Global warming to shrink fish by 24%

1st October, 2012

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The size of fish in the oceans is shrinking. A new report from the University of British Columbia in Canada states fish may shrink by as much as a quarter in the coming decades because of global warming. The research team conducted extensive tests on the effect of rising ocean temperatures on the size and number of over 600 species of fish around the world. They concluded that most fish are likely to shrink in size by 14-24 per cent by the year 2050. The biggest changes will be seen in tropical regions. The scientists said there is less oxygen in warmer water so fish cannot grow at the rate they should. They added that many fish will migrate to cooler waters outside the tropics.

Lead researcher Professor William Cheung said: "We were surprised to see such a large decrease in fish size. Marine fish are generally known to respond to climate change through changing distribution and seasonality. But the unexpectedly big effect that climate change could have on body size suggests that we may be missing a big piece of the puzzle of understanding climate change effects in the ocean." He added that human activities such as overfishing and pollution will worsen the problem: “Our work shows a very concerning future for the oceans and so it is very important to reduce greenhouse gas emissions and develop better fish management policies to adapt to these changes,” he said.
WARM-UPS

1. SHRINKING FISH: Walk around the class and talk to other students about shrinking fish. Change partners often. Share your findings with your first partner.

2. CHAT: In pairs / groups, decide which of these topics or words from the article are most interesting and which are most boring.

   size / shrinking / a quarter / global warming / species / tropical / oxygen / migrate / surprised / decrease / body size / puzzle / overfishing / pollution / greenhouse gas

Have a chat about the topics you liked. Change topics and partners frequently.

3. CONCERNED: What things worry you about the future of the Earth? Complete this table with your partner(s). Change partners often and share what you wrote.

<table>
<thead>
<tr>
<th>Worry:</th>
<th>How worried?</th>
<th>Why?</th>
<th>What to do about it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish stocks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weather</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drought</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cost of food</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. PLENTY: Students A strongly believe the oceans will always have plenty of fish; Students B strongly believe otherwise. Change partners again and talk about your conversations.

5. HUMAN ACTIVITY: Rank these things that affect our life and share your rankings with your partner. Put the worst things at the top. Change partners often.

   - overfishing
   - driving instead of walking
   - eating meat
   - using too much water
   - air conditioners
   - not turning off lights
   - destruction of forests
   - overconsumption (too much shopping)

6. GLOBAL WARMING: Spend one minute writing down all of the different words you associate with the term ‘global warming’. Share your words with your partner(s) and talk about them. Together, put the words into different categories.
1. TRUE / FALSE: Read the headline. Guess if a-h below are true (T) or false (F).

a. A report says all fish will shrink by 24 per cent by within decades. T / F
b. Researchers did tests on more than 600 different types of fish. T / F
c. Scientists say fish sizes will change most will be in the polar regions. T / F
d. The research predicts many fish will relocate outside of tropical areas. T / F
e. The head researcher was not surprised at the figures in his research. T / F
f. The researcher said marine fish do respond to changes in temperature. T / F
g. He suggested human activities are not helping make things better. T / F
h. He suggested humans needed to change the way they fish. T / F

2. SYNONYM MATCH: Match the following synonyms from the article.

1. shrinking a. relocate
2. coming b. probable
3. extensive c. approaching
4. likely d. problem
5. migrate e. diminishing
6. decrease f. react
7. respond g. worrying
8. puzzle h. large-scale
9. concerning i. strategies
10. policies j. drop

3. PHRASE MATCH: (Sometimes more than one choice is possible.)

1. in the coming a. of fish
2. The research team conducted b. policies
3. over 600 species c. outside the tropics
4. fish cannot grow at d. of the puzzle
5. migrate to cooler waters e. decades
6. fish are generally known to respond f. will worsen the problem
7. missing a big piece g. these changes
8. overfishing and pollution h. the rate they should
9. develop better fish management i. to climate change
10. adapt to j. extensive tests
The size of fish in the oceans is (1) ___________. A new report from the University of British Columbia in Canada states fish may shrink by as (2) ___________ as a quarter in the coming decades because of global warming. The research team conducted (3) ___________ tests on the effect of rising ocean temperatures on the size and number of over 600 (4) ___________ of fish around the world. They concluded that most fish are (5) ___________ to shrink in size by 14-24 per cent by the year 2050. The biggest changes will be seen in tropical (6) ___________. The scientists said there is less oxygen in warmer water so fish cannot grow at the (7) ___________ they should. They added that many fish will migrate to cooler waters (8) ___________ the tropics.

Lead researcher Professor William Cheung said: "We were surprised to see such a large (9) ___________ in fish size. Marine fish are generally known to (10) ___________ to climate change through changing distribution and seasonality. But the unexpectedly big (11) ___________ that climate change could have on body size suggests that we may be missing a big (12) ___________ of the puzzle of understanding climate change effects in the ocean." He added that human activities such as (13) ___________ and pollution will worsen the problem: "Our work shows a very (14) ___________ future for the oceans and so it is very important to reduce greenhouse gas (15) ___________ and develop better fish management (16) ___________ to adapt to these changes," he said.
LISTENING – Listen and fill in the gaps


The size of fish (1) ______________________ shrinking. A new report from the University of British Columbia in Canada states fish may shrink by as much as a quarter (2) ______________________ because of global warming. The research team conducted (3) ______________________ the effect of rising ocean temperatures on the size and number of over 600 species of fish around the world. They (4) ______________________ fish are likely to shrink in size by 14-24 per cent by the year 2050. The biggest changes will be (5) ______________________. The scientists said there is less oxygen in warmer water so fish cannot grow at the rate they should. They added that many fish will (6) ______________________ waters outside the tropics.

Lead researcher Professor William Cheung said: "We were surprised to see (7) ______________________ in fish size. Marine fish are generally known to respond to climate change through changing distribution and seasonality. But (8) ______________________ effect that climate change could have on body size suggests that we may be missing a big (9) ______________________ of understanding climate change effects in the ocean." He added that human activities (10) ______________________ and pollution will worsen the problem: "Our work shows a very (11) ______________________ the oceans and so it is very important to reduce greenhouse gas emissions and develop better fish management policies (12) ______________________ changes," he said.
1. **WORD SEARCH:** Look in your dictionary / computer to find collocates, other meanings, information, synonyms ... for the words ‘climate’ and ‘change’.

<table>
<thead>
<tr>
<th>climate</th>
<th>change</th>
</tr>
</thead>
</table>

• Share your findings with your partners.
• Make questions using the words you found.
• Ask your partner / group your questions.

2. **ARTICLE QUESTIONS:** Look back at the article and write down some questions you would like to ask the class about the text.

• Share your questions with other classmates / groups.
• Ask your partner / group your questions.

3. **GAP FILL:** In pairs / groups, compare your answers to this exercise. Check your answers. Talk about the words from the activity. Were they new, interesting, worth learning...?

4. **VOCABULARY:** Circle any words you do not understand. In groups, pool unknown words and use dictionaries to find their meanings.

5. **TEST EACH OTHER:** Look at the words below. With your partner, try to recall how they were used in the text:

<table>
<thead>
<tr>
<th>report</th>
<th>surprised</th>
</tr>
</thead>
<tbody>
<tr>
<td>much</td>
<td>generally</td>
</tr>
<tr>
<td>600</td>
<td>missing</td>
</tr>
<tr>
<td>2050</td>
<td>worsen</td>
</tr>
<tr>
<td>warmer</td>
<td>reduce</td>
</tr>
<tr>
<td>outside</td>
<td>develop</td>
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</table>
SHRINKING FISH SURVEY


Write five GOOD questions about shrinking fish in the table. Do this in pairs. Each student must write the questions on his / her own paper. When you have finished, interview other students. Write down their answers.

<table>
<thead>
<tr>
<th>Q.1.</th>
<th>STUDENT 1</th>
<th>STUDENT 2</th>
<th>STUDENT 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Q.2.</th>
<th>STUDENT 1</th>
<th>STUDENT 2</th>
<th>STUDENT 3</th>
</tr>
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<tbody>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Q.3.</th>
<th>STUDENT 1</th>
<th>STUDENT 2</th>
<th>STUDENT 3</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Q.4.</th>
<th>STUDENT 1</th>
<th>STUDENT 2</th>
<th>STUDENT 3</th>
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<table>
<thead>
<tr>
<th>Q.5.</th>
<th>STUDENT 1</th>
<th>STUDENT 2</th>
<th>STUDENT 3</th>
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</table>

- Now return to your original partner and share and talk about what you found out. Change partners often.
- Make mini-presentations to other groups on your findings.
SHRINKING FISH DISCUSSION

STUDENT A’s QUESTIONS (Do not show these to student B)

a) What did you think when you read the headline?
b) What springs to mind when you hear the word ‘fish’?
c) What do you think about what you read?
d) How big a problem is it if fish shrink by a quarter?
e) How important are fish in your life?
f) How would the world change if fish got smaller in size and number?
g) Why are fish in the oceans getting smaller?
h) If the fish migrate to cooler waters, will that mean the fish will grow to their regular size and there’ll be no problem?
i) What might the situation be like in the year 2100?
j) Do things like this worry you?

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SHRINKING FISH DISCUSSION

STUDENT B’s QUESTIONS (Do not show these to student A)

a) Did you like reading this article?
b) Why do you think the lead researcher was so surprised?
c) How do you respond to climate size?
d) Do you think shrinking fish will change the portions on your plate or things like sushi?
e) Do you think climate change could change our body size?
f) What should we do about overfishing and pollution?
g) What other human activities are affecting climate change?
h) What did you do today that added to greenhouse gasses or that helped the climate?
i) Will countries adapt to these changes? Why (not)?
j) What questions would you like to ask professor William Cheung?
The size of fish in the oceans is shrinking. A new report from the University of British Columbia in Canada states fish may shrink (1) **up** as much as a quarter in the (2) **by** decades because of global warming. The research team conducted extensive tests on the effect of rising ocean temperatures on the size and number of over 600 (3) **species** of fish around the world. They concluded that most fish are (4) **likely** to shrink in size by 14-24 per cent by the year 2050. The biggest changes will be seen in (5) **tropical** regions. The scientists said there is less oxygen in warmer water so fish cannot grow at the rate they should. They added that many fish will (6) **migrate** to cooler waters outside the tropics.

Lead researcher Professor William Cheung said: "We were surprised to see such a large decrease in fish size. Marine fish are (7) **generally** known to respond to climate change through changing distribution and seasonality. But the unexpectedly big effect that climate change could have on body size (8) **suggests** that we may be missing a big piece of the (9) **generalization** of understanding climate change effects in the ocean." He added that human activities such as overfishing and pollution will worsen the problem: "Our work shows a very (10) **concerning** future for the oceans and so it is very important to (11) **reduce** greenhouse gas emissions and develop better fish management policies to (12) **adapt** to these changes," he said.

**Put the correct words from the table below in the above article.**

1. (a) up  (b) at  (c) by  (d) of
2. (a) coming  (b) being  (c) going  (d) doing
3. (a) species  (b) races  (c) forages  (d) ancestors
4. (a) likely  (b) likeable  (c) likelihood  (d) liking
5. (a) agricultural  (b) tropical  (c) topical  (d) multicultural
6. (a) migratory  (b) migration  (c) migrant  (d) migrate
7. (a) general  (b) generalize  (c) generally  (d) generalization
8. (a) believes  (b) concludes  (c) thinks  (d) suggests
9. (a) puzzle  (b) doodle  (c) doodle  (d) muddle
10. (a) concerning  (b) worry  (c) fretting  (d) issue
11. (a) increase  (b) reduce  (c) stable  (d) enhance
12. (a) adopt  (b) apt  (c) adapt  (d) adept
Write about **shrinking fish** for 10 minutes. Correct your partner’s paper.
HOMEWORK

1. VOCABULARY EXTENSION: Choose several of the words from the text. Use a dictionary or Google’s search field (or another search engine) to build up more associations / collocations of each word.

2. INTERNET: Search the Internet and find out more about global warming. Share what you discover with your partner(s) in the next lesson.

3. SHRINKING FISH: Make a poster about the shrinking fish. Show your work to your classmates in the next lesson. Did you all have similar things?

4. CONCERNED: Write a magazine article about concerns over the shrinking size and number of fish. Include imaginary interviews with a fisherman/fisherwoman and a consumer.

Read what you wrote to your classmates in the next lesson. Write down any new words and expressions you hear from your partner(s).

5. LETTER: Write a letter to a global warming expert. Ask him/her three questions about the Earth’s rising temperature. Give her/him three of your opinions. Read your letter to your partner(s) in your next lesson. Your partner(s) will answer your questions.
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