

Ruben Meerman

presents

SCIENCE/P.D.H.P.E



Atoms In

Atoms Out



**The science of
food, digestion and healthy weight**

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Atoms In, Atoms Out

The science of food, digestion and healthy weight

THE PERFORMANCE

The word “metabolism” is derived from “metamorphosis”, and literally means the “transformation of food”. You are what you eat, but what is food made of? What kind of atoms are you munching on and where do they all go after you’ve digested them? If your mind is wandering towards the smallest room in the house, then you’re in for a huge surprise. Food is mostly water. The rest comes back out through your lungs as the carbon dioxide gas, which you exhale seventeen times per minute, twenty-four hours per day.

Ruben proposes fascinating questions to engage his audiences and stages spectacular experiments to reveal the surprising answers. Why do we need oxygen? How did the carbon atoms you’re exhaling get into your body? How does your body manage to stay warmer than its environment? Where in the body does your “metabolism” happen? Surprisingly few people can answer these questions in a biologically meaningful way.

This timely presentation demystifies the biology, chemistry and physics of nutrition and how to maintain a healthy weight. Students will discover that “carbohydrates” literally means *carbon atoms*, with hydrogen and oxygen atoms that *hydrate* them, hence the name. All sugars are just ‘simple’ carbohydrates and, just like every other kind, they are all made of nothing more than carbon, hydrogen and oxygen atoms. Once metabolised, all of those carbon atoms are exhaled as CO₂, and all of the hydrogen atoms become H₂O. The same is true for all of the different fats in our diet. Protein is made of carbon, hydrogen and oxygen too, plus some nitrogen, which is excreted as urea, and a wisp of sulphur.

By the end of Ruben’s presentation, students (and teachers) appreciate the deep connection between the food they eat, the physical activity they engage in, and the carbon dioxide they exhale.

Performance requirements: trestle table (or similar), data projector and screen, computer, whiteboard

THE PERFORMER

Ruben Meerman is a physicist, surfer, author and television presenter better known to a whole generation of Aussie kids as the ABC’s “Surfing Scientist”. His career took an unexpected turn to the science of weight loss and nutrition at the age of 42, after he lost a few kilograms and wondered where they had all gone. While it was already known that fat is converted to carbon dioxide and water during weight loss, Ruben’s research revealed for the first time that 84 per cent of its mass is exhaled, while the remaining 16 per cent becomes H₂O. His ground-breaking calculations were published in the prestigious *British Medical Journal* in December 2014. That same paper included the surprising results of Ruben’s survey of doctors, dietitians and personal trainers, which revealed very few health professionals realise that most of the mass in food and human fat is exhaled as CO₂. As a result, Ruben now presents regular guest lectures about the biochemistry of fat metabolism at UNSW’s School of Biotechnology and Biomolecular Sciences and speaks about weight loss at conferences. His latest book “Big Fat Myths” is published by Ebury Books (Random House Australia)

DURATION: 60 minutes + Q&A	SUITABILITY: Years 3 - 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

Young Australia Workshop

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