HOW EFFECTIVE PEDAGOGY MAXIMIZES LEARNING OF CONTENT SUBJECTS IN ENGLISH: A SHARING OF GOOD PRACTICES

Bette Li

Course Instructor, The Hong Kong Polytechnic University

Project Director, DOLACEE & ILLIPS

13 December 2014

Sharing good practices

- A lesson requires various good practices to make it effective. A single good practice may appear insignificant, but it is the timely use of a number of good practices that makes a difference in the delivery of the lesson to maximize student learning in a lesson.
- The examples given may not be from your own subject, but the pedagogical principle is the same.

Links

DOLACEE and ILLIPS projects

http://www.edb.gov.hk/en/sch-admin/sch-quality-assurance/professional-support-online-resources/lang-support-emi-edu/

Language across the Curriculum Professional Development

www.lacpd.net

Difficulties encountered

Two domains of difficulties encountered by many teachers when conducting lessons in English are:

- enabling students to understand the content
- having them express their understanding in both verbal and written form.

Classroom practices for successful learning

To enable students to understand the content, a clear and effective delivery of knowledge is required. The following strategies could be considered:

- Multiple ways of making meaning — language is the primary means of making meaning, but when students are learning through a language which they are still developing control of, then other means must also be used.
- Paraphrasing/rephrasing/unpacking and repacking
- Recycling vocabulary
- Breaking up knowledge into manageable bits
- Identifying patterns of language and knowledge
- Using the right sequence in teaching
- Interaction with texts

Multiple ways of making meaning

John Polias: Keynote TasTESOL Conference, Hobart, April 2012

Major	Minor	Examples
language visuals	*sound* *movement* *colour* *drawing* *real-life*	• spoken and written texts • real objects or photos of real objects • drawings or cross-sections • diagrams, tables, graphs, equations • hand and other body movements • simulations and animated diagrams • videos and time-lapse photographs of real-life and non-real-life events

Consolidating the learning of vocabulary

John Polias: Keynote TasTESOL Conference, Hobart, April 2012

Timing

- Say and do it at the right time
- Say and do it in the right order

Method

- Say and do it clearly
- Say and do it again another way
- Use language, visuals and actions that break up the meanings into 'manageable' bits
- Say and do it with examples and explain the examples

Recycling vocabulary

Everyday to technical language and visuals

ore

~~rock~~

mineral

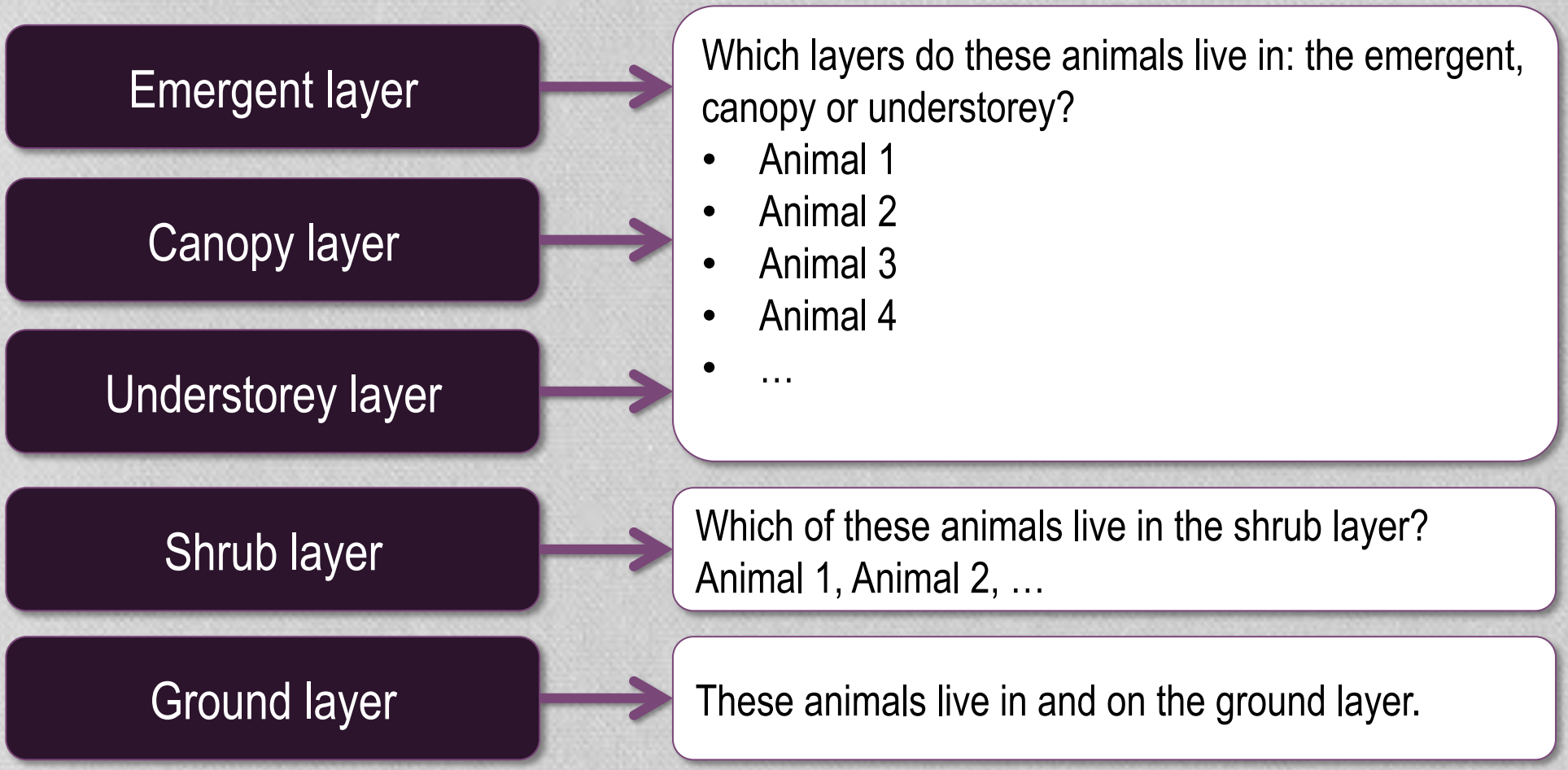
~~metal compound~~

bauxite

~~aluminium compound~~

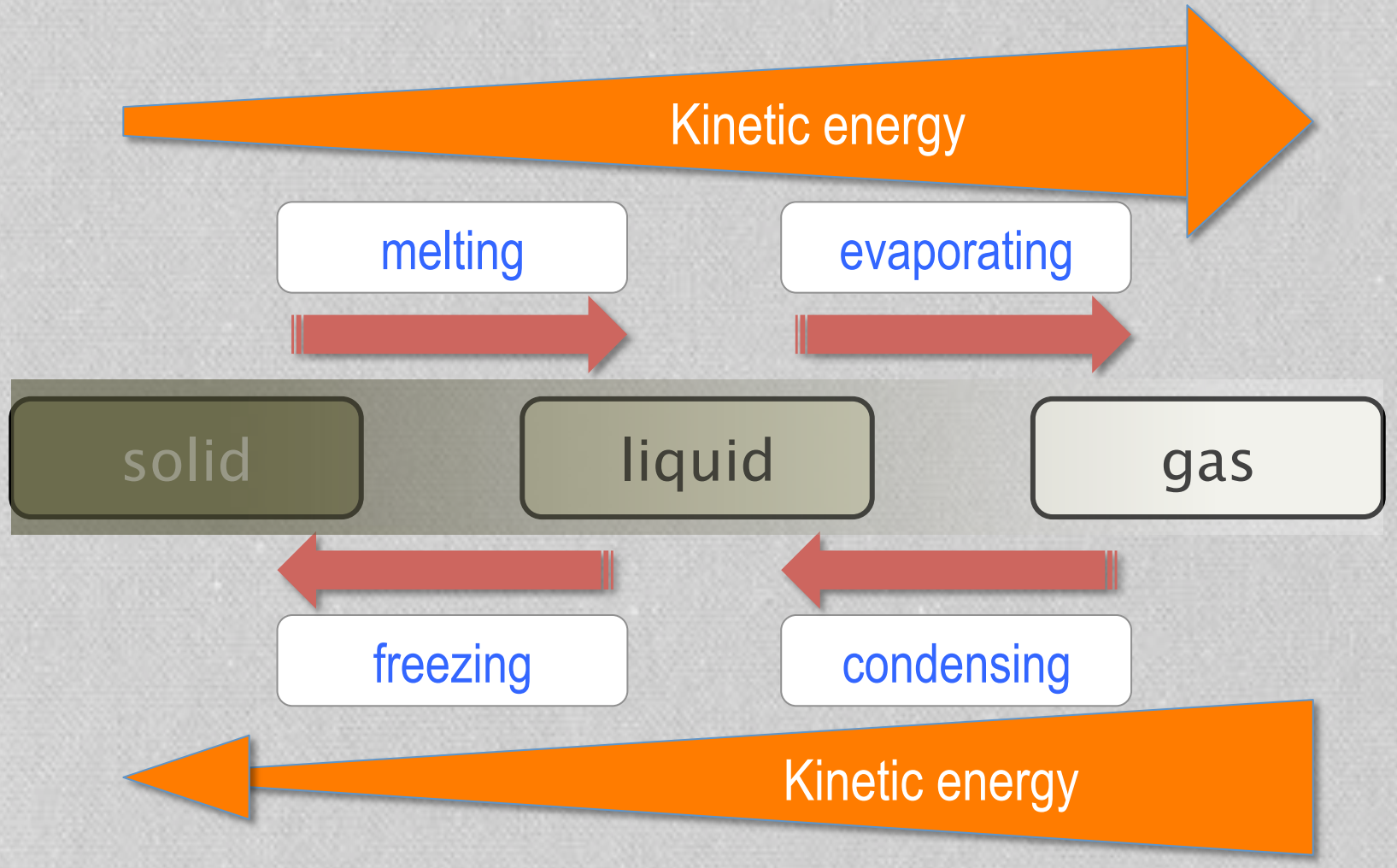
Visual patterns in the knowledge of Geography

John Polias for a secondary school 2011



Animated construction of knowledge

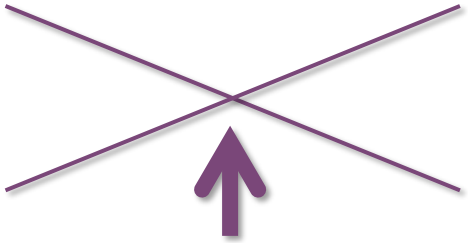
John Polias: Keynote, *Status for Literacy*, Diamanten, Copenhagen, 8 Sep 2014



Strong scaffolding if different ways are combined

MATHEMATICS: **Point of intersection**

Teacher started with the more concrete process of 'intersect' together with drawing the two straight lines intersecting.



Students could see the visual, the written language and hear the teacher say the meanings all at the same time.

What is one way that the teachers and students recycle the language?

T: (*Draws 2 lines intersecting each other*) See these two lines passing through each other, crossing each other? We say that they are intersecting each other. And the point where they cross each other, where they intersect is called the point of intersection. (*Draws 2 new lines intersecting each other)* So, what are these lines doing?

S: They are intersecting.

T: Good. And what do we call the point where they intersect?

S: The point of intersection.

T: Excellent, the point of intersection, because that's where they intersect.

Recycling language

SCIENCE

A teacher used the more everyday and concrete version of predicting ('expect to see'), then used the formal word in its verb form ('predict'), and then used the more abstract noun form ('prediction') and then ensured these were recycled:

T: Irene, what will you EXPECT TO SEE on the glass after …? So can you PREDICT what's going to happen?

S: …

T: … that's her PREDICTION.

S: …

T … So, is Irene's PREDICTION correct ? Did she PREDICT correctly?

SS: …

T … Yes, we can all agree that her PREDICTION is correct.

Moving from specialised words to everyday words

GEOGRAPHY

From the more written

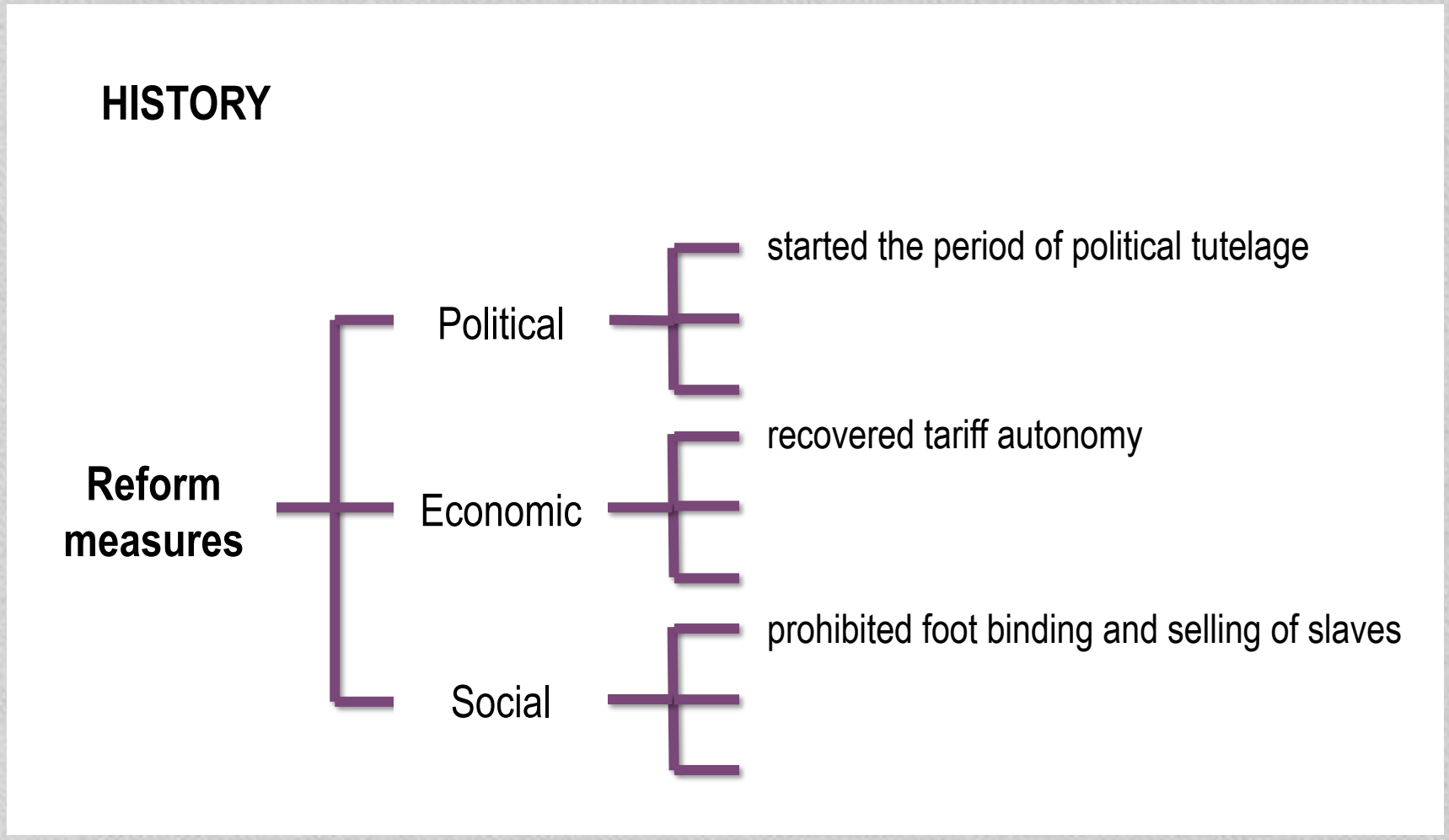
"A rise in the water table leads to increased salinity near the surface."

to the more spoken

"When the water table rises, the water near the top becomes more salty."

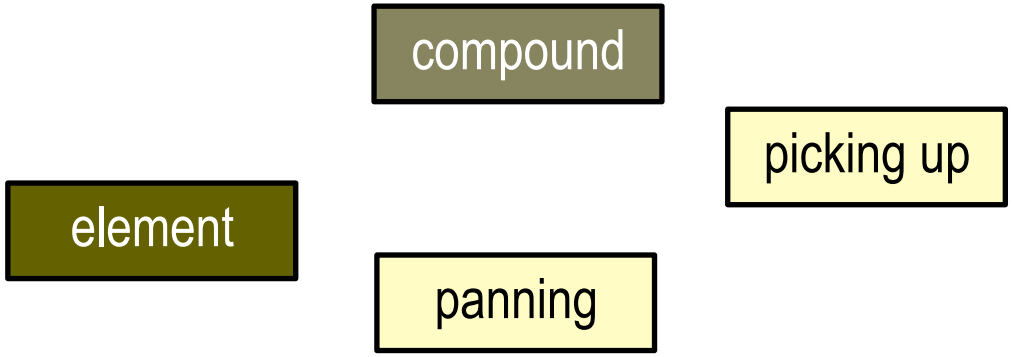
- Wanchai locals – people who live in Wanchai
- property developers – people who build houses for selling
- indicator – something that shows what you are talking about
- weapon – something you use to fight in the war

Visual patterns constructing the knowledge



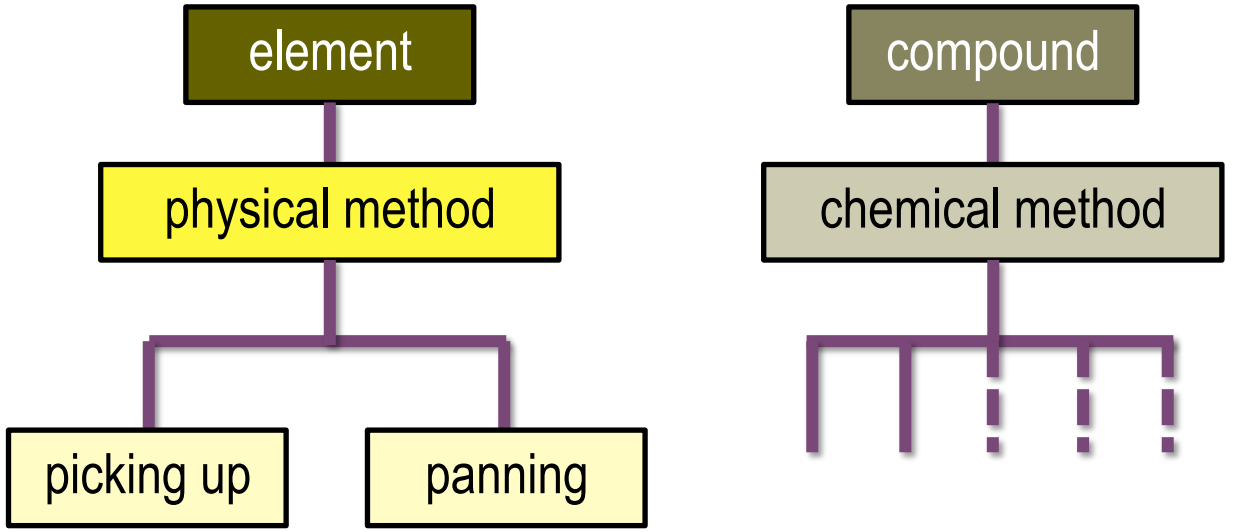
Working with language and visuals

SCIENCE: How are metals gathered from rocks?



Working with language and visuals

Breaking up and sequencing knowledge and language in ‘manageable bits’ with visuals.



The problem with questions that are too ‘open’

Not recommended

Asking overly general questions at the beginning of learning a topic, eg:

‘What does it mean by physical method?’

Or: *‘What’s the appearance of silver?’*

Recommended

Ask more specific questions with more concrete language, eg:

‘What is an example of the physical method?’

And with modelling and recycling, students can say ‘picking up’ and ‘panning’.

Or: *‘What is the colour of the metal?’*

Students could be taught to say ‘silvery grey’.

Everyday to technical / abstract language

A focus on verbs

A focus on nouns

EXAMPLE 1

"If something changes from a solid to a liquid …"	"… we can say that it has melted ..."	"… or, more technically, we say it is molten or in the molten state."

EXAMPLE 2

"When we separate the elements chemically, …"	"... we are using a chemical method and using electricity is one way …"	"… and we say that the substance decomposes, and the process is called decomposition."

Collocation — words that “go together”

EXAMPLE

SCIENCE: Action processes that are used when talking about energy

The MP3 player **gives out/emits** **sound**.

A car **has/possesses** **kinetic energy**.

Chemical energy **is stored** in a battery.

A battery **releases** **chemical energy**.

A fan **consumes/uses** **electrical energy**.

Sequencing in an ICT lesson

ICT: The meaning of file capacity

Not recommended — Starting with the abstract and then going to the concrete

1. Give definition of file capacity.
2. Give examples.
3. Do calculation.

Recommended — Starting with the concrete and then going to the abstract

1. Use file size and give examples – then use file capacity.
2. Do calculation.
3. Give definition of capacity and then recycle the subject language.

Interacting with a text to support students in reading

SOLAR ENERGY

Energy from the sun is called solar energy. Solar energy can be used in two ways. First, it can be used to heat water and greenhouses. Second, it can be changed into electricity. Solar energy is good because it is free, it is endless and it pollutes only a little bit. But it is expensive.

The questions asked and the way they are asked could include:

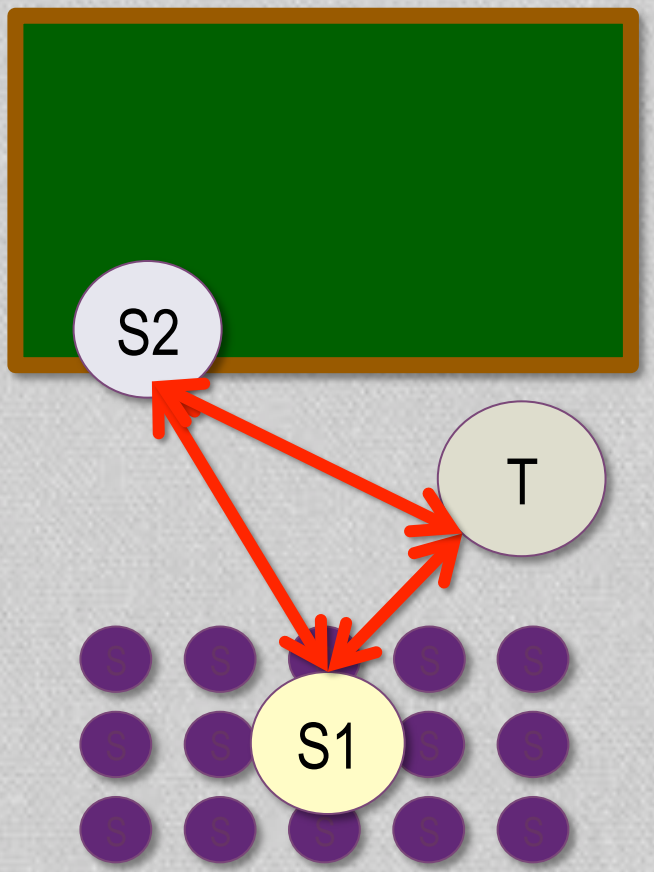
1. Find in the first line where solar energy comes from.
2. How many ways can solar energy be used?
3. There are two things solar energy can heat up. What are those two things?
4. In the fourth sentence, it tells us what we can change solar energy into. What can we change it into?
5. What are three positive things about solar energy?
6. What is one negative thing about solar energy?

A mathematics teacher's adoption of triangulation

1. T asks S1 to articulate her solution for the problem step by step. The teacher's role is to guide and be

One student (S1) standing at her desk is asked to instruct another student (S2) at the front of the classroom on how to complete a task. The teacher (T) stands to the side, forming a triangle – she has already modelled and deconstructed how to do the mathematical operation.

4. When S1 did not know how to use the specialised term 'diagonal', T explained both in language and with a gesture.



A Mathematics teacher's adoption of triangulation

Benefits of triangulation

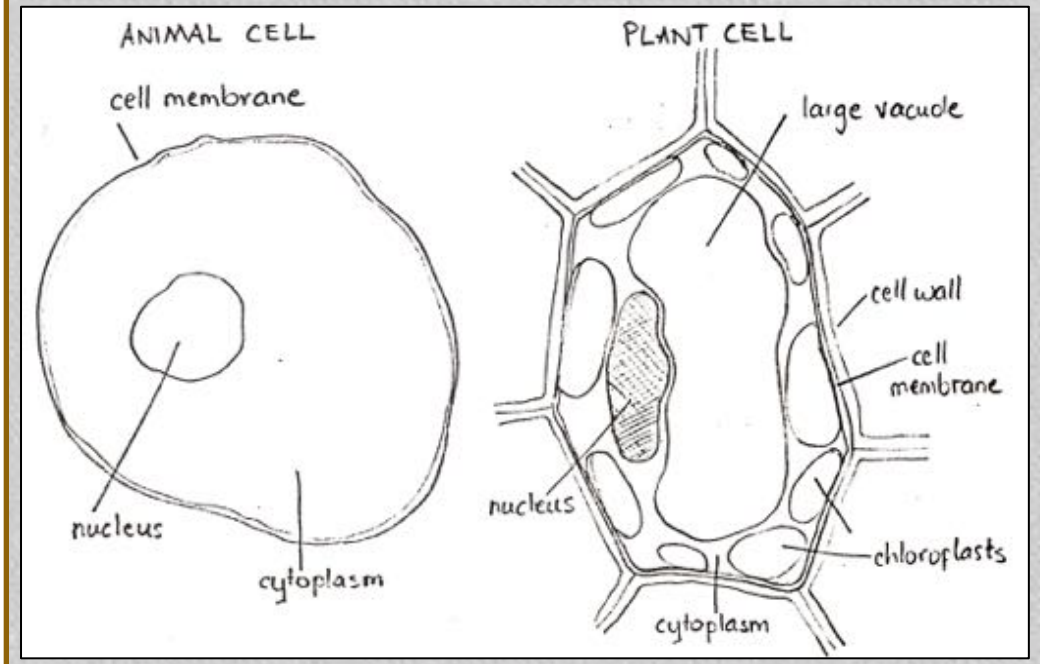
- S1 has to be very clear with her language in order to allow S2 to perform the task.
- S2 has to listen very carefully in order to complete the task.
- Both students are recycling the subject language in an authentic situation. The other SS are listening and observing.
- T is scaffolding the learning by intervening at the right time: helping when necessary, clarifying concepts or use of language, and pushing the SS to give more.
- When done well with frequent practice for both T and SS, it is an excellent pedagogical tool to enable SS to verbalise what they have learned and, thereby, deepening their knowledge.

Pushing students to recycle language/knowledge

SCIENCE
Comparing animal and plant cells

SS have been instructed to draw and label an animal cell and a plant cell in their worksheets. Two students are then asked to come to the board, one has to draw and label a plant cell and the other an animal cell. No interaction happens between the T and the SS nor the rest of the class. So, the Consultant, who is observing the lesson, asks one of the SS to stay at the front and turn away from the board to face the class. The following transcript shows the interaction between the Consultant and the S.

Consultant: John Polias for a secondary school 2014

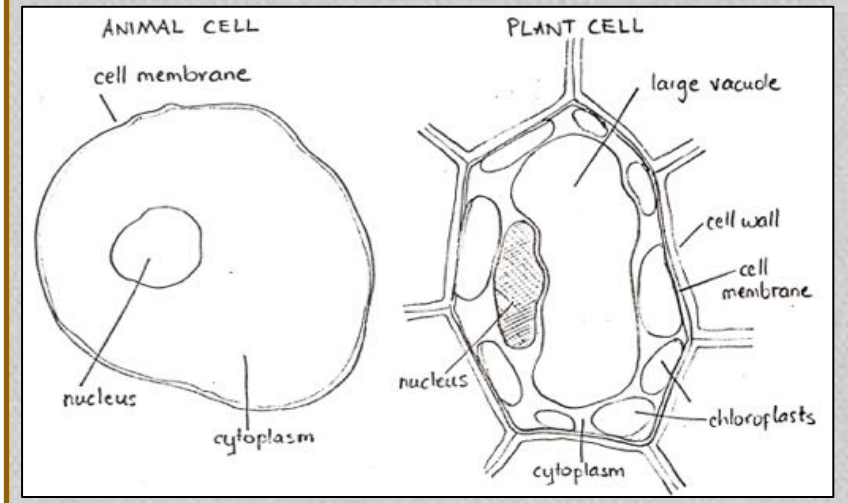


Stronger scaffolding at the start of learning

C: Just stay there, face me, please. Can you tell me what the parts of the animal cell are. Remember that you start from the outside *(Consultant moves his hands to form the shape of an animal cell)*. What is the outside of the animal cell called?

S: *(Turns around to check what he has written but more to remind him of the spelling to help him know how he should pronounce it. He faces the Consultant when talking, though.)* Cell membrane.

C: That's right. And what is the next thing, in the centre of the cell? *(Consultant forms his hand in a small circular shape. Although the nucleus can be seen as the most central component and therefore doesn't follow the path of outermost to innermost part, it is a good idea to get the SS to think of the outermost part first and then go to the nucleus and then deal with the other elements.)*



S: *(Again the student turns to check and turns back to face the Consultant.)* Nucleus.

C: Good. And the last part, the liquid part that fills the rest of the cell?

S: *(Again the student turns to check and turns back to face the consultant, who says the word with the student and some of the class join in.)* Cytoplasm.

C: That's right. Now these three parts are also what plant cells have. So, what are they again? Remember to start from the outside.

S: *(Repeats with minor hesitation)* Cell membrane, nucleus, cytoplasm.

C: And what are the three components that the plant cell has that the animal cell does NOT have? Again, start from the outside. *(The consultant again forms his hands to form the shape of the plant cell to show the cell wall.)*

S: Cell wall.

C: Yes, and then what is the big shape that fills up a lot of the cell?

S: *(Again the student turns to check and turns back to face the consultant, who says the words with the student (because the word vacuole is difficult) and the rest of the class also join in because they can see the words on the board behind the student.)* Large vacuole.

C: Yes, it is a big vacuole, a large one. And then what is the last one, the one that is green in colour?

S: *(Again the student turns to check and turns back to face the consultant, who says the word with the student and the rest of the class are now joining in freely.)* Chloroplast.

C: Yes, that is right, the chloroplast, and we will see that it is called the chloroplast because it has a chemical in it called chlorophyll. *(The consultant repeats "chlorophyll" because he wants the pronunciation of chloro- to be in the students' minds.)*

Weaker scaffolding as knowledge is consolidated

Consultant: John Polias for a secondary school 2014

Towards the end of the lesson after the SS have filled in a table of features that plant and animal cells have, the T asks a S to fill in an empty table drawn on the board. After completing the task, the S starts to return to his seat. At this point, the Consultant, asks the S to stay at the front and turn away from the board to face all the SS. Then the Consultant asks him several questions.

Animal cells	Plant cells
	Cell wall
Cell membrane	Cell membrane
Nucleus	Nucleus
Cytoplasm	Cytoplasm
	Large vacuole
	Chloroplasts

Weaker scaffolding as students learn

C: What are the three components in the animal cell? Remember to start from the outside.

S: The cell membrane.

C: Yes. And then?

S: The nucleus and the cytoplasm.

C: Excellent! Now, there are six components in the plant cell. Three of them are the same as that in the animal cell. What are they?

S: The cell membrane, the cytoplasm and the nucleus.

C: That's right! Now, what are the other three components that only the plant cell has? Again, start from the outside.

S: The cell wall, then the vacuole.

C: Yes, but is this vacuole usually a small one or a large one, a big one?

S: Large.

C: That's right, so what is it?

S: A large vacuole.

C: Good. And the last component?

S: ... the chloroplast.

C: Exactly! Excellent! Thank you.

(Goes to the front and erases all the information on the board.) Now, all of you: What are the three components that the animal cell and the plant cell have in common, that are the same for both cells?

Class: The cell membrane, the nucleus and the cytoplasm.

C: Good. And what are the three components that the plant cell has that the animal cell does not have?

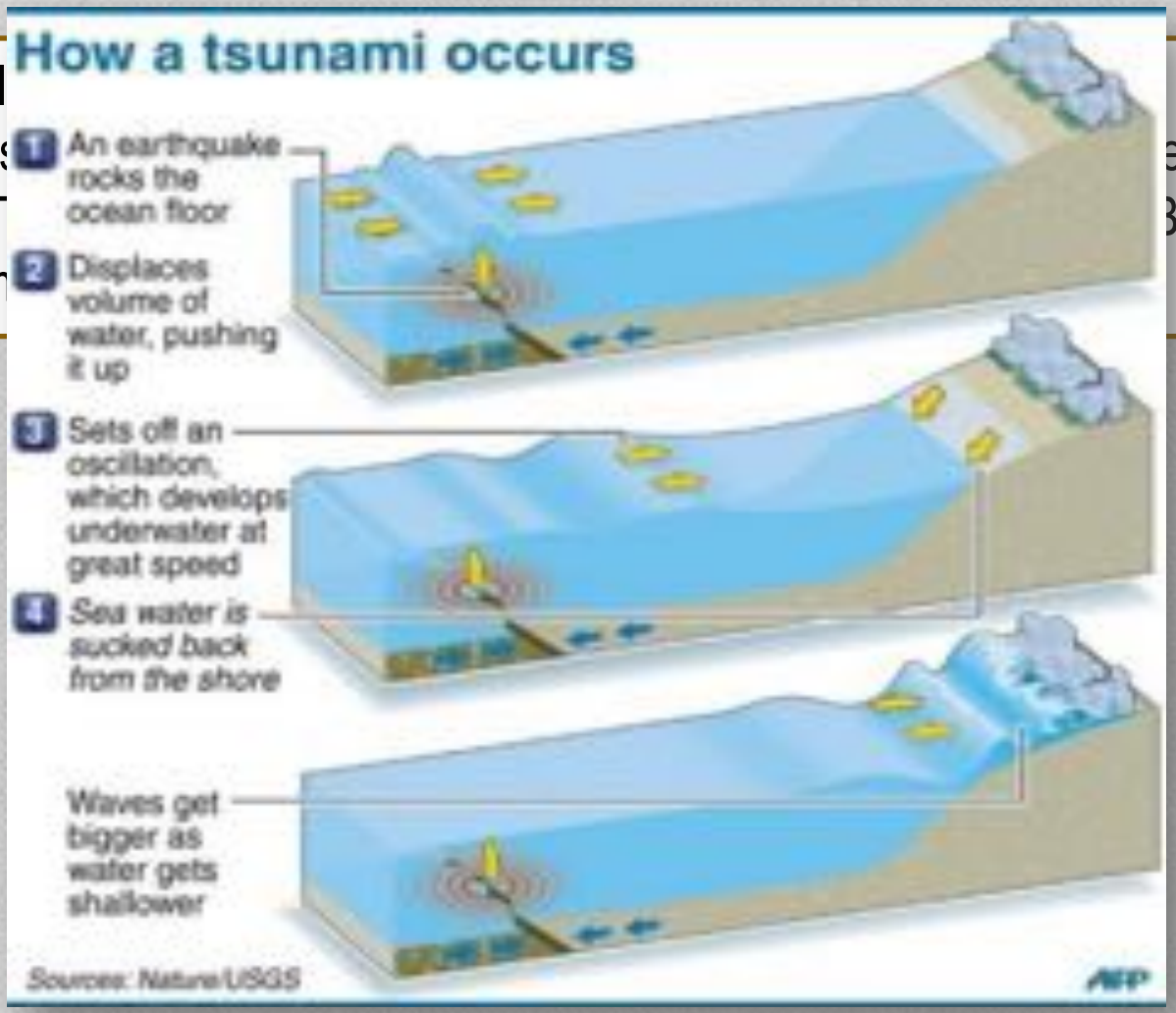
Class: The cell wall, the large vacuole and the chloroplast.

C: Very good!

Scaffolding the writing of sequential explanations

TSUNAMI

Recently, s ed by a
tsunami. T But how
are tsunar



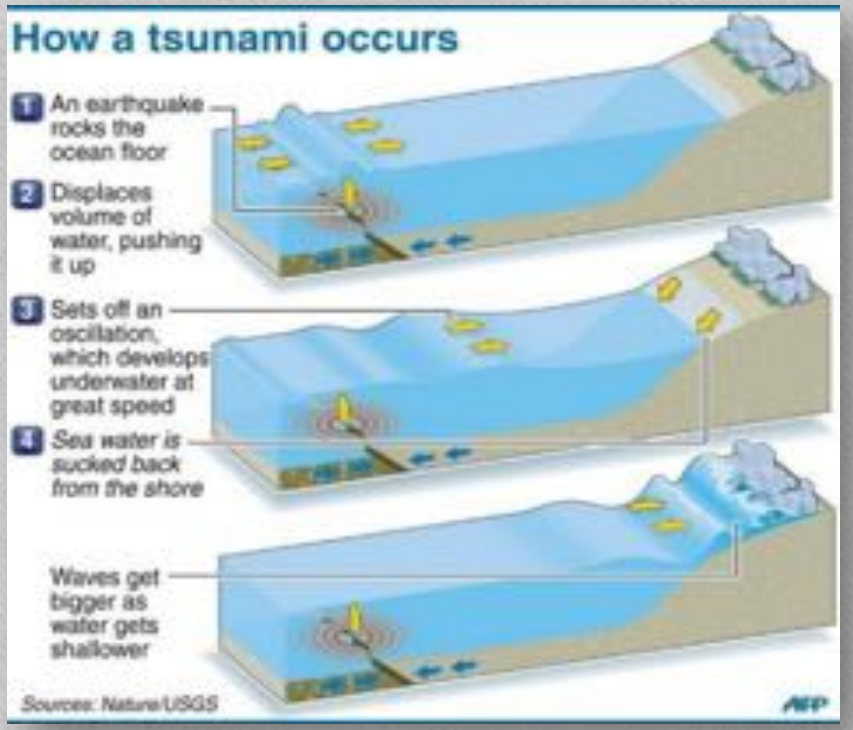
http://cdn.physorg.com/newman/gfx/news/2011/howatsunamio.jpg - accessed 18 Nov 2014

Scaffolding the writing of sequential explanations

TSUNAMIS

Recently, several coastal towns in south-central Chile were devastated by a tsunami. Tsunamis often affect countries around the Pacific Ocean. But how are tsunamis generated?

Tsunamis are usually triggered by earthquakes. The earthquakes shift a land mass vertically, which, in turn, displaces a large volume of water, forming a wave. This wave of water travels around the oceans and, when it hits the coast, it rises to a high level and forms the destructive wave.



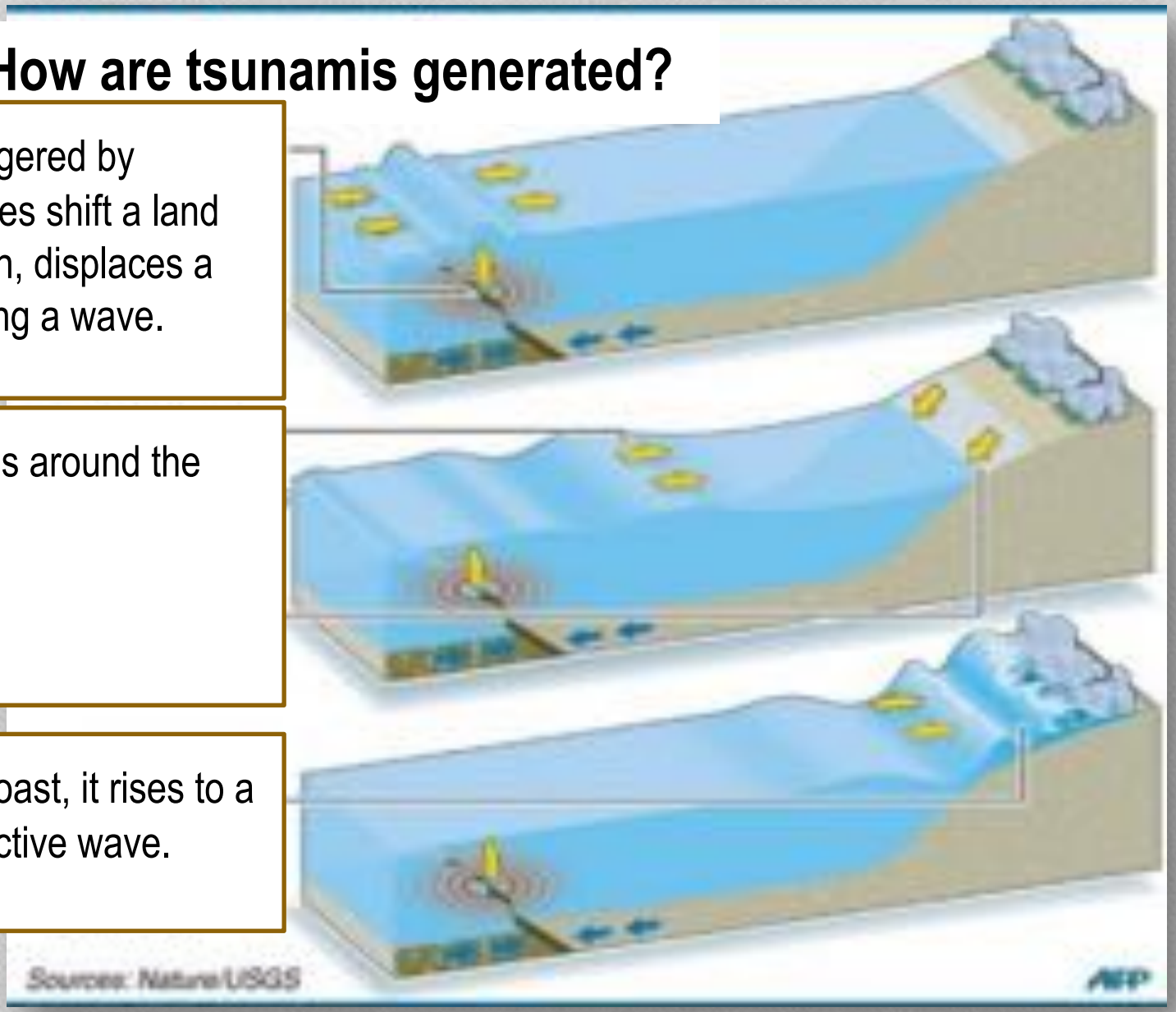
Text by John Polias 2014. Image http://cdn.physorg.com/newman/gfx/news/2011/howatsunamio.jpg - accessed 18 Nov 2014

How are tsunamis generated?

1. Tsunamis are usually triggered by earthquakes. The earthquakes shift a land mass vertically, which, in turn, displaces a large volume of water, forming a wave.

2. This wave of water travels around the oceans …

3. … and, when it hits the coast, it rises to a high level to form the destructive wave.



Text by John Polias 2014. Image http://cdn.physorg.com/newman/gfx/news/2011/howatsunamio.jpg - accessed 18 Nov 2014

How are tsunamis generated?

How are tsunamis usually triggered?	Tsunamis are usually triggered by earthquakes.
What do the earthquakes do?	The earthquakes shift a land mass vertically.
What does this vertical movement do?	It (the vertical movement) displaces a large volume of water, forming a wave.
Where does this wave of water travel?	This wave of water travels around the oceans.
What happens when this wave of water hits the coast?	When it hits the coast, it rises to a high level and forms the destructive wave.

Text by John Polias 2014. Image http://cdn.physorg.com/newman/gfx/news/2011/howatsunamio.jpg - accessed 18 Nov 2014

How are tsunamis generated?

Let's join the two sentences together and use 'which, in turn,'

Let's join the two sentences together and use 'and'. We need a comma in front of 'when', too.

Tsunamis are usually triggered by earthquakes.

The earthquakes shift a land mass vertically,

which, in turn, displaces a large volume of water, forming a wave.

This wave of water travels around the oceans …

and, when it hits the coast, it rises to a high level and forms the destructive wave.

Text by John Polias 2014.

How are tsunamis generated?

Part 1 of the diagram

Part 2 of the diagram

Part 3 of the diagram

Tsunamis are usually triggered by earthquakes.

The earthquakes shift a land mass vertically,

which, in turn, displaces a large volume of water, forming a wave.

This wave of water travels around the oceans …

and, when it hits the coast, it rises to a high level and forms the destructive wave.

Text by John Polias 2014.

How are tsunamis generated?

Part 1 of the diagram

Part 2 of the diagram

Part 3 of the diagram

Tsunamis are usually triggered by earthquakes.

The earthquakes shift a land mass vertically,

which, in turn, displaces a large volume of water, forming a wave.

This wave of water travels around the oceans …

and, when hits the coast, it rises to a high level and forms the destructive wave.

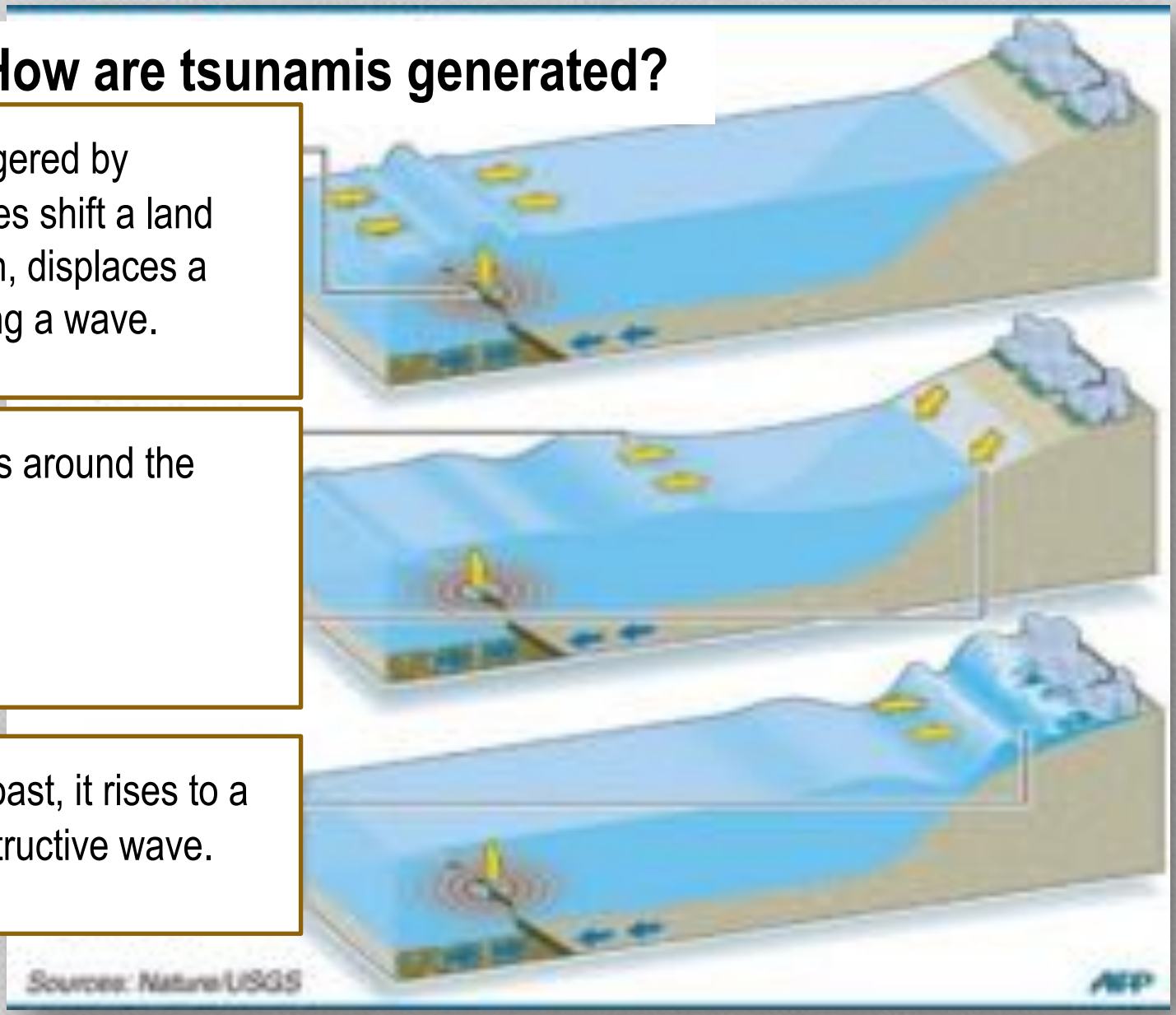
Text by John Polias 2014.

How are tsunamis generated?

1. Tsunamis are usually triggered by earthquakes. The earthquakes shift a land mass vertically, which, in turn, displaces a large volume of water, forming a wave.

2. This wave of water travels around the oceans …

3. … and, when it hits the coast, it rises to a high level and forms the destructive wave.



Text by John Polias 2014. Image http://cdn.physorg.com/newman/gfx/news/2011/howatsunamio.jpg - accessed 18 Nov 2014

Thank you