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Professional document generation and manipulation with MS Word

Autumn Semester

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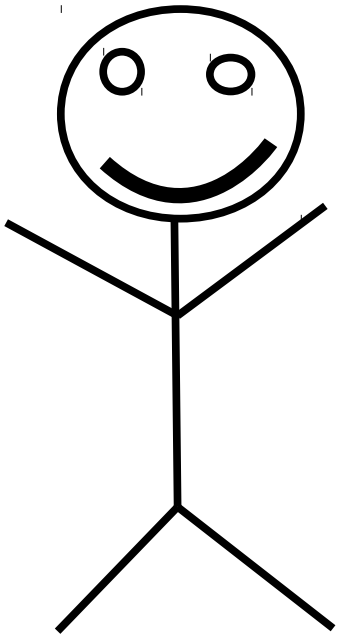
Autumn 2016

Lecture outline

- **Hello!, about me**
  - **Solar energy harvesting**
- A word about copyright
- Why do I need a lecture on document presentation?
  - Examples of good and bad documents.
- Software for generating documents
  - MS Word v.s. Libre/OpenOffice
  - Document file types – and why you should care.
  - Zip files
- Equations and pixels
  - Using the equation editor
  - Numbering equations automatically
- Referencing in documents
  - The quick and dirty way.
  - The correct way.
- Headers and footers
- Numbering images
- Aligning text
- Track changes
- Document comments.
- Document versioning.
- Document storage and backup.

Hello! I'm Dr MacKenzie or Rod but not Dr. Rod



Diagram

Raw experimental data

Before we get into today's lecture I thought I would tell you a bit about my self.

About me (background)

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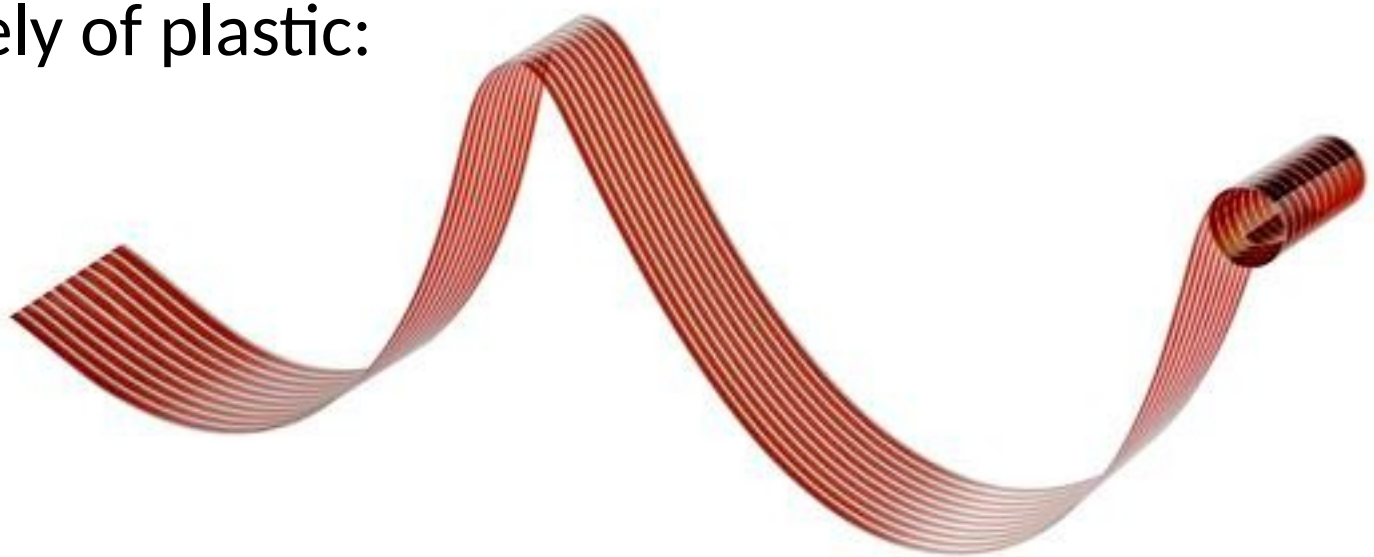
- When I'm not teaching you this module (and doing marking).

- I spend my life working on new types of low cost solar cells to convert sunlight into electricity. Such as this one made entirely of plastic:



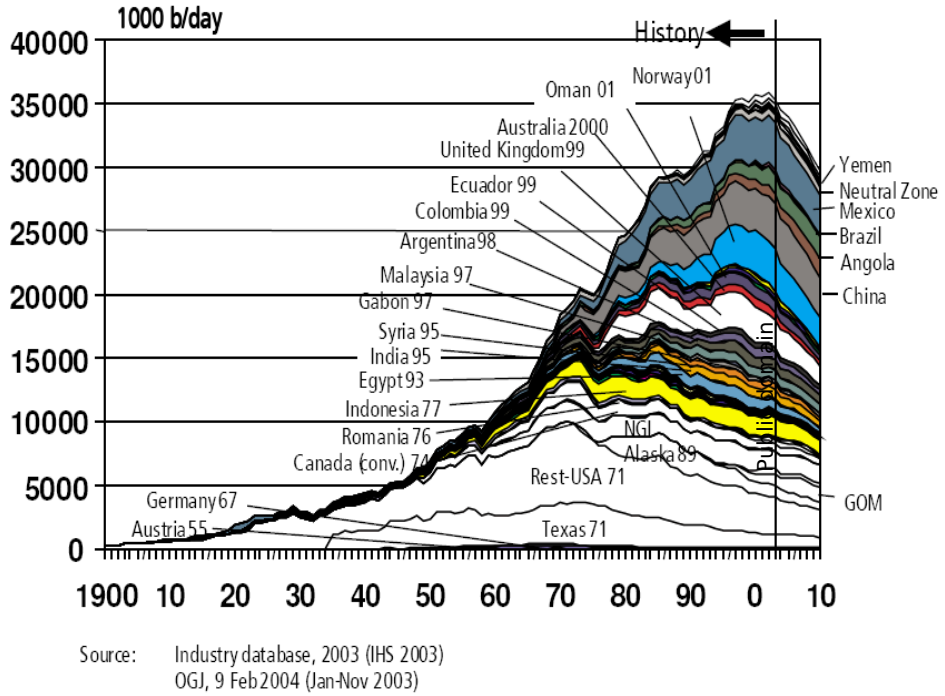
- With the aim of reducing our dependence on fossil fuels

Plastic solar cells are flexible and can be integrated into buildings.

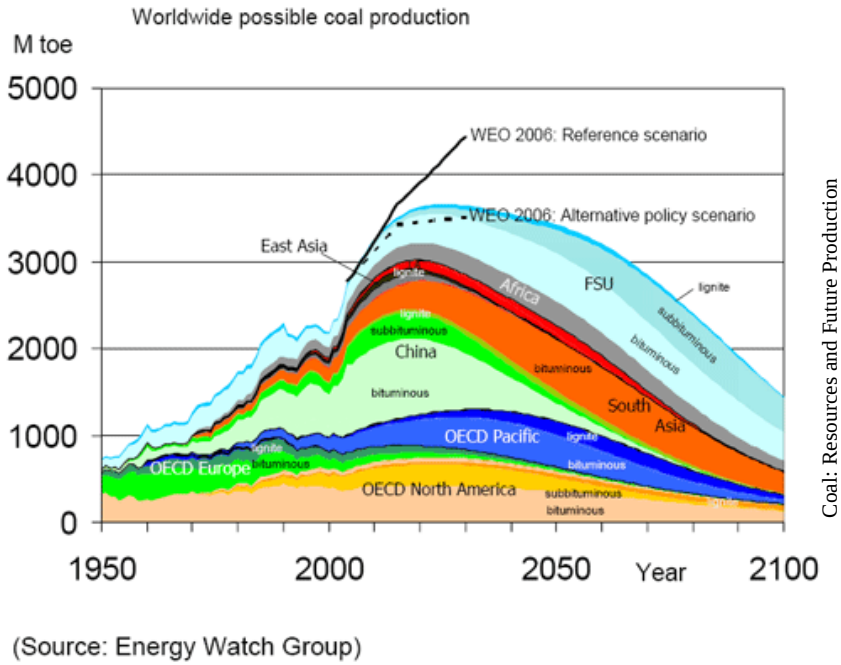
- These solar cells can also be printed just like newspapers, so they could be very low cost to produce in the future.

Images from www.konarka.com

But why do I spend my life doing this? Reason 1:



Oil production



Coal: Resources and Future Production (Energy Watch Group, 2007);

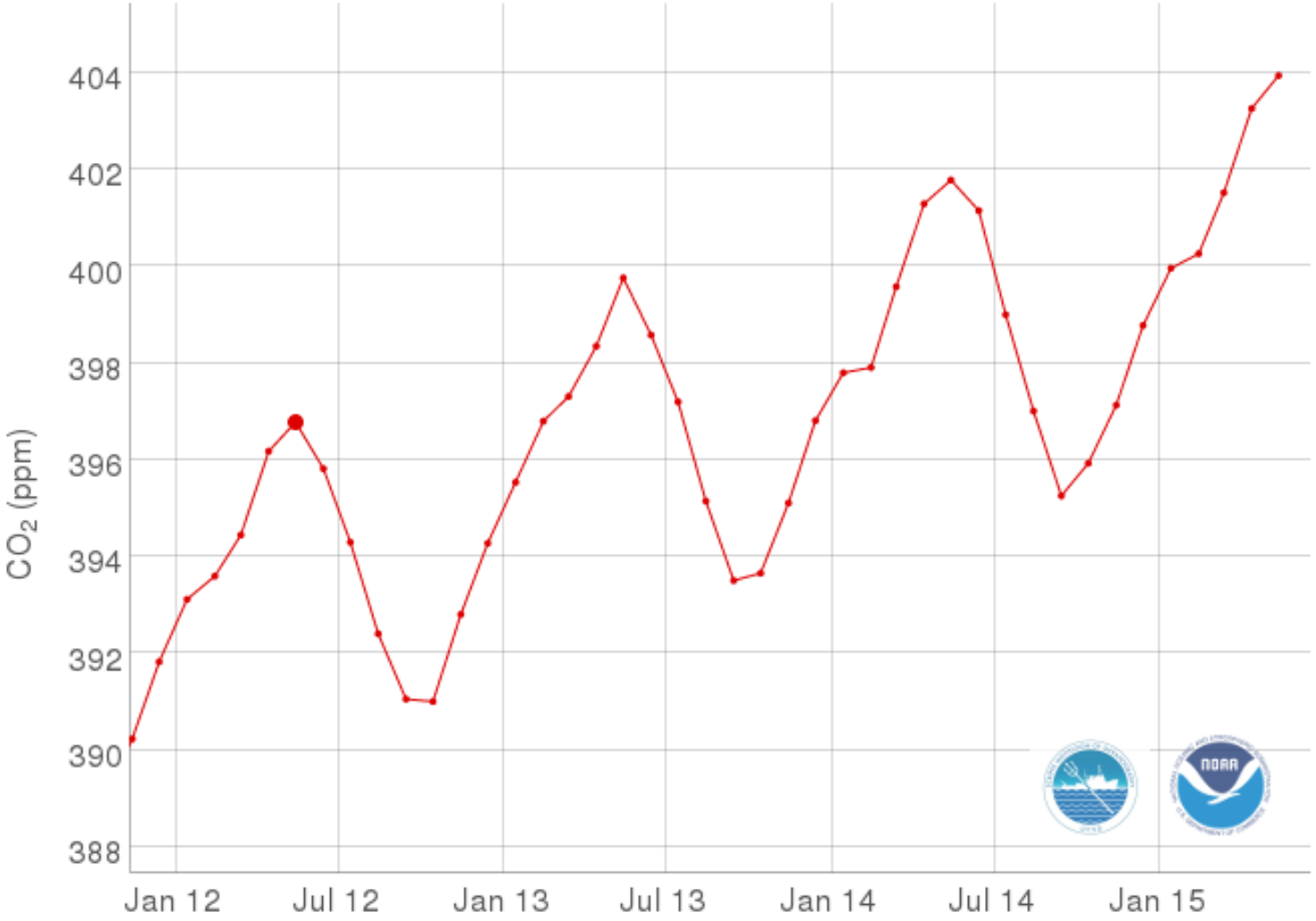
Coal production

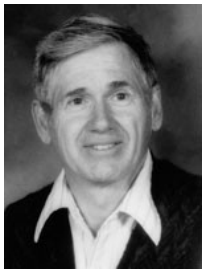
- This will damage the economy and our standard of living, our health and well being.

- Hydrocarbons are also far too useful to burn.

Nature, January 2012,Vol 481, pp. 433-435

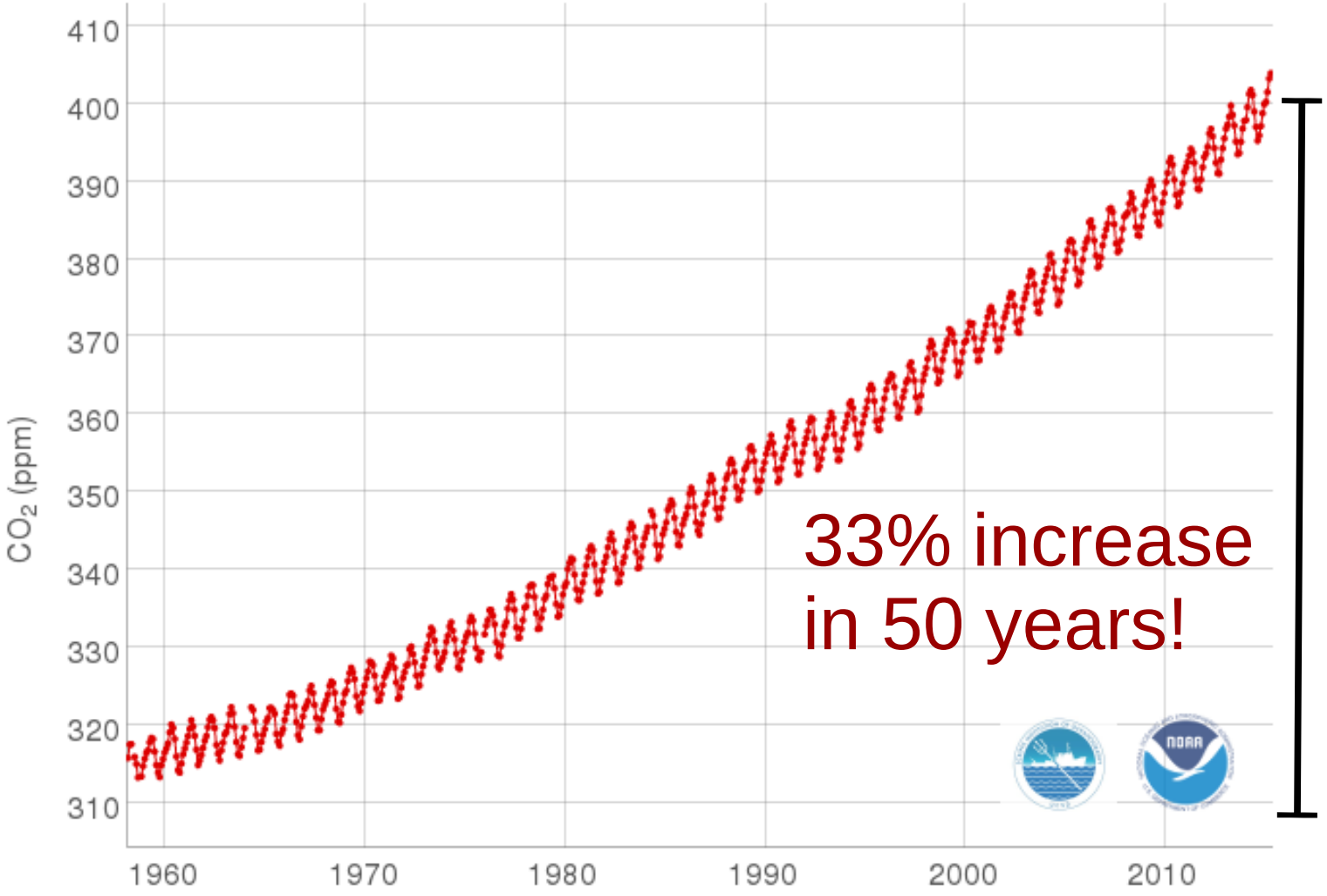
Reason 2: Global warming, the most scary graph you will ever see.



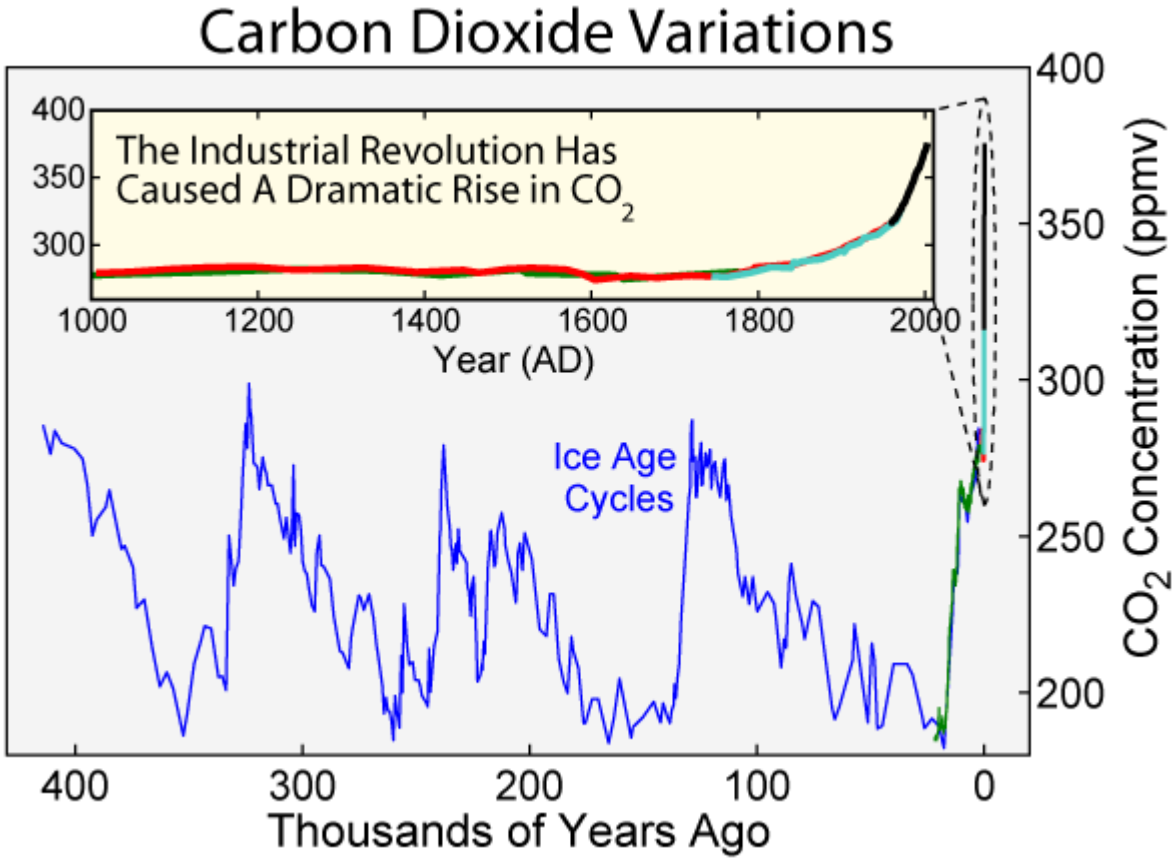


Charles Keeling

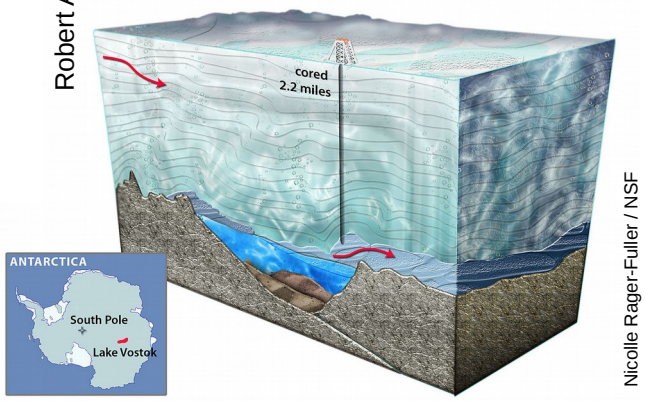
Jan 1980-June 2015



Carbon dioxide 400 AD – 2009 AD

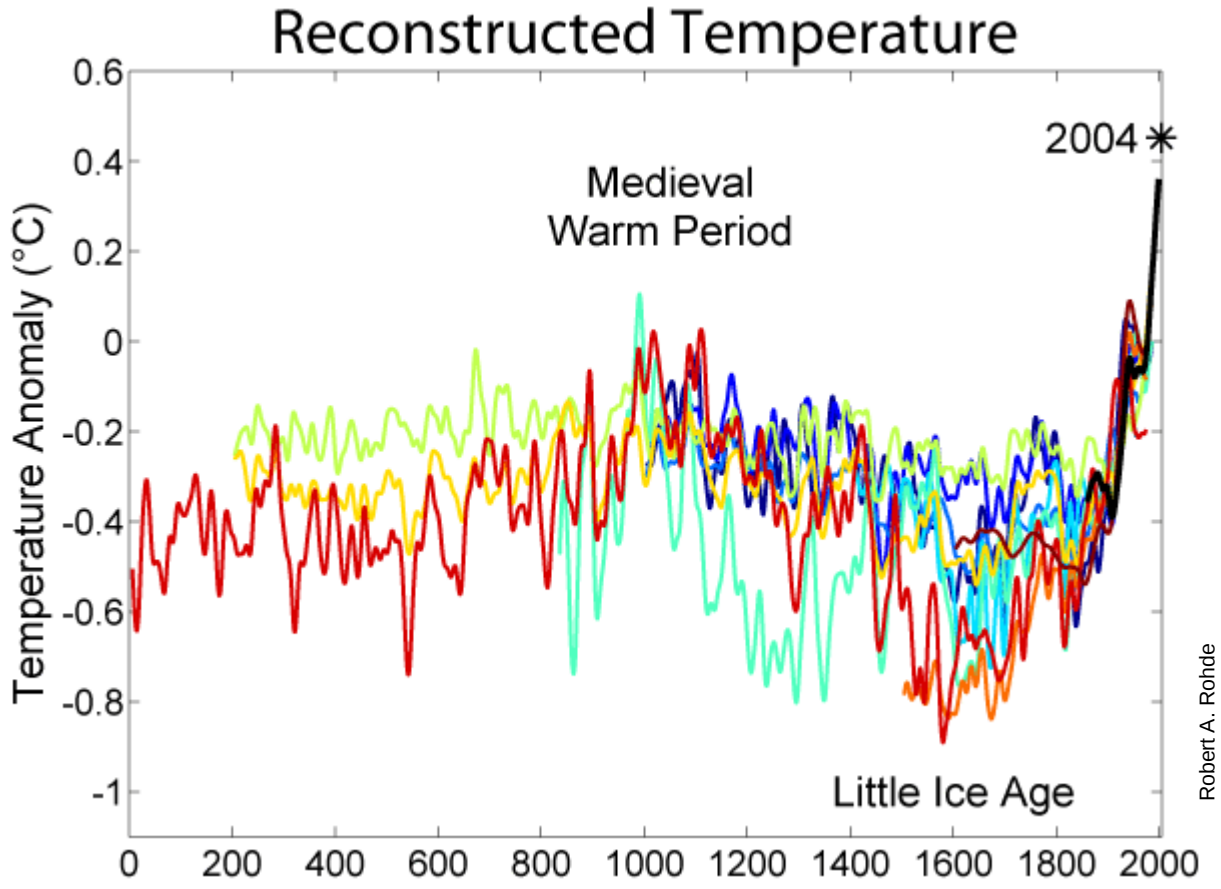


Robert A. Rohde



Nicolle Rager-Fuller / NSF

Global temperature 1000 AD – 2000 AD

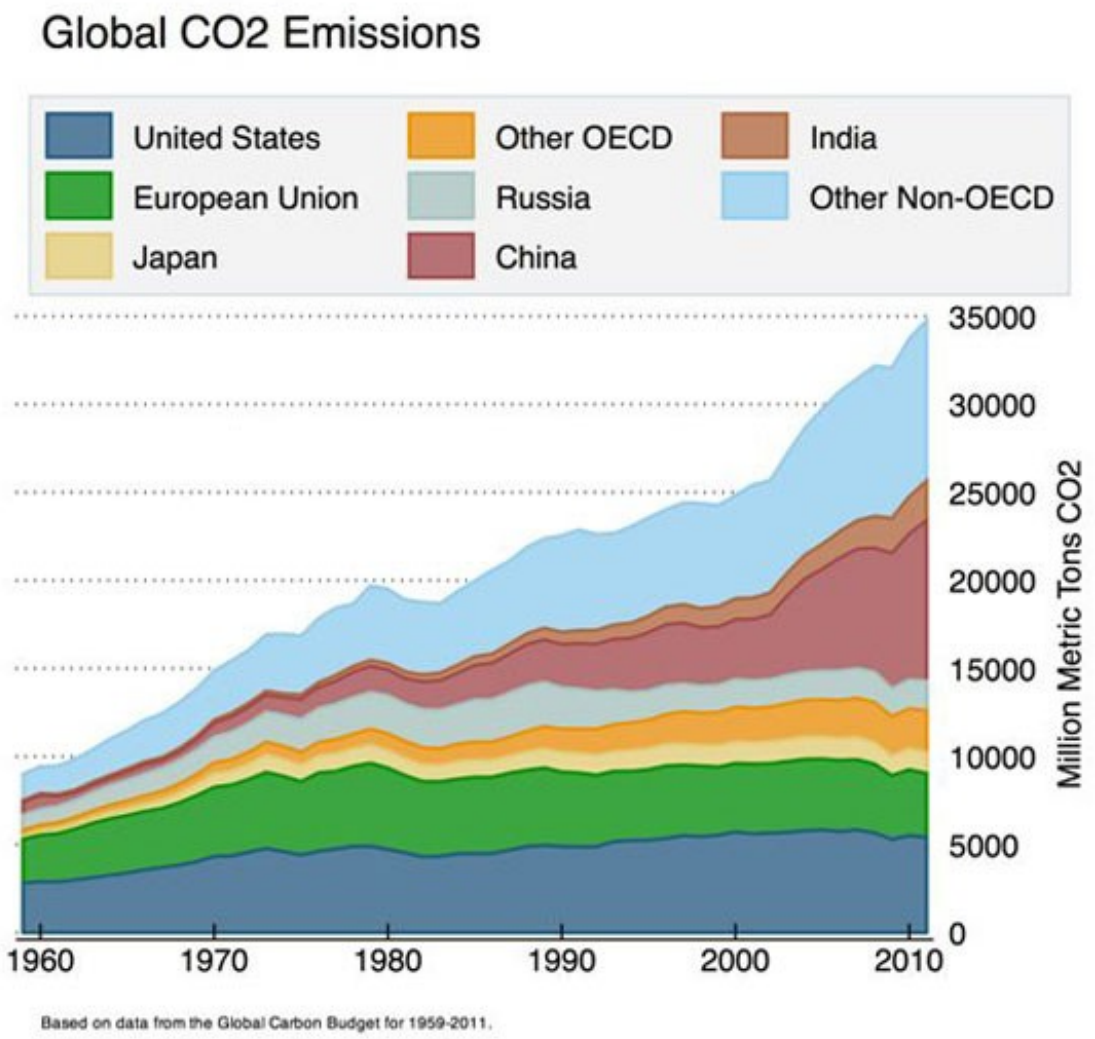


Robert A. Rohde

Jensk369

Do you spot the link between the last two graphs?

CO_2 Emissions by country



- This is even more scary!

If you want to read my papers….

Roderick C I MacKenzie

Edit | Follow

University of Nottingham
Organic Electronics, Quantum well laser diodes
Verified email at nottingham.ac.uk - Homepage
My profile is public

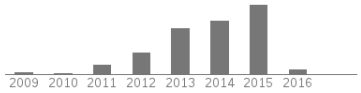
Change photo

Title | Add | More | 1–20 | Cited by | Year

Title	Cited by	Year
Modeling nongeminate recombination in P3HT: PCBM solar cells RCI MacKenzie, T Kirchartz, GFA Dibb, J Nelson The Journal of Physical Chemistry C 115 (19), 9806-9813	119	2011
Sensitivity of the Mott-Schottky Analysis in Organic Solar Cells T Kirchartz, W Gong, S Hawks, T Agostinelli, RCI MacKenzie, Y Yang, … American Chemical Society	74	2012
A numerical study of mobility in thin films of fullerene derivatives RCI MacKenzie, JM Frost, J Nelson The Journal of chemical physics 132 (6), 064904	61	2010
Extracting microscopic device parameters from transient photocurrent measurements of P3HT: PCBM solar cells RCI MacKenzie, CG Shuttle, ML Chabinyc, J Nelson Advanced Energy Materials 2 (6), 662-669	60	2012
Gravure printing for three subsequent solar cell layers of inverted structures on flexible substrates MM Voigt, RCI Mackenzie, CP Yau, P Atienzar, J Dane, PE Keivanidis, …	59	2011

Google Scholar

Citation indices	All	Since 2011
Citations	666	641
h-index	13	12
i10-index	15	13

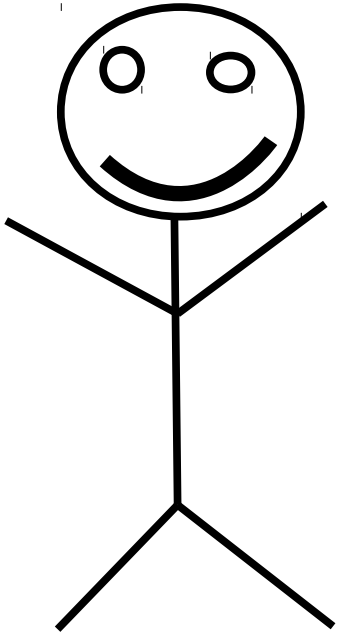


Co-authors Edit…

Thomas Kirchartz
Michael Chabinyc
George F. A. Dibb
Jarvist Moore Frost
Anders Larsson
Steven A. Hawks
Felix Deschler
Elizabeth von Hauff
Enrico Da Como
Maxwell J. Robb
Neil D Treat

- So, the point is that I am not the worlds expert on **MS Word**/**MS Excel**/ **MATLAB** but I do use these tools every day to do real world Engineering work/research.
- So everything I tell you will come from a practical point of view. And my aim is to make everything I teach you **useful**.

What will I be teaching you?



- I will be teaching you:
  - How to use **MS Word for professional document presentation** (1+2 hrs) to produce professional documents. (this lecture)
  - **MS Excel** to analyze scientific data (1 + 2hrs).
  - And **MATLAB** to program computers to do really cool things (~10+20 hrs).
    - I really love teaching you MATLAB, it's fun and I love programming.
    - You have to wait two weeks for this though.

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Copyright of my notes.

I release all of my notes and artwork under a creative commons license CC-BY.

This means you can **copy them**, **reuse them**, **edit them** and **give them to other people** but you must keep my name on them.

I'm not going to talk about copyright in detail here but when you are copying images or documents of the internet do check what license they are produced under.

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Why do I need a lecture on document preparation?

- How many of you have used MS Word/MS Excel before?
- However, you will be using word processing software a lot throughout your life (degree) so if I can teach you a few simple tricks now, it will make your life a ***lot easier***.
- I expect most people to know ***some*** of what I am going to teach you, but not all people to know ***all*** of what I am going to teach you.
- So look out for the things you don't know, just relax and take the rest as it comes.
- There is no test or exam at the end of today, this session is just to help you.

Let’s look at some examples of what not to do when writing documents.

- May be you don’t make all of these mistakes, but may be you make a couple.

An example of what not to do

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Introduction

Doctor blade is used to produce large area thin films widely. It was developed during the 1940's and it is used to form thin sheets of piezoelectric materials and capacitors. Doctor blading is an economical technique to form thin film because very few particles loss in the process, so small amount of starting materials is enough for making film. Because almost all the ink in the process of doctor blading can be fully used, therefore, doctor blading is a more material saving method compared to the spin coating. However, evaporation is slow and the solution does not tend to crystallize at high concentration by using this method.

- What issues can you see?

Examples of what not to do

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Bibliography

1. *Forrest, S. (2012). "Energy efficiency with organic electronics: Ching W. Tang revisits his days at Kodak". MRS Bulletin 37*
2. *Organic Electronics for a Better Tomorrow: Innovation, Accessibility, Sustainability A White Paper from the Chemical Sciences and Society Summit (CS3) San Francisco, California, United States September 2012*
3. *Organic Electronics II: More Materials and Applications, Hagen Klauk John Wiley & Sons, 2012*
4. *Printed Organic and Molecular Electronics, Daniel R. Gamota, Paul Brazis, Krishna Kalyanasundaram, Jie Zhang, Springer Science & Business Media, 2013*
5. *Charge Transport in Disordered Solids with Applications in Electronics, Sergei Baranovski John Wiley & Sons, 2006*
6. *Handbook of Flexible Organic Electronics: Materials, Manufacturing and Applications, Stergios Logothetidis, Elsevier, 2014*
7. *Yamashita, Yoshiro (2009). "Organic semiconductors for organic field-effect transistors".Sci. Technol. Adv. Mater.*

- What issues can you see?

Examples of what not to do

- What issues can you see?
- Generally generating nice documents requires attention to detail and a knowledge of how to use a word processor.

Abstract

Solar energy as a renewable and clean energy receives more and more attention. Plastic solar cells are modelled by Matlab to see the light propagation.

1 Introduction

Solar energy is an important renewable energy and it is radiant light and heat from the sun utilization [1]. The technologies of solar energy are divided into passive solar and active solar depending on the way that they gain and allot solar energy. Active technologies contain the application of photovoltaic systems, concentrated solar power and solar water heating to use the energy. However passive technologies include changing the direction of buildings to capture more sum light. Solar technology has been used in architecture, agriculture, horticulture and even transport. There are also many other renewable energies nowadays but solar energy has some outstanding benefits. There is no noise of capturing solar energy and less need for locations. The price of building solar energy devices are much cheaper than wind energy devices and hydropower devices [2].

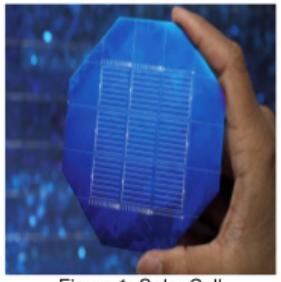

Figure 1: Solar Cell

1.1 Equations

$$\text{Photon flux}[m^{-2} * nm^{-1} * s^{-1}] = \frac{\text{Photon intensity}[Watts * m^{-2} * nm^{-1}]}{\frac{hc}{wavelength}[J]} \quad (1)$$

For equation (1), photon flux [3] reflects the amount of electrons that are produced from a solar cell. Photon intensity [4] represents the energy per unit area and unit time. Besides that h is planks constant is $6.6 * 10^{-34} m^2 Kg/s$ and c is the light speed is $3 * 10^8 m/s$.

$$I(x,\lambda) = I_0 * \exp(-x * \alpha(\lambda)) \quad (2)$$

Equation (2) is used to determine how much light is absorbed within the solar cell that is called Beer-Lambert law [5]. X is the position within the solar cell and α is the absorption coefficient depending on material characteristic. The value of α changes with the value of wavelength (λ). The I value is calculated at decided position and wavelength.

2 Code

```
load sun.csv
load plastic.csv
P=zeros ( 58 , 58 );
d=zeros ( 58 );
pos=0
for y = 1:58,
d(y)=pos;
pos=pos+5e-9;
end
myfile=fopen('file.txt','w')
for x=1:58,
for y=1:58,
P(y,x)=plastic(y,2)*sun(y,2)*exp(-d(x)*plastic(y,2));
fprintf(myfile,'%e %e %e\n',d(x),plastic(y,1),P(y,x));
end
fprintf(myfile,'\n');
end
fclose(myfile)
xaxis=d(:,1)
yaxis=plastic(:,1)
contourf(xaxis,yaxis,P)
xlabel('Position(m)')
ylabel('Wavelength(m)')
h=colorbar
title(h,'Solar intensity(Watts*m^-2*nm^-1)
```

3 Results

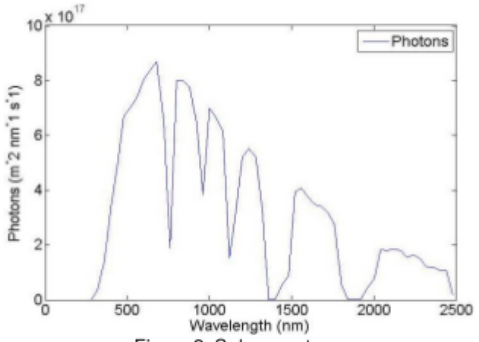

Figure 2: Solar spectrum

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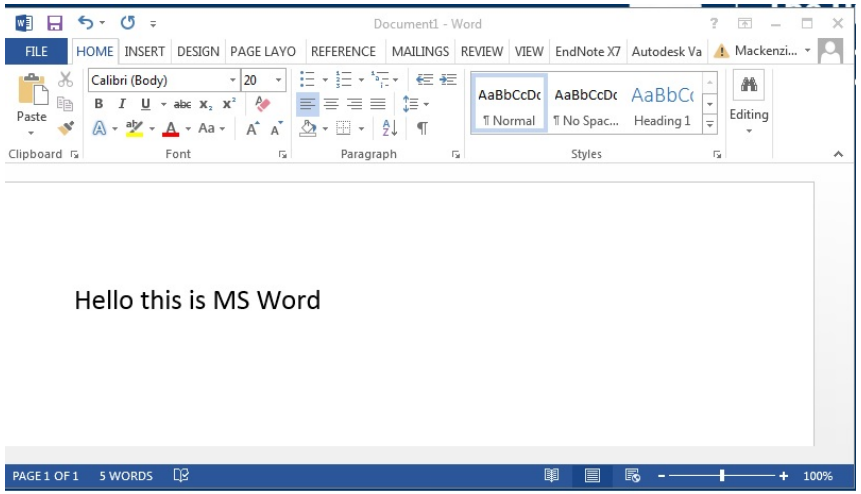
Choice of software

- There are a lot of packages available for professional document generation
  - MS Word
  - Libre/OpenOffice
  - google docs
  - Latex
  - iwork (Mac – never used it)
  - AbiWord, Kword, etc…

Microsoft Word

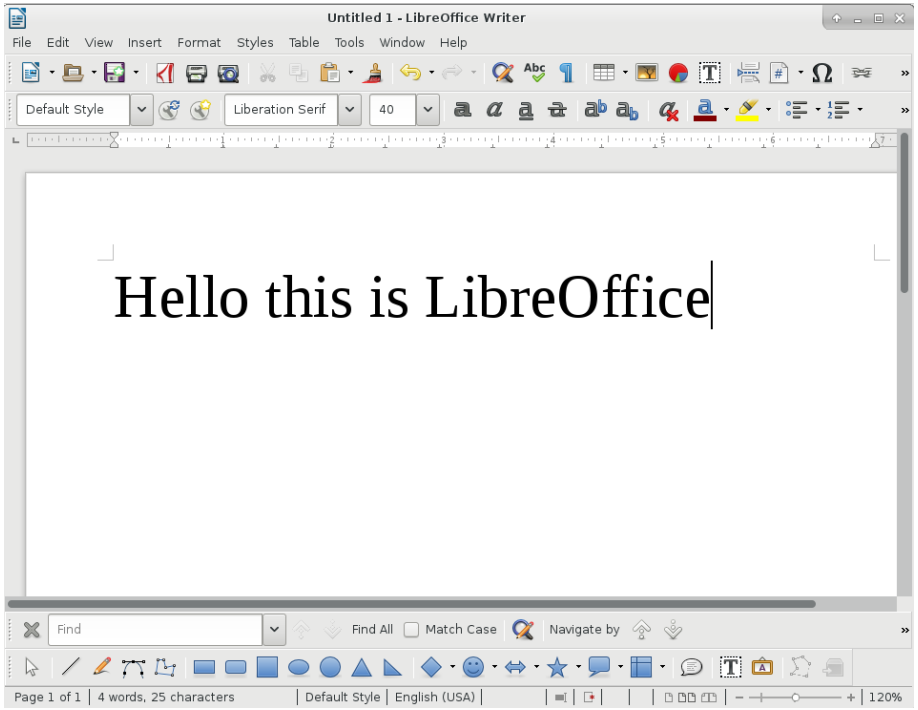
- Advantages:
  - It's on the university computers
  - It's quite easy to use.
  - It's tightly integrated with other MS products



- Disadvantages
  - It costs about 100 pounds for a student copy and 300 pounds for a business copy. (which is a lot of cash)
  - MS keep changing the file formats to force you to upgrade i.e. .doc or .docx. Even different version of MS office are ~~usually~~ sometimes incompatible.
  - You need an irritating license key.
  - Student copies are a bit of a trap.

Libreoffice

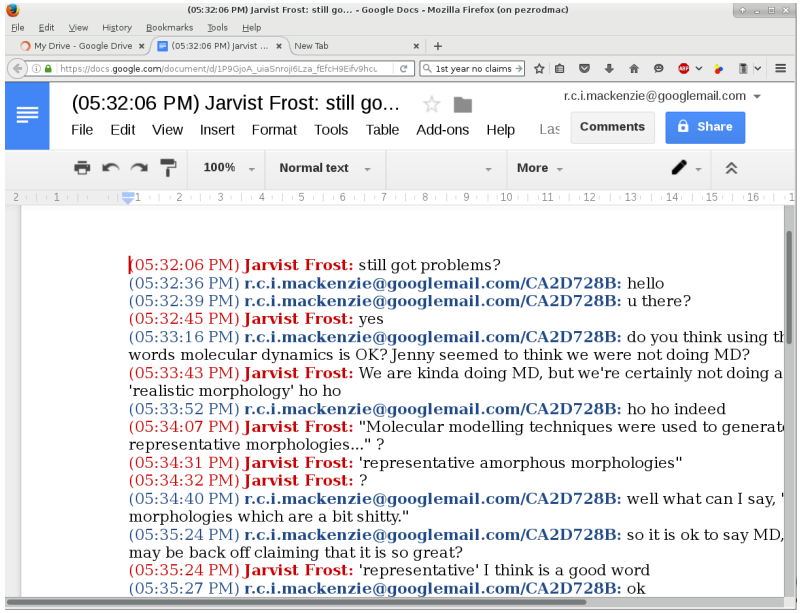
- Advantages:
  - It's free.
  - It's open source.
  - No irritating license key
  - I use it for everything :)
  - Did I mention it was free?



- Disadvantages
  - Sometimes struggles with opening saving .docx files. Especially with track changes
  - Grammar checker is not as good as MS Word.
  - Apart from that it's pretty good.

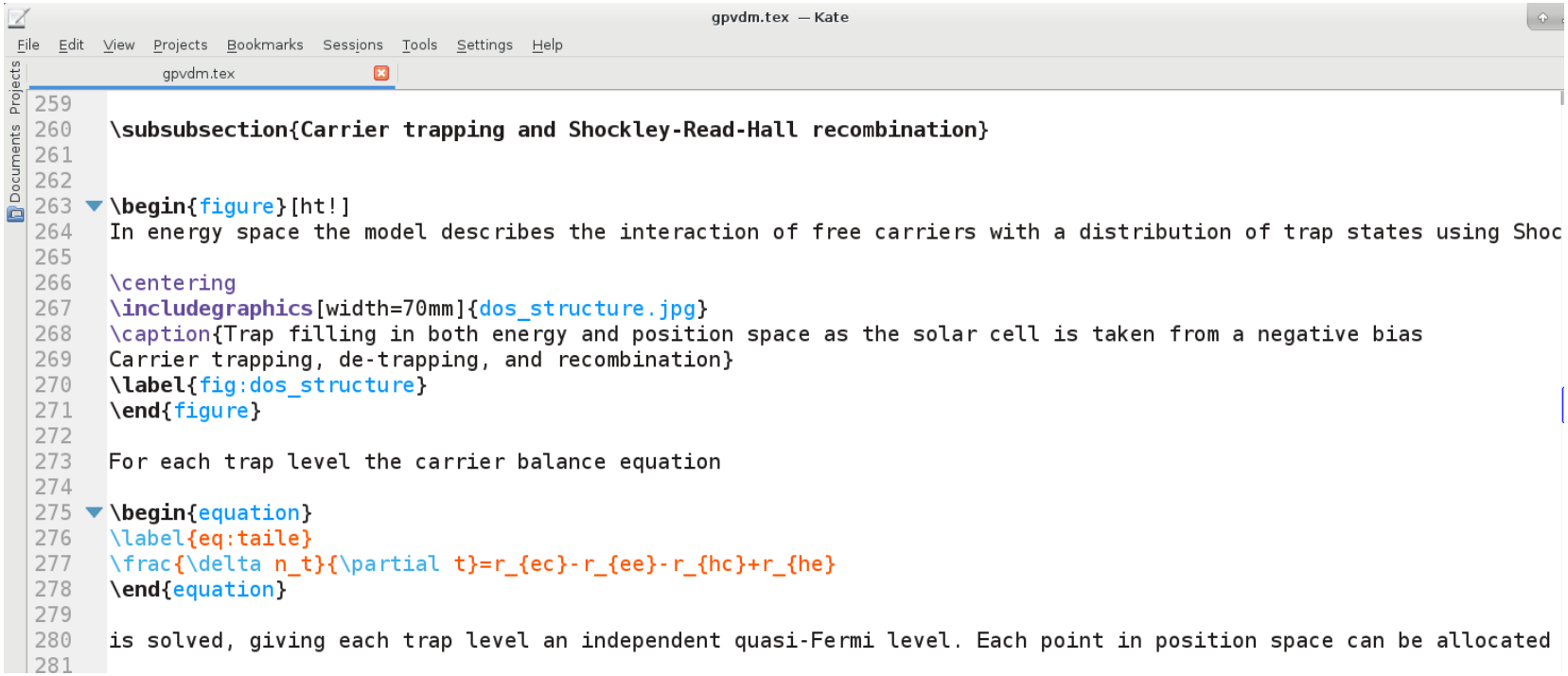
Google docs

- This is web based.
- You need a google account to access it.
- It' is really cool because you can share a document with your friends and edit it at the same time.
- With all the updates being displayed instantly.
- It's pretty good for collaboration work.
- Apart from that, as a word processor I don't like it that much.



Latex

- Latex is super cool – What you see is what you get.
- You have to write your document in a type of code, but once it is coded up, Latex will manage everything for you, figures, indexing, numbering the bibliography



- If I'm starting a big complicated project http://gpvdm.com/docs/gpvdm_documentation.pdf , I will tend to use Latex.

Latex

- The latex source code would be converted into this.

3.1.3 Carrier trapping and Shockley-Read-Hall recombination

For each trap level the carrier balance equation

$$\frac{\delta n_t}{\partial t} = r_{ec} - r_{ee} - r_{hc} + r_{he} \tag{14}$$

is solved, giving each trap level an independent quasi-Fermi level. Each point in position space can be allocated between 10 and 160 independent trap states. The rates of each process r_{ec}, r_{ee}, r_{hc}, and r_{he} are give in table 1.

The carrier escape rates for electrons and holes are given by

$$e_n = v_{th}\sigma_n N_c exp\left(\frac{E_t - E_c}{kT}\right) \tag{15}$$

and

16

- **PhD thesis:** You would be mad not to use Latex.
- **MEng :** Thesis could be worth using Latex.
- **Shopping list/Lab report:** Probably not.

Software for generating documents

- There are a lot of packages available for professional document generation
  - MS Word
  - Libre/OpenOffice
  - google docs
  - Latex
  - **iwork (Mac – never used it) (?)**
  - **AbiWord, Kword, etc… (?)**
  - **And the rest……**

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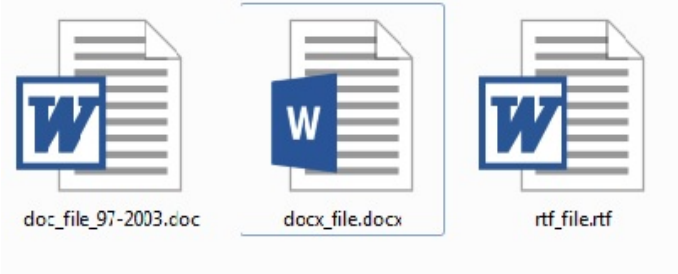
File formats and why you should care

- You will want to ***send*** your documents to other people to ***read*** and ***edit***.
- Very often different versions of MS Office will have difficulty opening files form older/newer versions.



Document formats

- Also **don't expect** the recipient to have MS Office.
- They might be reading your document on a tablet/ idevice. Very often .doc/.docx files look very odd when opened in anything but the version of word that made them.

File formats and why you should care

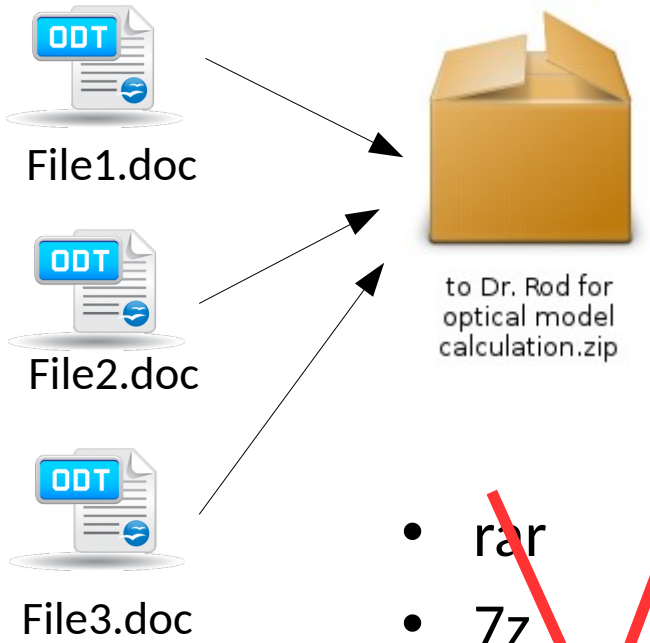
- Think about sending someone a CV – you want it to open first time.
- If it does not open nicely, you won't get the job.
- My advice is to stick to one file format during editing then when you are ready to submit. Send people the **PDF** of your work.

Luis Alberto Arjona Chin

- **PDF documents are an ISO standard (ISO 32000-1), other document formats are not so standardized.**
- **If sending an important document send it as a PDF.**

..... .zip files

- Very often you will want to submit multiple files at the same time
- The best way to do this is to submit a **zip file**.
- Zip files compress the contents so it's smaller than it was originally



- Zip files can be opened on most computers.
- I would ***strongly suggest*** you **only** use **zip files**, as if the recipient can't open the file – he/she may not bother.

- ~~rar~~
- ~~7z~~
- ~~tar~~
- ~~gz~~
- ~~....~~

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  - Using the equation editor
- Referencing
  - Equation numbering
  - Using references in documents
  - Headers and footers, page numbering
  - Figures and numbering of figures
- Tables
  - Aligning images in text
  - Figures in tables
- Interfacing with your boss/supervisor
  - Track changes
  - Comments in documents
  - Comparing documents
  - Line spacing
- Document versioning.

High quality equations in MS Word

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$$\boldsymbol{J_n} = q\mu_e n_f \frac{\partial E_{LUMO}}{\partial x} + qD_n \frac{\partial n_f}{\partial x}, \tag{9}$$

and holes,

$$\boldsymbol{J_p} = q\mu_h p_f \frac{\partial E_{HOMO}}{\partial x} - qD_p \frac{\partial p_f}{\partial x}. \tag{10}$$

Conservation of charge carriers is forced by solving the charge carrier continuity equations for both electrons,

$$\frac{\partial \boldsymbol{J_n}}{\partial x} = q(R - G), \tag{11}$$

and holes

$$\frac{\partial \boldsymbol{J_p}}{\partial x} = -q(R - G). \tag{12}$$

where R and G are the net recombination and generation rates per unit volume respectively.

To obtain the internal potential distribution within the device Poisson's equation is solved,

$$\frac{d}{dx} \cdot \epsilon_0 \epsilon_r \frac{d\phi}{dx} = q(n_f + n_t - p_f - p_t), \tag{13}$$

3.1.3 Carrier trapping and Shockley-Read-Hall recombination

For each trap level the carrier balance equation

$$\frac{\delta n_t}{\partial t} = r_{ec} - r_{ee} - r_{hc} + r_{he} \tag{14}$$

is solved, giving each trap level an independent quasi-Fermi level. Each point in position space can be allocated between 10 and 160 independent trap states. The rates of each process r_{ec}, r_{ee}, r_{hc}, and r_{he} are give in table 1

The carrier escape rates for electrons and holes are given by

$$e_n = v_{th}\sigma_n N_c exp\left(\frac{E_t - E_c}{kT}\right) \tag{15}$$

and

16

- Very often when we give students a work sheet like this.
- And tell the students to reuse the equations
- They take screen shots of the equation.
- Then copy and paste them into their report.
- Like this….

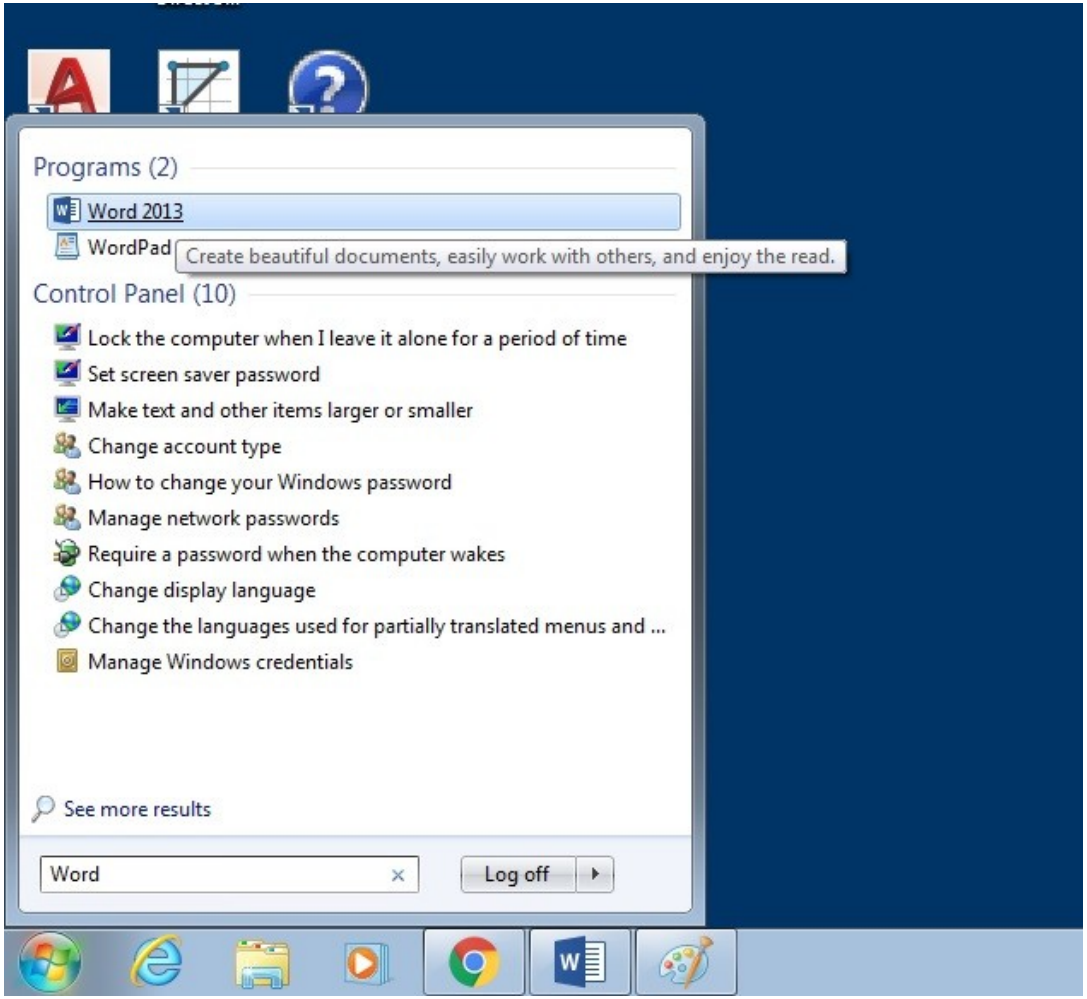
High quality equations in MS Word

- And it looks really really bad

$$\frac{\partial m_g}{\partial t} = r_{ec} - r_{ee} - r_{hc} + r_{hc}$$

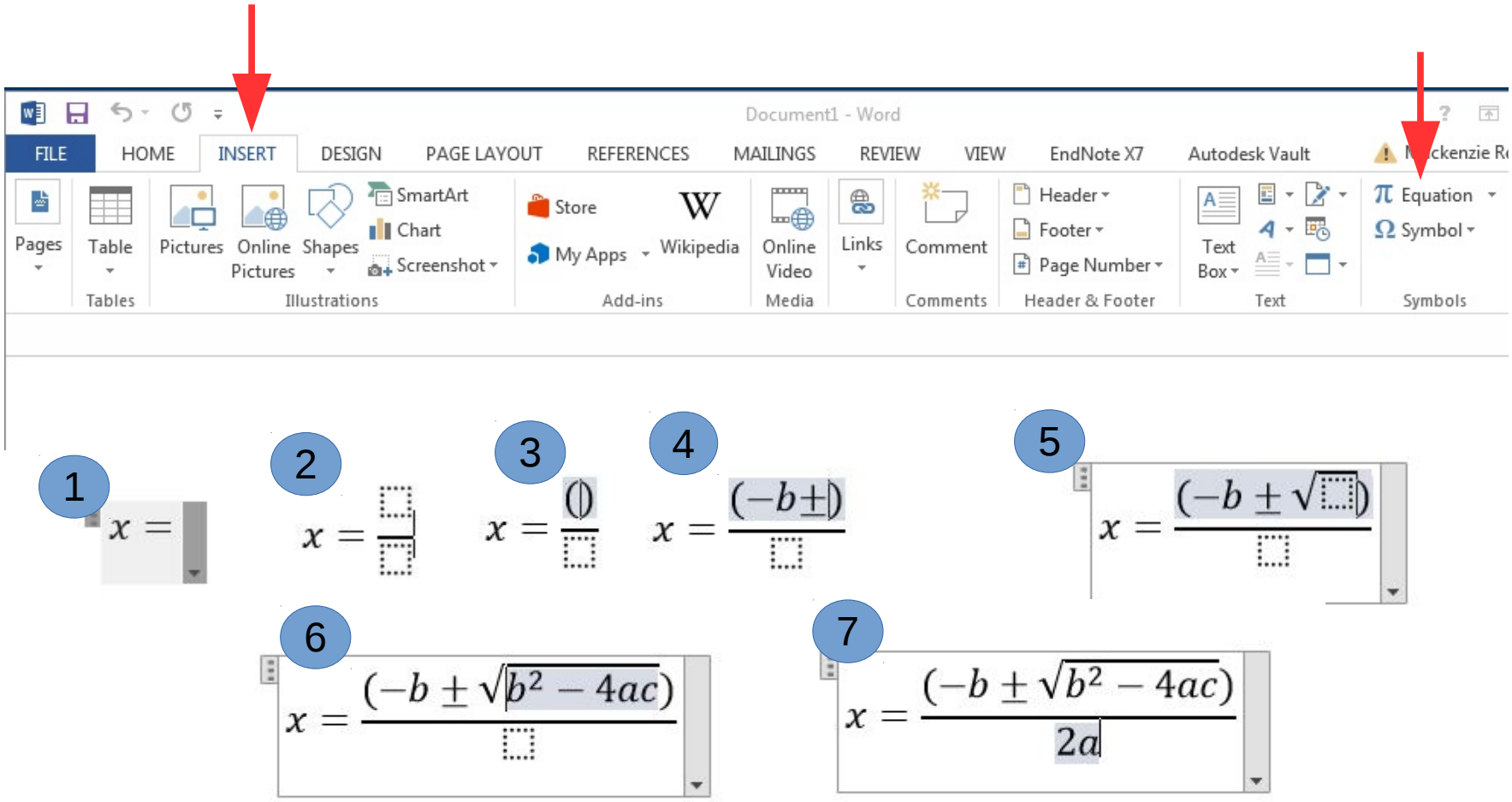
- If you are going to insert equations into a document use the equation editor.
- It looks much nicer.

Let's have a go at inserting an equation into an MS Word document.



- Log in and start MS Word.
- If you have any problems, please put your hand up and ask a demonstrator for help.

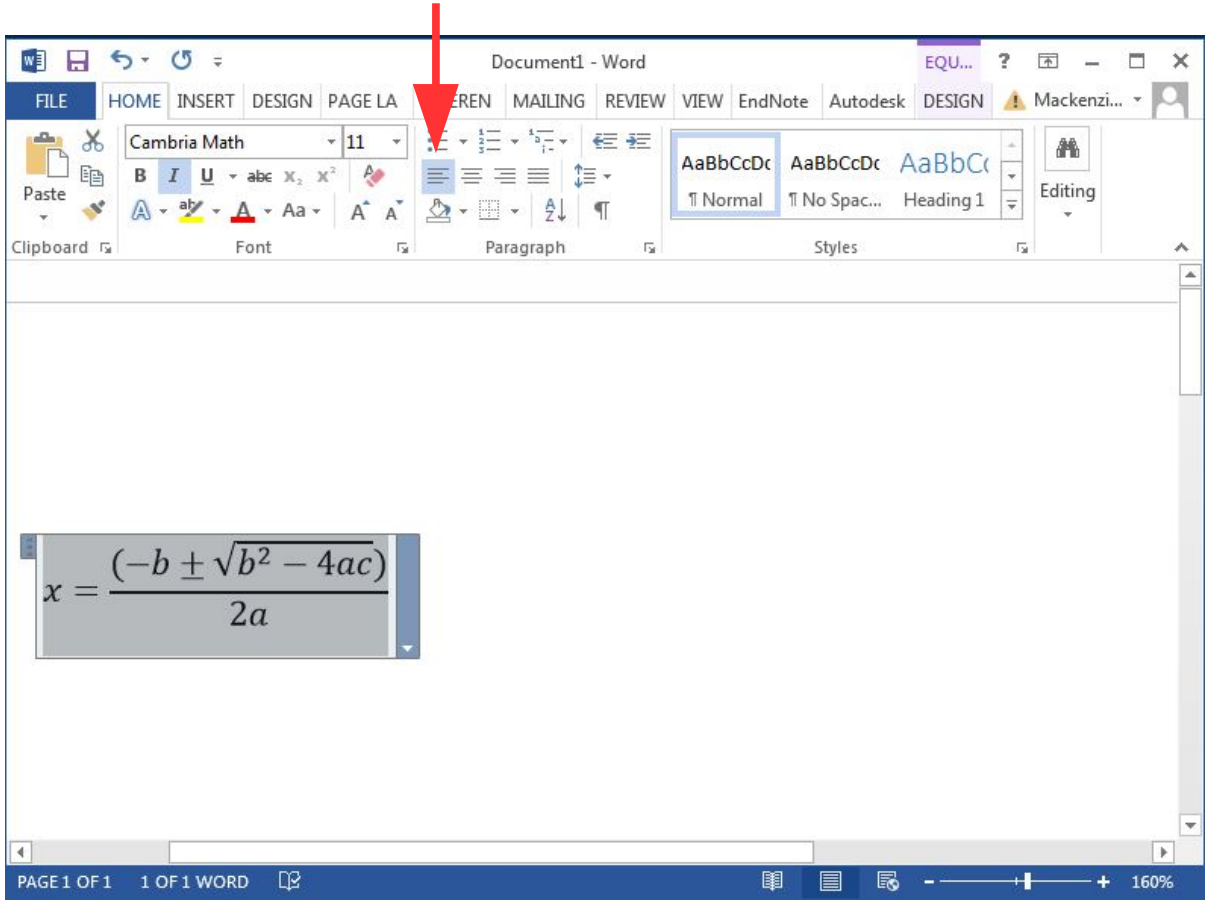
How to use the equation editor



- Please have a go at doing this now, the demonstrators will help you.

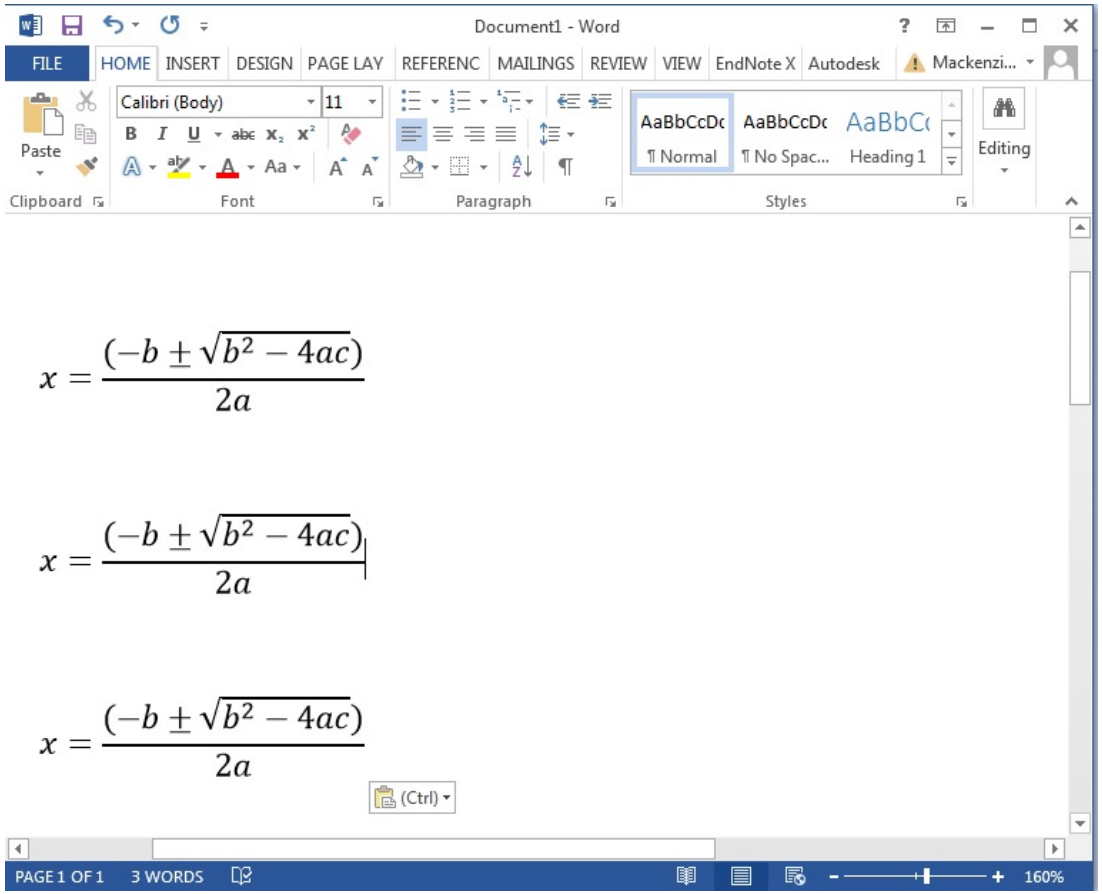
Manipulating equations

- Select your equation, then left align it.



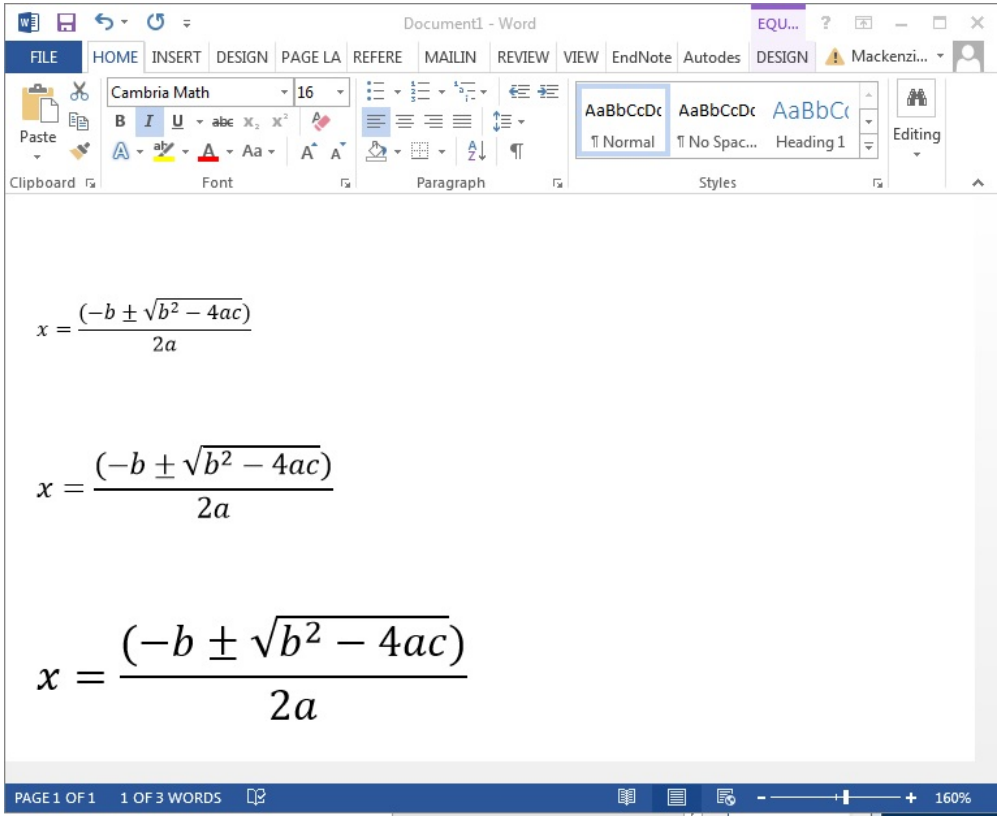
Manipulating equations

- Then make three copies of it like this



Manipulating equations

- Then make one equation small, and one bigger.



- Do this by selecting it and using the font menu. Dragging the corner does not work.

Lecture outline

- Hello!, about me
  - Solar energy harvesting
- Why do I need a lecture on document presentation?
  - Examples of good and bad documents.
- Software for generating documents
  - MS Word v.s. Libre/OpenOffice
  - Document file types – and why you should care.
  - Zip files
- Equations and pixels
  - Using the equation editor
  - **Numbering equations automatically**
- Referencing in documents
  - The quick and dirty way.
  - The correct way.
- Headers and footers
- Numbering images
- Aligning text
- Track changes
- Document comments.
- Document versioning.
- Document storage and backup.

Numbering equations and using the numbers to reference equations

- Very often you will want to refer to equations within text.
- Now make your document look like this:

Bla blab la Bla blab la **Equation 1** Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla

blab la Bla **Equation 2** blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la

Bla blab Bla blab la Bla blab **Equation 3** Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab.

$y = a + b$ 1.

y=2a 2.

y=a+b+c 3.

Referencing equations.

- Now using ctrl+x and ctrl+v, swap around the order of the equations.
- What happens to the numbering of the equations in the paragraph?

Bla blab la Bla blab la **Equation 1** Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla

blab la Bla **Equation 2** blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la

Bla blab Bla blab la Bla blab **Equation 3** Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab Bla blab la Bla blab.

$y = a + b$ 1.

y=2a 2.

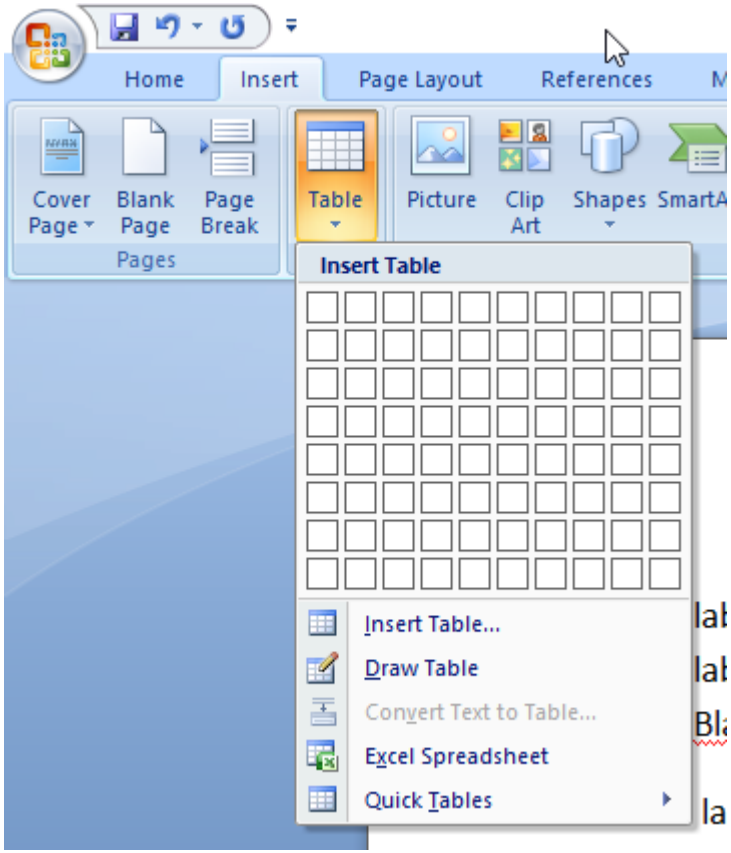
y=a+b+c 3.

Numbering equations properly

- Exactly, nothing…..
- The numbers you typed are just text.
- Having equation numbers not update automatically is OK for small documents like this but it is not OK for large documents.
- Personally, I find equation number in word a bit crazy and nicer in LibreOffice/Latex but here is the easiest way to do it that I can find…..

Numbering equations: Step 1

- Insert a table of width three



Numbering equations

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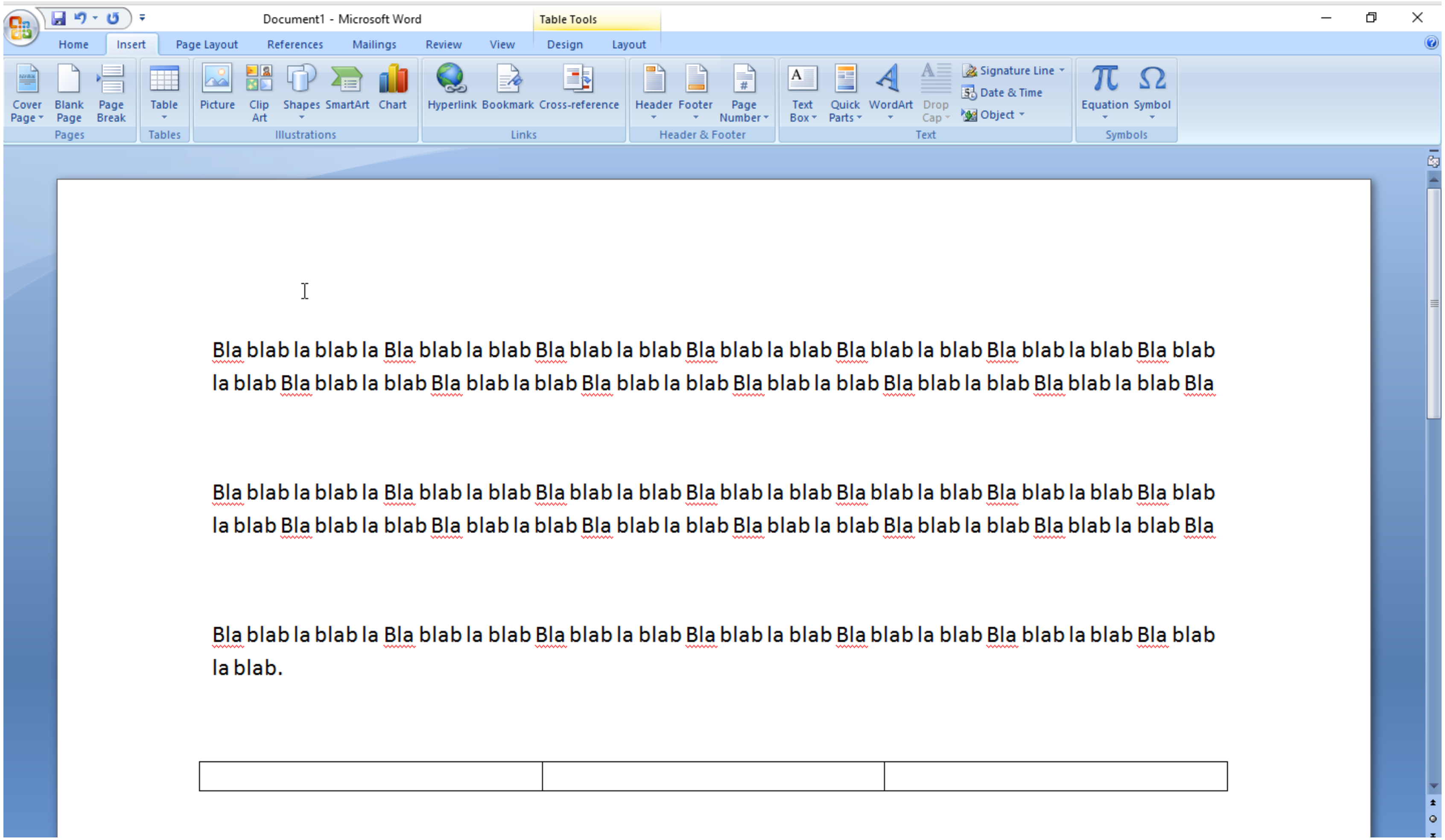
- It should look like this



Numbering equations

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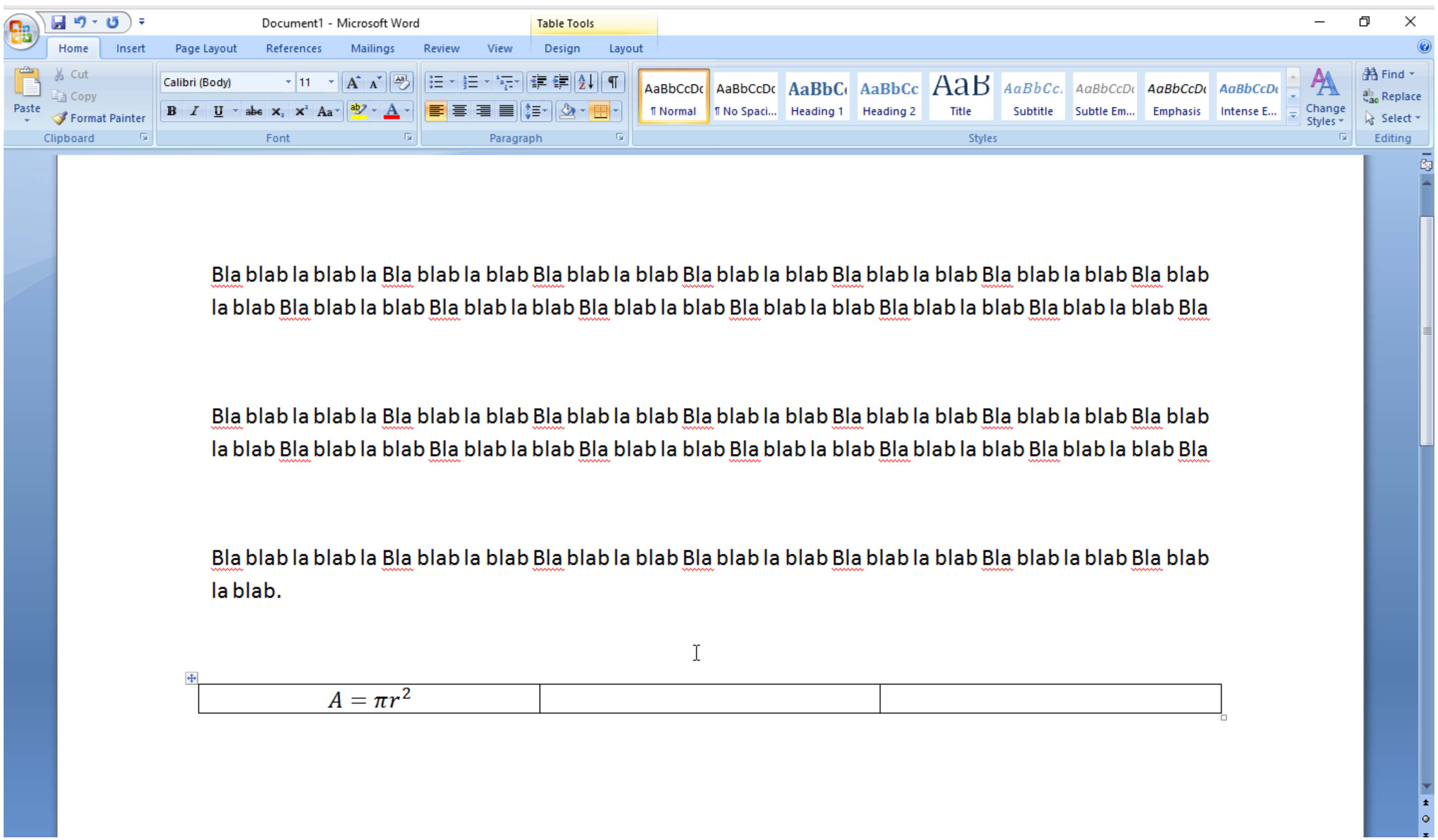
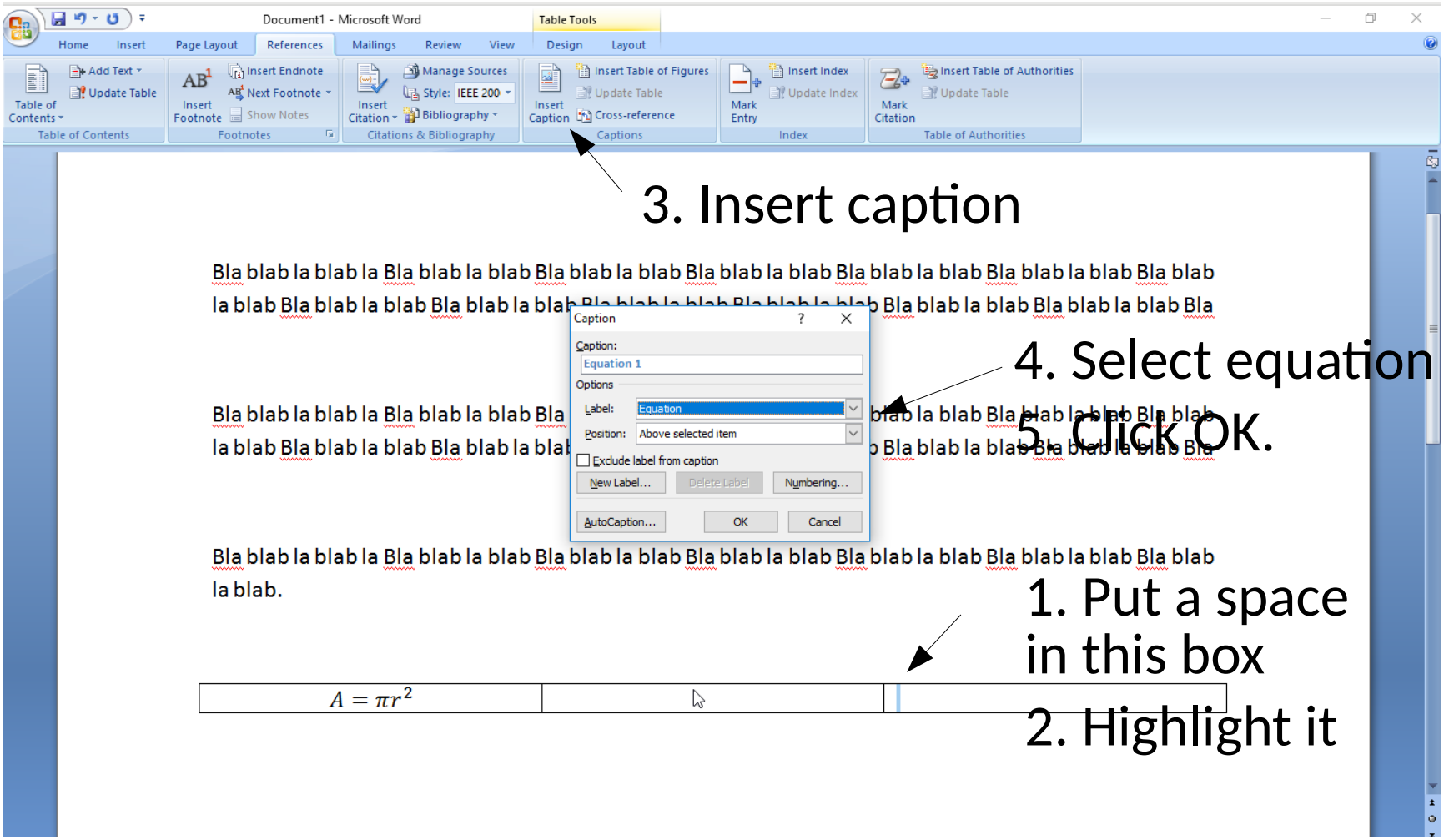
- Now insert an equation into the left most box

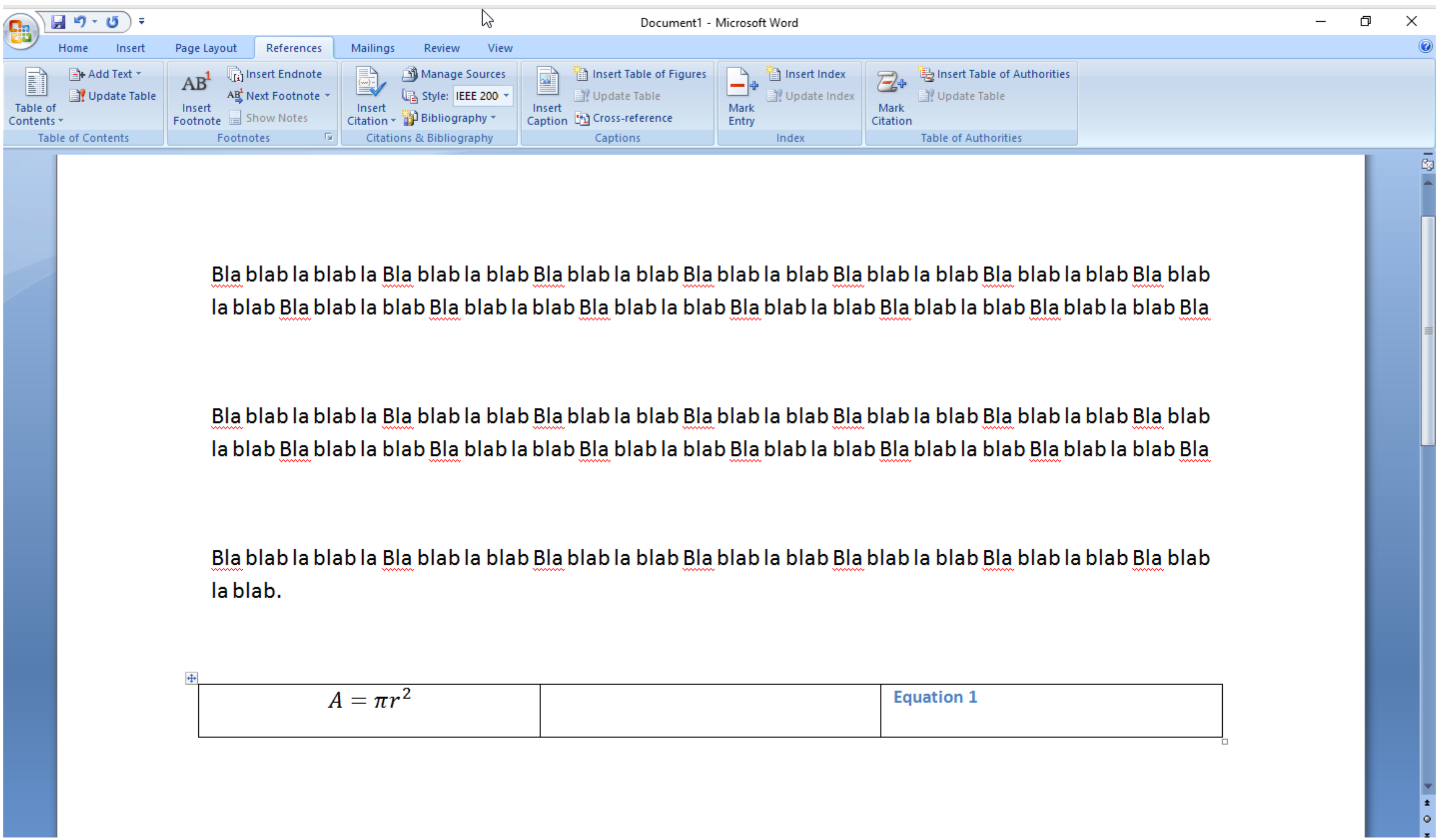


Numbering equations



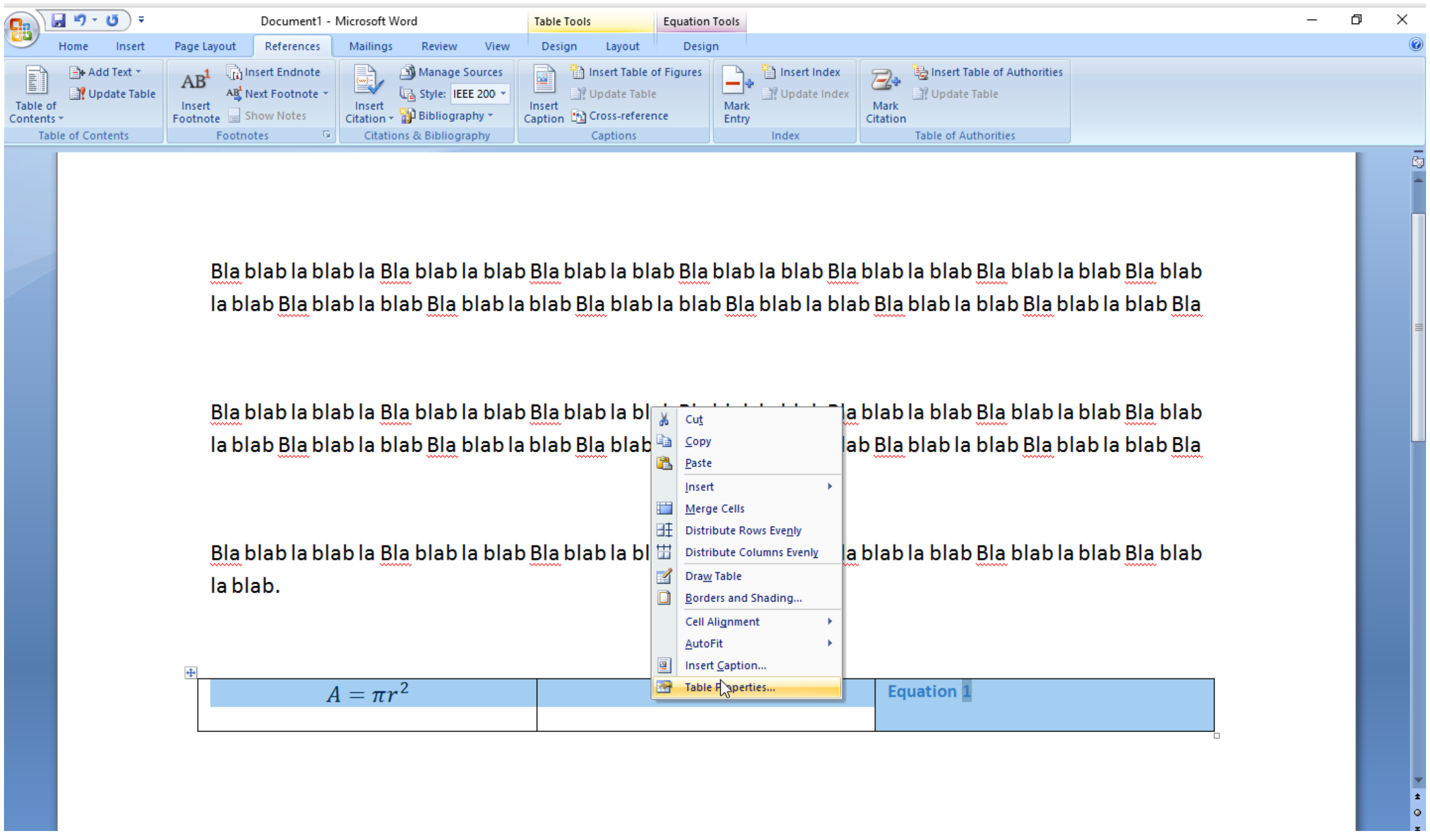
Numbering equations

- This should get you to this, it's a bit ugly right?

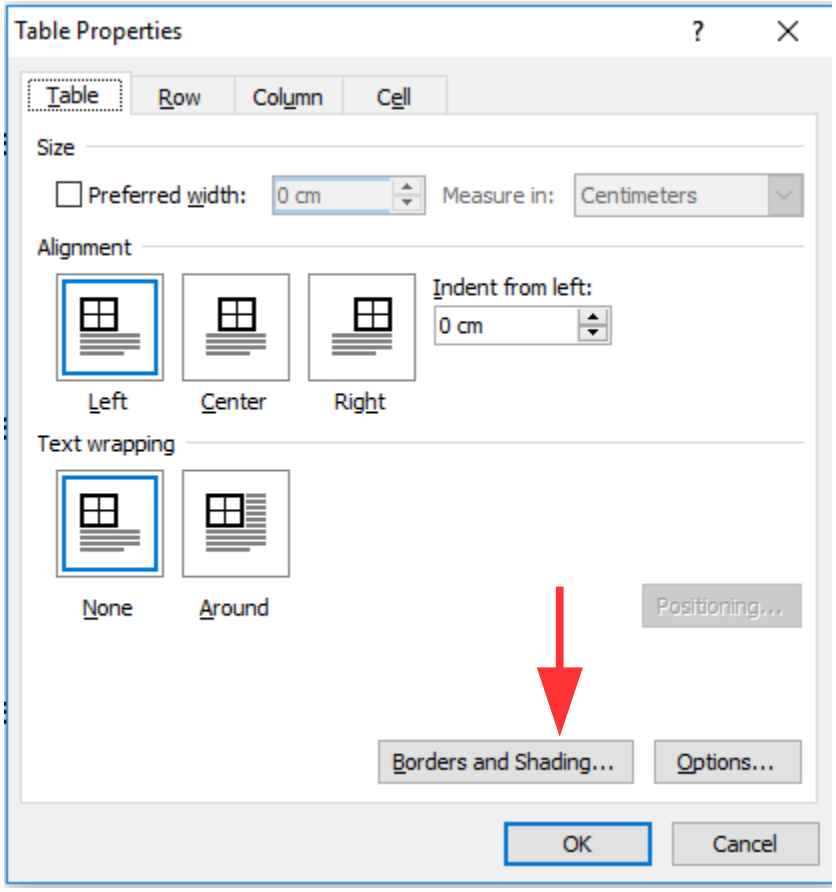


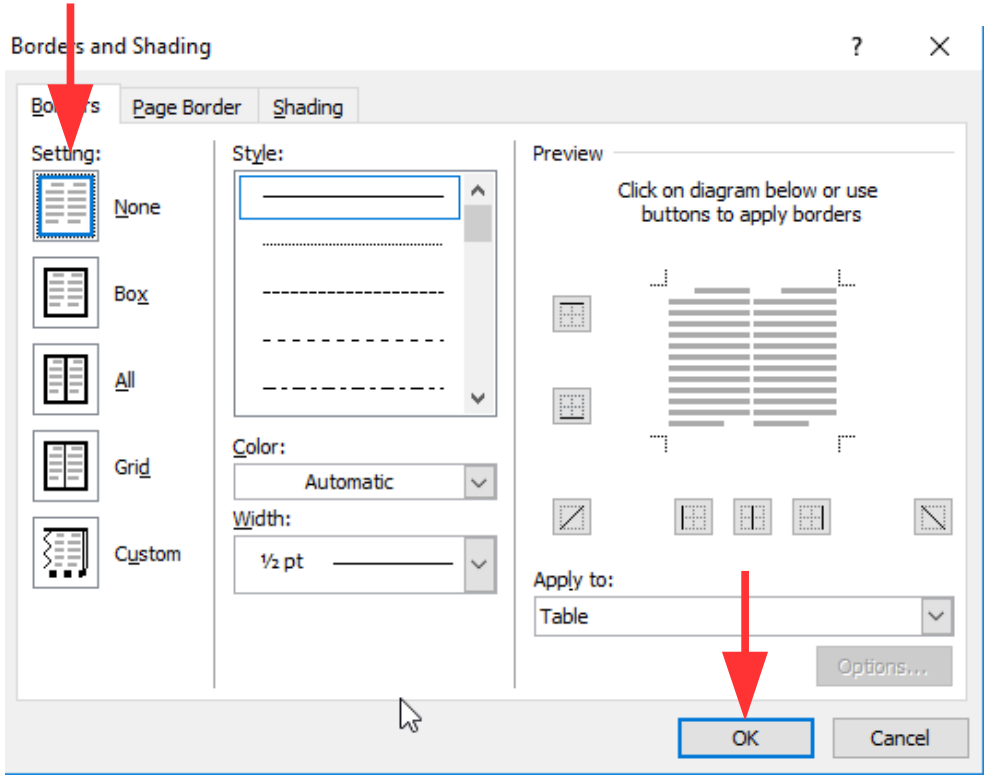
Numbering equations

- Highlight the table.
- Right click
- A click properties.



- Click on Boarders and Shading.
- Then select None, then OK.





Numbering equations

- The final result

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

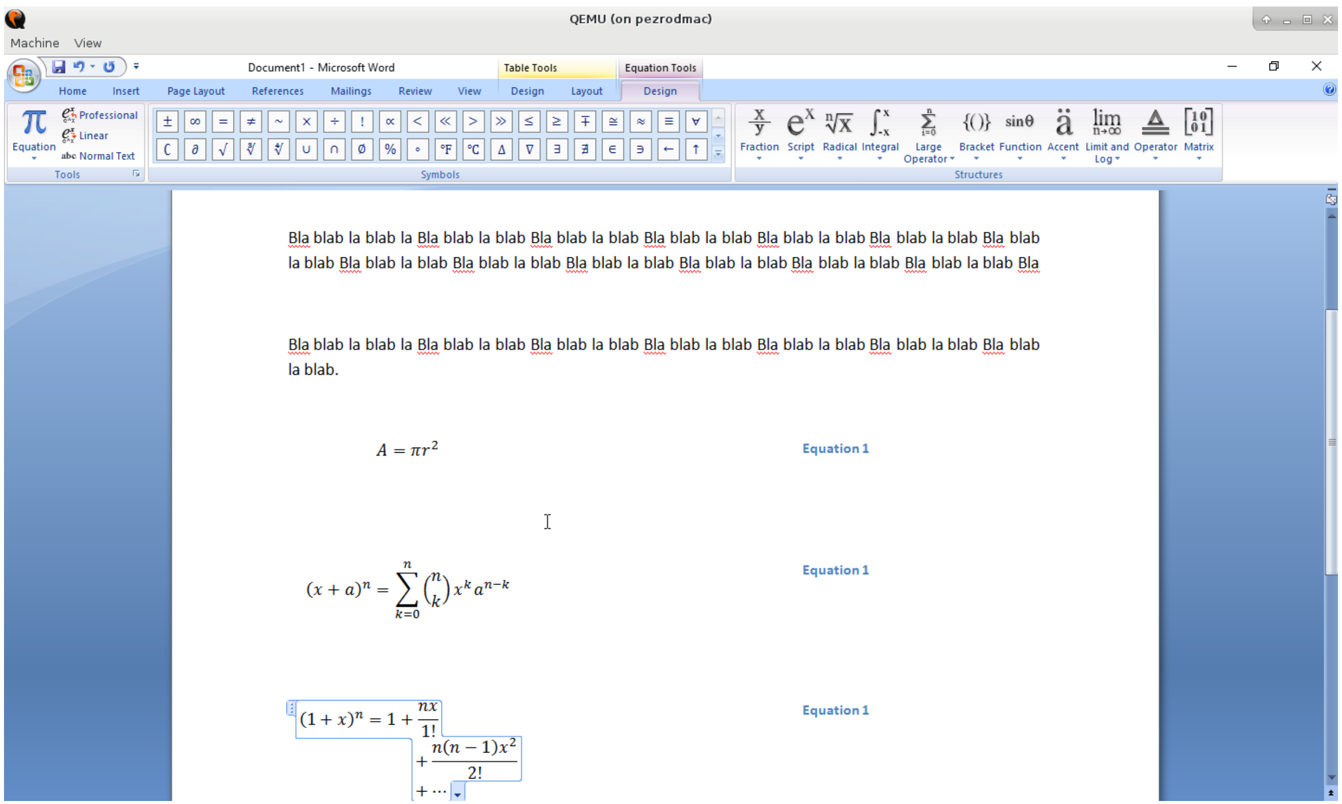
Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab.

$$A = \pi r^2$$ Equation 1

Using **copy and paste**, copy the table a few times and change the formula.

- So it looks like this
- The equation numbers update.
- Don’t worry.



Renumbering the equation numbers automatically

- Now press ctrl+A, then F9

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab.

$$A = \pi r^2 \quad \text{Equation 1}$$

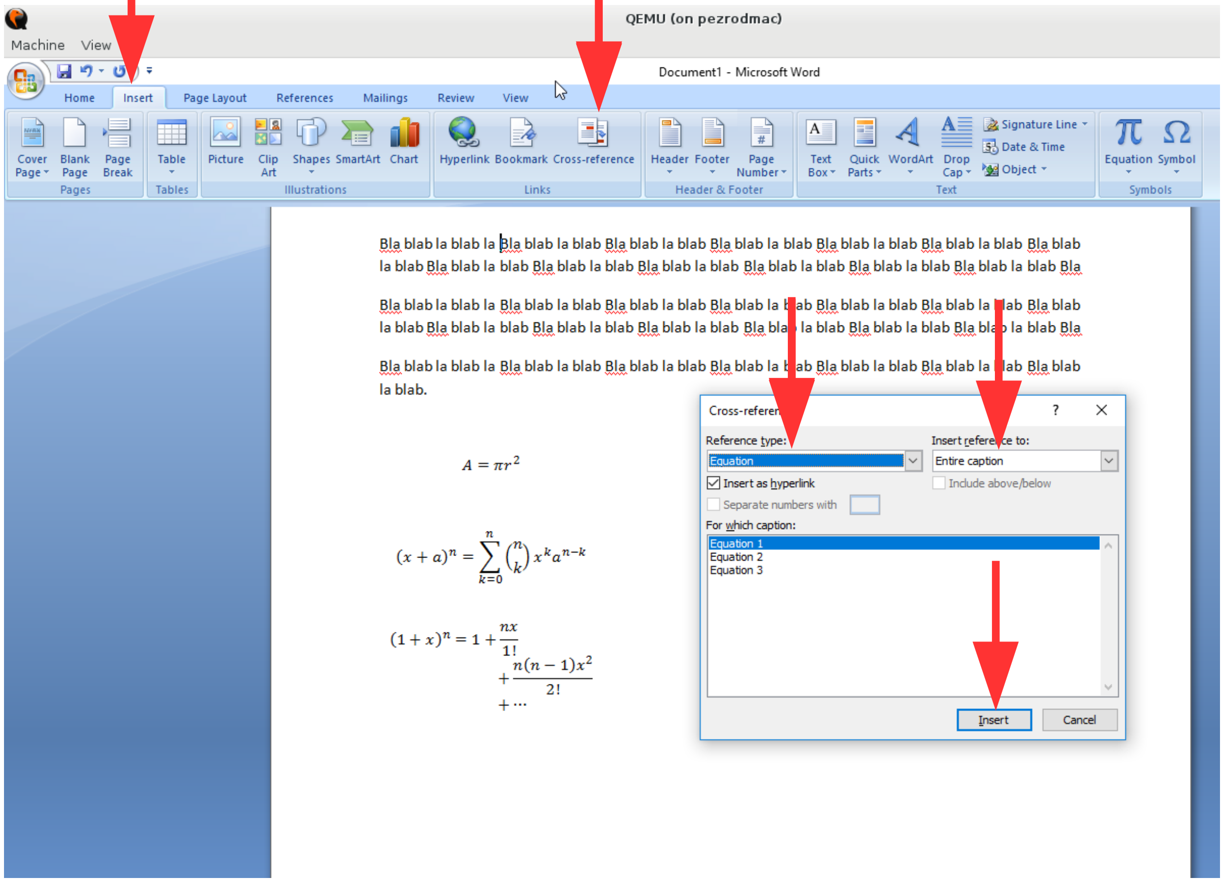
$$(x+a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k} \quad \text{Equation 2}$$

$$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots \quad \text{Equation 3}$$

- Now the equations in the document will automatically.

Referencing the equations

- Click somewhere in your text.
- Click, Insert→Cross reference
- Then insert Equation 1



Make your document look like this.

Bla blab la blab la **Equation 1** Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab **Equation 2** Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab **Equation 3** la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab.

$$A = \pi r^2$$ Equation 1

$$(x+a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k}$$ Equation 2

$$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots$$ Equation 3

Now for the clever bit...

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- Use ctrl+x and ctrl+v swap equation 1 and 2

Bla blab la blab la **Equation 1** Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab **Equation 2** Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab E**quation 3** la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab.

$$A = \pi r^2$$ Equation 1

$$(x+a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k}$$ Equation 2

$$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots$$ Equation 3

- The equation numbers will not update but…..

Press Ctrl+A, then F9, to update the equations.

Bla blab la blab la **Equation 2** Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab **Equation 1** Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla

Bla blab la blab la Bla blab la blab Bla blab Equation **3** la blab Bla blab la blab Bla blab la blab Bla blab la blab Bla blab la blab.

$$(x+a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k}$$ Equation 1

$$A = \pi r^2$$ Equation 2

$$(1+x)^n = 1 + \frac{nx}{1!} + \frac{n(n-1)x^2}{2!} + \cdots$$ Equation 3

- I suggest you use this approach for all your equations you use.

Lecture outline

- Hello!, about me
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  - Examples of good and bad documents.
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  - MS Word v.s. Libre/OpenOffice
  - Document file types – and why you should care.
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  - Numbering equations automatically
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  - **The quick and dirty way.**
  - The correct way.
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- Document versioning.
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Using references in documents.

- If you are writing text that cites references for example:

INTRODUCTION

In recent years, organic solar cells have shown great promise as a future low-cost source of low carbon electricity.[1] The ability to manufacture organic modules using high volume techniques such as gravure printing[2] has attracted considerable attention from both academia and industry. Power conversion efficiencies of 7−8% have now been reported.[3] Despite this success, there is still considerable debate surrounding the fundamental physics of device operation, and there is still no reliable framework for simulation of the opto-electrical behavior. Key device models such as nongeminate recombination,[4−7] mobility,[8] and the exact nature of the density of states[9] (DoS) are still hotly debated.[10−12] Part of the problem in finding a correct physical model for organic photovoltaics (OPV) operation is that the current density applied voltage curve ($J-V$ curve) itself does not contain enough information to give insight into the physical transport or

REFERENCES

(1) Bredas, J.-L.; Durrant, J. R. *Acc. Chem. Res.* **2009**, *42*, 1689–1690. PMID: 19916562.

(2) Voigt, M. M.; Mackenzie, R. C.; Yau, C. P.; Atienzar, P.; Dane, J.; Keivanidis, P. E.; Bradley, D. D.; Nelson, J. *Sol. Energy Mater. Sol. Cells* **2011**, *95*, 731–734.

(3) Liang, Y.; Xu, Z.; Xia, J.; Tsai, S.-T.; Wu, Y.; Li, G.; Ray, C.; Yu, L. *Adv. Mater.* **2010**, *22*, 1521–4095.

(4) Hilczer, M.; Tachiya, M. *J. Phys. Chem. C* **2010**, *114*, 6808–6813.

(5) Shuttle, C. G.; O'Regan, B.; Ballantyne, A. M.; Nelson, J.; Bradley, D. D. C.; Durrant, J. R. *Phys. Rev. B* **2008**, *78*, 113201.

(6) Abarca, A.; Gómez-Sal, P.; Martín, A.; Mena, M.; Poblet, J. M.; Yélamos, C. *Inorg. Chem.* **2000**, *39*, 642–651.

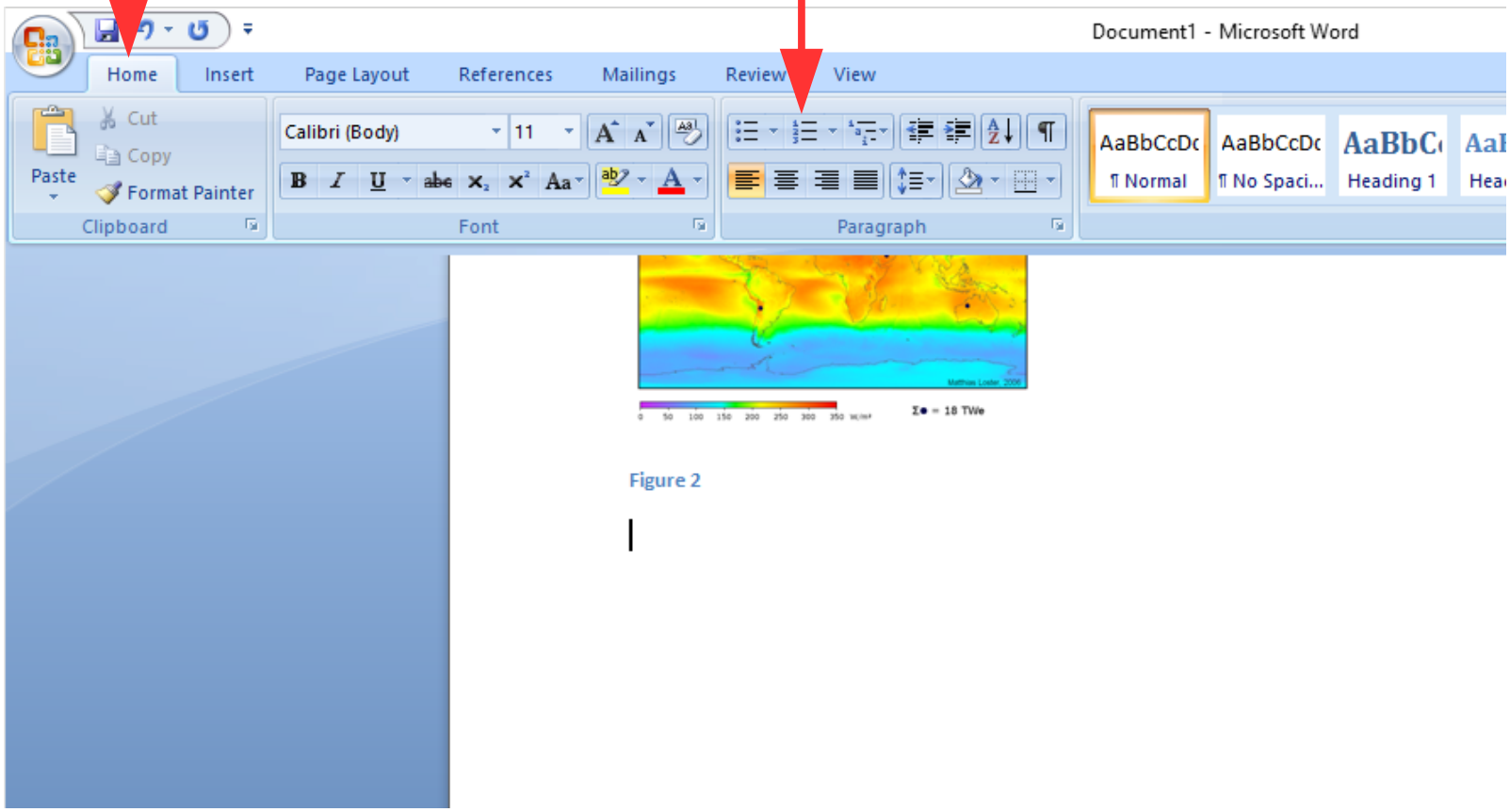
(7) Koster, L. J. A.; Mihailetchi, V. D.; Blom, P. W. M. *Appl. Phys. Lett.* **2006**, *88*, 052104.

(8) MacKenzie, R. C. I.; Frost, J. M.; Nelson, J. *J. Chem. Phys.* **2010**, *132*, 064904.

- One way to do this would be to type the references in by hand then.
- Take it from me this is a really bad idea, unless you have < 3 references.

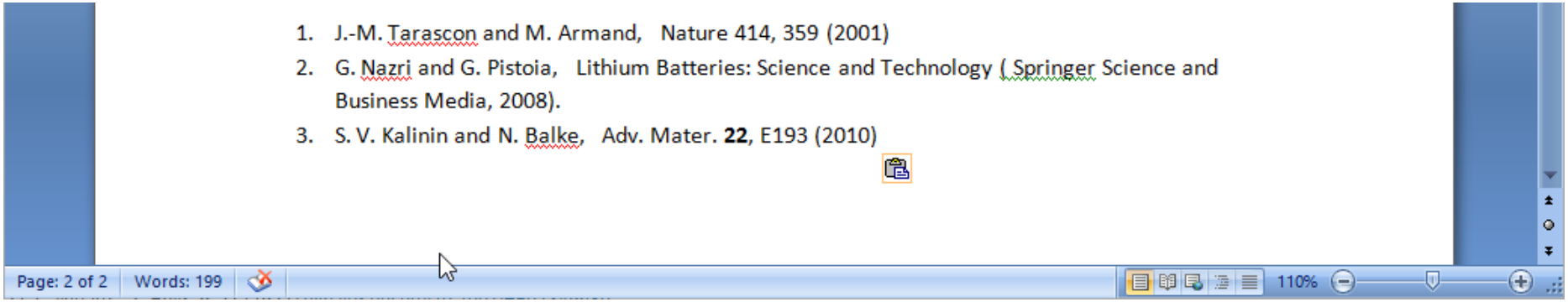
Doing referencing in MS Word (the dirty way)

- Go to the end of your document.
- Click on the home tab, then the numbering icon.



Doing referencing in MS Word

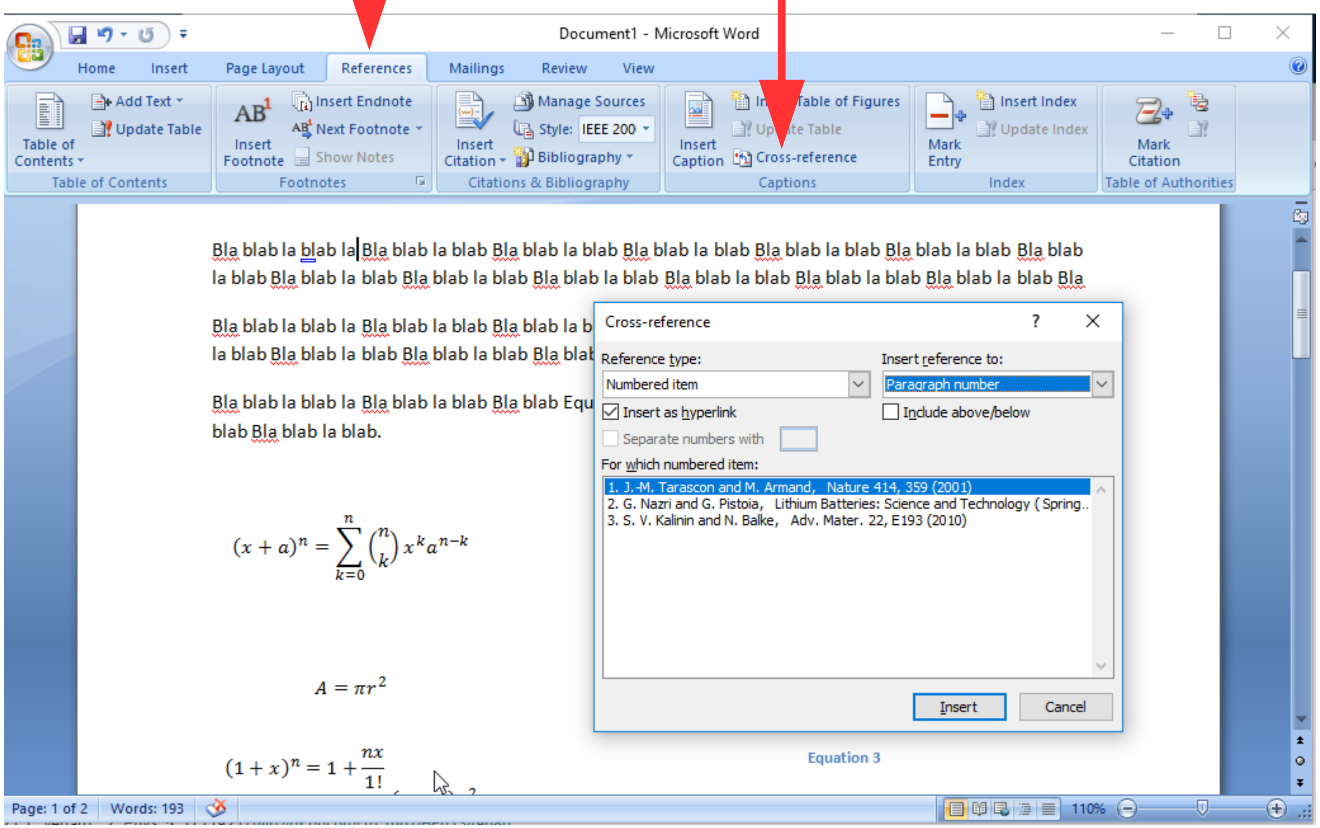
- And then type in the following three references.



- You can make up your own if you want.

Doing referencing in MS Word

- Now go to the top of your text, click references->cross-reference
- Select numbered item, and Paragraph number and then insert.
- If you need to add more references add just add them to your numbered list



- To update your reference list if for example you have reordered them
- Press: ctrl+A then F9

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- Track changes
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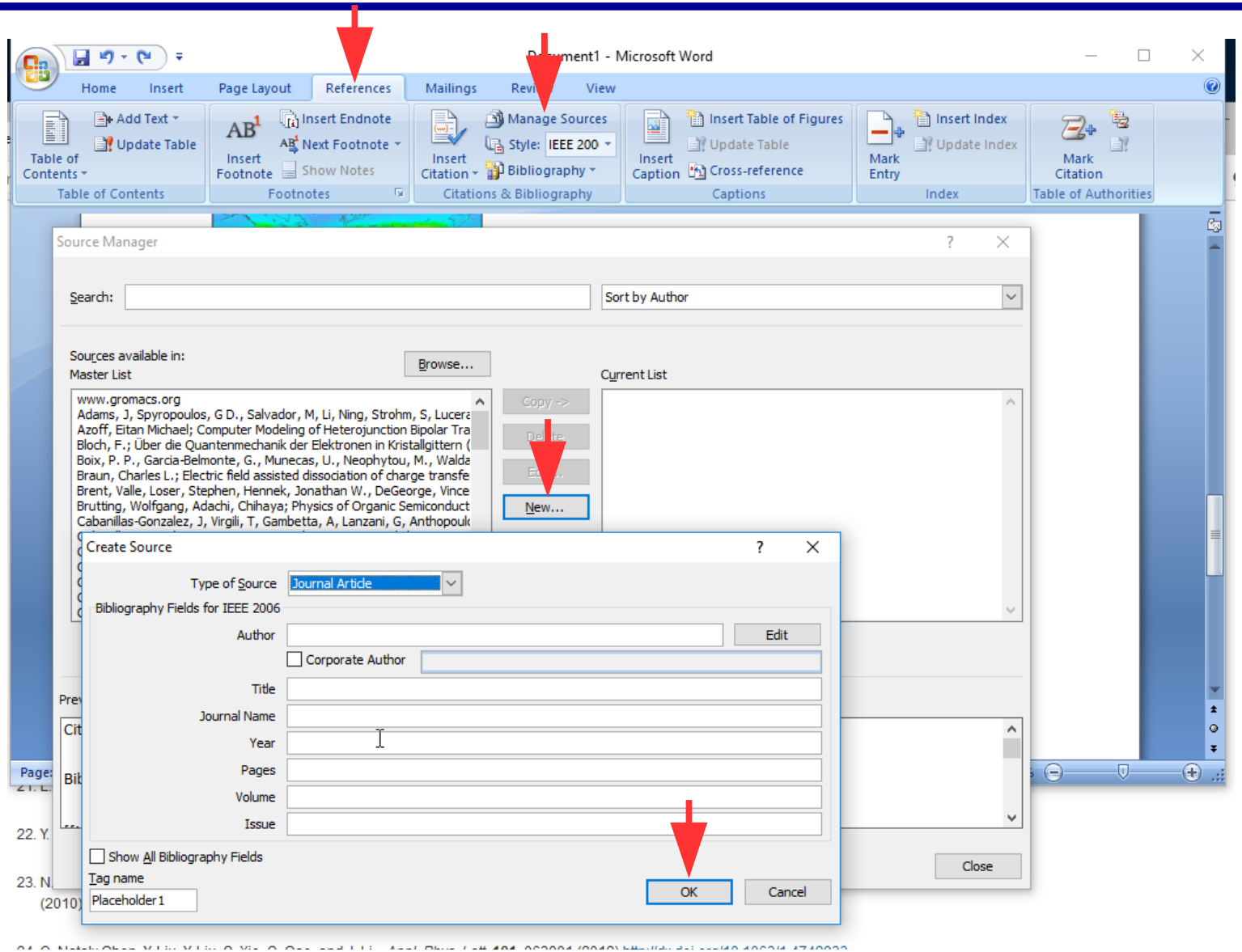
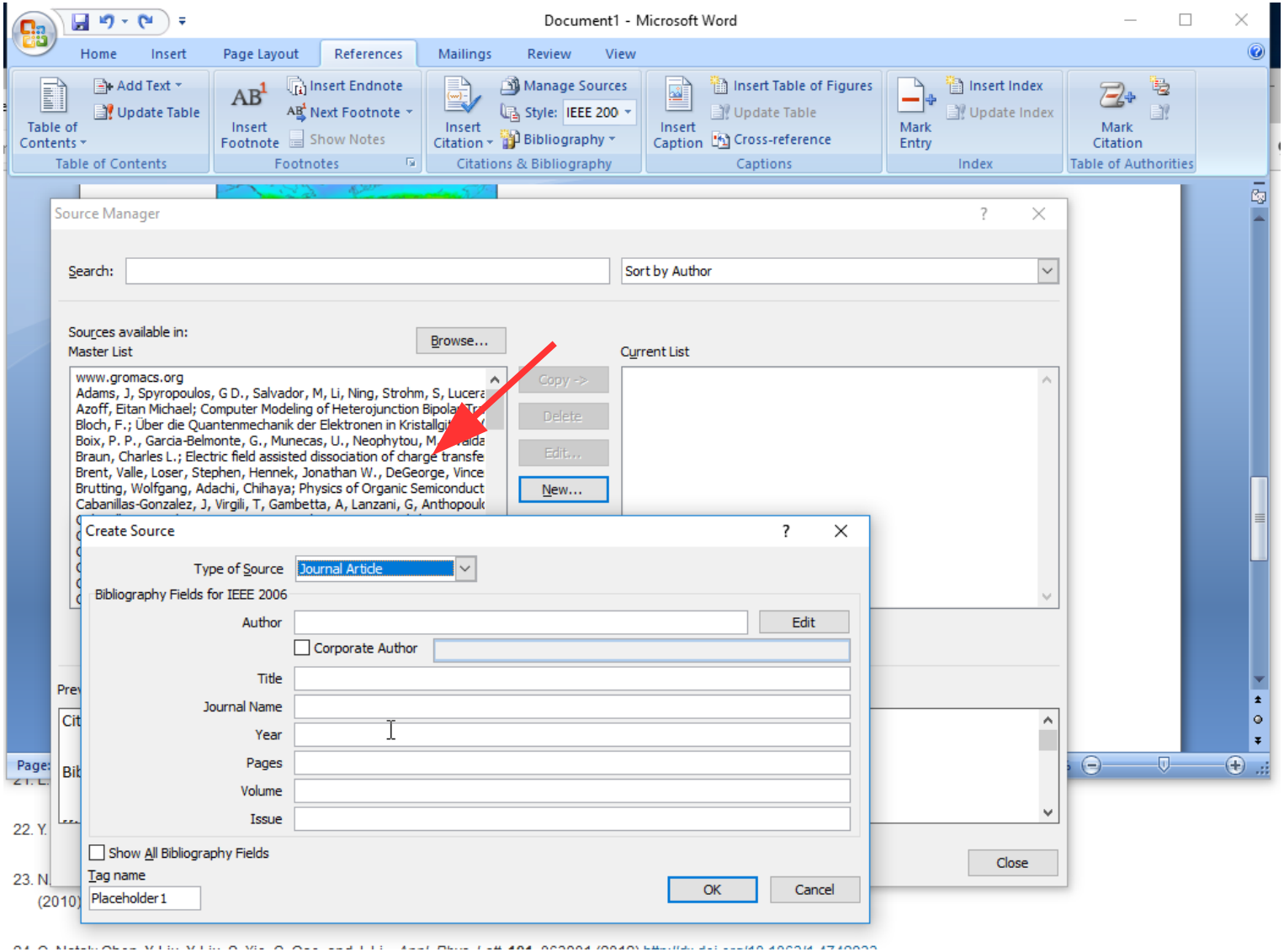
Doing referencing in MS Word the proper way.



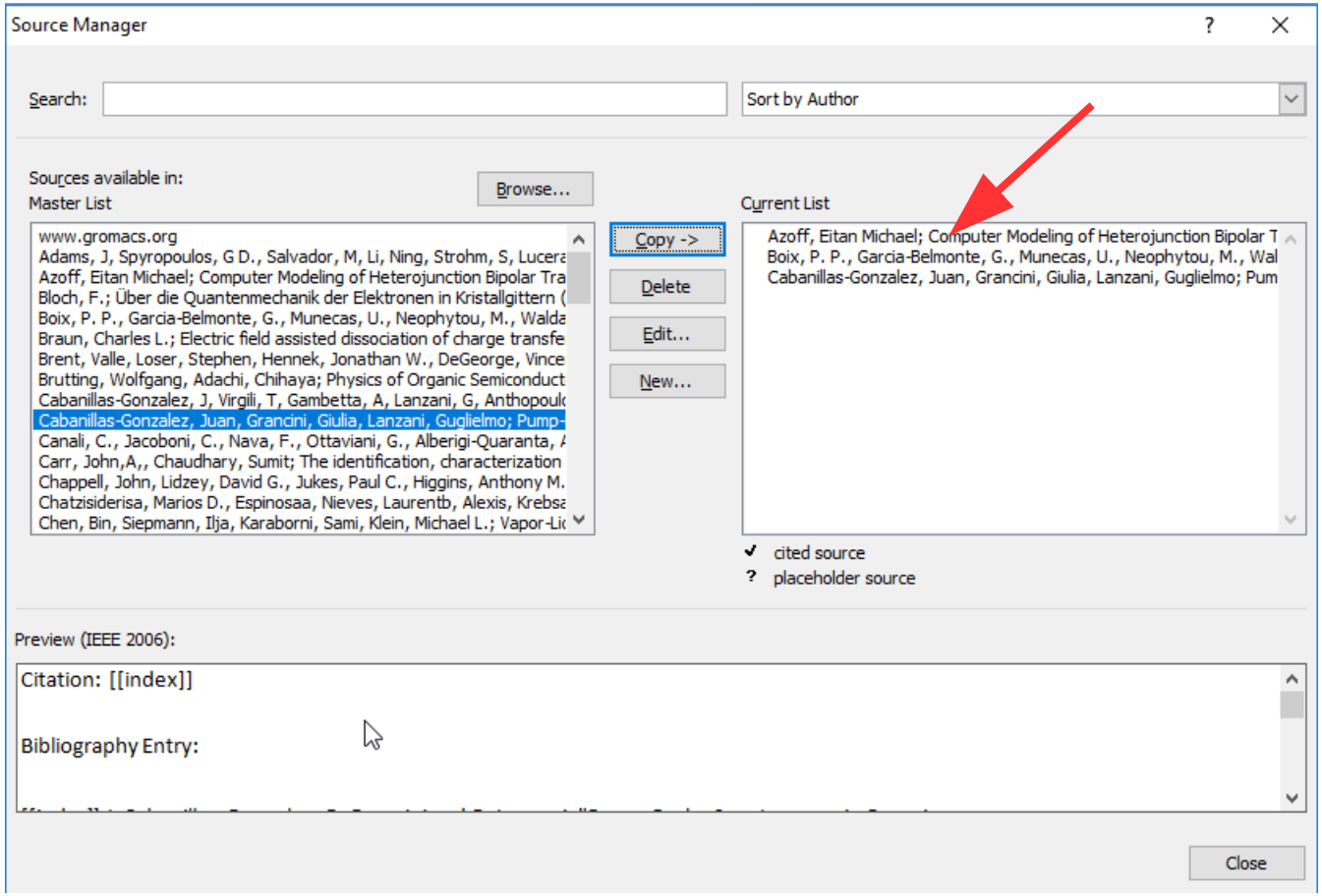
- Add two books or journal articles
- You can make them up.

Doing referencing in MS Word the proper way.



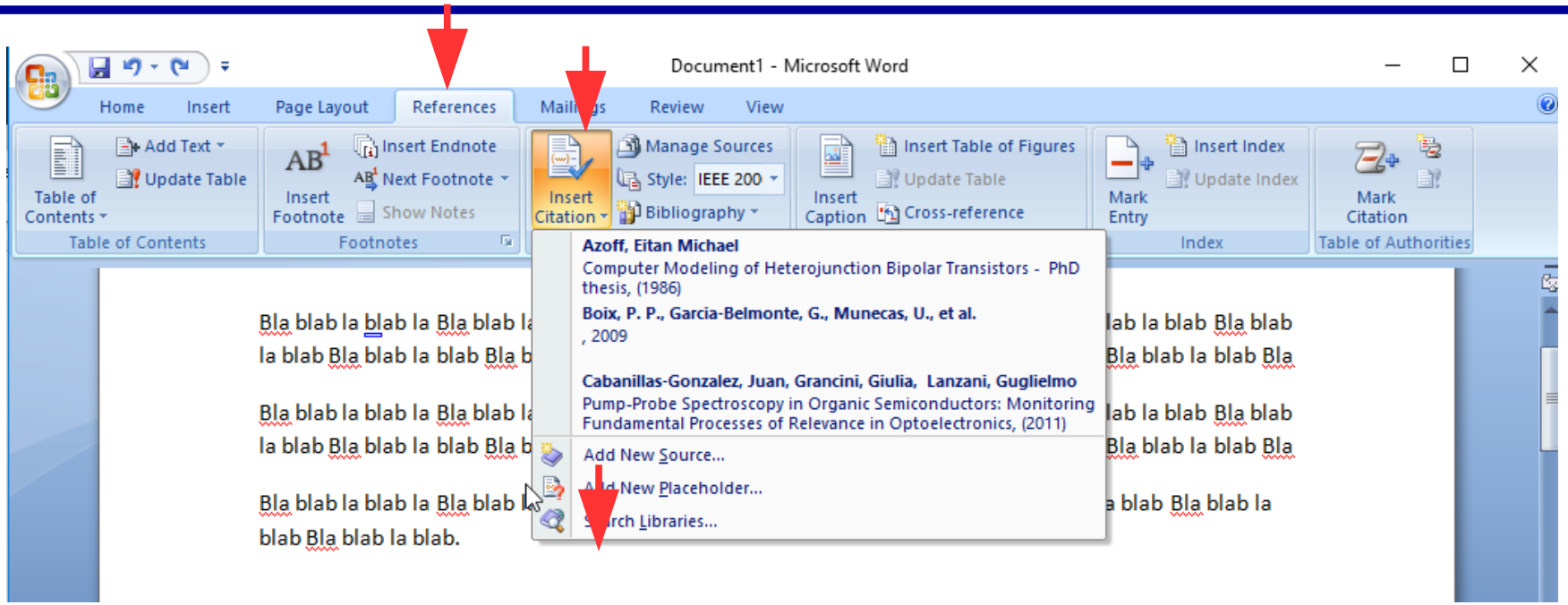
- They should appear in this list.

Doing referencing in MS Word the proper way.



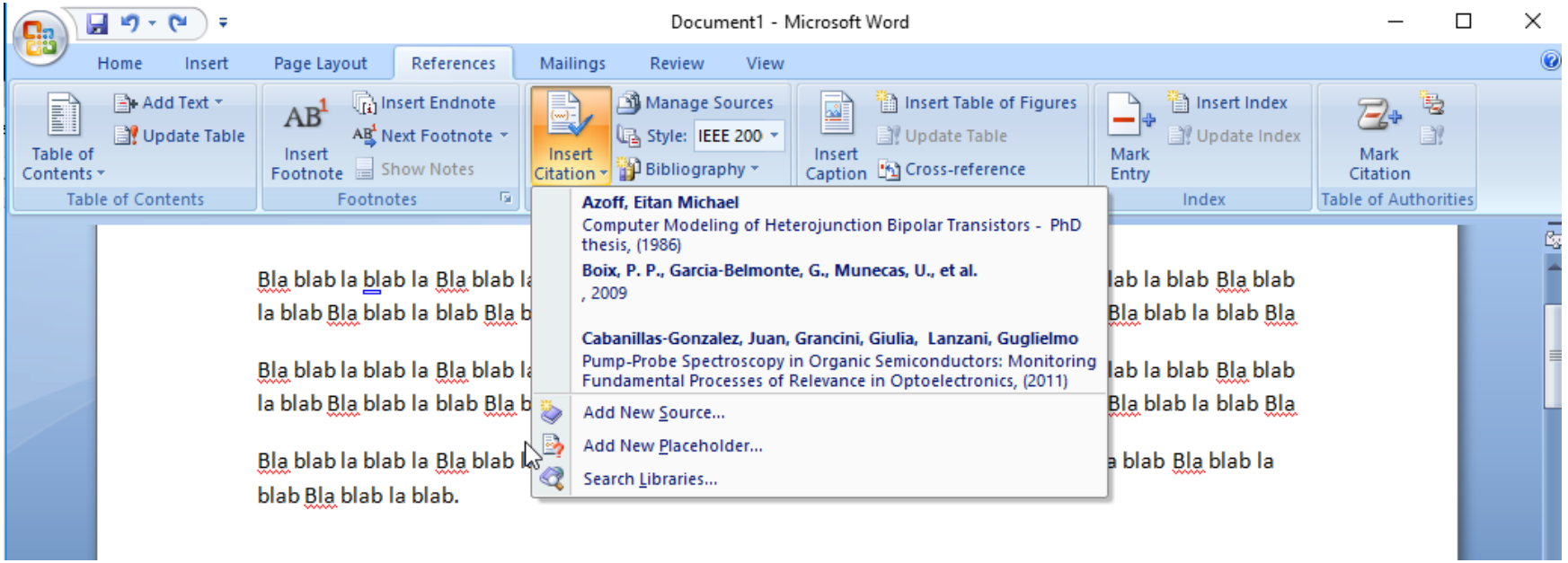
- Using the copy icon make sure they appear on the right hand side of the window.
- This may happen automatically in this version of word.

Doing referencing in MS Word the proper way.



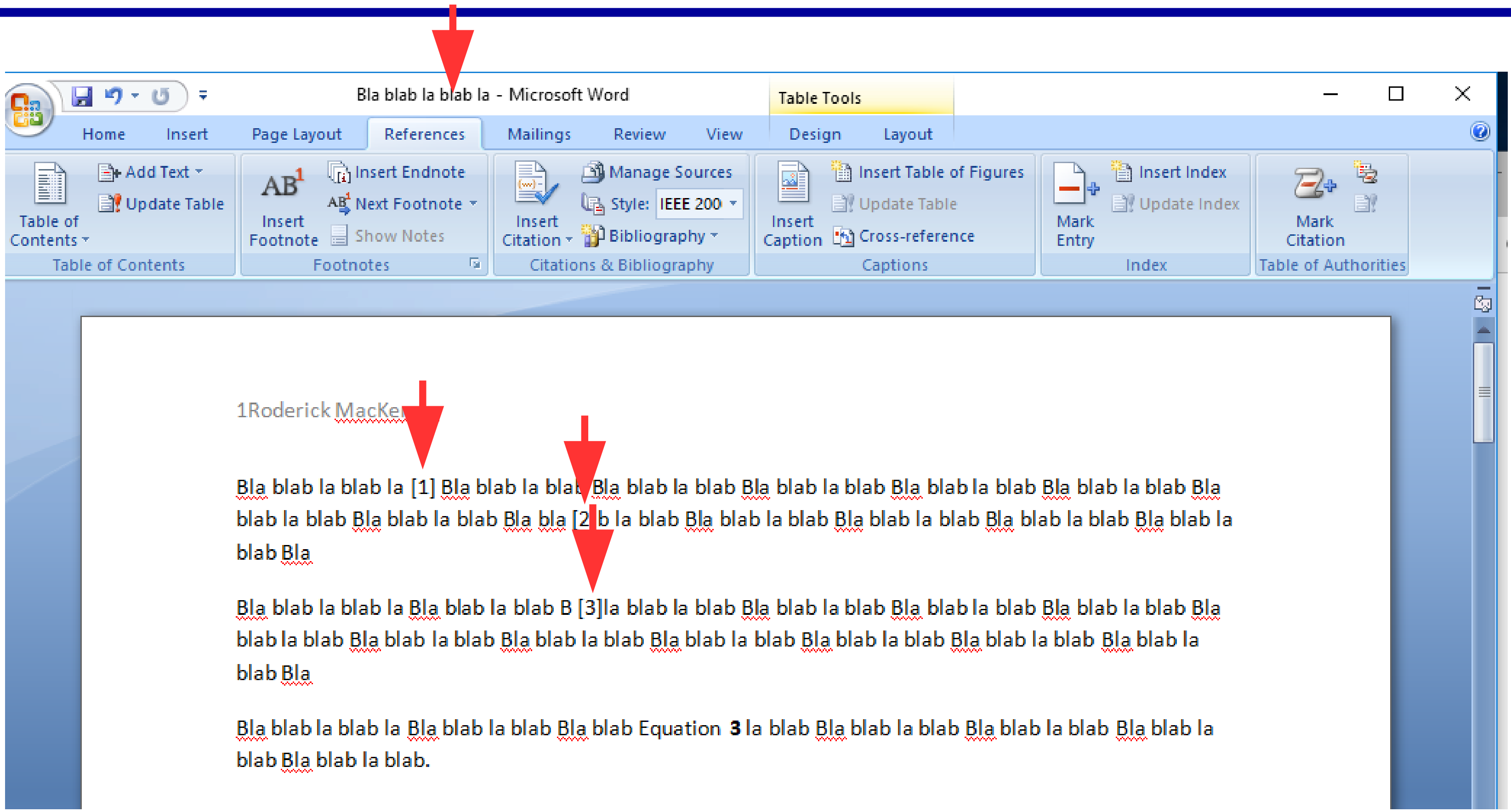
- Go to the top of your document again, find a place you would like to insert a reference.
- Then go to references → insert citation and select the reference you would like to insert.

Doing referencing in MS Word the proper way.



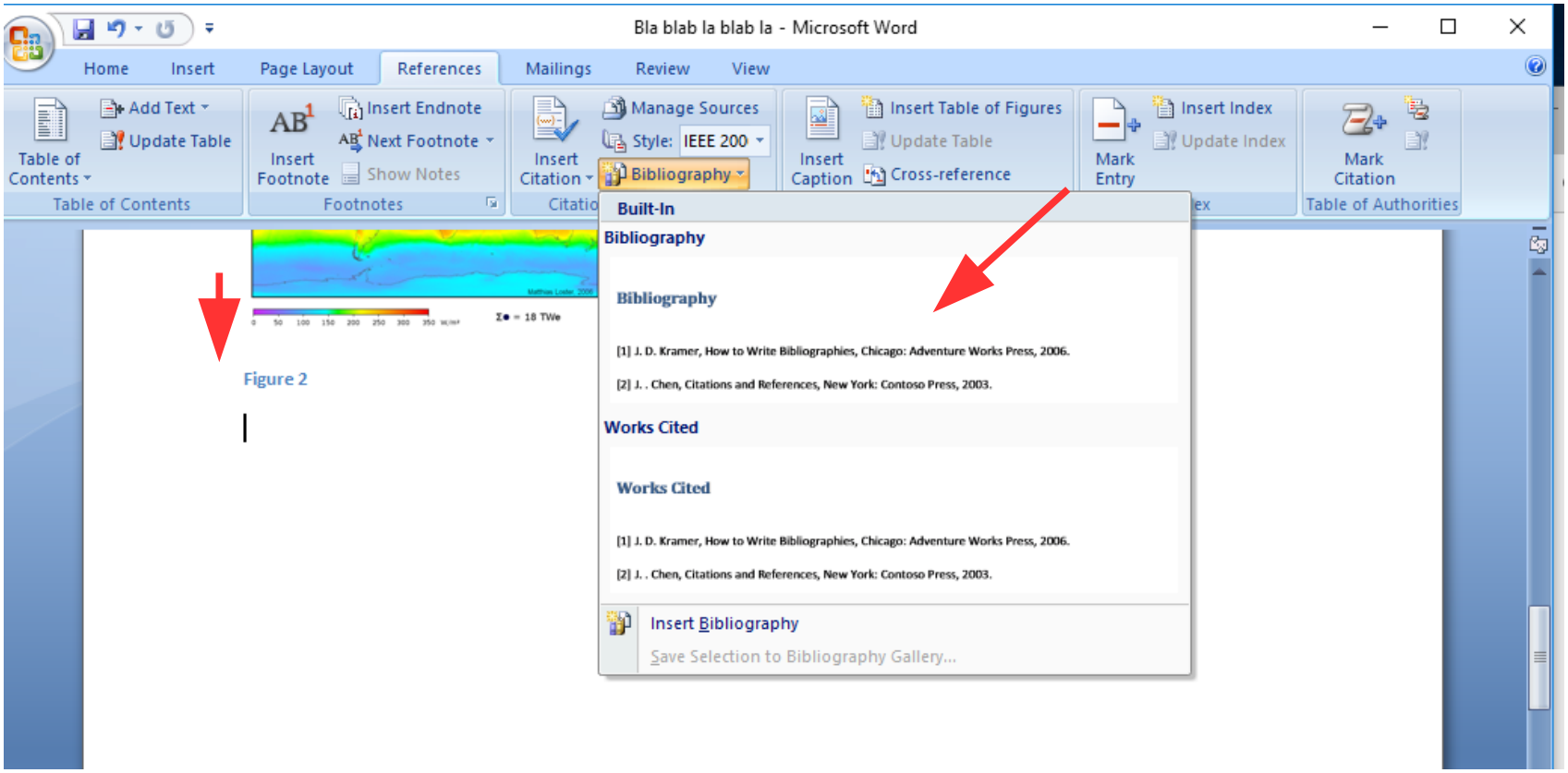
- Go to the top of your document again, find a place you would like to insert a reference.
- Then go to references → insert citation and select the reference you would like to insert.

Doing referencing in MS Word the proper way.



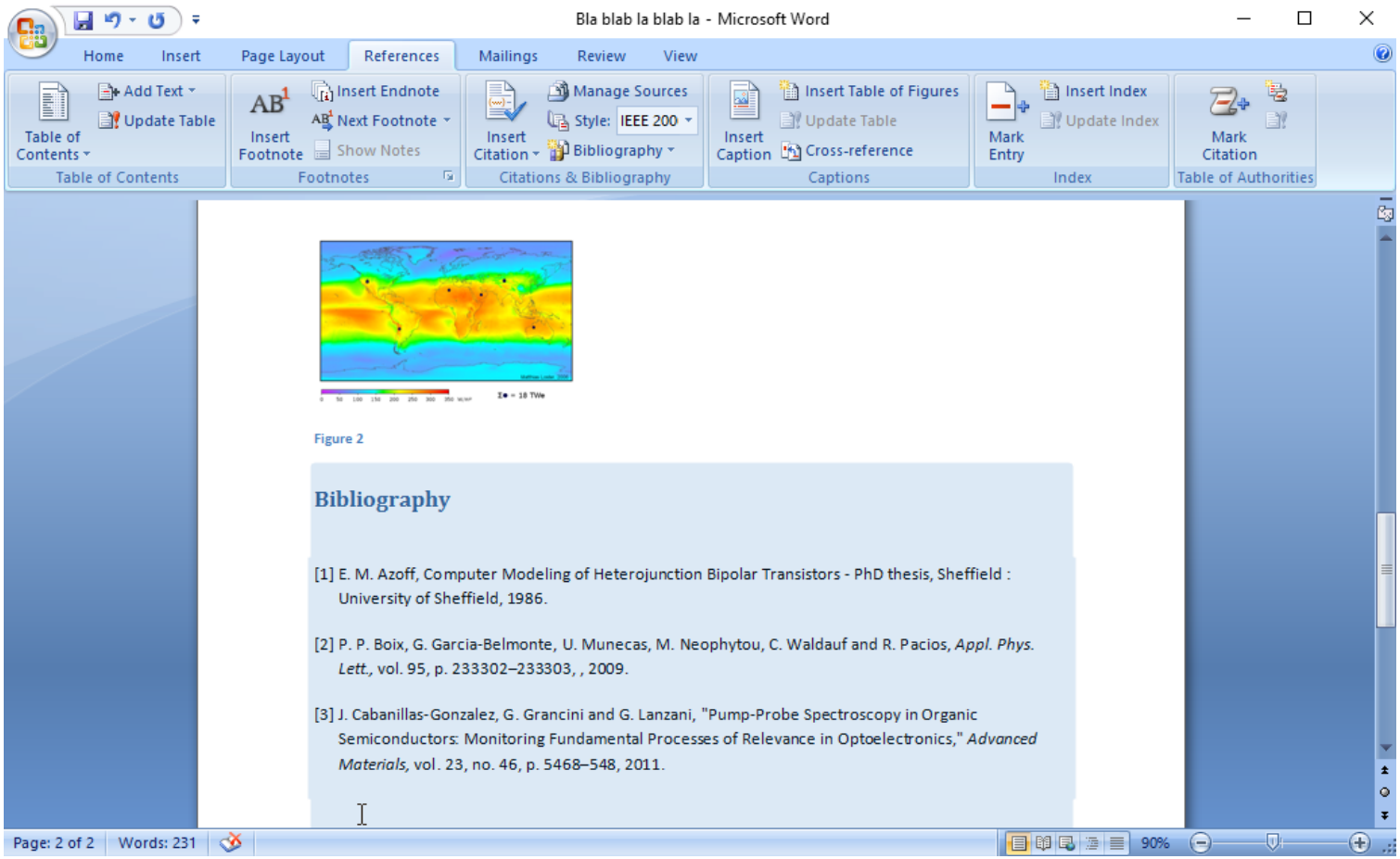
Doing referencing in MS Word the proper way.

- Now go to the end of your document.
- And click references→Bibliography and select a style.



Doing referencing in MS Word the proper way.

- And you should have a nicely formatted bibliography inserted.



Lecture outline

- Hello!, about me
  - Solar energy harvesting
- Why do I need a lecture on document presentation?
  - Examples of good and bad documents.
- Software for generating documents
  - MS Word v.s. Libre/OpenOffice
  - Document file types – and why you should care.
  - Zip files
- Equations and pixels
  - Using the equation editor
  - Numbering equations automatically
- Referencing in documents
  - The quick and dirty way.
  - The correct way.

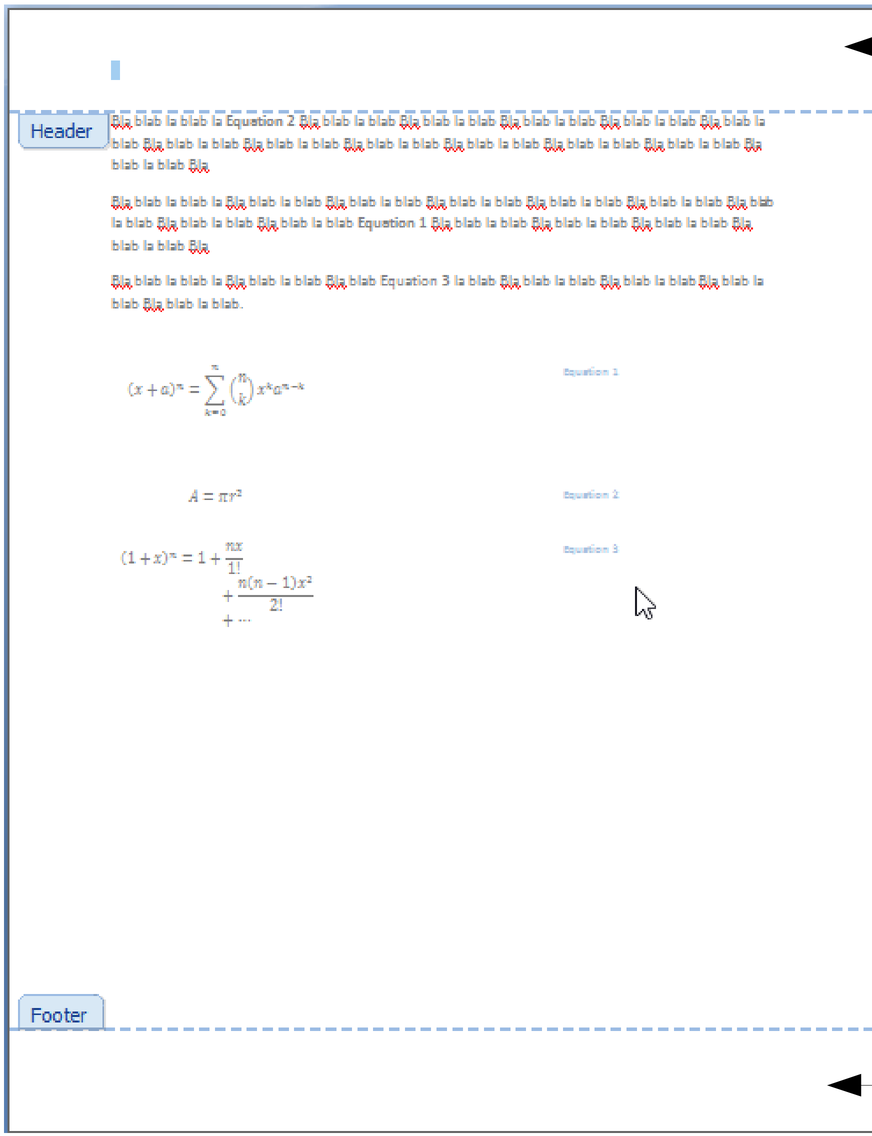
- **Headers and footers**
- Numbering images
- Aligning text
- Track changes
- Document comments.
- Document versioning.
- Document storage and backup.

Headers and footers

- Headers and footers sit at the top and bottom of a document. They typically contain your name, and a page number.

- Think about applying for a job and someone drops the whole pile of CVs on the floor. How will they match up the pages of your CV?

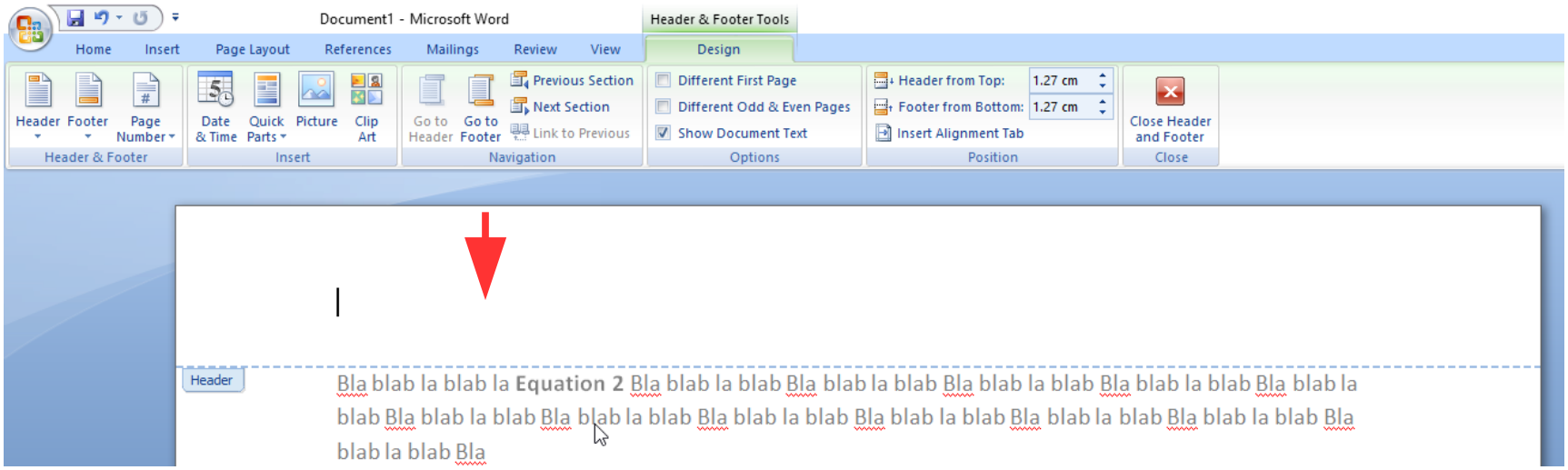
Adding headers and footers in MS Word



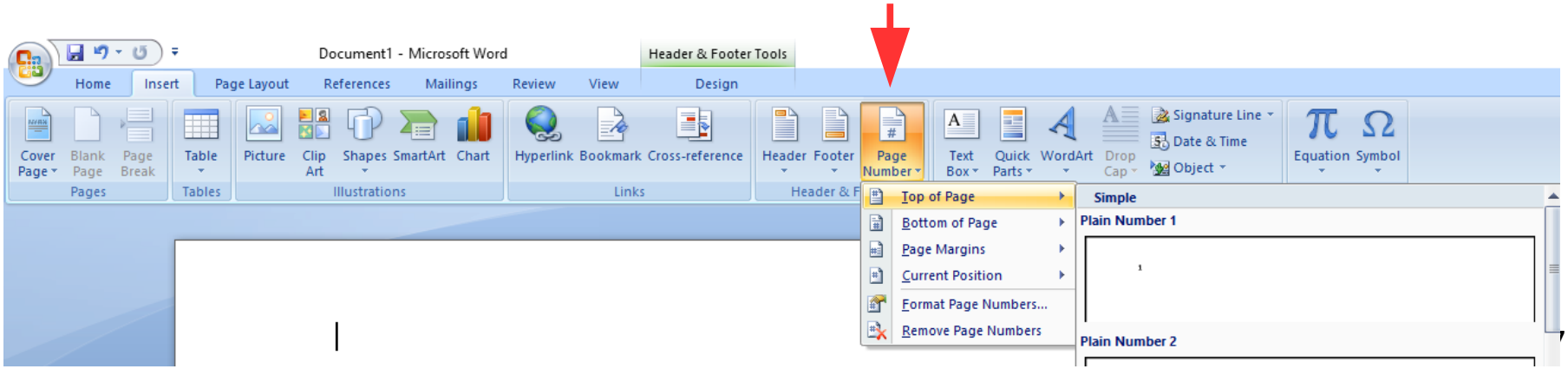
Header

Footer

Adding headers and footers in MS Word

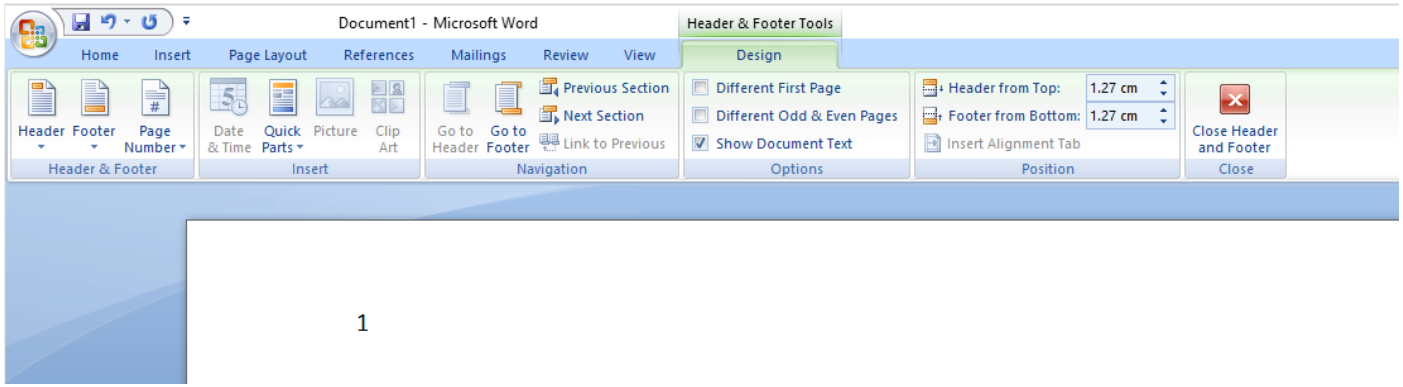


- Double click on the top of the document.
- Then go to the insert tab, and select plain number



Adding headers and footers in MS Word

- And you will have a number at the top of your page.
- You can then type your name in this box.



- Then you can arrange the page number and your name to look nice.
- If you then make a new page the numbers will automatically update.

Lecture outline

- **Hello!, about me**
  - **Solar energy harvesting**
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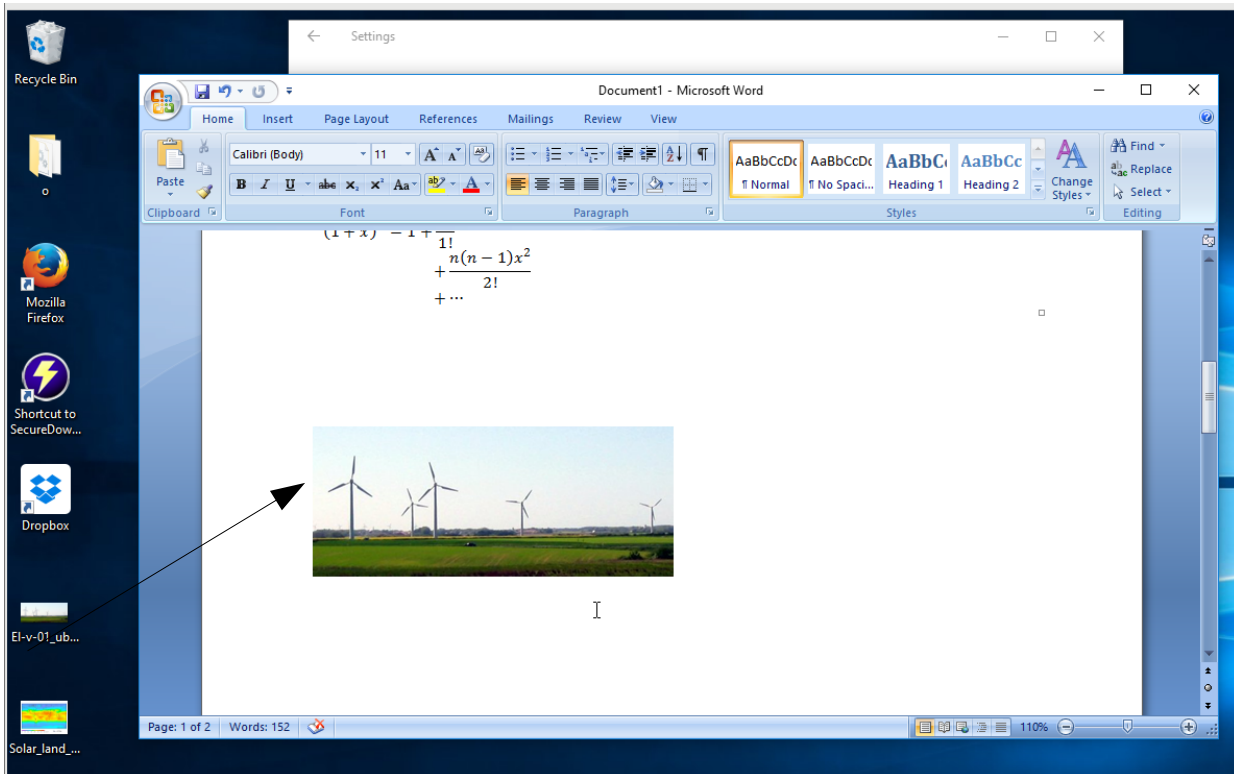
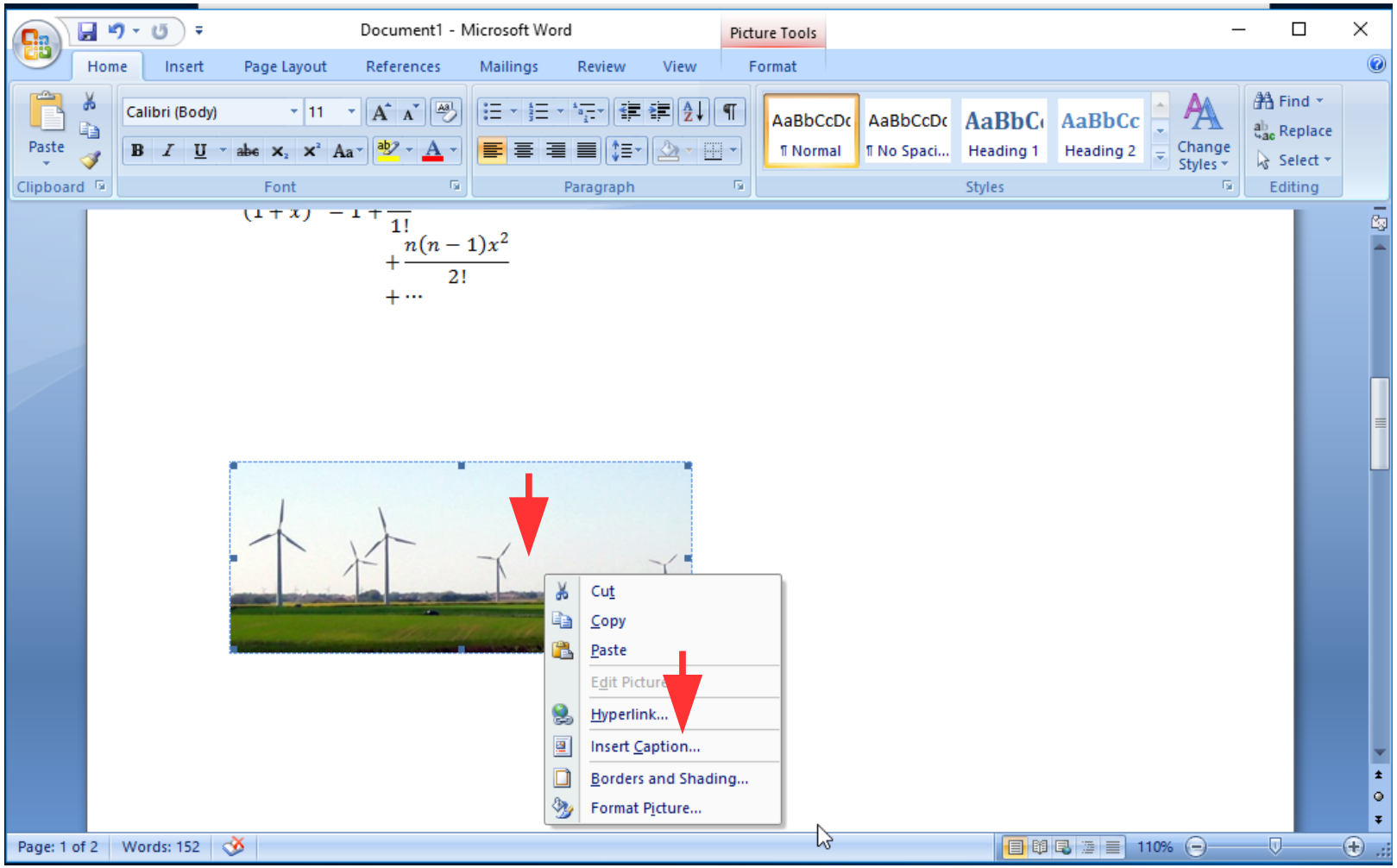
Firstly let's get some images from the web:

- Download two images and save them to your desktop.
- If you can't do this ask a demonstrator.
- Drag and drop these images into Word.



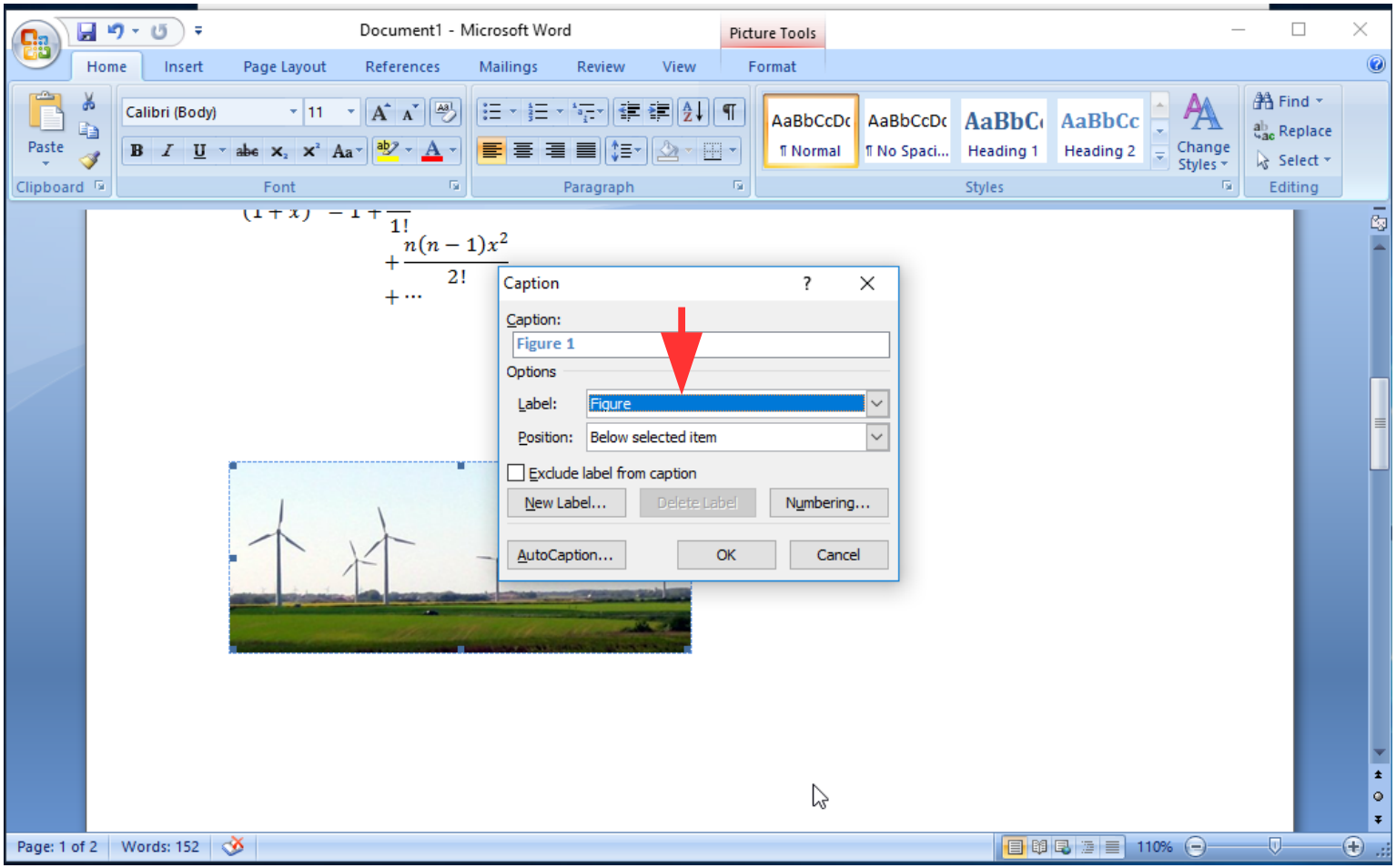
Adding images to a document

- Right click on the image on the image and click **Insert Caption**.



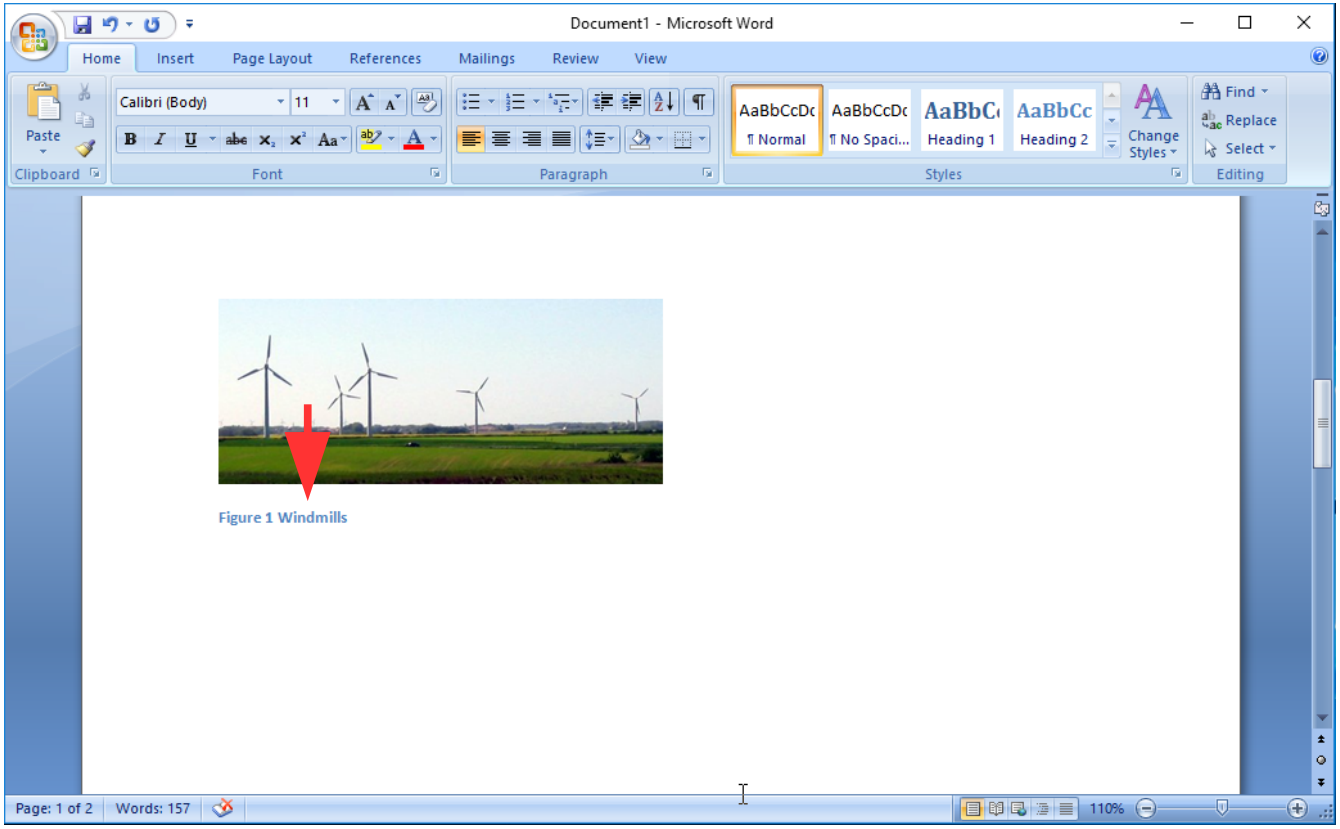
Adding images to a document

- Select figure, then click OK.
- Do this to the second image.



Adding images to a document

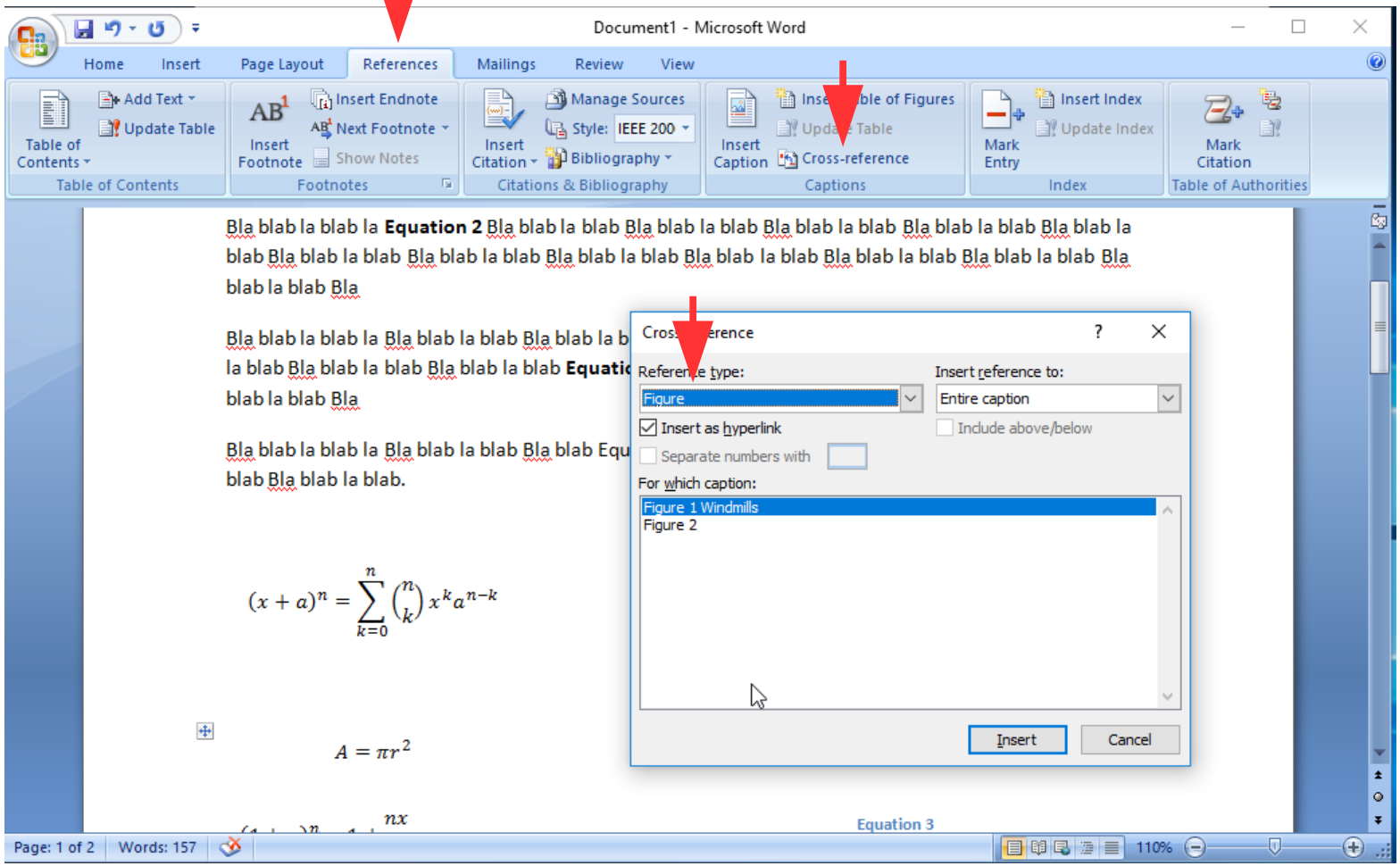
- Now add some text to the figure.



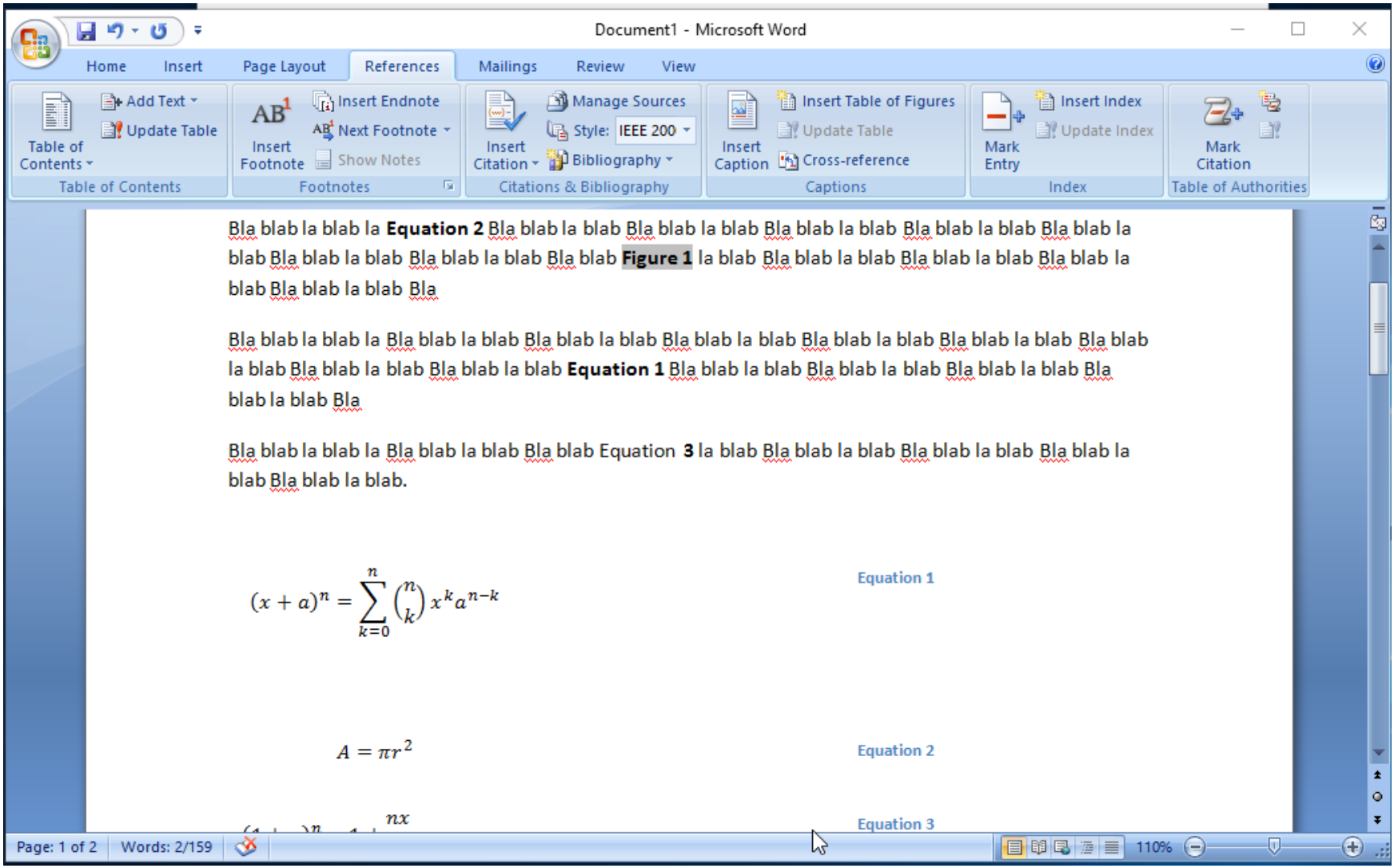
- Try to add enough text so the reader can understand the figure without having to read the whole test.

Adding images to a document

- Go back to the text and click references → Cross-reference, just as we did for the equation but this time insert a figure reference.
- Then click insert.

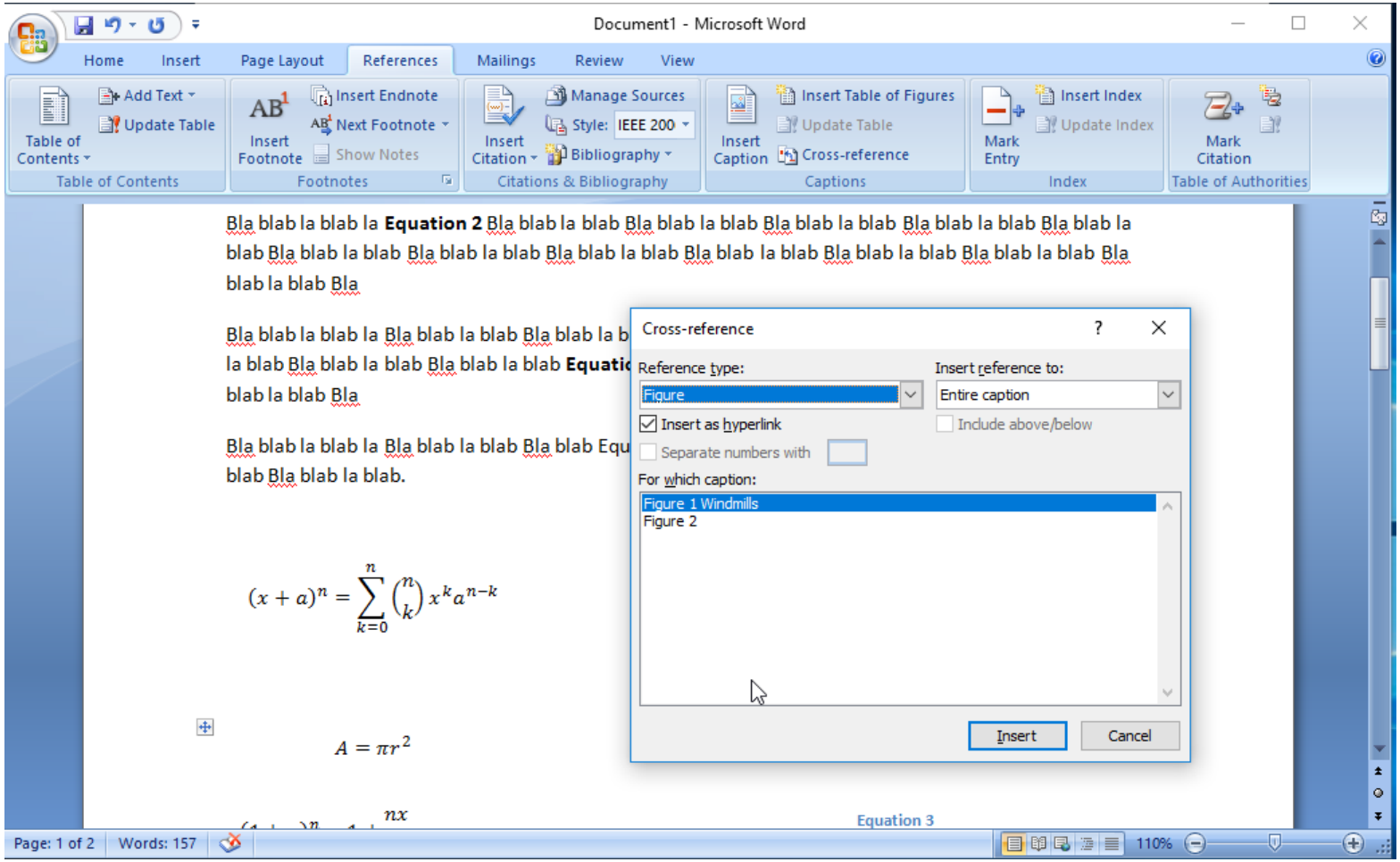


Adding images to a document



Adding images to a document.

- You can now automatically reference figures as well as equations.
- Remember, ctrl+A and then F9 to update all references in a document.



Lecture outline

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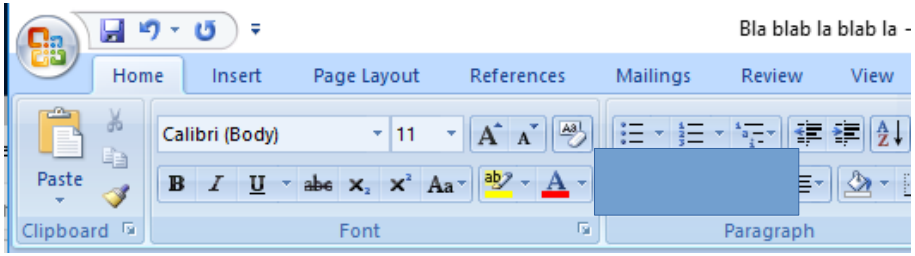
Aligning text



- Left align

A solar cell, or photovoltaic cell (in very early days also termed "solar battery"[1] – a denotation which nowadays has a totally different meaning, see here), is an electrical device that converts the energy of light directly into

- Justified ✓

A solar cell, or photovoltaic cell (in very early days also termed "solar battery"[1] – a denotation which nowadays has a totally different meaning, see here), is an electrical device that converts the energy of light directly into

- Center aligned

A solar cell, or photovoltaic cell (in very early days also termed "solar battery"[1] – a denotation which nowadays has a totally different meaning, see here), is an electrical device that converts the energy of light directly into

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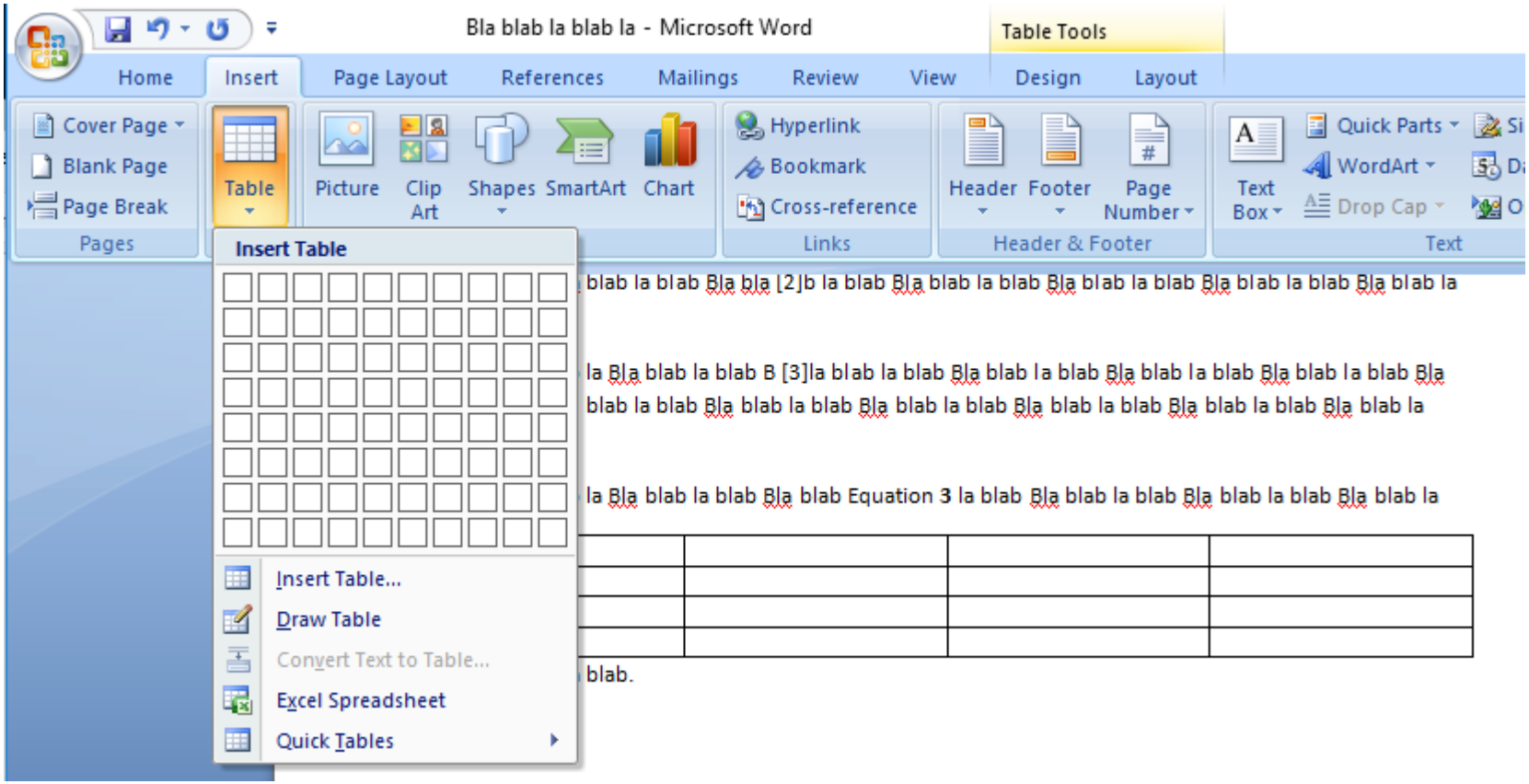
Tables

- We have covered tables already but just a few more words on them.
- They are generally used to store information.
- Be careful how you use them. They can get confusing very quickly.



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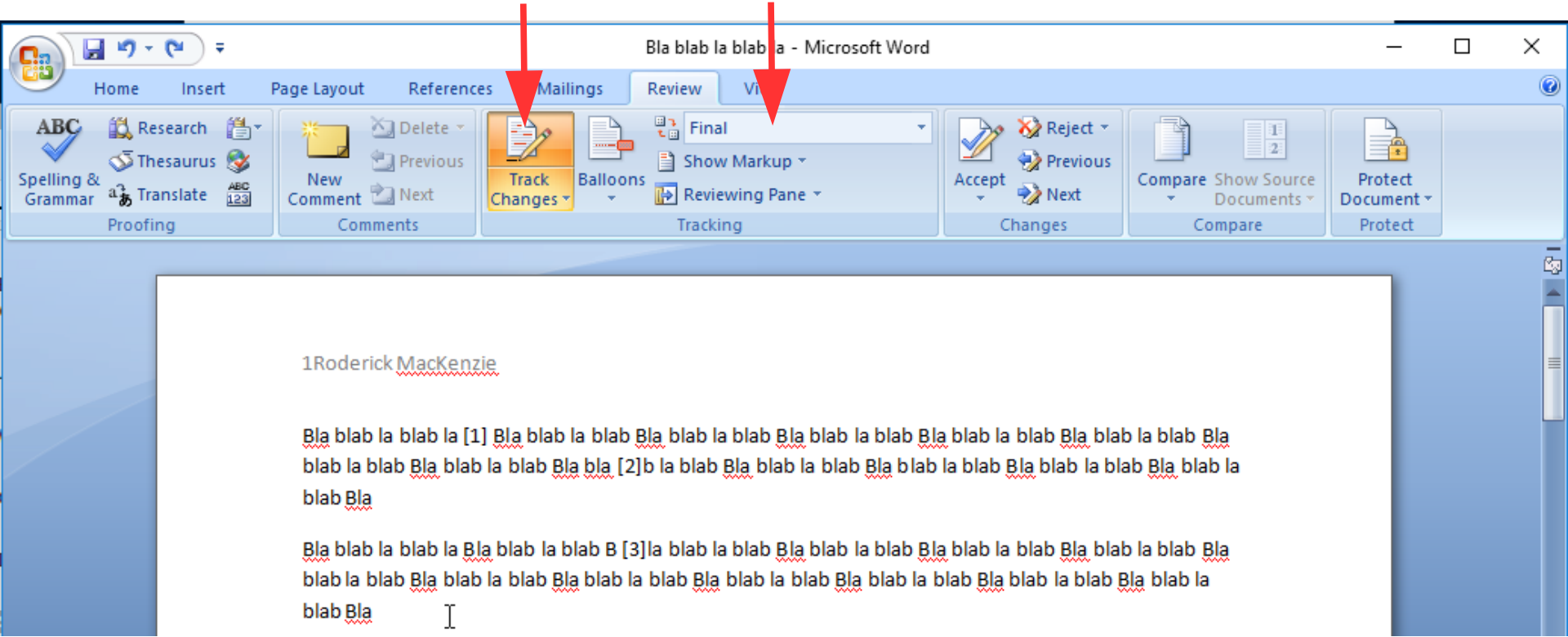
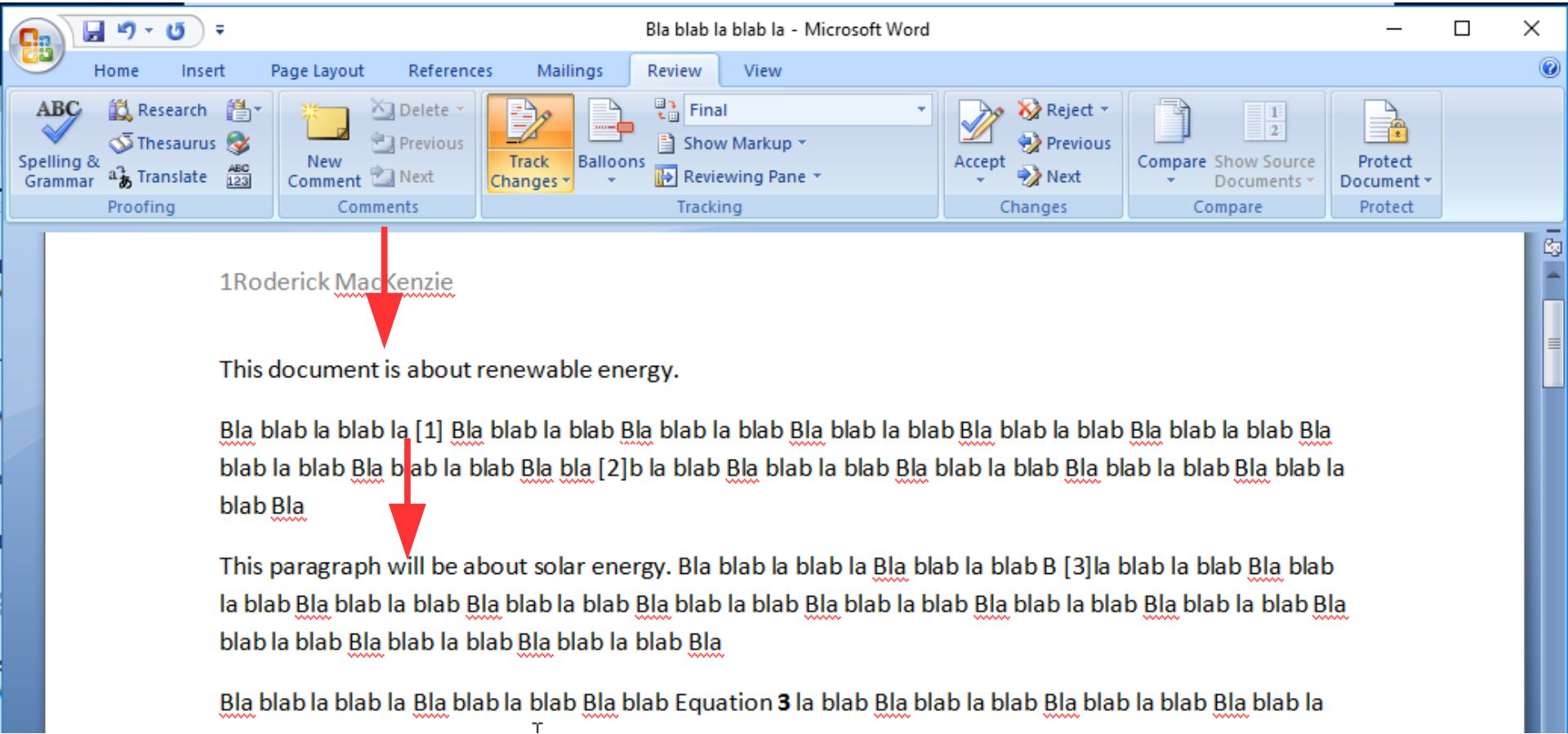
Track changes

- Go back to the top of your document and select Track changes
- Then set set the drop down dialog box to Final



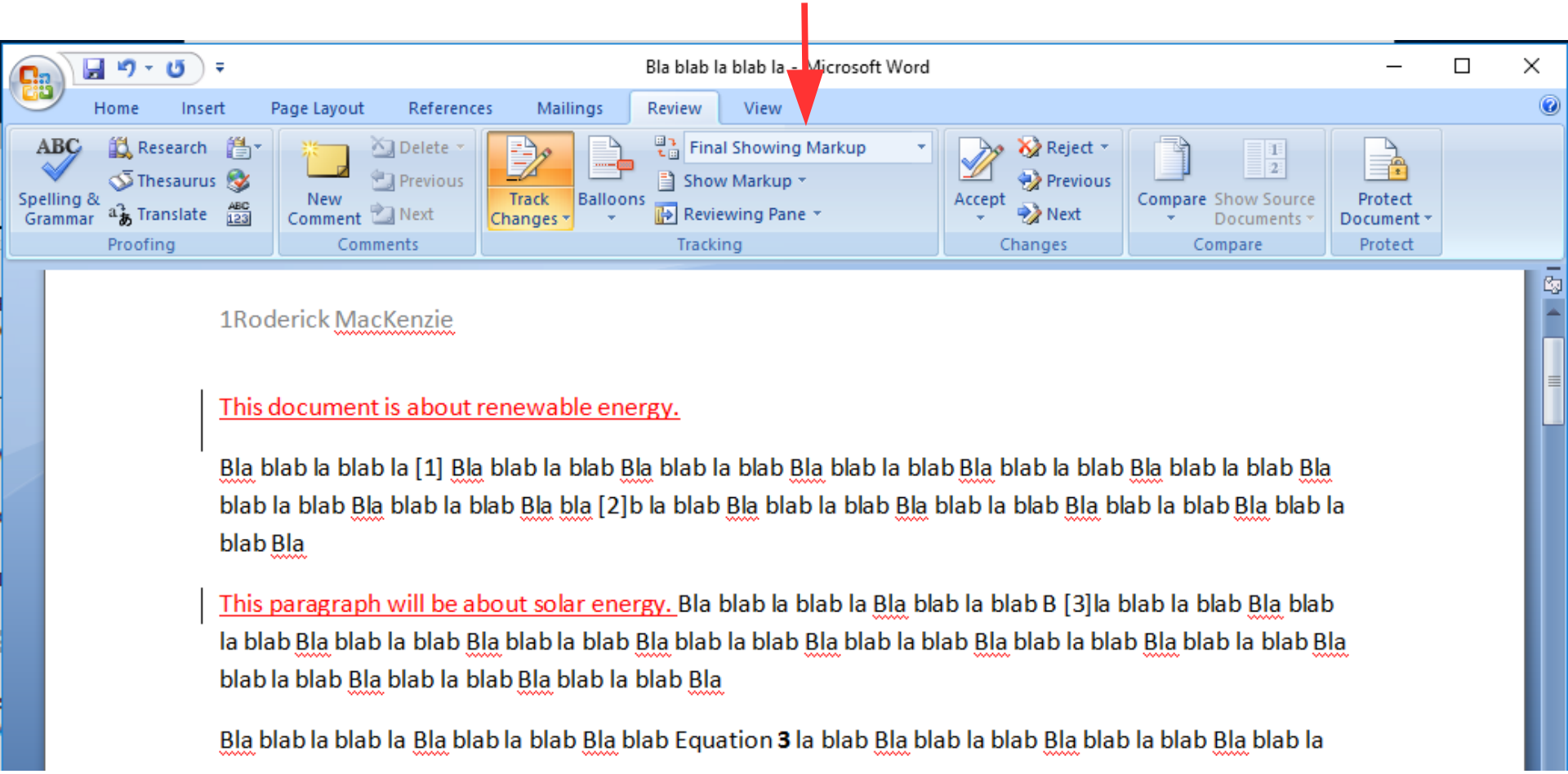
Track changes

- I made some changes.



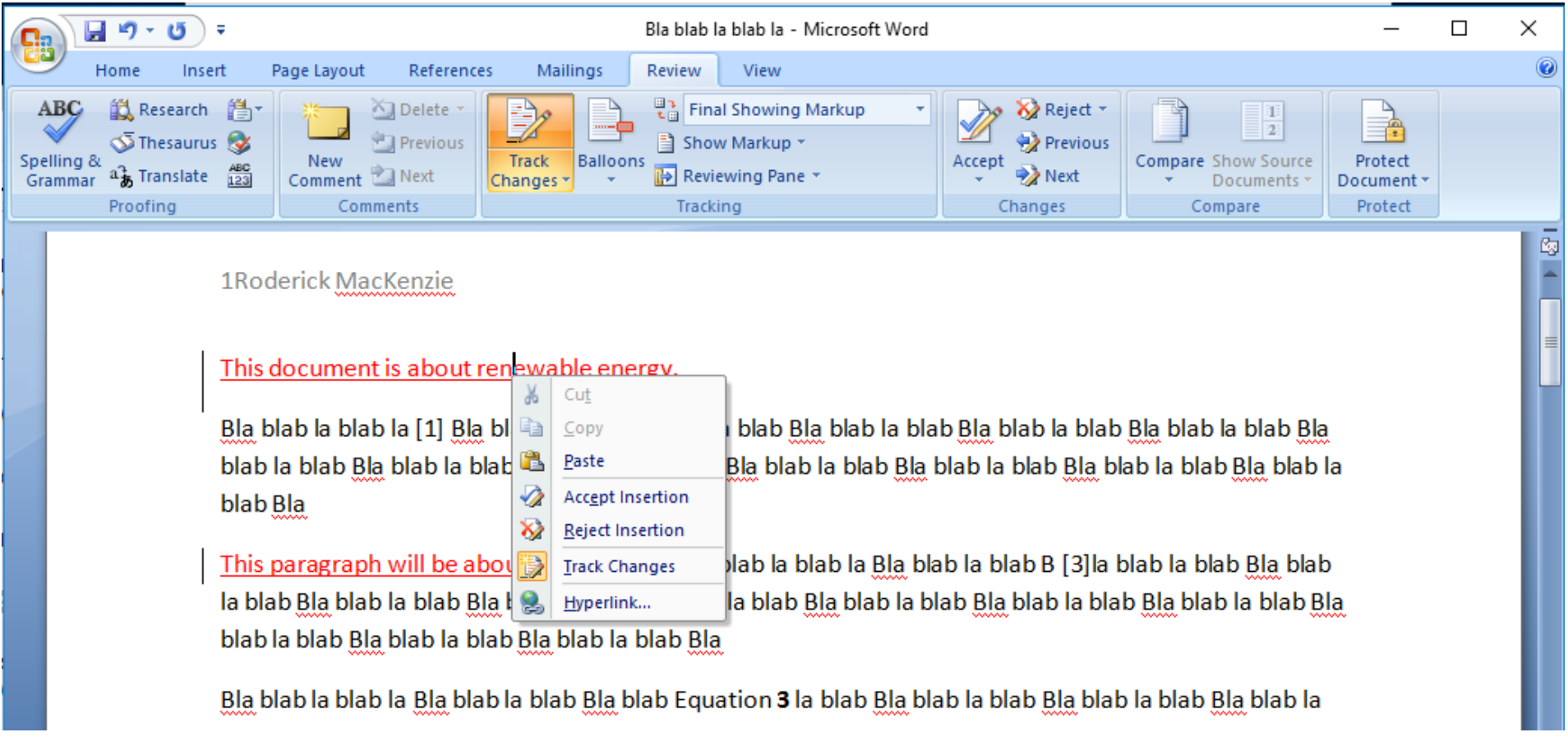
Track changes

- Now change this to final showing mark up
- You will be able to see your changes to the document.



Track changes

- By right clicking on the change you can accept or reject it.
- This is very useful when sending documents to a supervisor or when editing a document with multiple people.



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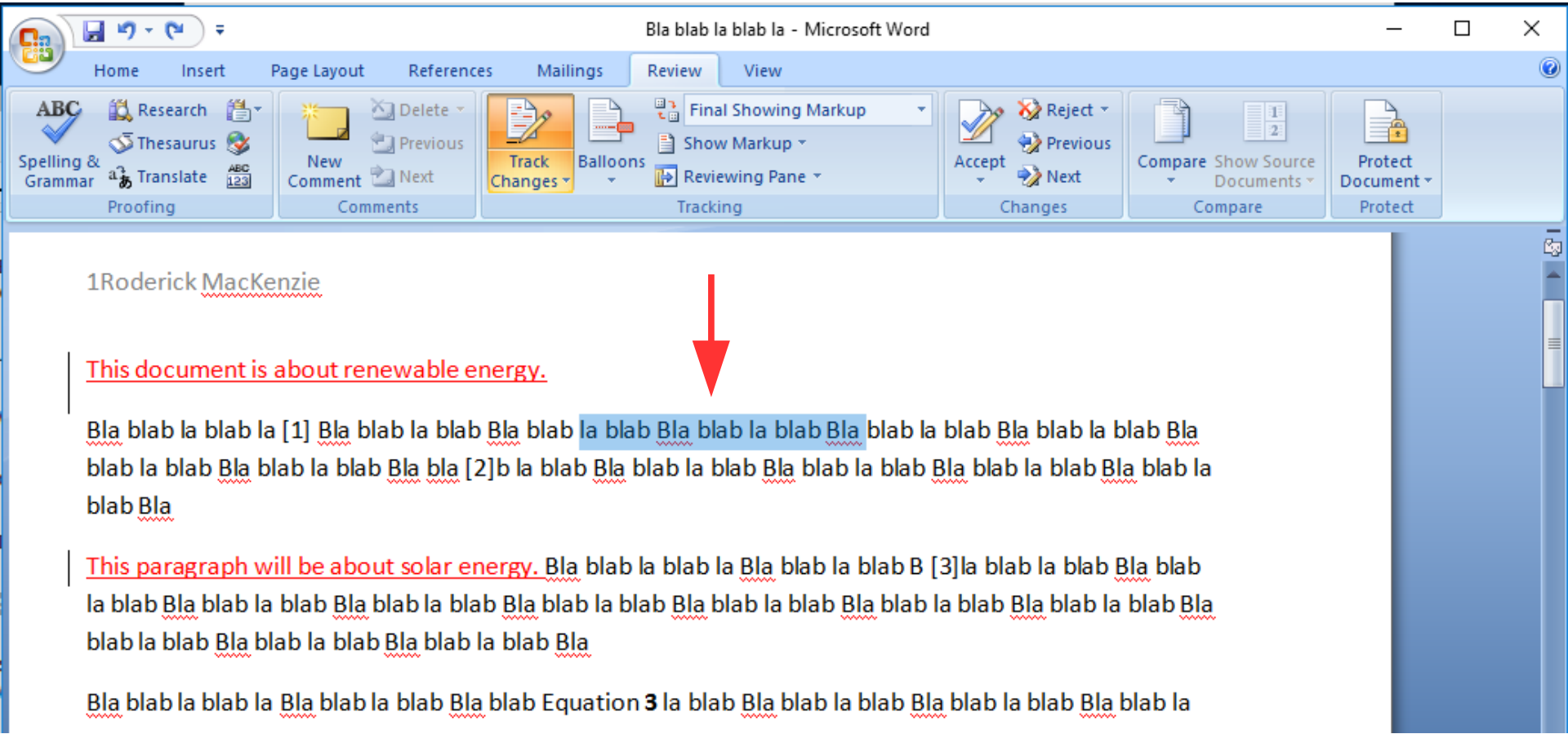
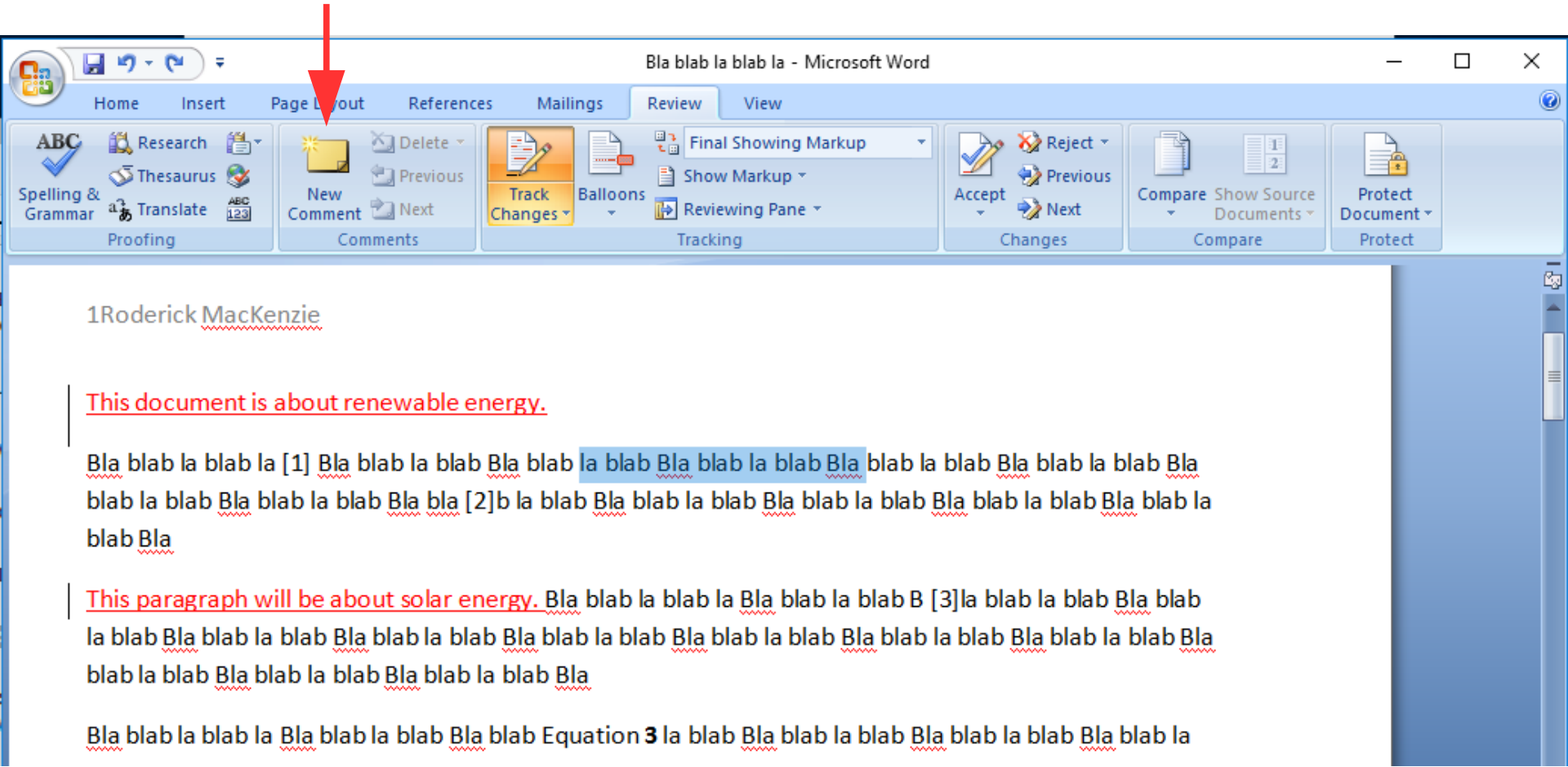
Comments

- Sometimes you want to add comments to a document, or your supervisor will want to comment on what you have written.
- Select the text you want to comment on



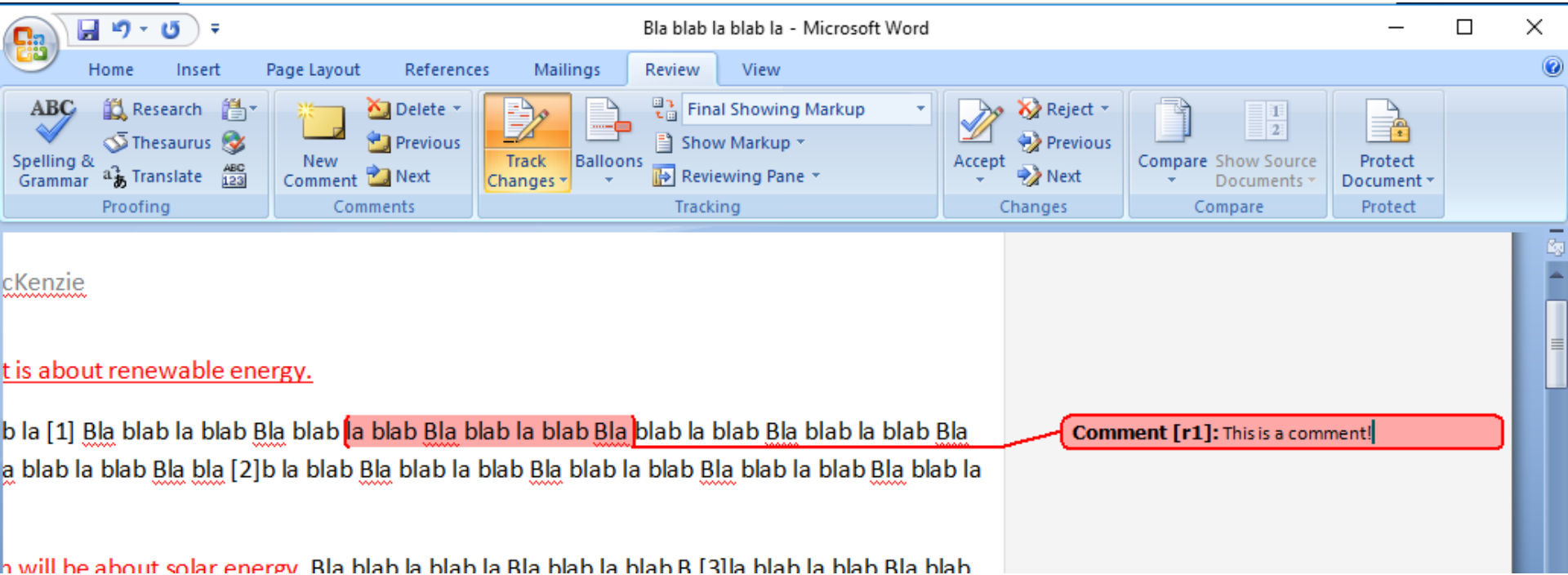
Comments

- Then click on the comment icon



Comments

- A balloon should appear into which you can type a comment.
- Hide this comment by changing “Final showing Markup” to “Final.”



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Final word on backups and document versioning.

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- So you can get back to changes you make in your document, I suggest that every time you make a major change to it, you save it as a different file name.

  - my_document_0.doc
  - my_document_1.doc
  - my_document_2.doc
  - my_document_3.doc
  - my_document_4.doc
  - ……
  - my_document_21.doc

- This way you will be able to track changes to the document.
- I suggest you never delete an old version of the document.

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Final word on backups

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- The C: drive on university computers gets wiped almost every day.
- If you save work there you will lose it!
- If you want to save work at university save it to you z: drive.
- I would also suggest saving it to at least one USB stick.
- Although, USB sticks often break or get lost.
- If you data is not in three physically different places just assume you have already lost it.
- Think what would happen if your house burnt down (or got burgled) and you lost your laptop on the same day…..