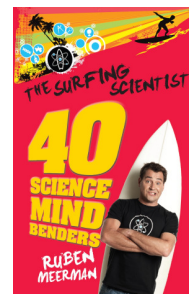
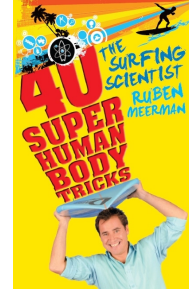
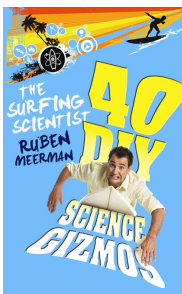
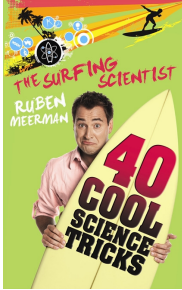


Ruben Meerman

The Surfing Scientist

presents



Climate Change

... fact or prediction, evidence or opinion, expert or amateur?

THE PERFORMER

Ruben is a surfer with a physics degree and a passion for science and education. He appears on ABC TV's **Catalyst** and as a regular guest on **Studio 3**. He was the first ever resident scientist on **Play School** and performed studio experiments with Elliot Spencer on the ABC's afternoon kid's program **Roller Coaster** from 2006 to 2010. Ruben has written four science books for children published by ABC Children's Books. Before his career in the media and presenting science in schools, Ruben worked as an industrial physicist designing and manufacturing thin film optical coatings for lasers and electro-optical systems. He has taught primary science education at Griffith University, toured with the Shell Questacon Science Circus and performed thousands of live science shows around Australia.

- Books:*
- The Surfing Scientist: 40 Cool Science Tricks* (ABC Children's Books, 2007)
 - The Surfing Scientist #2: 40 DIY Science Gizmos* (ABC Children's Books, 2008)
 - The Surfing Scientist #3: 40 Super Human Body Tricks* (ABC Children's Books, 2009)
 - The Surfing Scientist #4: 40 Science Mind Benders* (ABC Children's Books, 2010)

ABC TV Science Presenter & Children's Science Author

Ruben Meerman

The Surfing Scientist

Climate Change

Ruben explains the fundamental science behind climate change with spectacular live demonstrations and engaging slides bursting with stunning photographs and animations as well as the Scripps Institute's most up-to-date Keeling Curve and latest data from the Intergovernmental Panel on Climate Change.

Ruben begins his presentation by answering the most fundamental climate change question of all: why does the Earth have weather? Using **liquid nitrogen**, balloons and a kettle full of boiling water, he demonstrates how the Sun's heat, combined with the Earth's rotation, generates the wind, clouds, storms and waves. He explains the seasons, the Coriolis Effect and the thermohaline circulation of the oceans. By the end of this introduction, audience understand why day-to-day weather can be so incredibly difficult to predict while the year-to-year climate tends to be relatively stable over time.

Next, Ruben discusses the scientific claim that human beings are warming the planet and changing the Earth's climate. Understanding this central claim requires an understanding of the natural greenhouse effect and the "enhanced greenhouse effect". Ruben uses a standard infrared television remote control and simple static electricity demonstrations to explain how invisible forms of light can interact with invisible gases to cause global warming.

Human induced enhancement of the green house effect is the result of changes in the composition of atmospheric gases caused by human activities. Ruben makes this crucial distinction crystal clear with a transparent balloon, cooled to minus 196 degrees Celsius to reveal the invisible ingredients in air. The oxygen inside the balloon liquefies and becomes clearly visible. The carbon dioxide becomes solid 'dry ice' also becomes visible. As these two substances boil and sublime back into thin air, the audience develops new, lifelong appreciation of the nature of the gases in the air they breathe.

Students are now introduced to the famous Keeling Curve which first alerted the world's scientific community to the potential problem of climate change. Ruben explains the natural yearly fluctuations in atmospheric carbon dioxide concentrations (caused by the northern hemisphere's deciduous forests) as well as the observed long-term rise due to the combustion of fossil fuels by humans. If time permits, Ruben presents explains how and why the past climate changed naturally (changes in the Earth's orbit known as Milankovitch Cycles) as well as published observations of the impact on the Earth's climate, cryosphere and ecosystems.

Ruben also presents evidence that leaves students feeling optimistic and enthusiastic about their own future and empowered to make choices that will make a real difference to the future of the planet.

REQUIREMENTS : - One trestle table (or similar)

- Access to the school's data projector to run his computer through your system
- Access to the venue 15 minutes prior to the presentation

Video Conferencing available – please call for details

Cross Curriculum	Multimodal Texts	Curriculum Links
(3) Sustainability Ecological	(V) Visual (S) Spatial	SCIENCE observes changes in materials – observing, questioning, predicting ENGLISH identify texts that entertain / about social contexts DRAMA watch and listen as an active participant
DURATION: 60 minutes + Q&A (Can be extended to 90 mins upon request)		SUITABILITY: Years 5-12
PERFORMANCE COST \$6.00 per student <u>\$0.60 gst</u> \$6.60 Total		PERFORMANCE MINIMUM - 130 STUDENTS* \$780.00 per show <u>\$ 78.00 gst</u> \$858.00 Total

*PLEASE NOTE EVERY STUDENT OVER 130 PAYS \$6.00 + GST

Young Australia Workshop

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Facsimile 02 9690 1033 **Email** youngaustralia@inet.net.au **Website** www.youngaus.com.au **ABN** 89 074 032 518
GLEN LEITCH MANAGEMENT PTY LTD