

Models of the World

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A little exercise

- Please write down brief answers to the questions on a piece of paper
 - One sentence answers, at most
 - Do not confer
 - Do not ask for clarification
 - The answers may be obvious. These are not 'trick' questions.
 - You don't need to put your name on the paper!!!

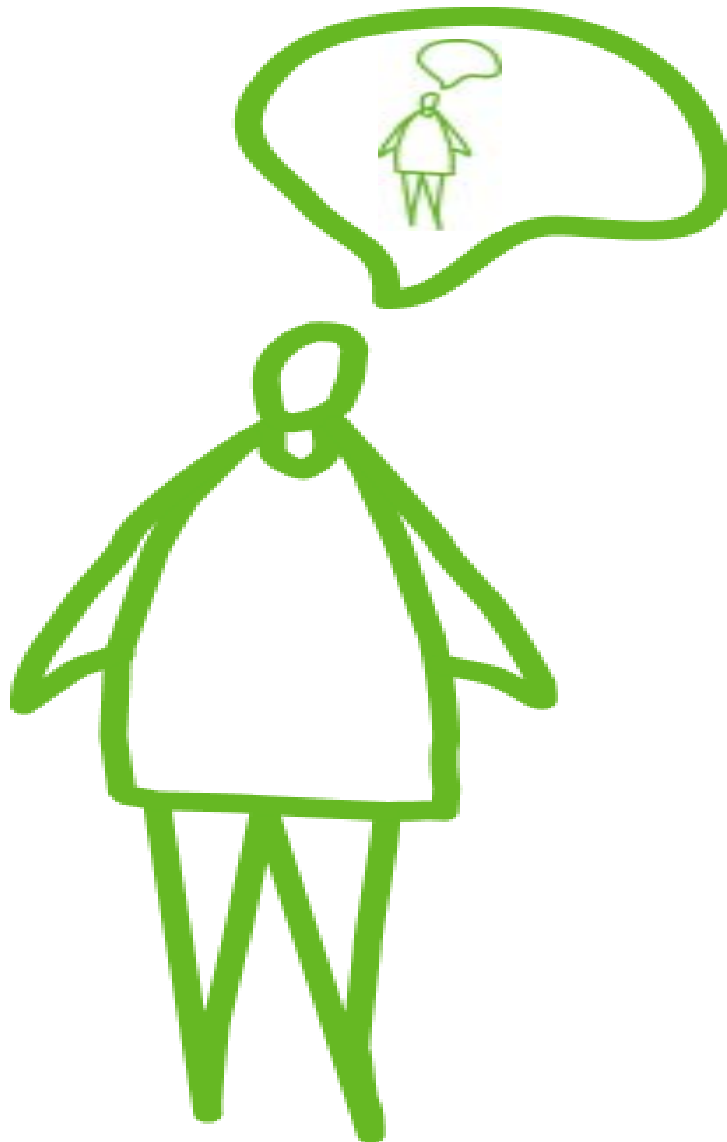
A little exercise

1. How big does an ordinary mirror need to be so that you can see all of yourself in it?
2. A little seed weighs next to nothing. A tree weighs lots. Where does the weight of the tree come from?
3. Why is it hotter in summer than in winter?
4. Now please scribble a diagram of the solar system and the way the planets orbit

I want to understand how the world works

- “How do you learn to be a scientist and invent things?”
- Real watches, mental watches

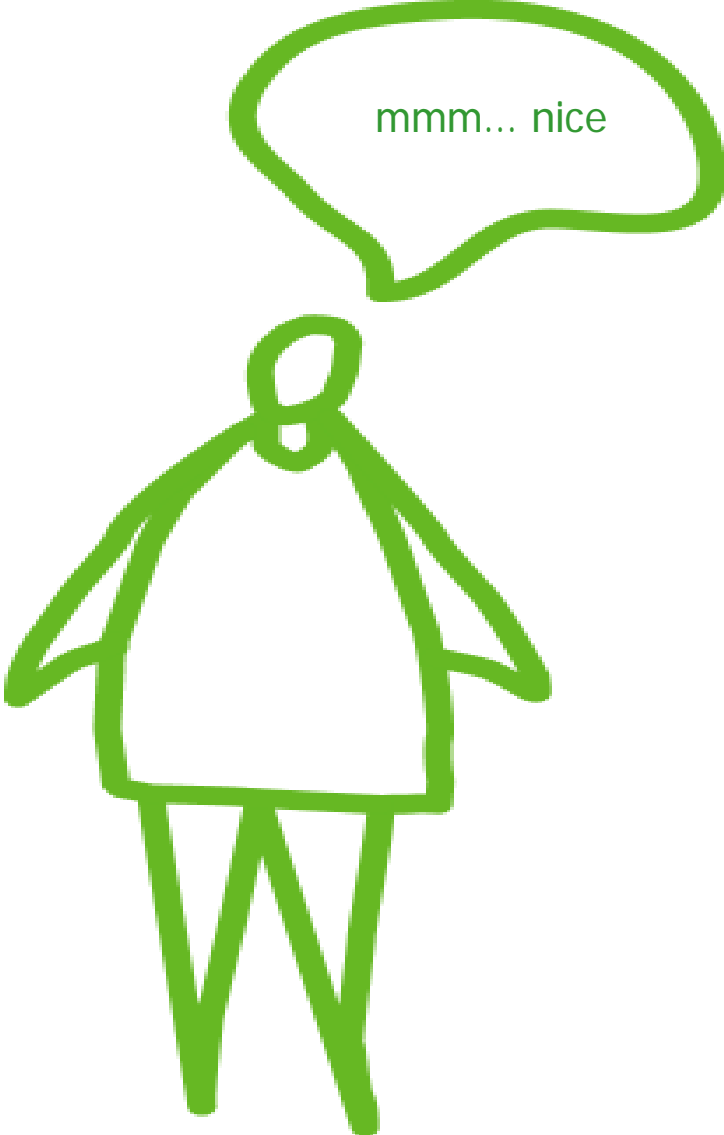
Thinking about thinking about the world...



We need to understand things in lots of ways

- This isn't just about science
 - But consider the primary school teacher
- Need multiple models
 - A selection of analogies
 - Analogies must relate to what we already know. But we all know different things
- Engage many senses
 - Post-It programming
 - Use the right media

Bad Models, Good Models





Bad Models

- Tomorrow's World
- La Villette Science City
- The Wellcome Wing

- Machined titanium, glass, of-a-piece, magic, behind-the-scenes, professional, blue

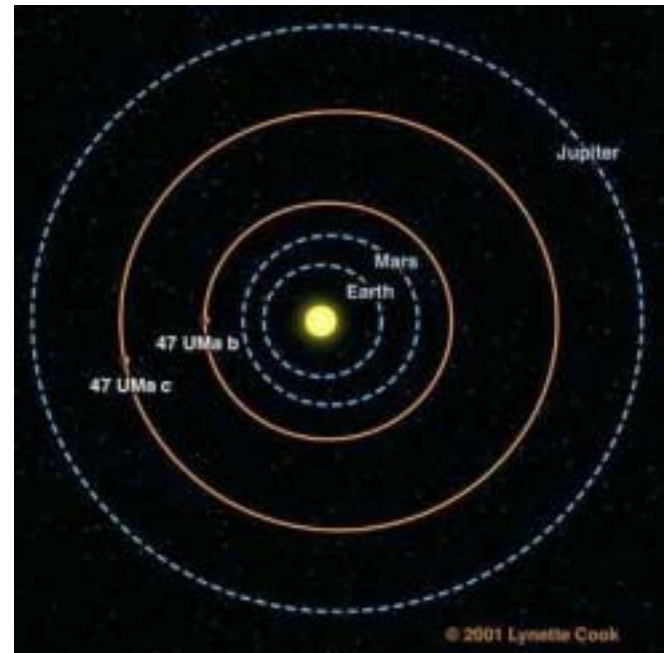
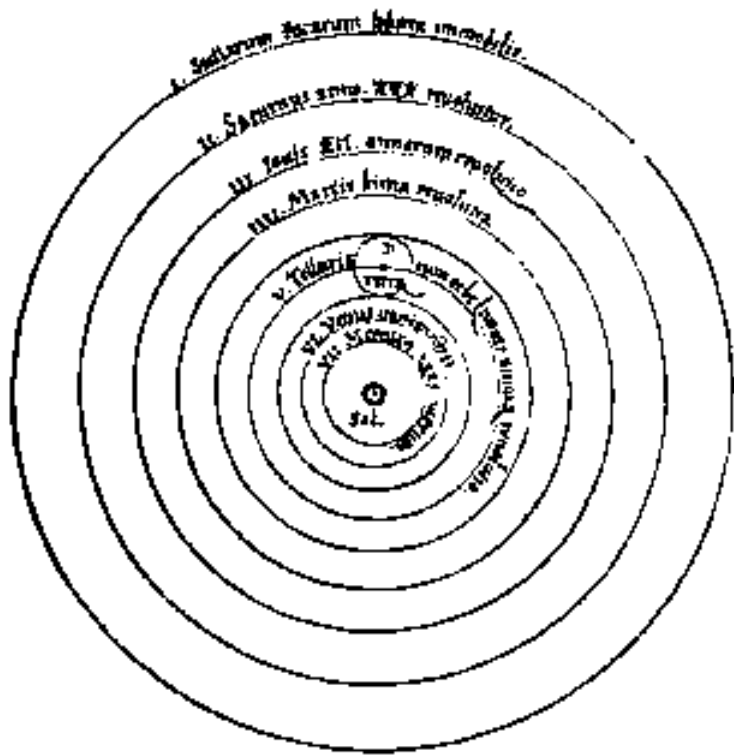


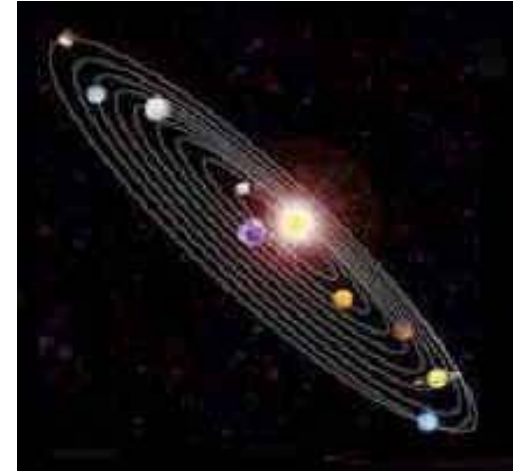
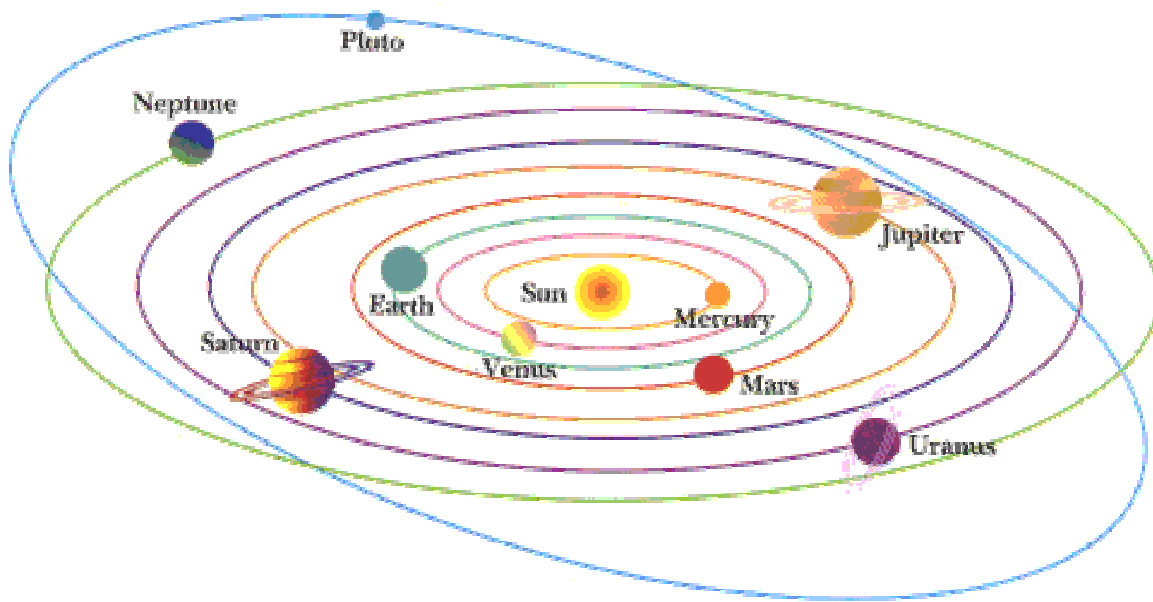
Good Models

- Local Heroes (plus 2nd vid if time)
- Exploratorium
- Drainpipes, bits of wood, stuff, bodged and stuffed, fiddled-with
- Amateur
- Transparent processes for building the models

Good analogies and good models may not be enough

1. How big does an ordinary flat mirror need to be so that you can see all of yourself in it?
2. Why is it hotter in summer than in winter?
3. A little seed weighs next to nothing. A tree weighs lots. Where does all the stuff come from that makes the tree?





Even with good analogies and good models, we can fail

- Children are not empty vessels
- Early mental models are extremely persistent
- We collude. We design tests badly
- Science explanation often fails unless learners' simulations of the world can be understood and sculpted

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