# HDB2033

## Professional Communication Skills
## Individual Technical Presentation Outline

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Year of Study : 2nd Year 2nd Semester

**Title of Presentation : Plate Tectonics Theory**

1. Is it a technical topic? Justify.

- Yes, it is a technical topic. This is because it is one of the topics within the syllabus of our course's core subject, Geology for Engineers. It has scientific knowledge about what is plate tectonics theory, what forces drive the tectonic plates to move and how are volcanoes, mountains and earthquakes formed.

**Audience**

1. How did you determine the knowledge level of your audience?

- I have talked to a selected few of the audience and since most of them are students from the Civil Engineering department, they have a fair amount of knowledge regarding the topic. However, there are a few among the audience that are not aware of what the topic is about as they are not taking the Civil Engineering course. A simple survey also gave me a great insight on the audience's knowledge level on the topic.

2. How did this information influence your presentation?

- Since there are a few among the audience that do not have the basic knowledge on the topic, I will explain the topic in the simplest way possible and avoid using difficult terminologies if possible. If any terminologies were to be used at all, I would first explain the terminology followed by a suitable example if applicable.

3. How do you plan to gain the audience's attention?

- At the beginning, I plan to play the sound of an earthquake and ask the audience what was the first thing that came to their mind when they heard the sound. After getting their answer, I will again repeat the answer stating that it was the sound of an earthquake. I will then put up a question, asking what would be the cause of an earthquake and will state that we will find the answer as we move on in the presentation.

**Presentation**

1. Introduction

- What is the purpose and importance of choosing this topic?

------ The purpose of choosing this topic is to relay information about what plate tectonics theory is all about and let more people be aware of its existence. The importance of this topic is to let the people know how are the natural phenomena happening such as the formation of mountains or volcanoes. How do earthquakes happen are especially the most important because if people know how do they happen, they could identify places that are most prone to earthquakes and could avoid going to such places.

- How is the topic relevant to the audience?

----- Mountains and volcanoes are everywhere around us in this world but not many people know how they existed. Dangerous natural disasters such as earthquakes can also be explained with plate tectonics theory and through knowledge of this theory, people can avoid going to places that are prone to this disaster.

- What is your thesis statement?

----- In this presentation today, we will look into the history of plate tectonics theory, what are the forces that drive the plates to move and, how do volcanoes, mountains and earthquakes form.

- List the main points that will support your thesis statement.

1. History of Plate Tectonics Theory

- Alfred Wegener was the first to propose this theory in 1915. But due to lack of evidence it was forcefully rejected by the public. [2]

2. Forces that drive the plates to move

- Convection cell currents at the Earth's mantle provides driving forces to move the plates [2]

3. How do volcanoes, mountains and earthquakes form

- The boundaries of the tectonic plates will interact with each other causing volcanoes, mountains or earthquakes to happen depending on the interaction [1]

- How are you establishing credibility?

----- As a student currently taking the Civil Engineering Course, I have sufficient knowledge to efficiently deliver the subject manner since this topic is under one of the courses that I have taken during my studies which is Geology for Engineers. Furthermore, I have done a thorough research on the topic to ensure the information will be correct.

<u>2. Body</u>

- Which organizational pattern are you using?

----- I am using the topical organizational pattern.

- List the supporting ideas for each main point.

1. History of Plate Tectonics Theory

- Alfred Wegener was the first to propose this theory but was rejected by the public due to lack of evidence of prove its authenticity.

- He first proposed that the Earth's land was a whole single piece which he called it Pangaea. This single piece of land slowly parted away from each other as they drifted bit by bit every year and finally became the land that we see today. This was the foundation of plate tectonics theory.

- Evidences was soon found that finally proved plate tectonics theory was right. The evidences were paleomagnetism, animal fossils found at places where the animals'

original habitat is separated by a large span of sea and the pieces of land fit together like a puzzle to form a whole single piece (Glasscoe, 1998).

2. Forces that drive the plates to move

- The earth is separated into several different layers as we go deeper within. The top layer which we are standing on is known as the crust and the layer below the crust is known as the mantle. The mantle is the place that is responsible for the moving of the plates.
- As we go deeper towards the core of the earth, the temperature rises and therefore there is a difference in temperature. This difference in temperature will create what we call a convection cell which means the lava in the mantle layer will flow in a circular motion (when it is cold it flows downwards, and when it is hot it flows upwards). This motion creates a flowing force strong enough to push the plates to move (Glasscoe, 1998).

3. How do volcanoes, mountains and earthquakes form

- There are three types of plate boundaries according to plate tectonics theory. The three are transform boundary, convergent boundary and divergent boundary.
- When the plate boundaries converge one plate would be denser than the other and the denser plate would subdue below the other. The plate that is now down within the mantle will be heated by the heat in the mantle and eventually melts to form magma. The magma will flow back upwards towards the crust and a volcano is formed.
- Convergent boundary also explains the formation of mountains when both plates converge but neither will subdue beneath the other. The plates will plow into one another and get higher to form a mountain just like the Himalayas.
- Between convergent boundaries are where the strongest earthquakes occur where magnitudes of earthquakes often exceed 9. Other boundaries such as the divergent and transform boundaries also causes earthquakes but the magnitude is lower. For example at transform boundaries, magnitudes are often lower than 8.5 while for divergent boundary, the magnitudes are often lower than 8 (Louie & Anderson, 2001).

3. Conclusion

- Describe how you are going to summarise the entire presentation.

----- I will summarise the entire presentation by recapping the main points and some of the key points within the main points with the aid of some pictures to help the audience recall back everything.

- Describe how you are going to reiterate the purpose and importance of the whole presentation to relate it to your audience (Memory Aid).

----- I will tell them that now they know why some places are always struck by earthquake and it is because those locations are located at the boundaries of the plates. With that knowledge in mind, they could easily identify places that are prone to earthquakes and avoid going to such places. Besides that, the next time they see a mountain or volcano, they would also know the origin of how those are formed and could appreciate it more. I will also show them pictures of volcanoes and mountains that were resulted from the plate tectonics theory.

**Question and Answer (Q&A) Session**

1. List three of the questions and answers that you anticipate from the audience.

Q: Why is it that the three different boundaries would cause different magnitudes of earthquakes?

A: This is because of the different interactions that the plates have between each other. For divergent boundaries, they are moving away from each other and thus the vibrations caused from this interaction is very small which results in small earthquakes. However, for transform boundaries, the plates are rubbing against each other and since the land is rough, there would be so much friction which could cause a much more massive vibration and thus a larger earthquake. Convergent boundaries create the largest earthquakes because one plate would be going below the other which would make huge movements to the plates. This huge movements would means huge vibrations and thus huge earthquakes.

Q: Is it possible for the East and West Malaysia to be separated according to the plate tectonics theory?
A: No, it is not possible because the East and West Malaysia are under the same plate. This means that if we drift, we drift in the same direction and same speed.

Q: How many plates are there currently on Earth?
A: As of now, the plates are categorized into 7 major plates namely the Africa Plate, Antartic Plate, Indo-Australian Plate, Australian Plate, Eurasian Plate, North America Plate, South America Plate and Pacific Plate. It is also made of many more minor plates but is often ignored because the 7 major plates have already accounts for 94% of the surface of the Earth (Anderson, 2002).

**References**

Anderson, D.L. (2002). How many plates?. *Geology, 30*(5), 411-414.

Glasscoe, M (1998). *History of plate tectonics*. Retrived February 12, 2018 from http://scecinfo.usc.edu/education/k12/learn/plate2.htm

Louie, J. & Anderson, J. (2001). *Plate Tectonics, the Cause of Earthquakes*. Retrieved February 12, 2018 from http://crack.seismo.unr.edu/ftp/pub/louie/class/100/plate-tectonics.html