

Preface

This handbook is compiled mainly for Indonesian teachers at junior high schools (SMP and MTs). It consists of practical hints for those teachers who want to give better lessons for their students.

The authors of this handbook are JICA Experts for SISTTEMS,¹ an official technical cooperation program implemented jointly by the Ministry of National Education of Indonesia and by the Japan International Cooperation Agency (JICA). Throughout the program period (2006~2008), the authors visited a number of SMP and MTs in the program sites and observed scores of lessons. This experience has taught the authors that many Indonesian teachers are ill-equipped with basic skills to design and conduct a good lesson. Moreover, we have come to realize that they have a common mindset resistant to innovation.

The authors are fully aware that in any country teaching practice is deeply rooted in the culture. Furthermore, as experienced teachers themselves admit, there are no “perfect” lessons: any lesson still has room for improvement. Then it would be very unwise for us to “advise” Indonesian teachers to imitate, say, Japanese teachers or “boast” that this handbook is the surest means to improve lessons. Certainly these are not what we intend to do.

What we want to do with this small booklet is to open Indonesian teachers' eyes to a different perspective. In that perspective, it is the students, not the teacher, who are at the center. After all, teaching at classes is for the students to learn and understand something. Every student has a right to learn. It is the teacher's duty to respect this right and help the students truly learn and understand.

This handbook is never meant to be exhaustive; it is not an encyclopedia of teaching skills. It only covers a limited number of topics but, we believe, is highly useful for teachers who are searching for workable hints on how to improve their classroom lessons.

The authors are grateful to many people both in Indonesia and in Japan who contributed something to this handbook.

October 2008
Jakarta

¹ SISTTEMS is an abbreviation of the *Program for Strengthening In-Service Teacher Training of Mathematics and Science Education at Junior Secondary Level*. The main objective of this program was to introduce Lesson Study to Indonesian schools.

Part 1 Mental Attitude

- 1 Teacher's Duty
- 2 Teacher's Ability
- 3 Teacher's Daily Work

1

Teacher's Duty

Teacher's duty is to make every student understand.

Every student has a right to learn and understand. Teacher's duty is to respect this right and make sure that every student learns and understands what teacher teaches.

If a student does not understand something or has difficulty to learn, it is primarily the teacher who should be to blame. The student cannot understand because the teacher did not teach him or her properly. Blame yourself. Don't put the blame on the students.

"Understanding" is not the same as "memorizing." In studying, students need both to understand and to memorize. However, in Indonesia, many teachers are only forcing the students to memorize something but do not facilitate their understanding. If students understand the central concept or principle of the topic, it is easy for them to memorize the whole contents. If they don't understand the core essence, they have no other way but to memorize some formulae or rules without digestion. Such learning is not effective at all.

Let's try to conduct a lesson where every student exclaims, "Yes, I got it!" To achieve this, teacher should first change his or her mental attitude. Teacher should listen to students' inner voices: Do they understand your explanations? Teacher should associate new things with existent things (knowledge or facts) to facilitate students' understanding: Don't force the students to memorize!

2

Teacher's Ability

Teacher should be able to:

- 1 Understand the contents of the subject matters;
- 2 Design a lesson;
- 3 Observe individual students and see if they are learning or not;
- 4 Observe other teachers' lessons and learn something useful from them;
and
- 5 Develop together with other teachers (colleagues).

First, teacher should be able to **teach the students**. To be so, he or she should have correct and sufficient knowledge of the subject matters he or she teaches [1]. Moreover, he or she should be able to design a lesson appropriately and flexibly according to the varying conditions: its objective, students' level of understanding, available teaching aids or materials, available time, etc. [2].

Second, teacher should be able to always **monitor the students** in the class to see if they are learning and understanding [3]. While giving explanations or letting them work in groups, teacher should constantly observe individual students and gauge their level of understanding. Teacher should never be fooled by good students into believing that every student understands the lesson well.

Third, teacher should be able to **learn from other teachers**. Teachers can learn best from fellow teachers [4]. Don't get isolated. Be open. As professionals, you and your colleagues should develop together to become better teachers [5].

Lesson Study is an effective way for teachers to acquire and improve those abilities above.

3

Teacher's Daily Work

In your daily life, teacher should:

- 1 Never be late to school or class;
- 2 Always prepare for lessons;
- 3 Know students' names and levels of academic achievement;
- 4 Praise students rather than scold them;
- 5 Consult colleagues frankly if you have a problem with your lesson or students; and
- 6 Try something you can do to improve, however small it is.

Improvement should start from your daily life. Six hints are:

- 1 Teacher should never be late to school or class unless there is an unavoidable reason. Be punctual. Teacher should be a role model for students to imitate.
- 2 Teacher should always prepare for lessons. Without preparation, your lessons can never be good. You cannot improve students' learning or academic achievements. When preparing a lesson, don't assume that students have studied the topic preliminarily at home. You should prepare a lesson assuming the topic is new to all students.
- 3 Teacher should remember the names of all students in your classes. Teacher should also know their individual levels of academic achievements and characteristics.
- 4 Teacher should make it a habit to praise students for positive points rather than to scold them for negative points. Praise is encouraging while scolding is discouraging.
- 5 Teacher should consult your colleagues or senior teachers when you have a problem with your lesson or students. Don't hesitate. Don't be arrogant, either, that you can solve any problems by yourself. Lend a hand to your colleague if you are asked for help.
- 6 Teacher should try to do something you can do. However small it is, it is the beginning of a big change. Where there is no action, there will be no change. Take action. Take a small step. Teachers are busy and innovation is never easy to come. Start with a small step you can take.

Part 2 Before Lesson

- 4 Make Plans
- 5 Simple Lesson Plan Is Enough
- 6 Two Types of Lessons
- 7 Teaching Process Is Made Up of Three Actions
- 8 Various Ways of Conducting a Lesson
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4

Make Plans

Teacher should make three plans:

- 1 Annual plan
- 2 Topic plan
- 3 Lesson plan (RPP)

An **annual plan** describes how many units should be devoted for respective topics in a year. Allocate an appropriate number of units to topics considering both the curriculum requirement and the number of available units. You have to keep all the contents in your annual perspective.

A **topic plan** defines what to be taught in more detail with regard to respective topics. Once again, allocate units appropriately.

A **lesson plan** (RPP) is a plan prepared for a specific lesson. You first carefully study the topic you will teach. Then specify the target(s) of that particular lesson. Be careful not to have too many targets for a lesson. If you put too many targets in one lesson, you have to hurry up and students will get confused. Then think about the scenario of the lesson. Identify materials and tools you will use in the lesson.

5

Simple Lesson Plan Is Enough

You don't have to make detailed lesson plans. A simple one will suffice.

A lesson plan (RPP) should follow an official format specified by the government. You have to satisfy this requirement. However, as far as the format is satisfied, the plan does NOT need to be detailed or elaborate.

A simple lesson plan will be just enough because a lesson is always "alive" and full of unexpected developments. Teacher should constantly adapt to such new developments to facilitate students' learning most effectively. Then it is meaningless, or even harmful, to prepare an elaborate lesson plan and stick to it throughout the lesson.

A simple, rough lesson plan will suffice. In such a plan, you should only describe a rough scenario of the lesson--what you will do in what sequence, what discourse you will have with students, when you will start an experiment, etc.

The two essential points you have to clarify in a lesson plan are:

- 1 **Objective.** You have to be absolutely clear about the objective you want to achieve in that lesson. If your objective is clear, you will not get lost during the lesson.
- 2 **Students' reactions.** You have to anticipate how students will react to your question or material. With this anticipation in your mind, you will be able to respond more appropriately to students' reactions.

These two points should be clarified in every lesson plan.

You don't have to print out lesson plans for daily lessons. You design a lesson, write a simple lesson plan and keep it in your mind when in class. That will be enough.

6

Two Types of Lessons

There are two types of lessons:

- 1 Practice (mastery) type
- 2 Exploratory type

One lesson can be of either type. Or teacher can mix the two types freely in one lesson.

The two types of lessons are:

Practice Type: A student comprehends what he/she learns in class, and he/she fully masters it by doing exercises repeatedly.

Exploratory Type: A student is eager to know something. He/she is absorbed in his/her thoughts or tries hard to understand a concept.

This distinction is necessary because teacher should use different approaches depending on the type. These two types can be mixed freely. Typical patterns of lesson are:

Pattern A

Practice type

Pattern B

Exploratory type

Pattern C

Practice type

Exploratory type

Pattern D

Exploratory type

Practice type

Pattern E

Exploratory type

Practice type

Exploratory type

A lesson can be of Practice Type (Pattern A), Exploratory Type (Pattern B) or Mixed Type (either Pattern C or D or E). The important point is that teacher should be fully aware of what type of lesson he or she is going to teach.

7

Teaching Process Is Made Up Of Three Actions

Teaching is to repeat the three actions:

- A Question
- B Search for the answer
- C Exercises

(A)+(B)+(C) is one set. Teacher should repeat the set as many times as necessary in a lesson.

Teaching process consists of three basic actions:

- A Teacher raises a question to all students.
- B Teacher and students jointly search for the answer.
- C Students do exercises to master the new knowledge.

These three actions, (A)+(B)+(C), makes up one set. In a lesson, teacher should repeat this set as many times as necessary.

Various Ways of Conducting a Lesson

Style of teaching process is not limited to one. Three basic styles are:

- 1 Lecture (teacher teaches students as a whole)
- 2 Individual work (students work individually)
- 3 Group work (students work in groups)

Teacher can flexibly combine these three styles in one lesson.

There can be various ways of conducting a lesson because teacher can freely combine the three styles. How should you combine the three styles? It depends on the objectives of the lesson and on the materials teacher will use in the lesson.

The three actions explained above (Section 7) are associated with the three styles as follows:

- | | | |
|---|-----------------------|-----------------------------------------------|
| A | Question | <i>Lecture</i> |
| B | Search for the answer | <i>Lecture / Individual Work / Group Work</i> |
| C | Exercises | <i>Individual Work / Group Work</i> |

As these three actions are repeated, there can be a number of combinations of styles. Following are some basic patterns of teaching process.

In either pattern, the important point is that teacher should make all students puzzled (Why?) and curious (Interesting!) **within 5 minutes** at the beginning of a lesson.

(1) Teacher teaches contents of the textbook in a lecture-style lesson

Lecture

* This pattern is possible but not recommended at all.

(2) Students do an experiment or look for information in science

Lecture	Experiment or Information Gathering (Group Work)	Deliberation (Group Work)	Lecture
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* This is a typical pattern of exploratory-type lesson where students explore new knowledge.

(3) Students find out various ways of solving one question

Lecture	Individual Work / Group Work	Lecture
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* This is another typical pattern of exploratory-type lesson where students try to find out several ways of solving a question. This pattern is also possible when students do exercises at the end of a topic (practice-type lesson).

(4) Students do exercises

Lecture	Individual Work	Explanation (Lecture)	Individual Work	Conclusion (Lecture)
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* This pattern is suitable for exercises. In the first session of the individual work on exercises, teacher carefully examines with which questions students make mistakes. Then, in the mid-class lecture session, the teacher explains about the common mistakes. Students continue exercises to secure their understanding.

(5) Students explore in the first half and practice in the latter half

Lecture	Individual Work / Group Work	Conclusion (Lecture)	Lecture	Individual Work	Conclusion (Lecture)
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* This is a typical case where students try to come up with a formula in the first half and, in the second half, they solve questions individually by using the newly found formula.

(6) Students step up from finding regularity or rule to applying it

Group Work	Lecture	Group Work	Lecture / Individual Work	Group Work
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* This pattern is an example of group work-led lesson. In the first group work students find out some regularity or rule by themselves from a familiar example. Then, students further explore it in the second group work. Finally, students do exercises in groups solving similar questions.

From Concrete to Abstract, from Abstract to Concrete

To help students understand abstract things, teacher should always begin with concrete things. After students understand concrete things, move on to generalize abstract conceptions from the results.

In mathematics, however, an opposite move from abstract to concrete is also necessary. When teacher has derived a formula, go back to concrete things: give enough exercises for students to solve using the formula.

Go always from concrete to abstract. Then go back from abstract to concrete. Never start from abstract and stay at abstract.

Students have to understand many “abstract” things particularly in mathematics and science. As we all know, it is not easy for people to understand abstract things. By contrast, it is a lot easier to understand concrete things.

From Concrete to Abstract: To help students understand abstract things, teacher should always begin with concrete things. For instance:

- Use a concrete topic (slot machine or lottery) at introduction to a lesson on probability.
- Use a molecular model to explain molecules in chemistry.
- Use a concrete example first to derive a formula.
- Arrange questions in LKS in such an order that concrete, easy ones come first and abstract, difficult ones come later.

From Abstract to Concrete: On the other hand, an opposite move from abstract to concrete is also necessary particularly in mathematics. When teacher has derived a formula, don't stop there. Go back to concrete things: give enough exercises for students to solve using the formula. Concrete exercises will greatly help students understand and memorize the abstract formula.

Go always from concrete to abstract. Then go back from abstract to concrete. Never start from abstract and stay at abstract.

Students in Three Groups

Students can be divided into three groups:

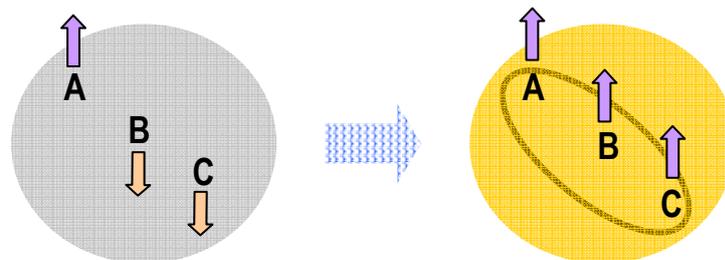
Group A: Excellent students who can easily understand contents of a lesson

Group B: Ordinary students who take some time to understand contents of a lesson

Group C: Slow-learning students who cannot easily understand contents of a lesson

In general, the percentage of Group A in the total is about 10%, Group B 60-70% and Group C 10-20%. In Indonesian junior high schools, however, Group C tends to be larger because many students do not thoroughly understand what they were taught at primary school.

Teacher should not give a lesson targeting only excellent students of Group A. If he or she does so, students in Groups B and C will be left behind. Group B is the main target of class. Furthermore, teacher should pay much attention to Group C. Ultimately, teacher and all students in class should together care and support the Group C students. Teacher's role is very important.



Key: Teacher should provide many occasions for students in Group C to communicate with students in Groups A and B. For example, teacher should encourage a student in Group C to ask a student in Group A or B to show and explain the process (not just the answer) of solving a question. **Caution:** It is not a right way that teacher asks a student in Group A to teach a student in Group C. This will only instill a sense of inferiority into every student's mind.

Why Group Work?

Why do we need Group Work? There are four reasons:

- 1 For slow learners: Slow learners can learn better with help by quick learners.
- 2 For quick learners: Quick learners can consolidate their understanding by explaining the subject to slow learners.
- 3 For all students: Students can solve problems listening to and utilizing other students' ideas and thoughts.
- 4 For all students: Students can nurture better relationships with each other.

A slow learning student is usually afraid of asking questions to teacher when they don't understand something. However, such a student feels less reluctant to ask questions to a fellow student. With help from other students, slow learners can understand what teacher is teaching. Group work can support slow learners best.

On the other hand, a quick learning student, when asked by a fellow student to explain, has a chance to clarify his or her thought by explaining the answer and the process to the student. Through this, the quick learning student will consolidate his or her understanding more. Group work is beneficial to excellent students, too.

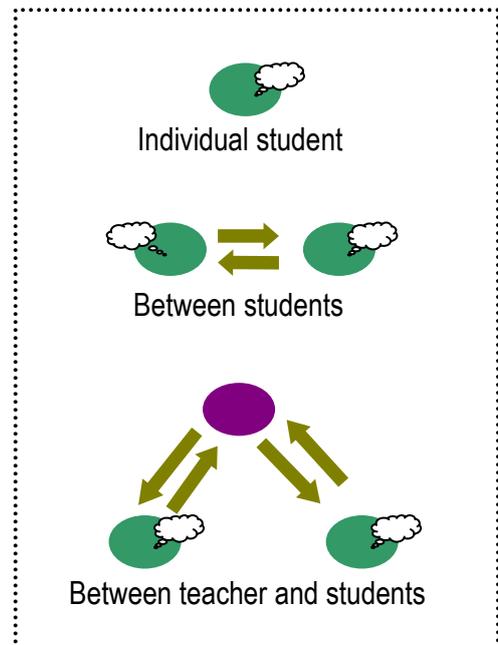
Group work also provides an opportunity for the students to exchange various ideas freely and incorporate them into their own thoughts. This way, they can solve problems or accomplish tasks which they might not solve or accomplish alone.

Group work is an effective means to nurture good, friendly relationships among the students. Caring and assuring relationships are the basis for the students to strive for better achievements at school.

Students actively talk among themselves--this is discussion. However, discussion is not always visually active. There are other forms of discussion as well.

Discussion is not always visually active. Discussion does not always involve many students at once.

- 1 A student quietly and deeply thinks in his or her mind: "Why so?" This is a form of discussion.
- 2 A slow learning student quietly asks his or her fellow student to show how to solve a question and the student sitting next shows the way. This is another form of discussion.
- 3 Teacher asks students for opinions and one student gives his or hers. Instead of saying whether the answer is correct or not, teacher again asks other students to reflect on the previous student's opinion. Another student gives his or her own opinion. This also is a form of discussion.



Caution: Many teachers think that if they give only one copy of LKS to each group, this will encourage lively discussion among the students. Wrong. Distributing one copy of LKS per group does not at all guarantee active discussion!

- 1 If that LKS is of filling-in-blanks type and shows small steps of solving a question, it reduces students' thinking power and does not encourage various thoughts. Therefore, discussion will not occur among the students.

- 2 If questions in the LKS only ask students to collect information from the textbook, discussion will not start. To facilitate discussion, LKS should contain such questions as “Why?” and “How?”

Is LKS Necessary?

It is not always necessary to prepare LKS. Sometimes, teacher may not need LKS at all because the teacher can use exercises in the textbook. In others, certain topics simply do not require any LKS.

Let us stop using the filling-in-blanks type of LKS. Such LKS does not stimulate students' thinking at all. Instead, try to put questions and tasks in LKS that start students thinking "Why?" or "How?"

Example 1: Typical LKS

You will calculate the surface area of a cylinder.

The radius of the top and the bottom of the circle is (r). The circumference is (k). The height of the cylinder is (t).

Top circle area = ... * ... * ... (1)

Bottom circle area = ... * ... * ... (2)

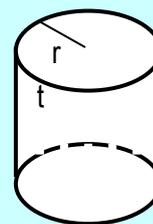
Side area = ... * ...
 = circumference * height
 = ... * ...
 = ... (3)

Surface area = (1) + (2) + (3)
 = ... + ... + ...
 = ... + ...
 = ... (... + ...)

Example 2: Exploratory LKS

You will calculate the surface area of a cylinder.

The radius of the top and the bottom of the circle is (r).
 The height of the cylinder is (t).



Q1: First, let us find out the shape when you cut and open the cylinder, and flatten it.

Q2: How do you calculate the surface of the cylinder?

How Many Copies of LKS?

How many copies of LKS should teacher prepare?

- 1 It is recommended to distribute 1 LKS for 1 group when the group members work together and discuss together.
- 2 It is recommended to distribute 1 LKS for 1 student when each student does exercises and explores questions.

Point 1: When group members need to cooperate or collaborate with each other on a subject, give 1 LKS per group. Distributing 1 LKS for 1 student prevents them from working together.

Reference: See Section 12 “Discussion” above. It explains how LKS can stimulate discussion among the students.

Point 2: If teacher distributes 1 LKS for 1 group when each student actually needs to do exercises or work, a smart student will very likely grab the LKS and solve all questions. The other members will be left behind without doing anything.

Example 1: Following type of exercises should be done individually.

- (1) $2a+3a+5a = ?$
- (2) $2a+3a+2b+b = ?$
- (3) $2a+3b+3a+b = ?$
- (4) $2ab+3ab = ?$

Example 2: Following type of exercises can be discussed between two students sitting next each other or among group members.

- (1) Why is ‘ $2b+b=2b$ ’ incorrect?
- (2) Why is ‘ $2a+3b=5ab$ ’ incorrect?

Part 3 During Lesson

- 15 Always Be Attentive
- 16 Keep Attracting Students' Interest
- 17 Do Not Talk Too Much
- 18 But Give Necessary Explanations in Full
- 19 Use Blackboard Skillfully
- 20 How to Arrange Students' Desks
- 21 Lecture Is a Dialogue Between Teacher and Students
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- 25 Whether to Do Group Work or Not
- 26 When to Start and Stop Group Work
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- 28 Does Each Group Need a Leader?
- 29 How to Let Students Present
- 30 Mistakes Are Valuable
- 31 Thank Students Who Made Mistakes
- 32 Always Correct Mistakes
- 33 Have Students Take Notes
- 34 Use Lesson Time Efficiently

Always Be Attentive

In conducting a lesson, teacher should always keep following points in his or her mind:

- 1 What do I want students to understand or learn in this lesson?
- 2 Does every student understand? If not, why and what point do they feel difficult to understand?
- 3 What should I do to help those students in trouble?
- 4 Are all students listening to other students?

Teacher should make instant decisions on what to do next according to the students' condition and reaction.

Remember, teacher's job is NOT to "transfer" knowledge unilaterally from teacher to students. Teacher's job is to **make every student understand and learn**. Therefore, when conducting a lesson, teacher should always be aware of:

- 1 the objective of the lesson; and
- 2 the students' condition and reaction.

Never lose sight of the objective of the lesson. What do you want students to understand in your lesson? What do you want students to learn in your lesson? As far as you firmly grasp the objective, you can forget about the lesson plan you prepared. You can divert from the plan if you think it necessary.

You should always monitor the students individually. You should be able to detect those students who have difficulty to understand what you teach. You should also be able to see why those students have that trouble. Once you know why, you should adjust your lesson to help them overcome the difficulty. See Section 22 below.

How should you help those students in trouble? There are several options to take. See Section 23 below.

Keep students attentive to other students particularly when some raise questions or make presentations. Students should listen to other students carefully. If some of the students are not listening to others, you have to instruct them to pay attention.

In a lesson, teacher should make many adjustments to the lesson plan and his or her way of teaching so that students can learn better. Don't be afraid of scrapping the lesson plan. Be bold enough to improvise a lesson as far as it helps students understand better.

Keep Attracting Students' Interest

Keep attracting students' interest by:

- 1 making introduction attractive;
- 2 using concrete materials, topics or actions;
- 3 adjusting time allocation; and
- 4 appointing those students who are losing interest at the center of the lesson.

Students will learn only when they have reason to learn. Even when they know why they have to learn, they will not learn if the lesson is uninteresting to them. Teacher should keep them interested throughout the lesson.

To raise and attract students' interest, the beginning is the key to a successful lesson. Teacher should try hard to make introduction appealing to the students.

One effective way to make a lesson attractive is to use something concrete. For example: a paper-made model of cone, sample grass leaves, a globe, a mirror, a model torso, pictures, and so on. Concrete things are not limited to physical materials. Concrete topics can also stimulate students' interest. For example, teacher begins a lesson on mathematical function by telling a story about motorbikes: what is the relationship between the mileage and gasoline consumption. Concrete actions raise their attention, too. All experiments are examples of this. Make students' ideas and thoughts concrete. This is what contextual teaching and learning is all about.

Teacher should manage time allocation well to make a lesson crisp and speedy. Poorly managed lessons are dull and boring. Be always attentive to students' reaction. If you notice some students getting bored, switch to the next step or task to keep them interested.

Another way to keep all students focused is to invite students who are losing interest to the center of the lesson. For example, appoint such a student to express his or her opinion in front of the class and start discussion. Or ask him or her a question and listen to his or her answer. Still another way is to praise such students' result in front of the class. Prevent those students from straying from the lesson.

Do Not Talk Too Much

If teacher keeps talking for an hour, students will surely get bored. Teacher should minimize his or her talk. Instead teacher should carefully listen to students' murmur or utterance. "Small mouth, big ears."

Many teachers tend to talk a lot. They are tempted to explain everything in words. Teacher's lengthy talk, however, is just boring to most students.

Do not talk too much. Save the words. Speak only what is minimally necessary. In this way, you are giving time for students to think.

What teacher should do instead is to listen to students. While studying, students tend to utter words like "Hmm, I cannot understand. . ." "Oh, I got it!" "This is difficult. . ." "Why is this so?" "Let me try but. . ." "Oh I see, I can solve this with yesterday's formula!" These murmurs, sometimes barely audible, are the indicators of what are happening in their minds. Listen to them. Try to understand what are going on in the inner worlds of students. Judging from their murmurs, modify your plan of lesson if you think it necessary. Also try to grasp the precious moment when one student utters something crucial to understand the essence of the lesson. Let all other students share and appreciate that idea or thought.

Thus teacher should have a small mouth and big ears.

A lesson should not be a monologue by teacher. A lesson should be a dialogue between teacher and students, between students and students. Teacher should organize a lesson and facilitate students' learning through a series of dialogues, not through a monologue.

But Give Necessary Explanations in Full

Don't talk too much--Some teachers misunderstand this and fail to give necessary explanations to students. This is wrong. Teacher should give full explanations about:

- 1 How this formula is derived
- 2 Why this answer is wrong
- 3 What steps should be taken in an experiment or group work (particularly when dangerous materials are used)

Some teachers do not give full explanations in his or her lesson even when they are necessary for students to understand the topic or take correct steps. Such teachers misunderstand the motto of "Don't talk too much."

The worst example is the case where teacher prepares an LKS with some instructions written on it, distribute it to students without any oral explanation and let them start working on it. Students easily get confused. Those teachers are not doing their duty at all. They do not deserve being called "teacher."

In any lesson, some explanations are absolutely necessary for students. Teacher should not skip them. Teacher should talk as much as needed to convey such minimum explanations. Three examples:

- 1 Teacher should explain how this particular formula is derived. If students understand the process, they don't have to memorize the formula by rote. They can construct the formula by themselves whenever they need it. This is what "understand" means.
- 2 When a student makes a mistake in presentation, teacher should point it out and explain why the answer is wrong to the whole class. This is the most effective way to correct some common misunderstanding held by students.
- 3 When an experiment or collaborative work is to be carried out, teacher should orally explain the steps before letting the students begin. These pre-experiment instructions are very necessary when some harmful materials are to be used or dangerous actions are to be involved.

Use Blackboard Skillfully

Make good use of the blackboard if available:

- 1 Write big and legible letters
- 2 Think well what to write/draw and where to write/draw on the blackboard
- 3 Give enough time if you ask students to copy the blackboard

Not all classrooms have a good blackboard. Nonetheless, if one is available, make good use of it in your lesson. Three points to keep in your mind:

- 1 When you write on the blackboard, write big and legible letters. Students sitting in the back of the classroom may not be able to read your small or illegible letters. Those students will be discouraged to learn.
- 2 A good teacher thinks what to write or draw on the blackboard beforehand, when preparing the lesson plan. A clear, concise and well-organized presentation will greatly facilitate students' understanding. A good teacher even thinks in advance about where to write or draw the presentation on the blackboard. This is to save time and to derive the best possible effect from the presentation. In short, organize your blackboard presentation well and beforehand.
- 3 If you ask the class to copy your presentation on their notebook, give enough time for them to do so.

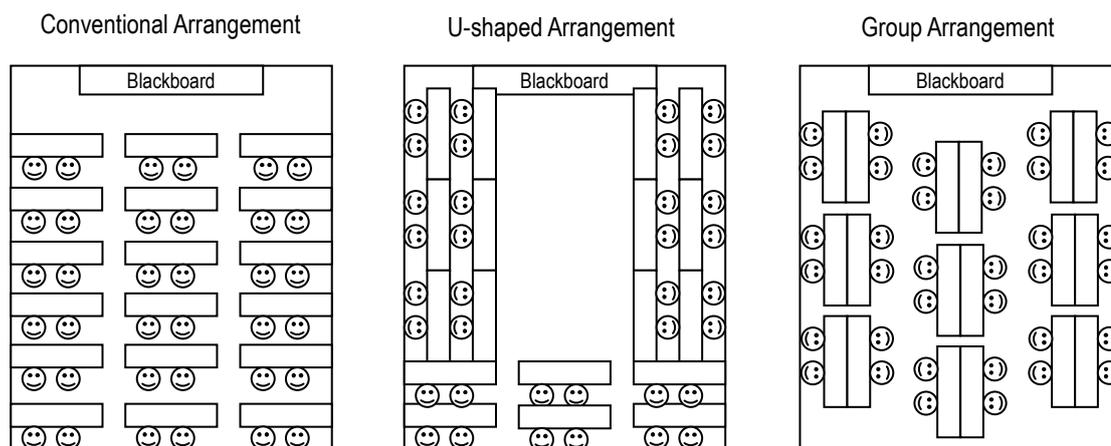
How to Arrange Students' Desks

There are three types of desk arrangement:

- 1 Conventional arrangement
- 2 U-shaped arrangement
- 3 Group arrangement

Choose one that is most appropriate for your purpose. You don't have to stick to one arrangement throughout a lesson. You can shift from one arrangement to another as your lesson goes on.

Three types of desk arrangements are:



Each has its own advantages and disadvantages:

Type	Advantage	Disadvantage
Conventional arrangement	<ul style="list-style-type: none"> • Teacher can monitor students' activities and face expression 	<ul style="list-style-type: none"> • Students cannot easily have discussion with other students
U-shaped arrangement	<ul style="list-style-type: none"> • Teacher can monitor students' activities and face expression • Students sitting in the back rows can be seen by teacher and other students • Students can easily shift to a group arrangement 	<ul style="list-style-type: none"> • Students sitting in the side rows have difficulty to face to the blackboard
Group arrangement	<ul style="list-style-type: none"> • Students can easily have discussion with other students 	<ul style="list-style-type: none"> • Some students have difficulty to face to the blackboard • Teacher may not be able to monitor students' activities and face expression

If students can move the desks without difficulty, teacher may shift from one type

of arrangement to another during a lesson according to the lesson's topic or contents. Examples:

Conventional arrangement → U-shaped arrangement

U-shaped arrangement → Group arrangement

Conventional arrangement → Group arrangement → Conventional arrangement

If students cannot move the desks (too large, too heavy or fixed to the floor), only one type of desk arrangement will be used throughout a lesson. However, even in such cases, teacher can have a similar effect by letting students move their chairs in order to do an experiment or a group activity, or to face teacher and the blackboard squarely.

Challenge: If you think that U-shaped desk arrangement is good and want to use it in your classes, please consult with other subject teachers and the principal. It will be better and recommended to adopt the arrangement school-wide in all classes by all teachers.

Lecture Is a Dialogue Between Teacher and Students

A lecture should be a dialogue between teacher and students. A dialogue here means a sequence of:

- 1 Question by teacher
- 2 Answer by student
- 3 Re-question (based on the answer above) by teacher
- 4 Answer by student

A lecture by teacher's monologue is boring. Students will not think or learn in such a lesson. Avoid such a lesson.

A lecture should be a series of dialogue between teacher and students. A dialogue here means a sequence of:

- 1 Question by teacher
- 2 Answer by student
- 3 Re-question (based on the answer above) by teacher
- 4 Answer by student

Example:

Teacher Do you remember the name of this solid?

Student A Cylinder.

Teacher That's right. Let's calculate the surface area of this cylinder. First, what is the surface of this object?

Student B Its surface means the side part and the two circles at the top and at the bottom.

Teacher Side part? Do you know another term for it?

Student C Side face.

Teacher Yes, that's right. Then how can you calculate the total surface area of this body?

Student D You should calculate the surface area of the side face and the area of the two circles and add them up.

Teacher Right. Let's start with the side face. How can you know its surface area?

Students

Teacher (After waiting for some time) What don't you understand?

- Student E I don't know the shape of the side face.
 Teacher How can you know that?
 Student F We can develop the side face.
 Teacher Develop? What do you mean?
 Student F Develop means cut and spread a face.
 Teacher Good. OK, let's cut this side face with scissors, then. We have this. What do you call this figure?
 Student G Rectangle.
 Teacher Yes. The curled side face is now a flat rectangle. Do you think the surface area of the curled side face is the same as the area of this rectangle?
 Student H Yes, the two have the same area.
 Teacher All right. Then we have to calculate the area of this rectangle. How?
 Student I Length times width.
 Teacher Right. Then how long the length and width of this rectangle are? Calculate them when the height of the cylinder is h and the radius of the circle is r .
 Students (Work individually)
 Student J Teacher, what would happen if we cut the side face obliquely?
 Teacher Oh, this is a good question. Can anyone answer this question?
 Students
 Teacher OK, let's try. Let me cut another cylinder obliquely. . . . You see, this is the result. What is this figure?
 Student K Parallelogram!
 Teacher Correct. Then shall we calculate the area of this parallelogram, too? Can anyone tell the formula for calculating the area of parallelogram?
 Student L Base times height.
 Teacher That's right. If you finished the rectangle, solve this parallelogram. If you don't figure out how long the sides are, you may ask your friend sitting next to you.

Find Out Students in Trouble

In any class, there are some students who cannot quickly understand what teacher says. Teacher should detect those students while giving a lesson. It is another duty of teacher's to do.

It is not difficult to detect students in trouble. You can tell them by seeing their facial and body expressions and eye movement.

In any class, some students are slow to understand what teacher says. Particularly students of Group C (See Section 10) are likely to fall behind.

Teacher should detect those students who have trouble in learning while teaching them. Be attentive. It is another duty of teacher's to detect them because teacher should respect their right to learn. It is very unprofessional for teacher to leave those students unattended. It is even more unprofessional for teacher to be unable to detect those students in class.

It is not difficult to detect students in trouble. You can tell them by carefully observing their facial and body expressions and, particularly, eye movement. Typical cases:

- Students who only copy notebooks of fellow students
- Students who try to hide their notebook from teacher
- Students who only watch other students do activities in group work
- Students who actively participate in group work but cannot summarize the results or fill in the LKS
- Students who listen to teacher absent-mindedly

Those students are waiting for teacher's care and assistance.

The ideal class is such where students can say without any humiliation, "I don't understand. Please explain it for me."

How to Help Students in Trouble

When some students have difficulty to understand, don't try to teach them individually.

You should instead rely on fellow students to take care of them. Group work is recommended precisely for this purpose.

Suppose you detect some students having trouble in understanding. You should help them. But how?

One way is for you to teach them directly. You may stand by them and give them more explanations and clarifications personally. However natural and respectable it may look, this approach is not recommended. If you do so, you will have to suspend your lesson for a while. While you are teaching them, other students wait and waste time.

To help those students in trouble, you should instead rely on fellow students. Steps to take:

- 1 Let all students start group work.
- 2 Approach the student in trouble and ask: "What don't you understand?" Listening to his or her answer, you should know specifically where he or she got lost.
- 3 Tell the student, "Ask someone in your group for help."
- 4 At the same time, tell other students in that group that he or she has difficulty to understand such and such. Ask them to kindly explain the point to him or her.

How to Care for Excellent Students

You don't have to care much about excellent students. They can go ahead without much help from teacher.

The most important thing for teacher to mind is to keep their motivation high.

Excellent students who belong to Group A do not require much care from teacher. They can understand what they are taught without much difficulty. As long as they are motivated, they will continue their good performance.

Therefore, the most important thing for teacher to mind is to keep their motivation high or not discourage them. Some hints to keep them motivated:

- 1 Don't conduct unorganized, unfocused or boring lessons.
- 2 Don't keep the level of lesson low; give challenging tasks as well and let them think.
- 3 In group work, let them teach slow learners.

In many classes, teacher tends to appoint excellent students only to make presentations or answer questions maybe as a way of keeping their motivation high. This practice is counterproductive, however, for three reasons:

- 1 It will deceive teacher himself or herself into believing that all students have understood.
- 2 It will fail to motivate other students.
- 3 It will instill a wrong notion into students that only correct answers should be presented in class. (This notion is totally wrong because students have right to make mistakes and because mistakes are very welcome in class. See Sections 30 and 31 below.)

Whether to Do Group Work or Not

Group work has unique benefits. It is generally recommended to introduce group work in any lesson.

However, group work does not automatically guarantee good learning. If group work is poorly designed and conducted, it will only waste students' time. Teacher needs some experience to properly introduce group work in lessons.

Think well whether the group work you are going to do is meaningful or not.

Group work has several benefits.

- 1 Students can learn using concrete materials available only to groups (experiments).
- 2 Students can learn other ideas and share various perspectives from fellow students.
- 3 Students who have difficulty in understanding can ask help from other group members.

Because of these unique benefits, it is generally recommended to introduce group work in any lesson.

However, group work does not automatically guarantee good learning. If group work is poorly designed and conducted, it will only waste students' time. As far as students' understanding is concerned, a conventional lecture can be much more effective than group work if the lecture is carefully designed and executed. Group work is an advanced teaching method. Teacher needs some experience to properly introduce group work in lessons.

If you want to introduce group work in your lesson, try. But think well whether the group work you are going to do is meaningful or not. Think also how you can make your group work effective to stimulate students' learning and facilitate their understanding.

When to Start and Stop Group Work

One main reason why group work cannot be effective is that teacher does not start or stop group work at appropriate times.

Many Indonesian teachers think that they should not intervene in students once they have started group work. This notion is wrong. There are cases where teacher must interrupt group work. Distinguish necessary interruptions from unnecessary, harmful interruptions.

It is easy to know when to start group work. Group work should start when:

- 1 students are given assignments to work together on; and
- 2 it is necessary for students to think together, talk together and learn together.

By contrast, it is not so easy to see when to stop group work. Group work should stop when:

- 1 almost all groups have finished their tasks or assignments; and
- 2 many groups are stuck in some trouble.

Teacher does not have to wait for all groups to finish. It is not important that all groups equally accomplish their assignments. It is more important that all students can learn even from other groups' results.

Hint: There are always some "smart" groups that finish assignments much earlier than other groups. It is a good practice for teacher to give some additional, advanced tasks to those groups to prevent their wasting time. Such additional tasks should be prepared in advance when teacher designs the lesson.

If many groups are stuck in some trouble and cannot proceed, it is meaningless to continue group work. Immediately stop group work and release the students from the assignments. Find out why they are stuck. If it is due to insufficient explanation, clarify their confusion and let them start group work again. If the trouble is more fundamental (e.g., design of group work is inappropriate), scrap group work or assignments and adjust the course of the lesson.

Generally speaking, teacher should avoid unnecessary intervention in students' group work. However, if students get confused or stuck for some reasons, teacher should intervene. Stop group work and take appropriate remedial actions.

How to Group Students

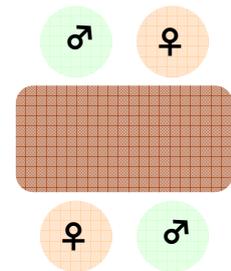
Experiences show that good grouping of students is such that:

- 1 3 or 4 students per group
- 2 boys and girls are mixed (2 boys and 2 girls ideally)
- 3 boys and girls sit alternately

However, these conditions are not absolute. Teacher should decide according to cases.

Experiences show that it is best to group students as follows:

- 1 3 or 4 students per group;
- 2 Boys and girls are mixed (2 boys and 2 girls ideally); and
- 3 Boys and girls sit alternately or diagonally.



Too big groups and too small groups cannot facilitate collaboration or discussion among the students. It is found that 3 or 4 students per group is just an appropriate number for grouping.

Mixing boys and girls is recommended because girls generally can endure difficult tasks than boys. Sitting this way, girls can stimulate boys to keep concentrated. Another reason is that boys tend to start chatting if they sit together.

Although such an arrangement is strongly recommended, it is not absolutely necessary. As a matter of fact, in most classes the numbers of boys and girls are not equal or even. Teacher should decide grouping on a case-by-case basis according to respective classes' conditions and characteristics.

Does Each Group Need a Leader?

Some people say that it is recommended to arrange groups so that each group has at least one excellent student because he or she will become “leader” of the group.

In Indonesia particularly when teacher tries to introduce group work for the first time, this recommendation is valid.

However, generally speaking, this arrangement is not absolutely necessary, either.

As experiences tell, if there is leader in a group, its group work is very likely to go smoothly and produce meaningful results. Hence some people say that it is recommended to arrange groups so that each group has at least one excellent student because he or she will become leader of the group.

This recommendation has a strong point worth noting. In Indonesia particularly when teacher tries to introduce group work for the first time, this recommendation is valid. Teacher should follow it.

However, it is not always true. When students get used to group work after some experiences, they will no longer need any leader. Or any student can take the lead in group work. In such a situation, there is no need for teacher to assign an outstanding student as group leader. Grouping can be at random and arranged lesson by lesson.

How to Let Students Present

Especially when a group work is done, teacher tends to let all groups to present their results without considering time or students' attention. In many lessons, students' presentations are ineffective and just a waste of time.

It is not always necessary to have all groups present their results. Think efficient ways of students' presentation.

There are two types of student presentations. One is a simple oral presentation (e.g., answering a question). The other one is an elaborate presentation usually using some aids (blackboard, paper, model, etc.). This second type is commonly seen after a group work. In this section, "presentation" means this elaborate type.

Many teachers spend too long time on students' presentation. Particularly after a group work, teacher commonly lets all groups present their results in front of the class. When there are many groups or if the presentation topic is too simple or too easy, students will soon lose interest and concentration. Such a session quickly becomes a waste of time.

Basic hints about presentation:

- 1 If the group activity is of **practice type** (See Section 6), students' presentation is not necessary. It is enough for teacher to read out answers and let students correct mistakes.
- 2 If the group activity is of **exploratory type**, students' presentation is necessary. For the sake of equality, it is strongly recommended to have all groups submit their results. However, it is not necessary to let all groups present their results or answers one by one in front of the class. Avoid the repetition of the same answers. Teacher should first sort out the results and let only representative groups present.

Following are some additional suggestions:

- 1 Presentation becomes meaningful if teacher gives open-end questions in LKS.

- 2 Teacher does not need to wait until all group work is finished to have presentation. It is possible to have presentations in the middle of group work.
- 3 Presentation does not always have to be oral one in front of the class. In many cases, just submitting and posting an answer sheet or summary table on the blackboard may be sufficient.
- 4 Urge those groups that could not finish the tasks or had difficulty to solve them to present their incomplete results, too. This is a good way to let students share the difficulty and lead those particular groups to the conclusion with help from fellow students.
- 5 Presentation can be substituted by group dialogue where students can similarly exchange their ideas, opinions and feelings.
- 6 Teacher should urge even passive and quiet students to make presentation. (This, however, should be done with utmost care.)

Mistakes Are Valuable

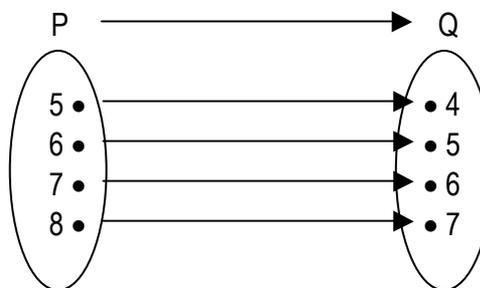
When students make a mistake, it is the best and most effective time for students to learn.

If you find a student making a mistake, it means that there may be many other students who are making the same or similar mistakes. If you correct that mistake in front of the class, you will prevent many other students from making the same mistake. This is an efficient way of learning. Mistakes are valuable.

Example 1:

A question of LKS: "Tentukan relasi yang mungkin dari himpunan P ke himpunan Q berikut" (a class of memahami bentuk aljabar, relasi, fungsi, dan persamaan garis lurus):

a. Diagram Panah



The answer is "1 kurang dari." But there are many students who answered "1 lebih dari." It means that the students did not understand which set (P or Q) should be the subject. When teacher encounters this kind of fundamental mistake, make sure that all students understand that it is a relationship from "P" to "Q."

If you find a student making a mistake, it is the best time to explore students' common way of thinking. Suppose student A has made a mistake. Teacher can ask other students, "Why do you think he thought in this way? What is the difference between the correct answer and his answer?" This will be a very challenging question, especially for smart students.

Example 2:

A question in LKS (a class of photosynthesis): “Write down the results of experiment, after you dip the leaf into iodine solution.”

Group A's answer

	Before experiment	After experiment
The part that was covered with paper or aluminium	Green	Green
The part that was not covered (exposed to the sunshine)	Green	Green

The part that was not covered was supposed to change to “purple” or “black.” But Group A concluded that “there was no change on the leaf.” This is a good chance for teacher to exploit students' curiosity. Teacher can ask all students “Why did Group A observe ‘green’ even after the experiment?” Some students may answer, “Because they did not boil the leaf long enough.” Then, teacher can ask again, “What happens if you boil the leaf?” or “Why doesn't color change if it is not boiled long enough?” The answer is “chlorophyll is melted when we boil the leaf” or “the color did not change because chlorophyll was there.” This mistake gives a very good chance where the students learn “photosynthesis is conducted in chlorophyll of the leaf.”

Teacher should treat students' mistakes as “treasure” or “gifts” for the lesson. Value students' mistakes. Do not ignore them.

Thank Students Who Made Mistakes

Teacher should value and thank students who made a mistake. They tell that your lesson was not good. Learn from their mistakes and improve your lessons.

When students make mistakes, many teachers tend to think that:

- the students are not smart;
- the students did not study the textbook beforehand; and
- the students are not ready to solve this topic.

They are wrong. Students make mistakes because:

- teacher did not teach them well and could not make them understand the topic well; and
- the media, LKS, experiment, or group activity did not contribute to students' learning.

In short, teacher's way of teaching was not good.

To scold the student who made a mistake is not good because:

- the student would lose his/her willingness to learn;
- the student would become afraid of making a mistake again and eventually keep silent in class; and
- teacher wrongly places his/her responsibility onto the student.

Teacher should appreciate the students who made a mistake, because the students implicitly tell teacher that the lesson was not good in some aspects. Don't scold them. Learn from their mistakes and improve your lessons.

Always Correct Mistakes

When students make a mistake, teacher must always figure out where the mistake comes from and correct the mistake. Never leave a mistake uncorrected.

When students make a mistake in their presentation or in LKS, teacher should follow the steps below:

- 1 Announce to all students that this is a mistake;
- 2 Figure out the reason for the mistake;
- 3 Ask students why this is a mistake or challenge them to have a correct answer;
- 4 Explain why and how the answer is wrong and clarify any confusion; and
- 5 Show the correct way and give the correct answer.

If teacher cannot notice or correct students' mistakes, he or she is not qualified to be a teacher. This is beyond argument.

If the mistake (or confusion) is caused by insufficient explanation or inappropriate instructions of LKS, teacher should immediately stop the activity or exercise. Clarify students' confusion by adding explanations.

Some teachers only erase the wrong answer and write down the right answer without giving any explanation. This is not appropriate because students' confusion or misunderstanding is not corrected this way. Always correct a mistake by giving full explanation and clarifying where that mistake comes from. Never leave a mistake uncorrected.

Have Students Take Notes

Students often need to go over what they learned in class to remember it. Taking notes is an important part of their learning. Have students take notes.

It is true that in lessons on some topics, taking notes is not so important because students can understand the concept at once (e.g., negative numbers).

On the other hand, however, there are many topics that students cannot understand and remember so quickly. They have to go over them again and again (e.g., mathematical formulas, names of organs in biology, historical events). With such topics, students need textbooks to review and exercise. In addition, they have to take notes of what teacher explained in classes. Taking notes is an important part of their learning.

If students do not have their own textbooks, their notebooks become all the more important.

Why is taking notes necessary?

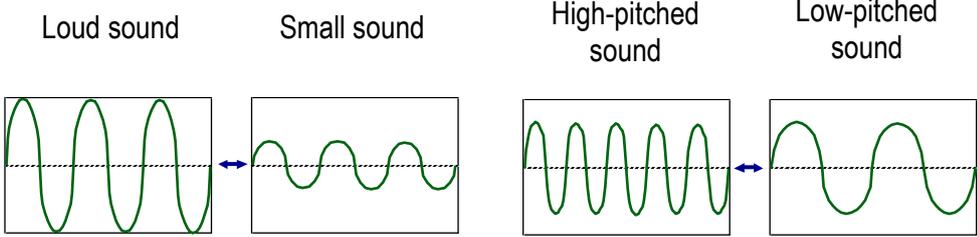
- 1 Handwriting helps students remember what they write or draw on the notebook.
- 2 Students can go over their notebooks to review what they learned.
- 3 If teacher collects LKS at the end of a class for evaluation, students will have only notebooks as a means to record and remember what they studied.

To urge and facilitate students to take notes, teacher should:

- 1 prepare in advance what he/she will write or draw on the blackboard. Teacher should try to imagine how students will take notes.
- 2 write clearly and legibly so that students can take notes easily.
- 3 give students enough time to take notes.

There are many ways for students to take notes. Writing down words is one way. Drawing figures is another way. Remember that appropriate figures are by far more effective to convey and instill concepts in students' mind.

Example of well-conceptualized figures:



Use Lesson Time Efficiently

One lesson takes 80 minutes (40 minutes times 2 units) at junior secondary schools in Indonesia. It is quite long time for junior secondary students to keep concentration throughout. It is also long for teachers and they tend to waste lesson time.

Teacher should use lesson time efficiently to keep students' concentration and complete all the topics as stipulated by curriculum.

The typical lesson pattern is:

Introduction (20 minutes)	Group work (40 minutes)	Presentation (20 minutes)
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If teacher follows this pattern mechanically without much thinking, he or she is very likely to waste time during the lesson. How can teacher avoid this?

Introduction

Introduction does not require 20 minutes. It should be short and straightforward. Once teacher has successfully attracted students' interest, teacher should move forward to the next part without wasting time.

Group work

Group work should not be dragged on. Suppose LKS has two assignments. Teacher should not let the students go through the two at once but instruct them to do one at a step. When the first assignment is finished, teacher asks all groups to shift back to lecture. After a discussion of the result and some explanation, teacher instructs students to go back to group work again. The second assignment starts. This way teacher can finely synchronize groups' work speed while securing individual students' understanding.

When teacher notices that some groups are confused with assignments, teacher should quickly intervene and tell all students to stop working and shift back to lecture. Teacher briefly gives necessary clarifications about the assignments. Don't let the students continue their group work with apparent confusion. This creates a waste of time.

If students work faster than expected, teacher should promptly wind up the group work. Don't spend unnecessary time.

Presentation

It is badly wasting time if teacher asks all groups to make presentation and these groups repeat the same results again and again. To avoid this problem, teacher may ask only one group to make presentation, and let all students discuss the presentation.

As another way to make group presentation efficient, each group writes or draws its result on a piece of paper and posts it on the blackboard. Teacher appoints only some representative groups to explain which have interesting results to make presentation.

Note: Many Indonesian teachers complain that they do not have enough time to complete the curriculum. However, the truth is that many of them do not use lesson time efficiently.

Part 4 After Lesson

35 Reflect on Your Lesson

Reflect on Your Lesson

After each lesson, teacher should take moments to reflect on it. Reflection is the surest way to improve your lessons.

There are three levels of reflection:

- 1 Individual (personal) reflection
- 2 Reflection with your colleagues at school
- 3 Discussion with fellow teachers at higher levels

1 Individual (Personal) Reflection

Teacher should go over the lesson in his or her mind each time it is over. Check points are:

- Did all the students understand today's topic?
- Did I see (grasp) all the students' learning condition?
- If any students did not understand today's topic, who were they?
- Was there any part which I could have explained better?
- Was there any part which I should not have explained that much?
- Were the media, LKS, experiment and group work appropriate for today's topic and students' understanding?
- Was my preparation enough?
- Did I manage time efficiently?

By checking these points, challenge yourself to make your lessons more efficient and effective in the future.

If you can, revise your lesson plan according to your reflection. Try to have a better lesson next time around.

2 Reflection with Colleagues

Individual (personal) reflection has limitations. Sometimes it is advisable to ask other teachers at your school to observe your lessons and do reflection together. Apply the same check points as for individual reflection. However, you should focus more on:

- Were there any important responses or facial expressions by students that were looked over by the teacher?
- Were there any mistakes made by students that the teacher did not notice?
- According to observers' past experience, what advice can observers give to improve the lesson?

3 Discussion with fellow teachers at higher levels

If MGMP is active in your kabupaten or kota, MGMP meetings can be another means to reflect on your lessons. To have a meaningful reflection, MGMP teachers should first observe some fellow teacher's open lesson and, after that, reflect together on the lesson. If organized and implemented properly, this way of reflection would also be helpful to gain a broader perspective.

Do not leave one lesson without any reflection. Reflection on today's lesson is crucial to improve your lesson tomorrow. Try out what you have found from today's lesson and reflection in your lesson tomorrow. This is the only way to improve your lessons.