serious discussion. I heard that in some areas, writing the “goal” and “summary” on the blackboard formally has become a task for teachers and has been on the check list for developing lessons. But if we think dispassionately, it is impossible to raise the students’ attainment by only writing down the “goal” and “summary” exactly.

Recently I have heard a lot of agony from the young teachers as they are forced to follow some fixed steps and hard to get their students excited in the class.

Depend on the exact “goal”, sometimes it would spoil the fun of the whole lesson if the teacher writes down the “goal” first. Furthermore, sometimes students would not be able to think of the most important things if the goal has been written on the blackboard first.

Same for the “summary”, many teachers have already experienced that let students to write down what teacher has written does not really help to develop the students’ abilities, although their notebooks may seem to be nice. So I think there is no fixed form for how to present the “goal” and “summary”.

I wonder whether other people also feel the danger like me of developing lessons mainly by the fixed form, despite what have been researched in our country have higher quality.

Although it sounds hackneyed, if we do not treasure the process that students raise their own “questions” during the problem solving activity, explain and summary them by their own words, we could not actually develop students’ abilities. These years private enterprises have also been emphasizing the importance of task setting ability, because more and more new employees are only able to deal with the work which has be given to them, lacking the ability to decide what should be done next by themselves. In the world of education, we should also make an effort to try to set the questions raised by students during the introduction of teaching materials as the current task, and place the true “goal” from the middle of the lesson.

The students’ attainment is the ability to learn. The lessons which have been developed attaching importance to students’ willingness, treasure the very moment when students create their question.

Once more, it is required to change the concept of teaching like this.

**<the goal changes little by little>**

From students’ perspective, the tasks which they are dealing with keep changing during the lesson. Some of them appear while students try to understand teachers’ question, and some arise from students’ thoughts. Because these little changes of tasks that raised by the 40 students diffuse and convergence in the classroom, teachers are required to have a high level of skill in

developing the lesson. As specialists of education, teachers should be conscious of these changes. If teachers are conscious of this, they would try to develop the lesson while checking the little changes of “goal”. With this consciousness, teachers would make sure that students who seem to be falling behind could also join in the activity. I think lessons that developed with the consciousness of these “little changes of goals” are able to deal with students’ individual differences and ability differences.

### 3. About the learning in this lesson

For the sixth grade, we have finished the contents of textbooks and enter the period of summary and extension after the middle of February. The textbook which our school used has the third book as the connection to secondary school. I designed this lesson to confirm the position of the learning of proportion and inverse proportion by examine various phenomenon of functional relations, as the extension of the unit of proportion and inverse proportion.

### 4. The development of this lesson

Objective of this lesson:

Know that there are lots of rules behind the phenomenon that one number changes following another one, in addition to proportion and inverse proportion. And be able to summarize the same and different points of each one.

learning activities	teacher’s role in supporting the activities																																
<p>1. Think of the rule of the changes  <math>2 \rightarrow ? \rightarrow 4</math>            T : “If I put 4 into this box, what number will come out?”            S: “Maybe 6?”            S: “Maybe 8?”            S: “It should be 16, isn’t it?”</p> <p>2. Investigate every case            Example: 6 comes out after 4 has been putted in</p> <table border="1" data-bbox="240 1440 778 1525"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr> </table> <p>T: “Under what condition would the numbers change like this?”            S: think of the concrete case</p> <p>3. Find out that there are different graphs with a same pair of numbers</p> <table border="1" data-bbox="240 1816 778 1901"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> <tr><td></td><td></td><td>4</td><td></td><td>2</td><td></td><td></td><td></td></tr> </table>	0	1	2	3	4	5	6	7	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7			4		2				<p>Have the students understood that the numbers change by the same rule in the box?</p> <p>Is every student aware of the fact that there are several kinds of rules could change 2 to 4?</p> <p>Could the students recall some specific relationships from the completed graph? In fact, some of them have been learned before. Students can look up in their notebook.</p> <p>This is the first time that students see relationships like get 2 from 0.</p> <p>From different viewpoint, the phenomenon that one number increase and the other one decrease could be thought different.</p> <p>It could be thought that they have a fixed produce like inverse proportion or have a fixed sum.</p> <p>Maybe some students do not feel like creating inverse proportion relationship from numbers in this case. But I want them to review their learning.</p>
0	1	2	3	4	5	6	7																										
2	3	4	5	6	7	8	9																										
0	1	2	3	4	5	6	7																										
		4		2																													