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Group assignment

The plan B



Plan A





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Inquiry 2 insight

Step 1: What is OA and its impact on marine ecosystems? Virtual lab on OA

Step 2: How does OA impact us? Interactive discussion on OA

Step 3: What can we do? Carbon footprint calculator



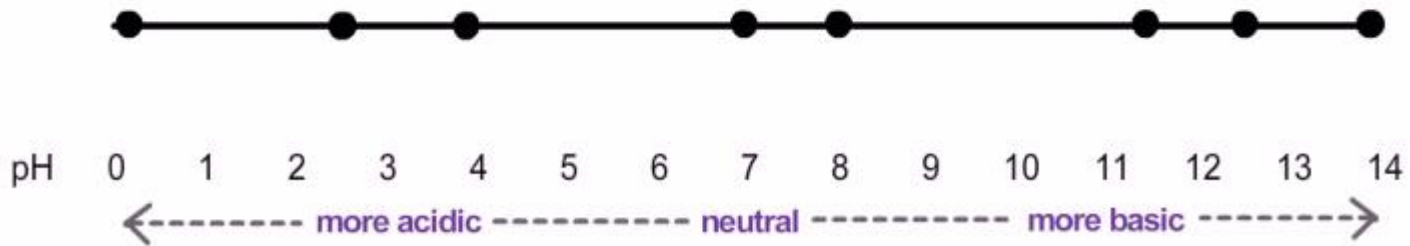
STEP 1

The virtual lab

pH of liquids

The acidity of liquids can be measured by pH, on a logarithmic scale from 0 to 14. Where do common liquids fall on this scale?

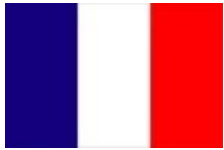
Drag the liquids below to their proper relative position in the pH scale at the bottom. The eight dots on the scale indicate the drop positions. Good luck!





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A success...



EPOCA



GREENPEACE 绿色和平



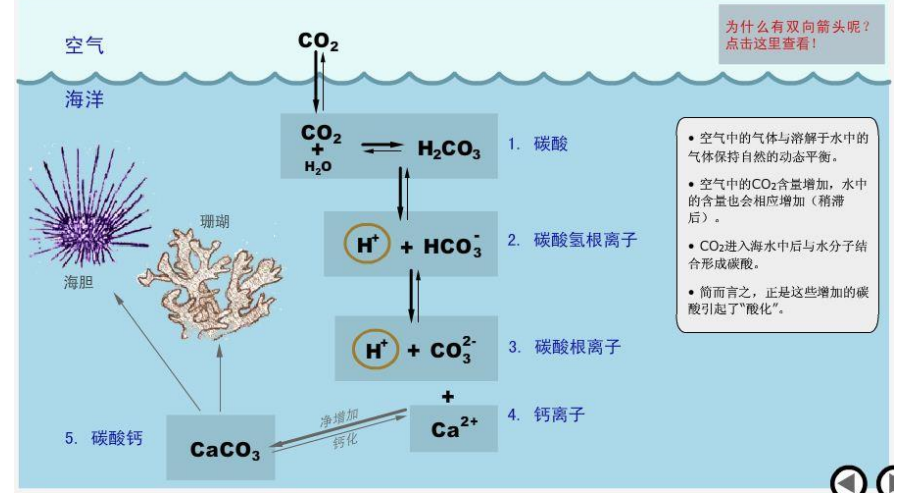
POLMAR



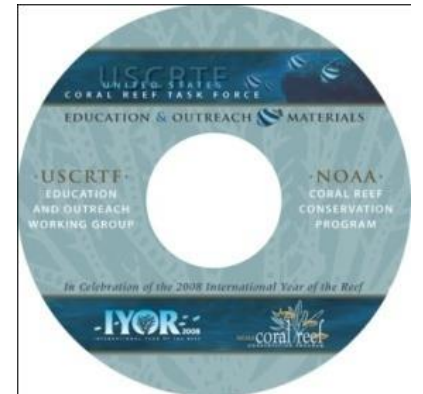
MedSeA
MEDITERRANEAN SEA ACIDIFICATION IN A CHANGING CLIMATE



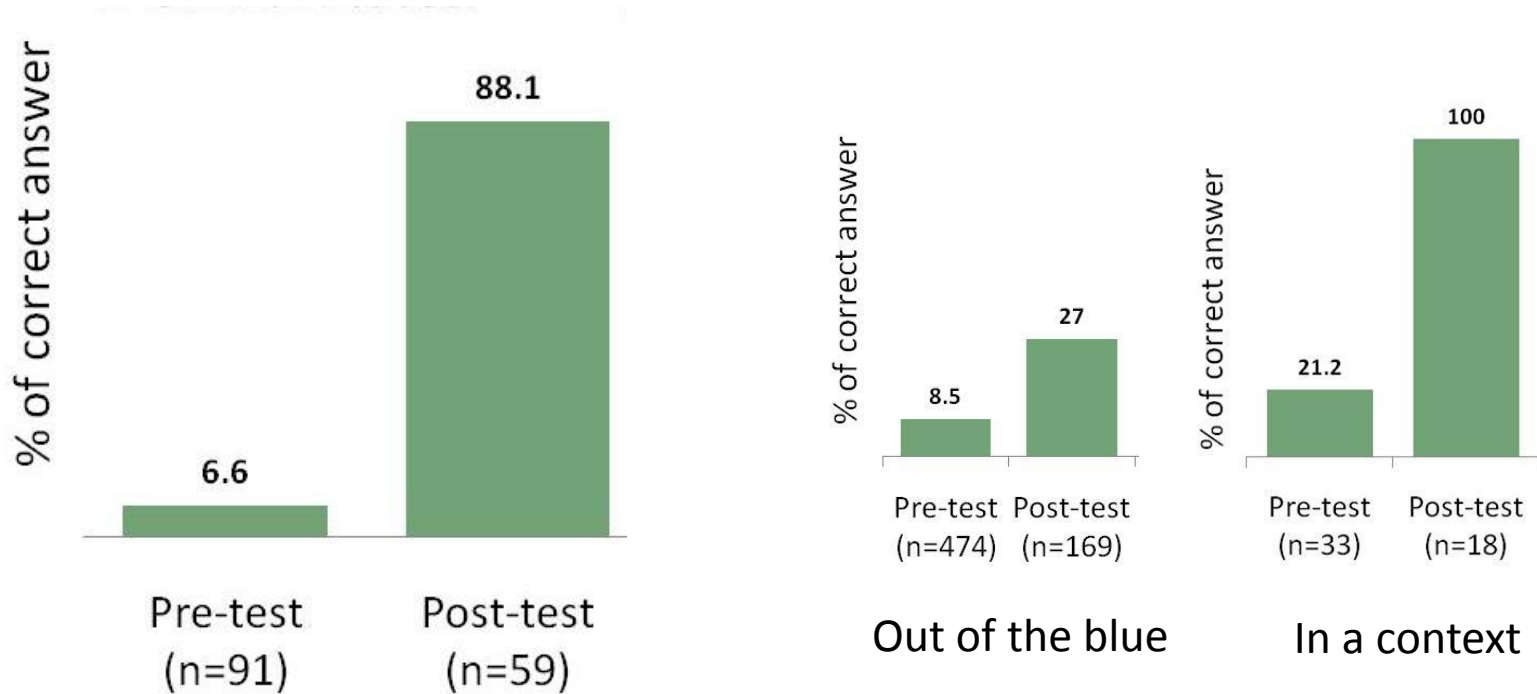
水中的碳



NOAA



... and it works !



Increased knowledge on ocean acidification

BUT

You need a context



STEP 2

voicethread

Sea urchin larvae are smaller in low pH water

SO WHAT???

- ✓ Students can browse at their own pace
- ✓ Students can leave comment and question



Public: Ocean acidification and animal early ...



Impact of CO₂-driven ocean acidification on early life-history – what we know and what we need to know



Sam Dupont & Mike Thorndyke
[sam.dupont@marecol.gu.se]



The Sven Lovén Ocean Acidification Facilities
Kristineberg

comment



Conclusions



Ocean acidification WILL have impacts on marine species and ecosystems

This can be dramatic (species extinction)

It is complicated and we need more data

BUT WE NEED TO ACT NOW

**WHAT CAN YOU
DO?**

What can we do? = decrease CO₂ emissions

Introduction

Where do you live? 

-- choose your country --

Enter Your Name:

Please note that this carbon footprint calculator is currently under development
If you encounter any problems or mistakes, we apologize, but would love your feedback!
Please email us at seastar@stanford.edu ... thanks for trying it out!



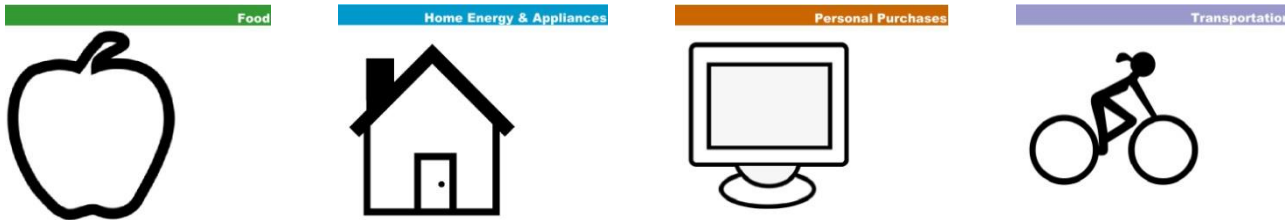
Navigation arrows: ◀ ▶

Change our behaviours



STEP 3

Carbon footprinting



- ✓ students' life style
- ✓ Takes into account user's location
- ✓ Synchronization behavior - emission



Introduction

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-- choose your country --

Enter Your Name:

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If you encounter any problems or mistakes, we apologize, but would love your feedback!
Please email us at seastar@stanford.edu ... thanks for trying it out!





Conclusion

Your average carbon footprint is 10312 pounds of CO₂ per year, compared to an average of 15286 for Sweden.

	You:	Your region:
Transportation:	1317	4176
Home:	2120	2882
Food:	4574	6595
Purchases:	2301	1633

Convert pounds to kilograms (kg)

pounds = kilograms

*Values in this chart are in pounds CO₂ equivalents;
use the converter at right to convert these values to kg*

Now go back and adjust values to try to lower your footprint to a Brasil level.

(approx. 1800 kg, or 4000 lbs CO₂ equivalents)

Print

Email

Average:



15286 pounds CO₂ per year

Your total:

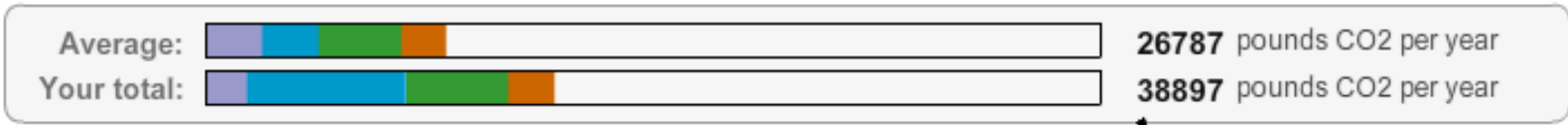


10311 pounds CO₂ per year



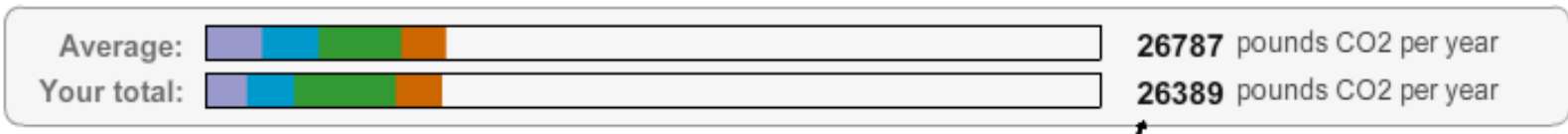
click above to change between pounds and kg

Take a “bad” citizen



Teach him/her how to save energy

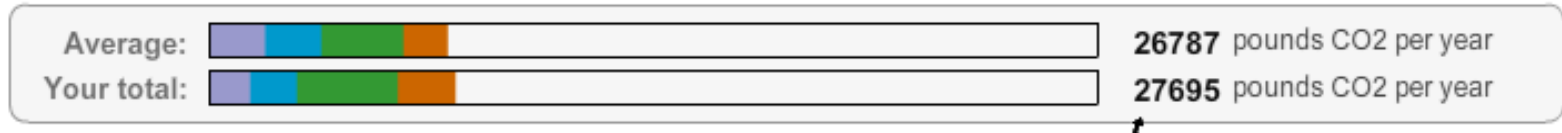
[e.g. turn off computers and electric equipment when not in use]



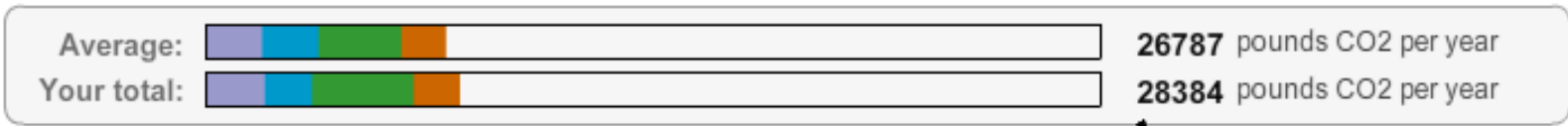
Save energy AND save money

Spend it for...

1) i-phone, computer, etc.



2) A city trip with Ryan Air





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The International Student Carbon Footprint Challenge



Get an international view on CO₂ footprint

Learn from each other

Envision solution together

ISFC participants from: Apr 2011; Sept 2011; Nov 2011; Feb 2012; Apr 2012; Sept 2012; Nov 2012; Feb 2013;
 Apr/May 2013; Sep/Oct 2013; Feb 2014; Sep/Oct 2014;

To submit your class data, see the [Participate](#) page at this site for instructions and contact information.



>20000
participant
40 countries

The International Student Carbon Footprint Challenge



Einztein BETA
The Social Learning Network

Einztein is the social learning network for higher education and lifelong learners.

Learning Group 603   

The International Student Carbon Footprint Challenge (ISCFC)

























Curated by Jason Hodin

Welcome to your International Student Carbon Footprint Challenge (ISCFC) Learning Group!

ISCFC students and teachers should click the "Join Now" button at the top to join this group; this is the page where all of the student conversations are ... [\[expand \]](#)

[carbon emissions](#) [carbon footprint](#) [environmental sustainability](#) [iscfc](#)

Discussions (16) [Post to Discussions](#) [Join Discussions](#)

 Is climate change real? Is it mostly human? Jason Hodin 30 	 Off the table? I2I Admin 196 
 Student footprints I2I Admin 302 	 Wants or needs? I2I Admin 228 
 ISCFC schools in the news! Pam Miller 16 	 Home grown Jason Hodin 100 
 Deforestation SOS Bert Breton 150 	 DISCUSS: Green products Marita Batsiou 102 
 Clean development I2I Admin 98 	 Family footprint I2I Admin 191 
 Food & hunger I2I Admin 160 	 Reuse & repurpose I2I Admin 142 



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VIRTUALMARINESCIENTIST

STIFTELSEN
MARCUS OCH AMALIA
WALLENBERGS
MINNESFOND



UNIVERSITY OF GOTHENBURG
BIOLOGICAL & ENVIRONMENTAL SCIENCES



UNIVERSITY OF GOTHENBURG
DEPT OF EDUCATION, COMMUNICATION AND LEARNING

CHALMERS



UNIVERSITY OF GOTHENBURG

Department of Applied Information Technology

http://www.ipkl.gu.se/english/Research/research_projects/vms/



VIRTUALMARINESCIENTIST



Perform virtual experiments

Inquiry to Sea

Wallenberg global learning network



The screenshot shows the I2SEA website. At the top, there is a banner with the I2SEA logo and the text "Inquiry to Student Environmental Action" and "promoting student environmental understanding and international collaborations". Below the banner is a navigation menu with links for HOME, ACTIVITIES, RESOURCES, ABOUT, and CONTACT. The main content area contains a paragraph about the project's purpose and a list of digital learning tools. Three tool thumbnails are visible: "Carbon Footprint Calculator" (showing a beach), "Our Acidifying Ocean" (showing a wave with green algae), and "Ocean Acidification: So What?" (showing a dark, textured surface).

I₂Sea Inquiry to Student Environmental Action
promoting student environmental understanding and international collaborations

HOME ACTIVITIES RESOURCES ABOUT CONTACT

The "Inquiry to Student Environmental Action" (I2SEA) project promotes international collaboration among high school and secondary school students as they learn about, discuss, and envision solutions to shared environmental challenges.

In particular, we offer the following free, interactive digital learning tools relating to climate change and ocean acidification:

- Carbon Footprint Calculator
- Our Acidifying Ocean
- Ocean Acidification: So What?

All open access: <http://i2sea.stanford.edu/>



Plan B: write a research proposal

Rules:

- *Ocean acidification*
- *Include biological experiment*
- *Realistic (e.g. manpower, infrastructure/species available at your institutions, budget, time)*
- *Use what you've learned (e.g. optimize resources, no "waste")*



Time table

Thursday

2:00-... – Group assignment (discussion, plan) + Technical forum

Friday

10:15-12:15 – Group assignment (prepare presentation)

12:15-1:30 – Lunch

1:30-3:00 – Presentation Groups 1 – 4

3:00-3:15 – Break

3:15-4:00 – Presentation Groups 5-6

4:00-5:00 – Evaluation #2, experimental challenges, final discussion biology



Groups

Rules:

- *6 groups (4-5 persons)*
- *No rules...*

But:

- *Maximize expertise*
- *Be strategic (e.g. geography, language)*



Presentation

Rules:

- *Any support*
- *15 minutes max*
- *Everyone contributes*
- *Detailed information on what, why and how (e.g. design, statistics, endpoints)*

Evaluation criterias

1/ originality / novelty / hypothesis

2/ Scientific strategy / methodology

3/ Feasibility (including budget)

4/ Societal relevance & Communication plan

How to design your experiment

1. What is your question? Your hypothesis?
2. How can I test this?
 - What are my limitations?
 - What is the best model?
 - What are the best endpoints?
 - What are the best design/stats?
 - What are my controls?
 - etc.

Can I REALLY answer my question with the collected data?