

B1 First day of the course

B1.1 Introduction

My name is John Smith. I'm your Chemistry lecturer.

Allow me to introduce myself. My name is Peter Johnson.

I am your IT professor, so I'll be seeing you twice a week throughout the first term.

I am the lecturer responsible for the subject of Electronic Engineering.

I will be taking you for the first two modules of Mathematics I.

The lecturer taking you for problem sessions is Paul Smith.

I've got four hours with you each week.

You will have two lectures a week on this subject.

Our Monday lectures will take place in Room 301. The whole group will be together.

For the second class session each week, you will work in smaller groups in the computer room.

I expect the lecture to start on time.

If you are late, please join the class without interrupting.

B1.2 Guidelines for queries

I prefer to answer your questions during the break or at the end of the lecture.

Please feel free to ask any questions at any stage of the lecture.

Outside class time, you can come and see me with your queries at the set times.

I will handle your queries and questions on Thursdays from 3 to 5.

You can reach me in my office every Wednesday between 9 and 11.

My time for dealing with queries is Tuesdays from 9 to 10 in the morning.

Bear in mind that I am available for queries on Fridays.

Don't leave your queries until the last week of the term.

It is very important for you to deal with questions as they come up.



B1.3 Objectives and competences

Throughout this course, we will be studying the basics of this theory.

By the time you finish this course, you should be able to interpret all wave functions.

The aim of this course is to provide you with the basic tools for solving problems in this area.

The main goal is to understand the fundamentals of Quantum Mechanics.

The objectives we have to achieve in this subject are the following:

Here is the list of the basic objectives and the complementary objectives.

We will also work on improving oral and written communication skills.

As a generic competence, we place great importance on teamwork.

Can you take a look at the list of specific competences for this subject?

The competences related to this subject are the following:

We will provide you with tools to help you improve your autonomous learning skills.

B1.4 Course content

Outlining the syllabus

Each unit stands on its own.

Each unit is related to the previous one.

In order to understand each unit, you will have to have studied the previous one.

The course content is divided into two sections.

The second part deals with circuit theory.

In Unit 1, we'll review the basic concepts of the subject.

In Unit 2, we'll study the technical details for the construction of the models.

In the third unit, we will summarise the key points from the previous units.

In Unit 4, we will learn how to apply this in other contexts.

The last unit will help you to understand how the apparatus really works.



Scheduling the course

By Christmas, we should have got to Unit 5.

We'll spend two weeks on each unit.

Each unit specifies the number of hours of class that will be spent on it.

On each unit you should spend double the number of class hours.

B1.5 Assessment

The mid-term exam accounts for 30% of the total grade, and the end-of-term exam for the remaining 70%.

There will be a final exam for this subject on June 10.

The end-of-term exam is on June 20.

50% of your final grade is based on continuous assessment.

All exams and assignments are taken into account for continuous assessment.

In order to pass, you will have to hand in at least two of the assignments.

There will be two eliminatory exams during the first semester.

There will be a mark awarded for classwork based on the activities we do.

For your end-of-year grade, we calculate the average of the grades from your final exam and your classwork.

It is compulsory to take part in fieldwork.

B1.6 Resources

Referring to the bibliography

Here is the list of reference books.

The first book listed in your bibliography deserves special mention.

We will be following Larson's book as a text book.

We won't be following any one book in particular as none of them includes all the units.

You can expand on what I explain in class by referring to the books listed in the complementary bibliography.

It's important to compare different sources of information.

Please note that some of the books have an answer key, while others don't.



You should try to get through the reading list during the term.

Following that, you also have a list of interesting web sites.

I am sure you'll be able to find other web sites that will be of use to you.

When you use the Internet to search for information, check that the source you use is reliable.

All the information on this subject can be found on the digital campus.

Keep posted on the activities and assignments that will be set.

You should log in to the digital campus every week to make sure you stay informed.

Problems, notes and summaries are listed on the digital campus.





A1 Starting the lecture

A 1.1 Opening minutes

Greetings

Good morning everybody.

Hello. How are you all today?

Come on. We have work to do.

How are you doing?

Settling down

Are you all ready to start?
Pay attention everybody.
Settle down now so that we can start.
Please stop talking and let's start.

Getting started

Right. Let's get down to work.

OK. Let's begin.

This lecture lasts an hour.

It's time to start.

We'll take a five-minute break half way through.

A1.2 Setting the scene

Linking to a previous lecture

Let's just go back to what we did in the last lecture.
In the last lecture, we dealt with Unit 4.
Let's take up from where we left off in the last lecture.
We'll keep working on what we did on Wednesday.
Last week, we finished Unit 5.



Stating objectives

Today, we'll look at how to solve differential equations.

What I'd like to do today is present some new results.

What I'll be covering in my talk today is hypothesis tests.

Today, I intend to analyse recent developments.

The aim of this lecture is to explain how the model works.

This afternoon, we will touch on just a few aspects of the Gauss theory.

I don't intend to cover all of the technical details.

The focus of today's lecture is Theorem A.

The lecture will highlight the most important aspects.

A1.3 Signposting the lecture

Today's lecture will be in two main parts.

First of all, I'll introduce the problem, and then we'll analyse the data.

I'm going to divide my lecture into three parts.

Firstly, I'd like to state the theory. Secondly, we'll look at the results. Finally, I'll give you some examples.

In the first part, I'd like to set the notation, and then I'll present some relevant facts.

I'll begin by introducing some technical settings, and then I'll describe them.

We'll begin with an introduction to the problem, and later on we'll discuss possible solutions.

Towards the end, we will work in small groups.

At the end, we'll focus on the consequences.

I will leave you plenty of time for questions at the end.





A2 Delivering the lecture

A2.1 Connections

Linking

This takes us back to the point I made earlier.

There is a direct link between this and what we looked at last week.

This ties in with the project you are doing at the moment.

This relates directly to your lab work.

Changing direction

After this preliminary step, we can go back to the main result.

Now we are going to turn our attention to Exercise 2.

So, that's the application of Formula 7. Now, let's look at the next one.

That completes my overview of the case. Now I'd like to move on to the proof of Theorem 5.

A2.2 Reasoning

Because of this, t = 5, as long as the model remains stable.

As a result, we conclude that the property holds.

Since a = 1, this proves that b = 2, which simplifies the previous equation.

This proves that the model is at fault, so it needs to be restructured.

Therefore, Property A is true.

Let's apply the formula here. As a consequence, we get the result [...]

The result is contradictory, so the hypothesis is false.

This contradicts our assumption about the model.

It is clear that Property A implies that the model works.

It is easy to check the calculations. I'll leave it to you.

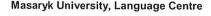
Since A = 0, it follows that the property has not been verified.

It suffices to say that the energy is always conserved.

We'll study the new design in order to see how it works.

Properties 1 and 2 are deduced directly from the previous result.

Let v be the velocity. If we assume v is constant, then this result is true.





A2.3 Conditions

If this is true, then the model works.

If this were true, then the model would work.

If this had been true, then the model would have worked.

This would be true if we could cancel the initial force, but that's not possible.

We can assume that production grows, unless p = 1.

This holds true only if the reaction is carried out in suitable conditions.

The function is positive even if the m parameter decreases.

What if we change the initial conditions of the experiment?

These conditions are achieved either at the outset, or after a few minutes.

Equality holds if and only if a = b = 2.

Under the previous conditions, the process will work.

A2.4 Comparisons

Like Theorem 5, Theorem 2 is also a fundamental result.

Unlike the formula we looked at earlier, in this case we can interchange f and g.

We now have a result similar to that in Theorem 6.

This theory is less important than the one we are going to study today.

If a is greater than b, then c is less than a.

The more you work on your own, the easier it will be to understand the material.

This a good example, but I think the one I have on this handout is better.

The best case in point is the one I mentioned earlier today.

You can apply that argument. Likewise, the other arguments work here too.

A deeper discussion of this result may lead to new perspectives.

The radius of A is twice that of B.

The diameter of A is the same as that of B.

A is four times greater than B, whereas C is three times smaller than A.



A2.5 Options

On the one hand, we have theory A. On the other hand, we have theory B.

There are lots of pros and cons.

Let's consider some alternatives to this theory.

We've looked at three options. Nonetheless, the first one is the least expensive.

One way of solving this problem is by using today's formula. Another way would be to apply the following formula:

Although there are two alternatives, we are going to work with just one.

There are different ways of looking at this theory.

The first option is clear. But, what about the second option?

So, now let's look at the third option.

Let's take a look at the strengths and weaknesses.

Despite this result, the proof is still incomplete.

There are, however, disadvantages.

What about the advantages?

In spite of this difficulty, the problem is actually quite straightforward.

We haven't reached the right conclusion yet.

While this appears to be true, it is not.

However, there are some problems too.

I'd like to point out the positive points of this project.

A2.6 Examples

For instance, a does not always equal b.

Let's look at the case of Borel sets.

The Gauss theory is a case in point.

For example, take a look at Taylor's Formula.

To understand this better, let's consider an example given to us by the University of Berkeley.

By studying this model, we can confirm our conjecture.

Now, we are going to analyse some examples.

This example illustrates how the design works.



Actually, this is an excellent example of how to prove the theory. As a matter of fact, you can find good examples in Chapter 5. You need to find examples of your own.

A2.7 Expanding

Adding information

Likewise, Theorem 1 could be applied in this case here.

Not only does Theorem 5 work here, but so does Theorem 6.

Furthermore, we will test this theory ourselves.

There is yet another explanation in Chapter 5.

Indeed, this theory was first introduced in 1968.

You can look up references to this on your reading list in order to get more details.

In fact, we will be studying this in greater depth next week.

Rephrasing

In other words, this assumption isn't always true.

Let me put it to you another way.

Right. I'll rephrase what I just said.

Perhaps I should explain it in a more simple way.

Digressing

By the way, there is an article on this subject in today's newspaper.

I'd like to digress for just a moment.

Some of you might be interested to know that there is an exhibition on Art and New Technology on in Barcelona next week.

There is no need to write this down, but did you know that this formula was validated by a professor from this university?

This may not seem relevant, but there is a talk being held here tomorrow on semiconductors.

Incidentally, there will be no class on 12 May.





B7 Impromptu situations

B7.1 In the classroom

I'm sorry.

Sorry, that was my fault.

I'll be back in a moment.

Excuse me. I'll be right back.

I've got to go out for a moment.

Carry on with the exercise while I'm out.

I'm afraid I can't speak any louder.

I seem to be losing my voice. I have a sore throat.

I have a headache. Let's leave it there for today.

I'm feeling under the weather. We'll finish this the next day.

Excuse me. I need to take a short break.

B7.2 In the corridor

What was the matter?

What is going on?

Could I get past, please?

You're blocking the way.

Can I get through, please?

Would you mind picking that up, please?

Excuse me. Could you make less noise, please? There is a class going on in here.





A4 Using visual aids

A4.1 Equipment

Using the tools

Please look at the board.

I am going to show you a short video clip on this subject.

Now, let's look at this slide which outlines the objectives.

Right. I'll show you a slide of a diagram to illustrate this.

This transparency outlines the process to be followed to obtain the result.

If you look at the screen, you can see a computer simulation.

I'll show you how this works on my laptop.

Checking clarity of sound and image

Could someone switch the lights off, please?

Can you all see the board?

Can everyone in the back row see?

Can you all hear this clearly?

Can you read the small print?

Is there a reflection on the screen?

Do want me to zoom in on any part?

Can you read this clearly?

A4.2 Signposting

In the background, you can see a real image of the prototype.

The result is in the top right-hand corner.

In the top half, there is a bar chart.

In the lower section, you can see the formula that was used.

Over here, we have the proof.

The main problem is here in the centre.

The scale of this is 1:1000.





The letters X and Y stand for the unknown variables.

If you follow the flow of the arrows in this diagram, you'll get to the result.

The source of the information is given at the bottom of the page.

Let's move on now and look at the next diagram.

I'd like to make a few comments about these graphs.

Let's go back to the previous transparency.

Now we can move on to the next slide, which illustrates Property 1.

It will become clearer when I show you the slide with the example.

A4.3 Explaining

Describing content

This diagram on the transparency illustrates this cycle.

This chart outlines the data we need.

These figures give us a breakdown of this year's budget.

These data are not up-to-date but they will serve our purpose.

This figure is just over 3 million.

Referring to sources

This diagram was drawn up by the University of Michigan.

The data was provided by the Central Statistics Office.

This equation was tested by a well-known Russian professor.

With each image, there is a reference to the source web site.

At the end of the presentation, I'll give you the list of references.





B2 Class activities

B2.1 Group work

I want you to form groups.

Work together with the person sitting beside you.

Work in pairs.

Find a partner to work with.

Form groups of three.

Here are some tasks for you to work on in groups of four.

There should be four or five of you in each group.

Put your tables together and work as a team.

Move your desks to form groups of four.

Each group should appoint a spokesperson.

B2.2 Class management

Everyone has to take part.

Work on the task on your own.

Brainstorm your ideas. Meanwhile, one of you should write down your ideas.

I'll ask you for your feedback in half an hour.

Work together with the people in your group.

Divide out the work among the members of the team.

Ask the others in the group about their working method.

You'll work on your own for 10 minutes, and then we'll work together on the board.

To solve the challenge you have been set, I recommend you look at your class notes.

I have already explained the theory, now it's up to you to work on the practice.

You have to come up with a solution before the end of the class.

Go through each question as a group and write down the results.

Hand in one sheet per group with the result.

I am giving you one feedback sheet per group. Fill it in together.



B2.3 Problem solving

How are you getting on?

What question are you on?

Now, we'll move on to the next exercise.

By now, everybody should be on Exercise 2.

Move on to the next activity.

Could you try the next one?

Let's try and work this out together.

So far so good?

Where did you get stuck?

May I make a suggestion?

Don't you think you should try another approach?

Wouldn't you agree that X and Y need to be greater than 0?

Wouldn't it be better if you applied a different formula?

Why don't you look at the problem from another angle?

You should take into account what we studied last week.

Perhaps we could solve this a better way.

Finish this exercise off on your own outside class time.

B2.4 Results

It's time for your feedback.

Whose turn is it to explain the answer?

Who would like to present the solution on the board?

Any volunteer?

Right, let's see what you have come up with.

I'd like to see what each group has found out.

What conclusions have you reached?

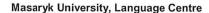
Can you write a summary of your results?

Have you been able to prove the statement?

How far did you get in Question 5?

Did you all work that out?

Let's see what approach each group took.





Did you all use the same method to get the result?

Did everyone get this answer for Question 1?

Did anyone come up with a different result?

Those of you with this result, please raise your hands.

Is everyone happy with this answer?



A3 Interacting with students

A3.1 Feedback

Checking understanding

Is everyone OK with that?
So far so good?
Do you understand this?
Is everyone following the lecture?
Will you let me know if I am going too fast for you?
Would you like me to repeat that for you?
Are you with me?

Inviting questions

Please feel free to ask questions.

Raise your hand if you have any questions.

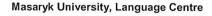
I'd be happy to answer any questions.

Don't be afraid to interrupt me if you have any questions.

Yes. We do have time for some final questions.

A3.2 Direct questions

Does anyone know the answer to this question?
Can anyone give me an answer?
Can anyone answer that question?
Who would like to hazard a guess?
Can you work this out?
Do you know what the result is?
What are the exceptions to this rule?
Do you have any suggestions?





Can anyone come up with the solution?

What's the explanation for this?

What are the implications in this context?

When does this property hold?

Why is this statement true?

How does this theory tie in with our everyday lives?

Why do we need to know this?

A3.3 Direct answers

That's right.

You're right.

Actually, you are quite right.

Exactly. Excellent answer.

Both answers are correct.

Well done. That's a good answer.

I'm afraid that's not the right answer.

Indeed, that is the crux of the matter.

That's a good point. I'm glad you brought it up.

Good question. It's directly related to the conclusion I am heading towards.

No, I'm afraid that's wrong.

You aren't quite there yet. Keep trying.

It's not exactly right, but you are on the right track.

A3.4 Evasive answers

I'm afraid you've got me there. I can't give you a precise answer.

I'm not sure. What do you think?

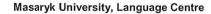
I'll get back to you later with an answer. Alright?

Yes, I see what you are saying. However, there are other factors to be considered.

If you don't mind, I'd like to go back to what I was saying.

That's an accurate observation, but I'd prefer to discuss this some other day.

I know it's difficult to accept the decision, but there is evidence to prove this.





I'm afraid I'm not the right person to answer that question.
I don't know the exact figure off the top of my head.

We'll leave that question for another day.

That is scheduled for discussion in the next lecture.

A3.5 Clarifications and self-correction

When you say "the formula", do you mean Taylor's formula?

Can you speak up, please?

I didn't hear the question.

I'm sorry. Could you repeat that, please?

I'm not sure I understand the question. Can you put it another way?

Sorry about that. I meant to say Theorem 5, not 4.

Perhaps my instructions weren't clear enough.

Sorry, it's the other way round. We need to replace a with b.

That's not exactly what I meant.

Excuse me. I need to correct that.

What I meant was one thousand, not one hundred.





B4 At the computers

B4.1 Beginning and ending the session

Start the session by entering your username and password.

Open a new file and save it under your username.

You have to create a new file to save your work from today's session.

Can you all check that you have saved your work properly?

Don't forget that when you turn off the computer, everything you have done will be deleted.

Copy the file on your USB flash drive and finish this yourselves.

Don't forget to save all the files.

Turn off your computer.

Turn on the terminal and connect as a root user.

Leave your computer on.

B4.2 Guidelines

Using the PC

Look at the main menu.

Follow the instructions for this practical session.

Click on the box at the top and the menu will appear.

Open the programme by clicking on the icon on your desktop.

Accept the process and move on to the next stage.

Today, you are going to draw up a spreadsheet with your results.

Run the programme by giving different values to the parameters.

Collecting results

By the end of the session, everyone should be very familiar with this programme.

I want your results on an Excel sheet.

Don't forget to send me the file. My e-mail address is: professor@upc.edu.

Print your results and hand them in before you leave.





B6 Exams

B6.1 Rules

I don't want to see anything except the exam sheet and pens.

Close your books and notes and put them away.

You can use a calculator.

We won't start until there is silence.

Settle down now so we can start.

Once the exam is underway, there must be silence.

There should be no mobile phones in the exam hall.

There are different versions of the exam, so please focus on your own exam paper.

Make sure you write down your name and ID at the top of the page.

You may not leave the exam hall during the first half hour.

Raise your hand if you have any questions.

If you change your mind, make sure you cross out the previous answer.

Think before you answer.

Please try to avoid spelling mistakes.

Don't forget to sign the attendance sheet when you hand in your exam.

B6.2 Time management

You have three hours for the exam.

About one hour has gone by.

You have half an hour left.

Make sure you time yourself well in order to finish the whole exam.

Don't spend too much time on just one question.

Don't rush through the first part.

You have plenty of time, so please don't rush through it.

Give yourself time at the end to check your exam.

In five minutes, we will be picking up your answer sheets.

You can have ten more minutes and that's it.

Please put down your pens. The exam is over.



I'm afraid your time is up.

Time's up. Hand in your exams as they are.

B6.3 Instructions for multiple choice exams

Mark your choice, a, b or c, with a cross.

There is only one correct answer for Exercise two.

Please do not tick two answers. If you do, neither will be accepted.

In Question 3, there is more than one right answer.

The questions are in a different order on each exam paper.

The first part of the exam consists of multiple-choice questions.

Only one question must be answered from each section of the paper.

Mark your answer on the question paper and then transfer it to the answer sheet.

You must hand in both the exam paper and the answer sheet.

On the answer sheet, mark your answer by placing an X in the appropriate box.

Marks will be deducted for incorrect answers.

You will be deducted 0.3 points for each incorrect answer.

B6.4 Instructions for exams in general

Your exam includes one section with short-answer questions, and another with two essay-type questions.

In all of the questions, give an answer and a brief explanation.

In the short-answer questions, get straight to the point.

Fill in the blanks with a missing word or phrase.

In Question 1, you have to work out the values of the different variables.

Make sure you read the instructions to each question carefully.

Watch out for Question 4. It's guite tricky.

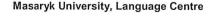
On the exam sheet, you will see four problems. You have to do three of them.

Get as far as you can in solving the problem.

Marks will be given for every stage in solving the problem.

You will get marks for showing how you work out the problem, not just for the answer.

You have to justify your answer. You won't get marks if you only give a numerical result.





Marks will also be deducted for mistakes in the calculations.

The first part of the exam accounts for 40% of the total, the second and third parts 30% each.

Don't skip any of the questions. All of them count.

The questions are equally weighted unless otherwise stated.

B6.5 Qualifications and post-exam tutorials

Your results will be out in three weeks.

I will give you the results during the next class.

I will post the grades on the notice board.

The answers to the exam questions will be posted on the digital campus, so you can compare them with your own.

You can find the solutions to the exam questions on the digital campus.

The exams will be corrected by next week.

I will go through the exam with you at the beginning of our next lecture.

You can come and see me about your results on Friday, July 7.

You can come and see me to go through your exam at the set time.

Post-exam review is scheduled for June 20, between 10 and 11 in the morning.





A5 Referring to documents

A5.1 Handouts

I've detailed some examples on a sheet which I'll be passing round now.

Please pass these handouts around.

Can somebody hand these out, please?

Everyone should now have three sheets of paper.

Does everyone have the handout?

If there aren't enough copies for everyone, make sure there is one copy for every two students.

Now, does everyone have a copy of the diagram in front of them?

Please don't take more than one sheet per person.

Can you give me back any handouts that are left over?

Could you open your books on page 234?

Can everyone see where we are?

A5.2 References

Look up the references given in the bibliography.

This theory is validated in the book Relativity - Theory and Practice, which is on your reading list.

According to Professor Edgar Smith, this theory does not apply in that setting.

This formula was drawn up by the Engineering Department at MIT.

I recommend you read the article on this subject in this month's Engineering Today.

My recommendation would be to search for a newer edition with up-to-date information.

I'd like you to go through your bibliography and see if you can find the source of this information.

This website will give you a clear picture of how this actually works.

For an in-depth study of Bolzano's theorem, read through Chapter 5.





B3 In the laboratory

B3.1 Guidelines

Using equipment

Set down all the equipment on the table.

In front of you, you have the instruments you'll be working with.

Everyone should be working with the same equipment.

Is everyone's working?

Some of you may have earlier models of the detector, but don't worry, they all work in the same way.

You should wear gloves at all times when handling this solution.

Don't touch the liquid in these test tubes. It might be toxic.

Put on your protective goggles.

Watch out. The liquid is highly flammable.

Please be careful. The material is fragile.

Outlining the rules

Don't touch the switches until I have checked everything.

Wash your hands before and after our sessions in the lab.

Set the power supply voltage at 15 V and limit the current to 50 mA.

View your signals on the oscilloscope in DC mode.

Take notes as you work.

Please pay close attention to my instructions.

B3.2 End of the practical session

At the end of the practical session, I want you to give me a summary of your results.

Fill in the sheet with the results you get as you work.

Has everyone filled in the worksheet?

Tidy up before you leave.

Make sure you have cleaned all the material.

Check that everything has been put away safely.



Don't take any of the material with you.

Pack up your things.

Have you turned everything off?

Clean the tools you used.

Hand in your work, please.



B5 Projects and assignments

B5.1 Guidelines

Explaining presentation guidelines

Your assignments should be laid out according to the guidelines on this sheet.

Handwritten assignments will not be accepted.

Bear in mind that the presentation of your assignments is very important.

Instructions on how to present assignments can be found on the digital campus.

Follow the guidelines that have been set.

Assignments that don't have an index or that don't cite the information sources will not be accepted.

Setting deadlines

This assignment must be handed in by October 30.

Do exercise 7 on page 12 for next week.

Take a look at the next chapter before our lecture on Monday.

Solve these exercises for the next day.

Don't forget to hand in your assignment.

Don't forget to bring in your homework tomorrow.

The deadline for your work is Tuesday, November 19.

I won't accept any projects after the deadline.

Outlining the system of qualifications

Remember that marks are given for all of the assignments, and they help you to pass.

I will post the results on the notice board.

I won't deduct marks for incorrect answers.

Each assignment accounts for 10% of your end-of year grade.

I will take your homework into account when I assess your final result.





A6 Ending the lecture

A6.1 Concluding

Recapping

Let's summarise the main areas we have covered.

Before you go, I'd like to go over the formula again.

We can conclude from today's lecture that more than one approach to this problem is possible.

So, the key points to bear in mind from today's lecture are the following:

I'll go through the main points again.

Allow me to run over the key areas.

Let's finish up by discussing the result.

Linking to the next lecture

We'll do the rest of this chapter next week.

We'll look at this in greater depth in the next lecture.

We'll finish this off the next day.

We've no time left, so we'll come back to this the day after tomorrow.

Don't forget to work on this theorem over the weekend.

We've run out of time, so we'll continue with this during the next lecture.

We'll continue this chapter next Monday.

We'll stop here and take this up again on Wednesday.



A6.2 Closing minutes

Holding attention

One last thing before you go.

Can you bear with me until the lecture is over?

We seem to have finished early today.

Stay where you are for a moment

There are still two minutes to go.

Now, there are five minutes left.

The class isn't over yet.

Finishing up

Right, that's it for today.

That wraps it up for today.

Saying goodbye

Thank you for your attention. Now, you may go. See you again next Wednesday.
I'll see you again tomorrow afternoon.
Have a good weekend.



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Signposting Section of presentation	Signmost language
section of presentation	Signpost language
Introducing the topic	The subject/topic of my talk is I'm going to talk about My topic today is My talk is concerned with
Overview (outline of presentation)	I'm going to divide this talk into four parts. There are a number of points I'd like to make. Basically/ Briefly, I have three things to say. I'd like to begin/start by Let's begin/start by First of all, I'll and then I'll go on to Then/ Next Finally/ Lastly
Finishing a section	That's all I have to say about We've looked at So much for
Starting a new section	Moving on now to Turning to Let's turn now to The next issue/topic/area I'd like to focus on I'd like to expand/elaborate on Now we'll move on to I'd like now to discuss Let's look now at
Analysing a point and giving recommendations	Where does that lead us? Let's consider this in more detail What does this mean for? Translated into real terms Why is this important? The significance of this is
Giving examples	For example, A good example of this is As an illustration, To give you an example, To illustrate this point
Summarising and concluding	To sum up To summarise Right, let's sum up, shall we? Let's summarise briefly what we've looked at If I can just sum up the main points Finally, let me remind you of some of the issues we've covered To conclude In conclusion In short So, to remind you of what I've covered in this talk, Unfortunately, I seem to have run out of time, so I'll conclude very briefly by saying that I'd like now to recap
Paraphrasing and clarifying	Simply put In other words So what I'm saying is To put it more simply To put it another way
nvitation to discuss / ask questions	I'm happy to answer any queries/ questions. Does anyone have any questions or comments? Please feel free to ask questions. If you would like me to elaborate on any point, please ask. Would you like to ask any questions? Any questions?

Informal to formal vocabulary

Informal	Formal		
About	Regarding / Concerning		
Add (at the end of something)	Apend		
Agree with	Be bound by		
And	As well as		
Bearing in mind	Reference being made to		
Because	As a result of / due to (the fact)		
Begin	Commence		
Broken down	Divided / inoperable		
By which	whereby		
While	Whereas		
Careful	Cautious / Prudent		
Carry out	Effect a (an) / perform a		
Cause	Trigger (a reaction)		
Check	Verify		
Despite (this)	Notwithstanding		
Enough	Sufficient		
Fill me in	Inform / Tell (me, you, etc.)		
Find out	Ascertain / discover		
Follow	Duly observe		
Get	Receive		
Get by	Survive		
Get in touch	Contact		
Go against	Contradict / oppose		
Go over	Exceed		
Going on	Continuing / persisting		
Going up	Increasing		
Got worse	Deteriorated		
Has to be	Should be		
(Have to) give in	Submit		
If you	Should one		
If or not.	Whether or not.		
If you don't	Failing / Failure to		
In accordance with	Pursuant to		

In the red	Overdrawn		
In this way	thereby		
Involve	Entail		
Live / lie (in)	Reside		
Lost	Inadvertently mislaid		
Looked into	investigated		
Make sure	Ensure		
Many (a lot of)	Several / Numerous		
Meet	Convene / assemble		
Order	Authorise		
Pay	Settle		
Rather	Somewhat		
Research shows	Research indicates		
See (understand)	Perceive		
Show	Demonstrate		
Showed up at	Attended		
Similarly	Likewise		
Sorry!	We regret		
Stand for (be a sign of)	Denote		
Supply	Furnish		
Take away	Withdraw		
Tell	Disclose		
The opposite	The converse		
Think about	Consider		
Think up	Conceive		
Trusted	Entrusted		
Use	Utilise		
Very important	Crucial		
When we get	On receipt		
Wipe out / make useless	Negate		
Write (e.g. Cheque)	Issue (e.g. Cheque)		
Written	Shown / Indicated		
He discussed issues like famine and poverty	Issues such as famine and poverty were discussed (by)		

If you've got any questions	Should you have any queries		
Lots of people think	It is widely believed / It is generally accepted		
People gave €1000 to charity	€1000 was donated to charity		
Put in writing	Provide written confirmation		
Scientists have tried to prove	Scientists have attempted to prove		
She has got to find alternatives	She needs to find alternatives		
The changes he made were bad	The changes that were made (by) were unacceptable		
There were many reasons for this	A number of causes were responsible for		
Three problems have been found	Three problems have been discovered		
We do not have enough resources	There are not sufficient resources to		
We don't want to do this	This a course of action we are anxious to avoid		
We'll call the law	We will have no alternative but involving our legal		
What do you need?	Please outline your requirements		
Whenever we like	Without prior notice		
,			



PRAISING

Nice work! Great stuff (everybody/team A/this group/Maria)

You did a good/great job! You (all) did very well

(Very) well done (all the girls/ teams that have already finished)

Perfect/(A) perfect score

No místakes!/ You dídn't make any místakes (at all)/ You dídn't make a single místake.

Ten out of ten/100%

It's a (class) record! That's the best this year this term this week today

That's better than (all) my other classes

That was (at least/more than/about) twice as good as your last attempt

Give yourself/yourselves a pat on the back

Let me shake your hand!/ Give me five!

This team was the fastest, this team was the neatest, and this team wrote the most. Well done (everybody)!

(That is/was) (really/absolutely) excellent/fantastic/fabulous/superb

That's so/very/really good!

Not (too) bad (at all)

That's right! / Exactly! / That's (exactly) the correct answer!

Give him a big hand! / Give her a round of applause / I think that is worth a round of applause / Put your hands together for...

Congratulations! Bravo!

(You) got it first time! / You did it on your first attempt!

You (finally) did it! (You finished) just in time!

I'm impressed/ That's (very/really) impressive

You've been a great help/ | couldn't have done it without you

O.K, I'll accept that (as an answer)

That's a (very) good/great/original/imaginative suggestion/idea!

I like that (very much)!

like this one best/This one's my favourite (because...)



That's (a) nice drawing/story/ending/handwriting

That's very neat/imaginative/carefully done/long/accurate/intelligent/creative

(That is/was) marvellous/magnificent/terrific/fabulous/superb/fantastic

Wow (that was quick)!

I'll give that a gold star

100/1000/10000/ a million points for that

I'll put this up on the wall

(You are) the winner/ the champion(s)!/ You have won the game!

(That's a) good/ great question

You have made a lot of/good/excellent progress.

That's more like it/That's much better/That's a lot better

You've improved (your grammar/ accuracy/ fluency/ pronunciation) a lot

Don't change your mind, that was correct/ I think that's the right answer, I just couldn't hear you

That's exactly the point/That's just what I was looking for

ENCOURAGEMENT

Keep going/Don't give up/You can do it!

(You're) nearly there/almost there/getting there/getting closer

(You're) getting better

(This/that is/was) much better than last time/last week/yesterday

Next time we'll do it perfectly!

(That was a) nice try/attempt

Don't be shy/ No need to be shy/ Don't hold back

No one in the other class managed that/ to finish either

Try again (after looking in your books for 30 seconds/ at the beginning of the next lesson/ after I give you this hint)

Don't worry about your pronunciation/how long it takes/your spelling

There's no need to rush/There's no hurry/We have plenty of time



Good try, but not quite right/ Do you want to try again? / Have another go You were almost right/ That's almost it/ You've almost got it. Try again You're halfway there/ You're on the right lines. Try changing the...
Go on. Have a try/ Have a go/ Have a guess/ If you don't know, just guess You won't lose marks for wrong answers

Numbers 1 to 7 and 9 are correct. See if you can correct the others.

(That is) nearly/ almost (right/ perfect/ finished)

90% right/ finished. I'll give you two minutes to finish/ correct the rest

The drawing is great, now try working on the text (a bit more)

Only one mistake

Third time lucky!/ Last try!

CONSOLING/COMMISERATING/BEING POSITIVE ABOUT NEGATIVE FEEDBACK

That's a shame/That's a pity. Better luck next time

I'm sure you'll do it/manage next time

Never mind. (You won the game last week, remember?)

You did very well (but there were more people in their team/ Juan just knew all the answers)

(That's a good idea but) not quite what I was looking for

That's good English but it has another meaning

Not exactly

l understand what you mean, but we don't say that in English

You can't say that, I'm afraid/ (That's a good word/ Well remembered, but) you can't use that word here

That's the right word in Korean/French, etc, but do you know what it is in English?

Adapted from Using English.com





HOW TO DISAGREE POLITELY

When using English as a medium of instruction, the teacher is passing on not only the knowledge of the field itself but also the way communication is done in English. This can be at times very different from the way students are used to communicate in their native languages. Disagreeing with someone is a typical example.

When you disagree with someone, it can often be a challenge to express your point of view without offending that person. At the same time, it's important to express your honest opinion.

Rule number one is to acknowledge the other person's opinion before you disagree. Make sure you make it clear that you understand what the other person is saying and that it is a valid argument before you disagree. This shows you are listening to the other person and makes your argument stronger. To do this, you can use phrases such as:

"I see what you're saying but..."

"I understand where you're coming from, but..."

"That's a valid point, but..." / "I see your point, however..."

"I feel the same regarding ..., on the other hand ..."

In short, you should never disagree straightaway and should always find something you can agree with to start your statement with. For example, you can use **an apology to introduce your disagreement**. This is another way of making your disagreement more polite but can soften the impact of your argument. For example: "I'm sorry but I disagree with you about this."

It is not a good idea to say that the other person is wrong. Instead, you can add a reason why another idea may be correct. It hurts to be told you are wrong, but finding out something new and useful is a more positive experience, even if you don't agree with the answer.

Pretending to be unsure about agreeing is another common way to disagree. Expressions like "I'm not sure I agree with you about this" or "I don't think I have the same opinion as you" really mean 'I don't agree'.

Finally, you can always agree to disagree on a certain topic...





SUMMARIZING, PARAPHRASING AND RETELLING

Summarizing, paraphrasing, and retelling are closely related processes, however there are certain differences among them.

Paraphrasing

When students are asked to "put things in their own words" when taking notes, they are actually being told to paraphrase. Paraphrasing is, therefore, restating ideas in different words. This is quite different from retelling and summarizing, both of which require a reader to gain a global picture of the text.

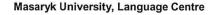
Retelling

Retelling is a skill we learn very early on. After hearing or reading a story, a child retells the events to a listener. In recent years, retelling has become more popular as a tool for both instruction and assessment.

A summary is a shortened version of an original text, stating the main ideas and important details of the text with the same text structure and order of the original.

Summarizing language:

As was previously stated/mentioned... As has been mentioned,... As has been noted,... All in all,... To put it briefly... Given these points, ... To summarize, ... In summary,... To sum up, ... To be brief,...Briefly... On the whole, ... In conclusion, ... Consequently,... In short,... Overall.... So... Thus... Then... In all... Hence...





Transition Words and Phrases

Transition words and phrases help establish clear connections between ideas and ensure that sentences and paragraphs flow together smoothly, making them easier to read. Use the following words and phrases in the following circumstances.

To indicate more information:

To indicate an example:

Besides Furthermore In addition Indeed In fact

Moreover

For example
For instance
In particular
Particularly
Specifically
To demonstrate
To illustrate

To indicate a cause or reason:

To indicate a result or an effect:

As
Because
Because of
Due to
For

Accordingly Finally Consequently Hence So

For the reason that

Therefore

Since

So that

Thus

To indicate a purpose or reason why:

To compare or contrast:

For fear that In the hope that In order to So

Although
However
In comparison
In contrast
Likewise
Nevertheless

With this in mind

On the other hand Similarly Whereas

Where Yet

To indicate a particular time frame or a shift from one time period to another:

After

Initially Lastly Later

Before Currently During Eventually

Meanwhile
Next
Previously
Simultaneously

Finally

Soon

First,...Second,..., etc. Formerly

Subsequently

Immediately

To summarize: To conclude:

Briefly In brief Given these facts Hence

Overall
Summing up
To put it briefly

To summarize

In conclusion

So Therefore Thus

Examples of Transitions:

Illustration

Thus, for example, for instance, namely, to illustrate, in other words, in particular, specifically, such as.

Contrast

On the contrary, contrarily, notwithstanding, but, however, nevertheless, in spite of, in contrast, yet, on one hand, on the other hand, rather, or, nor, conversely, at the same time, while this may be true.

Addition

And, in addition to, furthermore, moreover, besides, than, too, also, another, equally important, first, second, etc., again, further, last, finally, not only-but also, as well as, in the second place, next, likewise, similarly, in fact, as a result, consequently, in the same way, for example, for instance, however, thus, therefore, otherwise.

Time

After, before, then, once, next, last, at last, at length, first, second, etc., at first, formerly, rarely, usually, another, finally, soon, meanwhile, at the same time, for a minute, hour, day, etc., during the morning, day, week, etc., most important, later, ordinarily, to begin with, afterwards, generally, in order to, subsequently, previously, in the meantime, immediately, eventually, concurrently, simultaneously.

Space

At the left, at the right, in the center, on the side, along the edge, on top, below, beneath, under, around, above, over, straight ahead, at the top, at the bottom, surrounding, opposite, at the rear, at the front, in front of, beside, behind, next to, nearby, in the distance, beyond, in the forefront, in the foreground, within sight, out of sight, across, under, nearer, adjacent, in the background.

Concession

Although, at any rate, at least, still, thought, even though, granted that, while it may be true, in spite of, of course.

Similarity or Comparison

Similarly, likewise, in like fashion, in like manner, analogous to.

Emphasis

Above all, indeed, truly, of course, certainly, surely, in fact, really, in truth, again, besides, also, furthermore, in addition.

Details

Specifically, especially, in particular, to explain, to list, to enumerate, in detail, namely, including.

Examples

For example, for instance, to illustrate, thus, in other words, as an illustration, in particular.

Consequence or Result

So that, with the result that, thus, consequently, hence, accordingly, for this reason, therefore, so, because, since, due to, as a result, in other words, then.

Summary

Therefore, finally, consequently, thus, in short, in conclusion, in brief, as a result, accordingly.

Suggestion

For this purpose, to this end, with this in mind, with this purpose in mind, therefore.



Micro-teaching activities

Interactive activities have multiple benefits: they engage students and thus support their learning and understanding, and they often enable the teacher to quickly assess the student level of knowledge, comprehension or mastery of the material. The activities listed below are not universal or strictly defined; they are to be adapted to various teaching contexts and teaching styles.

We can distinguish several basic types of student interaction:

- individual work escalating to pair-work or group-work
- pair-work
- group-work
- interaction via technology Facebook, Twitter, Youtube, Wikis/GoogleDocs, blogs, chat rooms, ...
- interaction through homework learning logs, portfolios, ...

The following activities are divided into five categories (introductory activities, learning a new topic or reinforcing the knowledge, checking understanding, applying the knowledge/skill, closing activities), however, each activity can be readily shifted to another category if we modify its goal.

1. Introductory activities

Activities that help motivate and focus on a new topic:

- pictures, movie clips the teacher shows a picture, or a brief segment of a movie to illustrate a point/start a discussion/point out a common misconception/...
- controversial question, personalizing a topic the teacher poses a controversial question related to the day's topic, or asks for a personal experience connected to the topic
- brainstorming on the board or in groups the teacher invites students to call out concepts and terms related to a new topic; the students work as a class (the teacher writes words on the board) or in groups with a person responsible for noting down the words; there can be a lot of variation putting the concepts into categories, circling the main concepts, writing the words for the letters of the alphabet, ...
- entry tickets (prompts which provide teachers with student diagnostic at the beginning
 of a lesson) students write answers to the teacher's question (e.g. "Based on the
 reading for class today, what is your understanding of") on small pieces of paper,
 the teacher collects the answers



Activities that revise previous lessons:

- student pictures the teacher asks students to bring their own photos (in mobile devises or on paper) which illustrate a concept learnt or a problem debated, their peers in groups discuss the meaning of the picture first, and only then the author reveals their original idea behind the picture
- imaginary show and tell students pretend they have brought an object/concept relevant to the topic learnt and "display" it to the class while talking about its properties/features
- jigsaw crossword puzzle the teacher creates a crossword puzzle from words important for the topic, however, prepares two handouts which complement each other, each with half of the words filled in; students work in pairs (each having a different half) and ask for explanations of words they need to fill in (this type of crossword puzzle can be created online, e.g.
 http://www.armoredpenguin.com/crossword/ using the "information gap puzzle" option)
- definition cards the teacher prepares cards with key terms (a term for a card) and hands them out to students who then mingle creating pairs; in a pair each student explains the term in a card – if the other student identifies the term he/she takes this card, after exchanging the explanations, they search for a new pair

2. Learning a new topic or reinforcing the knowledge

- student presentations students work in groups, each group is given a different topic
 or source material, the teams work together to understand the assigned topic and to
 present it to the whole class; the audience is expected to take notes and ask questions
- student videos instead of presenting a new topic in the class, students can make videos and upload them for others to watch
- *jigsaw reading (group experts)* students work in groups, each group is given a different topic, the teams work together to understand the topic and to be ready to explain it; the teacher then re-mixes groups with one "expert" for each topic who has to teach his new group
- board rotation the teacher assigns groups of students to each of the boards (posters) which has been set up in the room, and assigns one topic/question per board; each group search for the answer and write it down within a time limit, then they rotate to the next board, study what is already written, they can make corrections and they continue with answers; after each group complete the round and gets to their original board, they check the answer and report to the class
- compare the results (pick the winner) the teacher divides the class into groups and
 assigns all groups the same problem; the groups record their answers on paper which
 is then switched and the groups evaluate the answers of other groups; the groups then
 merge and select the best answers which are then presented to the class
- mind-mapping (concept mapping) students are asked to organize key words into a map indicating connections between them (the key words can be provided in full or



- partly); the connections are then explained to the class (especially if there are more correct options)
- describing a process teacher selects two processes which may be related (e.g. making beer and making wine) and prepares the main steps on slips of paper; groups of students are given the same sets of steps, first they identify the two process, then they decide which steps belong to each of them; the teacher then asks half of the groups to focus on one procedure and the other half on the other procedure organizing the steps into correct order and then describing the process in class

3. Checking understanding

- true or false? a popular activity with a lot variations, e.g. the teacher prepares a card with a statement for each student (if possible, half of the statements are true, the other half false), students decide if theirs is one of the true statements or not and go to the assigned part of the classroom if there are e.g. more truths, the "true" students should reconsider the answer
- one-sentence summary/rephrasing/TV commercial students are asked to summarize
 the topic into one sentence that incorporates who/what/when/where/why/how OR
 students are to rephrase the topic for a layperson, e.g. a grandparent OR students are
 asked to create a 30-second commercial for a topic being discussed in class
- defining features matrix if the course involves definitions, the teacher can prepare a simple table for students to decide if a defining feature is present or absent, e.g. whether the given theories refer to behaviorist or constructivist model
- think-pair-share students work individually, then share and compare possible answers to a question with a partner before addressing the larger class
- pair-share-repeat each student has a different question, after preparing the answer they pair and share their answers, then they are asked to find a new partner and share the wisdom of the old partner to the new partner
- pass a question the teacher distributes a sheet of paper to pairs of students; pairs write 2 or 3 questions related to the topic and pass them to another pair who will write answers, then they pass them to another pair who will check if the answers are correct

4. Applying the knowledge/skill

- role-playing depending on a topic the teacher assigns roles and scenarios, e.g. a
 doctor explaining a diagnosis to a patient; in order to have the role play more efficient,
 there can be another person evaluating the performance, e.g. a novice doctor talking a
 patient and a supervising doctor who is listening, making notes for the feedback (it is
 advisable to prepare a short evaluation form) and then giving feedback
- debate students debate in class (with the set rules for speakers) or in pairs (each is assigned a position, e.g. pros or cons of a jury trial, students defending the same side can prepare arguments together, then each is paired with an opposing partner)



- reported discussion students in groups of five discuss the same problem, 2 students are assigned special roles: 1) a spokesperson doesn't take part in the discussion, just listens, makes notes and after the discussion reports the results back to the class, 2) a discussion leader is in charge of the discussion, must make sure that everybody (except the spokesperson) has a chance to express their opinions and that the group arrives at a conclusion
- press conference/panel discussion the teacher assigns roles (or the roles can be drawn): reporters/lay audience ask, experts give answers
- ranking alternatives the teacher gives a situation/problem, everyone thinks up as many alternative courses of action/explanations/solutions as possible; students in groups compile a list and rank them by preference
- simulation/problem solving this activity is usually long-term: students are placed into simulating a situation and solving problems which arise, e.g. setting up a business
- case study students follow "real-life" scenarios from their discipline, they analyse a problem and arrive at a solution
- Switch it up! students are asked to work on one problem for a few minutes and then
 move to a second problem without debriefing the first one, solve the second one and
 only then return to the first one for more work. A carefully chosen second problem can
 shed light on the first problem, but this also works well if the problems are not directly
 related to each other.

5. Closing activities

- exit ticket students write answers to the teacher's question (e.g. "What was the muddiest point in today's class?") on small pieces of paper, the teacher collects the answers
- one-minute paper students write for one minute on a specific question (which might be generalized to "what was the most important thing you learnt today")
- harvesting students are asked to write reflectively about the implications of what they learnt, e.g. why it is important, how they can apply it, how it relates to their thesis/other subjects
- advice letter the whole course closing activity students write a letter of advice to future students on how to be successful students in that course

[Adapted from:

 $\underline{https://www.brown.edu/about/administration/sheridan-center/teaching-learning/effective-classroom-practices/interactive-classroom-activities}$

http://www.fctl.ucf.edu/TeachingAndLearningResources/CourseDesign/Assessment/content/1 01 Tips.pdf]



Class talk - useful phrases

Introducing next steps/Signposting:

Let's revise the main points from last week.

Now I'd like you to imagine that ...

You're going to read a short text explaining ...

What I'd like to do now is ...

What comes to your mind when you hear the word ...?

We have already covered the theory, now let's work on the practice.

Class management:

Work on the task on your own.

Work together with the person sitting beside you.

Work in pairs.

Form groups of five.

Here are some tasks for you to work on in groups of four.

Each group should appoint a spokesperson.

Brainstorm your ideas. Meanwhile, one of you should write down your ideas.

Go through each question as a group and write down the results.

Divide out the work among the members of the team.

Monitoring/Problem solving

How are you getting on?
What question are you on?
So far so good?
May I make a suggestion?
Wouldn't it be better if you applied a different formula?
To solve this problem, I recommend you look at your class notes.
Where did you get stuck?

Results

It's time for your feedback.
Who would like to present the solution?
Any volunteer?
Whose turn is it to explain the answer?
What conclusions have you reached?
Did you use the same method to get the result?
Did anyone come up with a different answer?
Those of you with this result, please raise your hands.
Let's see what approach each group took.



Checking answers

Exactly. Excellent answer.

Both answers are correct.

Well done. That's a good answer.

That's a good point. I'm glad you brought it up.

You aren't quite there yet. Keep trying.

It's not exactly correct, but you're on the right track.

I'm afraid that's not the right answer.

[Adapted from: http://www.upc.edu/slt/classtalk/]

Further reading:

Dale, Liz; Tanner, Rosie. CLIL Activities with CD-ROM: A Resource for Subject and Language Teachers, Cambridge University Press, 2012.

(Activities organised into five chapters: Activating, Guiding understanding, Focus on language, Focus on speaking and Focus on writing. A further chapter provides practical ideas for assessment, review and feedback.)

Deller, Sheelagh; Price, Christine. Teaching Other Subjects Through English (CLIL), OUP Oxford, 2007. (Over 60 activities, each using a demo subject, which can be adapted to suit a variety of subjects and circumstances. Ideas to support the subject text book and reduce the language obstacle for teachers and learners. Appendix of classroom language for non-native speaker teachers.)

Mehisto, Peeter; Marsh, David Mark; Frigols, María Jesús. Uncovering CLIL: Content and Language Integrated Learning in Bilingual and Multilingual Education. Macmillan Education Australia. 2008. (A wide range of practical ideas and activities that can be used in the CLIL classroom.)

