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ESL ENGLISH LESSON (60-120 mins) – 20th May 2012

Plastic waste increases in North Pacific

Today let's talk about the vast increase in plastic waste in the North Pacific. All across the area you will find huge amounts of floating debris. Data, published recently, by the *Scripps Institution of Oceanography* in California, says the quantity of small plastic fragments floating in the North Pacific has increased a hundred fold over the last 40 years. Scientists from the *Scripps Institution of Oceanography* documented the big rise when they trawled the waters off California. They were able to compare their plastic "catch" with previous data for the region. The group reported its findings in *The Journal of Biology Letters*.

Note: All plastic discarded into the ocean that does not sink will eventually break down. Sunlight and the actions of the waves will degrade and shred the material over time into pieces the size of a fingernail, or smaller. However, a side effect of this is that this micro-material could and probably is digested by marine organisms.

The Scripps team noted another, perhaps unexpected, consequence. The plastic fragments found in the ocean make it easier for the marine insect *Halobates sericus* to lay its eggs out over the ocean. These "sea skaters" or "water striders" – relatives of pond water skaters – need a platform for the task. Normally they would use seabird feathers, tar lumps or even pieces of pumice rock. The Scripps result show they now use numerous plastic surfaces now available in the Pacific. This situation was just not evident 40 years ago. This is now having a profound change on plants and microbes now living on hard surfaces in the Pacific.

Today the North Pacific is home to vast garbage patches. In the North-Eastern Pacific, one of these concentrations of debris is seen in waters between Hawaii and California – commonly known as the North Pacific Subtropical Convergence Zone. Ocean eddies and other small ocean circulation features will aggravate material into more discrete "garbage patches". The result is that 9% of fish collected by the Scripps team had plastic waste in their stomachs.

Another issue is toxicity caused by this plastic pollution. Ecosystems are also being affected. "Rafting communities" caused by abundant plastic waste is allowing certain species to adapt to life on or around objects floating in the water. Likewise underwater crabs or fish can use plastic to hide in.

Category: Environment / Pacific Ocean / Plastics
Level: Intermediate / Upper intermediate

EXERCISES

1. Plastic waste: Think of three things you know about plastic waste. Go round the room swapping details with others.

2. Dictation: The teacher will read four to six lines of the article slowly and clearly. Students will write down what they hear. The teacher will repeat the passage slowly again. Self-correct your work from page one - filling in spaces and correcting mistakes. Be honest with yourself on the number of errors. Advise the teacher of your total number of errors. Less than five is very good. Ten is acceptable. Any more is room for improvement! More than twenty - you need to do some work!

3. Reading: The students should now read the article aloud, swapping readers every paragraph.

4. Vocabulary: Students should now look through the article and underline any vocabulary they do not know. Look in dictionaries. Discuss and help each other out. The teacher will go through and explain any unknown words or phrases.

5. The article: Students should look through the article with the teacher.

a) What is the article about?
b) What do you think about the article?

6. Geography: Pacific Ocean: Where is the Pacific Ocean? Name six countries around it or in it. Draw a map on the board then **look on Google maps** to help you. Locate California and Hawaii.

7. Plastic waste: In pairs using the article find five things about plastic waste in the Pacific Ocean. Then add five solutions to help combat it. Write them below. Discuss together.

Plastic waste	Solutions to combat it
1	1
2	2
3	3
4	4
5	5

The teacher will choose some pairs to discuss their findings in front of the class.

8. Let's roleplay 1: Debate FM: In pairs/groups. One of you is the interviewer. The others are one of the following people. You are in the *Debate FM* radio studio. Today's interview is about: *Plastic waste in the North Pacific.*

1	An environmentalist	3	A fish in the North Pacific!
2	A scientist from Scripps	4	A fisherman in the North Pacific

The teacher will choose some pairs to roleplay their interview in front of the class.

9. Let's think! In pairs. On the board write as many words as you can to do with ***plastic waste***. *One-two minutes.* Compare with other teams. Using your words compile a short dialogue together.

10. Let's roleplay 2: In pairs. You are in a bar in a Pacific fishing port. Start a conversation about: 'Plastic waste in the North Pacific'. *5-minutes.*

11. Let's do 'The Article Quiz': Have the students quiz each other in pairs. They score a point for each correct answer and half a point each time they have to look at the article for help. See who can get the highest score!

Student A

1) Name the ocean.
2) Name the institution.
3) What has increased a hundred fold?
4) Where was the report published?
5) What happens to the plastic in the oceans?

Student B

1) What was the other unexpected consequence?
2) Explain rafting communities.
3) What are garbage patches?
4) 9% of what have what?
5) Crabs and fish use what for what?

12. Economic and business: Think of six economic and business reasons why recycling waste is good. Discuss together with your partner.

13. Pacific Ocean: In pairs, think of 10 things you know about the Pacific Ocean. Write them below. Discuss together. What does it tell you?

1	6
2	7
3	8
4	9
5	10

The teacher will choose some pairs to discuss their findings in front of the class

14. Presentation: In pairs, groups or individually: Prepare in class or at home a two minute presentation on: ***Plastic waste***. Stand at the front of the class to give your presentation to the class. The class can vote on the best presentation. Class – After the presentations go through the good and weak points on each presentation. Learn from the results.

15. Let's write an e-mail: Write and send a 200 word e-mail to your teacher about*:* ***Plastic waste in the oceans****.* Your e-mail can be read out in class.

16. Sentence starters: Finish these sentence starters. Correct your mistakes. Compare what other people have written.

a) Plastic waste _____

b) Microbes _____

DISCUSSION

Student A questions

1) Did the headline make you want to read the article?
2) What do you do with your plastic waste?
3) Do you recycle your rubbish? Explain.
4) Should governments do more to stop the dumping of waste at sea?
5) Why do people dump plastic waste at sea?
6) Should ships be banned from dumping their waste at sea?
7) Where should ships dump their waste?
8) How do you think the Japanese Tsunami has helped spread the waste in the Pacific Ocean?
9) What advice would you give to combat plastic waste in the North Pacific?
10) What should the 'Scripps team' do next?

Student B questions

1) What do you think about what you read?
2) Have you learnt anything in today's English lesson?
3) Can you think of a business opportunity for plastic waste in the Pacific?
4) Do you have a lot of plastic waste in the sea near you?
5) Is plastic waste in the oceans dangerous?
6) Would you eat a fish with plastic waste in it?
7) What do you think the fishes think of the plastic waste in the North Pacific?
8) Is all this plastic and other rubbish now on garbage islands in the Pacific good? Explain.
9) How should humans solve this plastic waste in the oceans issue?
10) Did you like this discussion?

SPEAKING

Let's discuss! Plastic waste in the North Pacific

Allow 10-15 minutes – As a class / small groups / pairs / 1 to 1

Debate the issue…

20 things about plastic waste in the North Pacific
or
10 causes – 10 solutions

The teacher can moderate the session.

GAP FILL: READING:

Put the words into the gaps in the text.

Plastic waste increases in North Pacific

Today let's talk about the (1)_____ increase in plastic (2)_____ in the North Pacific. All across the area you will find huge amounts of floating debris. (3)_____, published recently, by the *Scripps Institution of Oceanography* in California, says the (4)_____ of small (5)_____ fragments floating in the North Pacific has increased a hundred fold over the last 40 years. (6)_____ from the *Scripps Institution of Oceanography* documented the big rise when they trawled the waters off California. They were able to compare their plastic "catch" with (7)_____ data for the region. The group reported its findings in *The Journal of Biology Letters*.

scientists

quantity

previous

plastic

vast

waste

data

Note: All plastic discarded into the ocean that does not (1)_____ will eventually break down. Sunlight and the actions of the waves will degrade and shred the material over time into pieces the size of a (2)_____, or smaller. However a side effect of this is that this micro-material could and probably is digested by (3)_____ organisms.

The Scripps team noted another, perhaps unexpected, (4)_____. The plastic fragments found in the (5)_____ make it easier for the marine insect *Halobates sericus* to lay its eggs out over the ocean. These "sea skaters" or "water striders" – relatives of pond water skaters – need a (6)_____ for the task. Normally they would use seabird feathers, tar lumps or even pieces of pumice rock. The Scripps result show they now use numerous plastic surfaces now available in the Pacific. This situation was just not evident 40 years ago. This is now having a (7)_____ change on plants and (8)_____ now living on hard surfaces in the Pacific.

platform

sink

marine

microbes

fingernail

ocean

consequence

profound

GAP FILL: LISTENING: edited

Listen and fill in the spaces.

Plastic waste increases in North Pacific

Today let's talk about _____ plastic waste in the North Pacific. All across the area you will find huge amounts of floating debris. Data, published recently, by the *Scripps Institution of Oceanography* in California, says the quantity of _____ floating in the North Pacific has increased a hundred fold over the last 40 years. Scientists from the *Scripps Institution of Oceanography* _____ when they trawled the waters off California. They were able to compare their plastic "catch" with previous data for the region. The group _____ in *The Journal of Biology Letters*.

The Scripps team noted another, perhaps unexpected, consequence. The plastic fragments found in the ocean make it easier _____ *Halobates sericus* to lay its eggs out over the ocean. These "sea skaters" or "water striders" – relatives of pond water skaters – need a platform for the task. _____ use seabird feathers, tar lumps or even pieces of pumice rock. The Scripps result show they now use numerous plastic surfaces now available in the Pacific. This situation _____ 40 years ago. This is now having a profound change on plants and microbes now living _____ the Pacific.

Today the North Pacific is home to _____. In the North-Eastern Pacific, one of these concentrations of debris is seen in waters between _____ – commonly known as the North Pacific Subtropical Convergence Zone. _____ other small ocean circulation features will aggravate material into more discrete "garbage patches". The result is that 9% of fish collected by the Scripps team had plastic waste _____.

GRAMMAR

Put the words into the gaps in the text.

Plastic waste increases in North Pacific

Today let's talk about the vast increase in plastic waste (1)__ the North Pacific. All across the area (2)__ will find huge amounts of floating debris. Data, published recently, (3)__ the *Scripps Institution of Oceanography* in California, says the quantity (4)__ small plastic fragments floating in the North Pacific has increased a hundred fold over the last 40 years. Scientists from the *Scripps Institution of Oceanography* documented the big rise when they trawled (5)__ waters off California. They were able to compare their plastic "catch" with previous data (6)__ the region. The group reported (7)__ findings in *The Journal of Biology Letters*.

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Note: All plastic discarded into the ocean (1)__ does not sink will eventually break down. Sunlight and the actions of the waves will degrade and shred the material over time into pieces the size of a fingernail, or smaller. (2)__, a side effect of (3)__ is that this micro-material (4)__ and probably is digested by marine organisms.

The Scripps team noted another, perhaps unexpected, consequence. The plastic fragments found in the ocean make it easier for the marine insect *Halobates sericus* to lay its eggs out over the ocean. (5)__ "sea skaters" or "water striders" – relatives of pond water skaters – need a platform for the task. Normally they (6)__ use seabird feathers, tar lumps or (7)__ pieces of pumice rock. The Scripps result show they now use numerous plastic surfaces now available in the Pacific. This situation was (8)__ not evident 40 years ago. This is now having a profound change on plants and microbes now living on hard surfaces in the Pacific.

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SPELLING TEST

The teacher will ask the class individually to spell the following words that are in the article. Afterwards, check your answers with your teacher, using the following ratings: **Pass = 12, Good = 15, Very good = 18, Excellent = 20**

1	debris	11	shred
2	numerous	12	degrade
3	normally	13	plastic
4	feathers	14	situation
5	eventually	15	evident
6	vast	16	fingernail
7	organisms	17	previous
8	unexpected	18	commonly
9	consequence	19	scientists
10	normally	20	fragments

LINKS

http://www.bbc.co.uk/news/science-environment-17991993
http://www.bbc.co.uk/news/science-environment-11478261
http://news.bbc.co.uk/2/hi/science/nature/8225125.stm
http://sio.ucsd.edu/
http://rsbl.royalsocietypublishing.org/

ANSWERS

GAP FILL: Plastic waste increases in North Pacific: Today let's talk about the **vast** increase in plastic **waste** in the North Pacific. All across the area you will find huge amounts of floating debris. **Data**, published recently, by the *Scripps Institution of Oceanography* in California, says the **quantity** of small **plastic** fragments floating in the North Pacific has increased a hundred fold over the last 40 years. **Scientists** from the *Scripps Institution of Oceanography* documented the big rise when they trawled the waters off California. They were able to compare their plastic "catch" with **previous** data for the region. The group reported its findings in *The Journal of Biology Letters*.

Note: All plastic discarded into the ocean that does not **sink** will eventually break down. Sunlight and the actions of the waves will degrade and shred the material over time into pieces the size of a **fingernail**, or smaller. However, a side effect of this is that this micro-material could and probably is digested by **marine** organisms.

The Scripps team noted another, perhaps unexpected, **consequence**. The plastic fragments found in the **ocean** make it easier for the marine insect *Halobates sericus* to lay its eggs out over the ocean. These "sea skaters" or "water striders" – relatives of pond water skaters – need a **platform** for the task. Normally they would use seabird feathers, tar lumps or even pieces of pumice rock. The Scripps result show they now use numerous plastic surfaces now available in the Pacific. This situation was just not evident 40 years ago. This is now having a **profound** change on plants and **microbes** now living on hard surfaces in the Pacific. **(V2)**