

**Interactive science  
teaching:  
The secrets of  
Plasticine balls and the  
structure of the Earth**

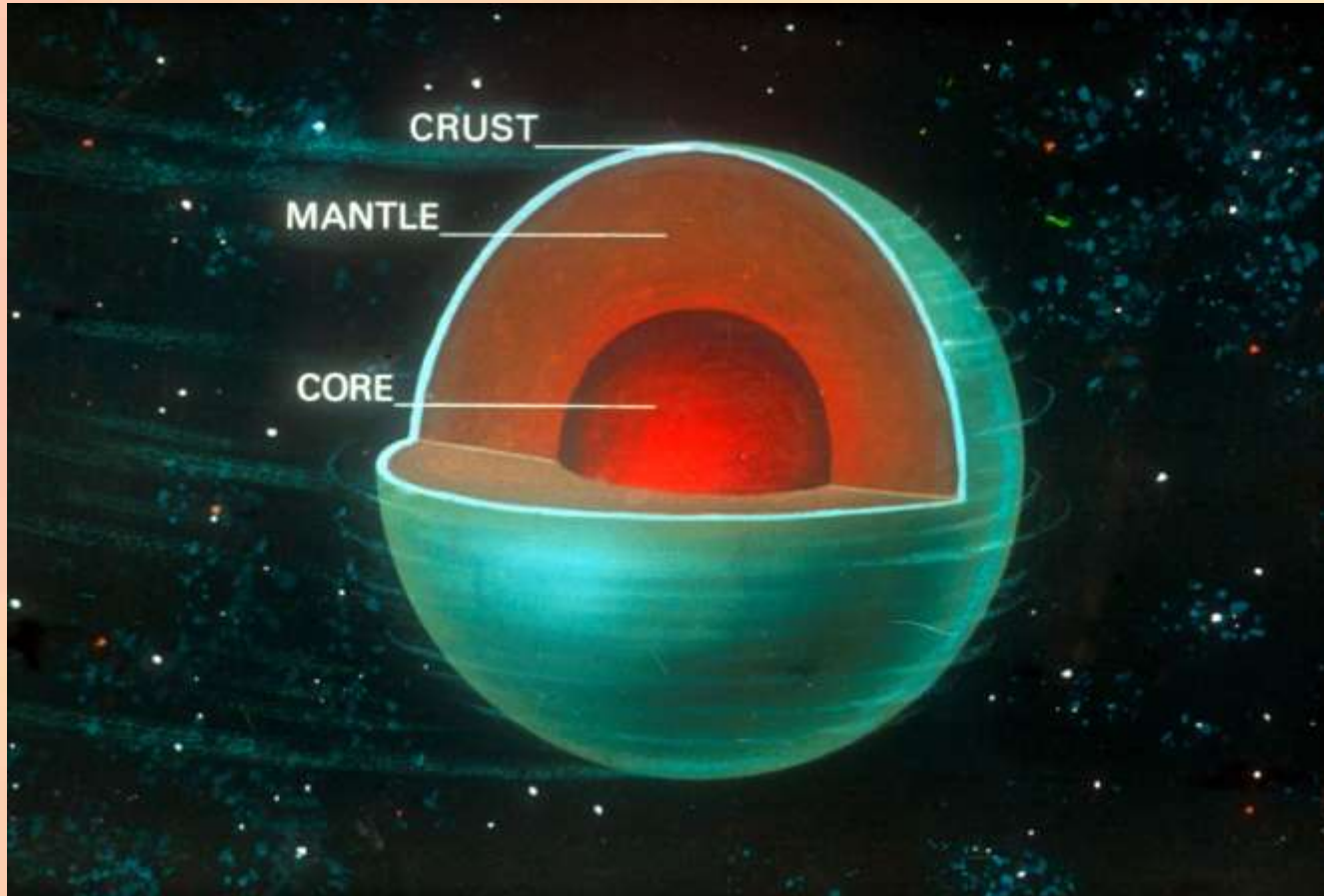


**Chris King,  
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# Interactive science teaching

- Either we can ask undergraduates to learn Earth Science

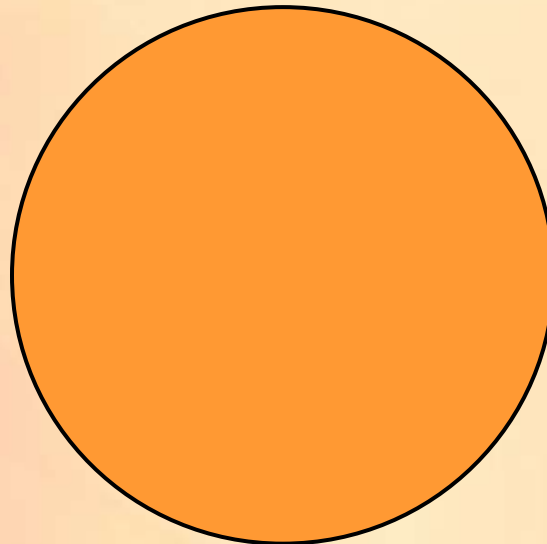
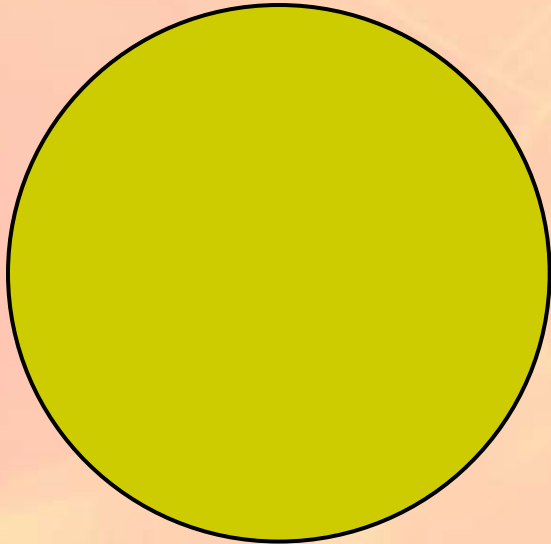




# Interactive science teaching

Or we can ask them to 'do' Earth science

- Two balls of different colours – what other differences are there?



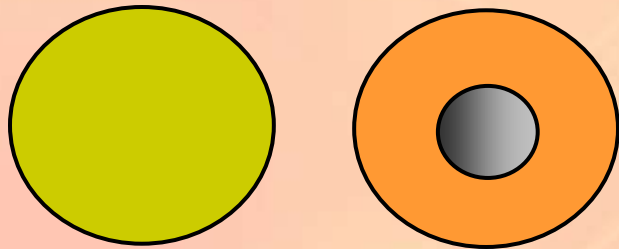
- Without destroying the balls, how could we test to find out which of the ideas is right – using the facilities in this building or in this city?



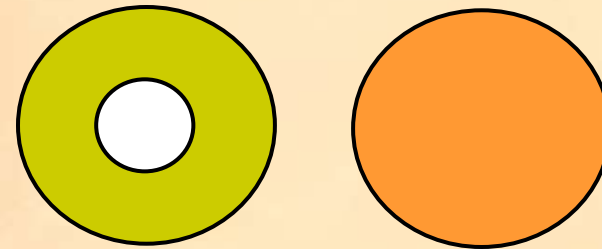
# Interactive science teaching

One feels heavier, and it is - reasons could be:

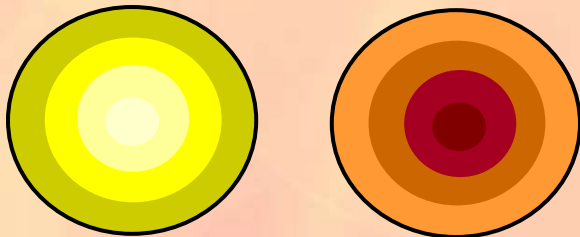
- something heavy in the centre of the heavy one



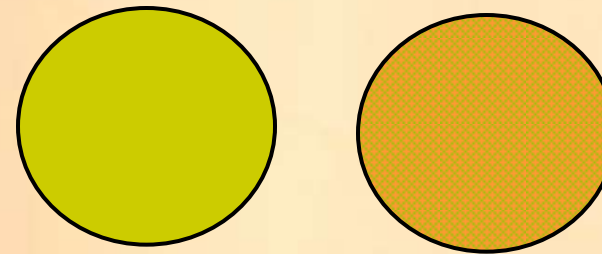
- something light in the centre of the light one



- one gets steadily heavier (or lighter) towards the centre



- one is made of heavier 'stuff' than the other





## Interactive science teaching

How could you find out which is right - without destroying the ball?

- Stick a pin in
- Magnetism
- Inertia
- Ultrasound
- X-ray
- Radioactivity

Which of these could you use on the Earth in an attempt to find out what is in the middle?



# Interactive science teaching

Which of these could you use on the Earth to find in an attempt to find out what is in the middle?

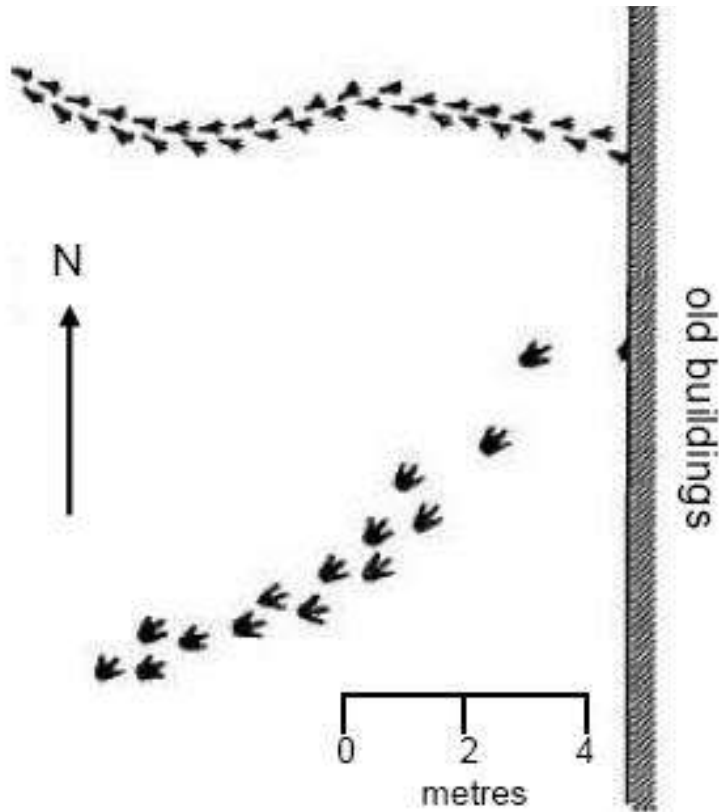
- Stick a pin in - no, can't drill that deep
- Magnetism - yes, measure and interpret effects
- Inertia - yes, measure and interpret effects
- Ultrasound - no but 'infrasound' or lower frequency seismic waves do give important information
- X-ray - no, can't penetrate that far
- Radioactivity - no, can't penetrate that far
- This shows how we can 'do' Earth science in the lecture theatre – rather than simply learning about Earth science

# Interactive science teaching: the meeting of the dinosaurs





# The meeting of the dinosaurs – 100 MA ago



Imagine that the ground near your school is being dug up to build a new football pitch. As the old buildings are removed, the footprints shown on the map are discovered in the rocks below.

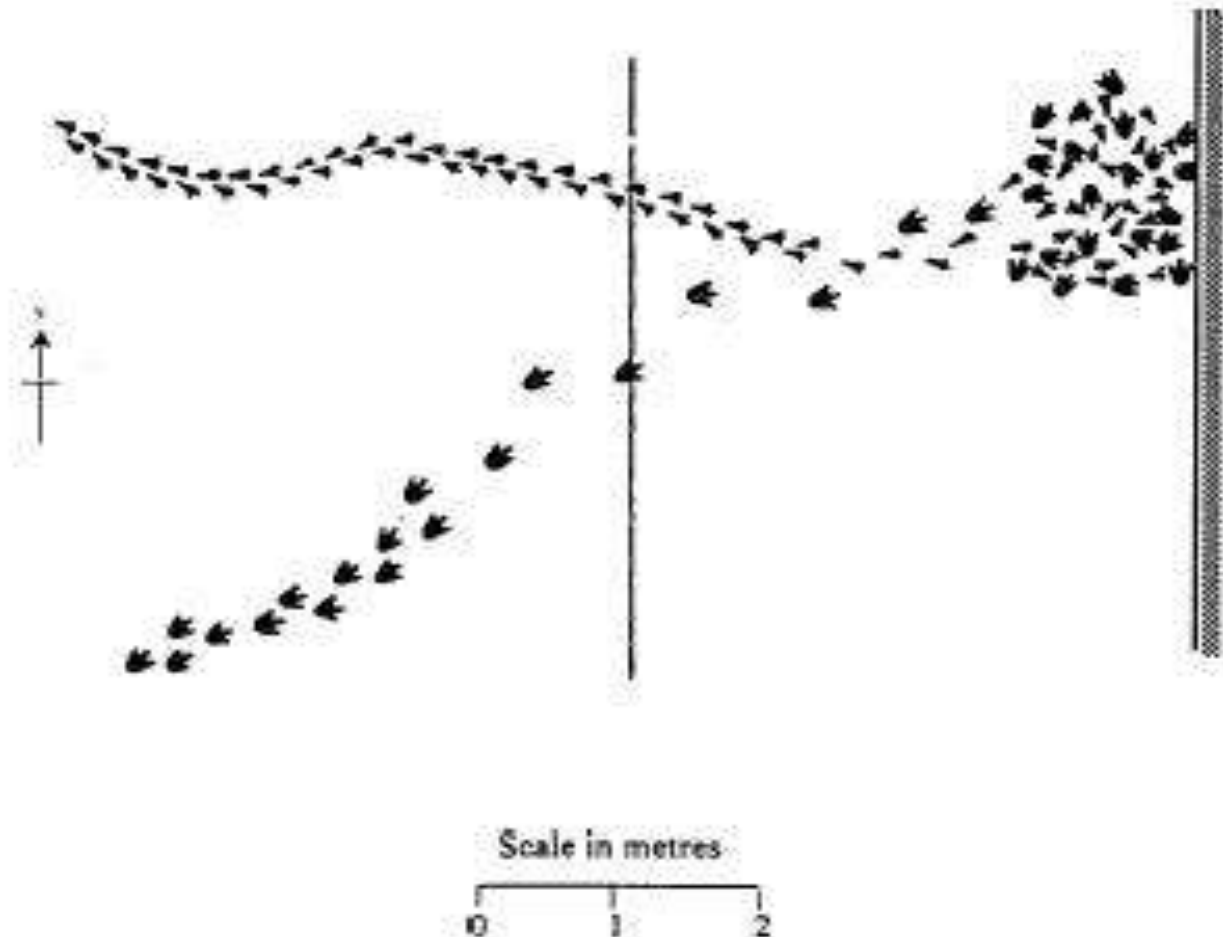
What do the footprints tell you about the two dinosaurs?

- What do you think happened to the two dinosaurs where the ground is hidden by the buildings in the east? - three different ideas?
- What evidence in support of your ideas would you expect to see when more of the footprints have been uncovered? - evidence for each of your three different ideas?





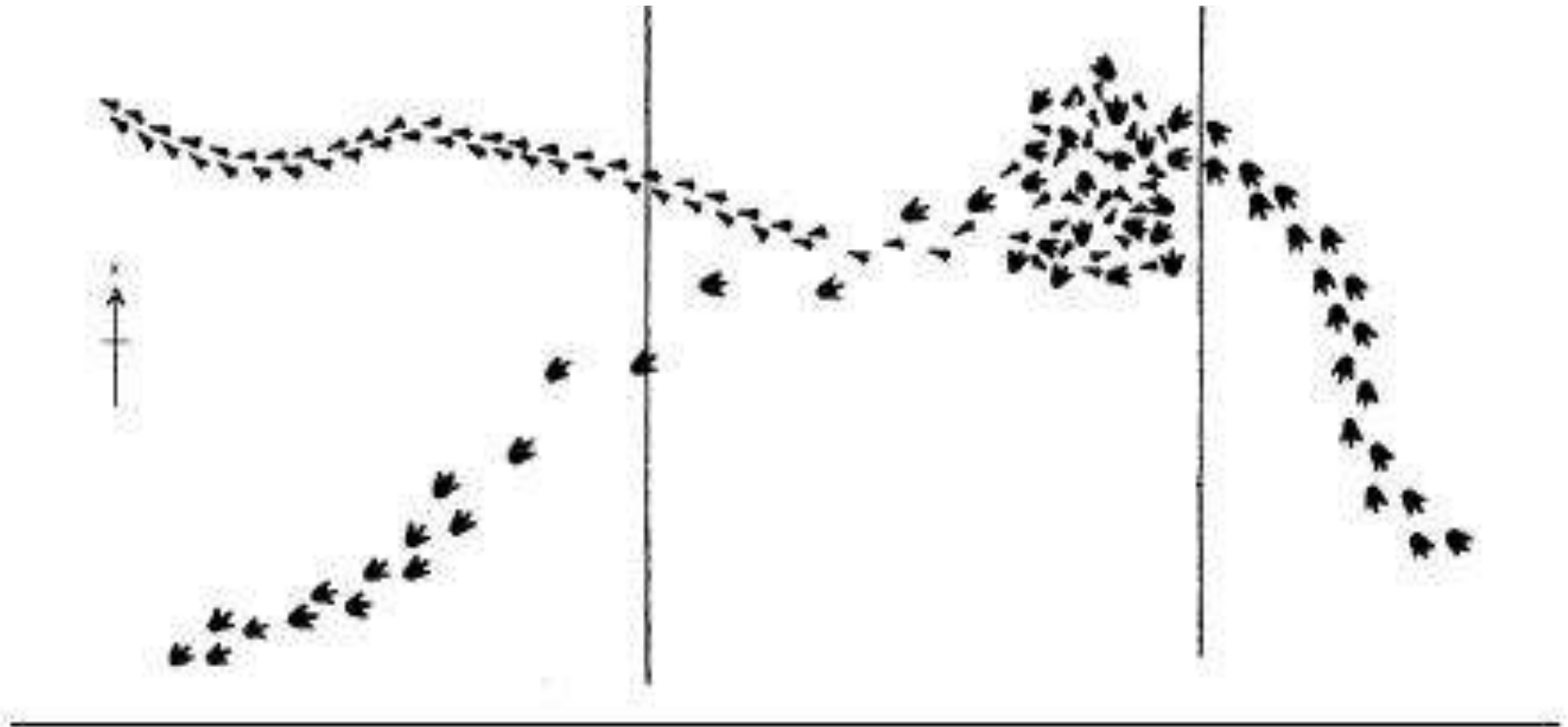
# The meeting of the dinosaurs – 100 MA ago



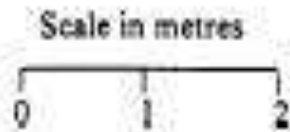
- Which of your ideas best fits the new evidence?
- What do you think happened to the two dinosaurs in the ground which is still hidden? - three different ideas?
- What evidence in support of your ideas would you expect to see when more footprints have been uncovered?



# The meeting of the dinosaurs – 100 MA ago



- Which of your ideas best fits the new evidence?
- Will we ever know what really happened?



- Have we got a better idea of what happened than at the beginning?
- Is this learning science or doing science?

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