

Why is Materials Science so Awesome? – Family Notes



By Jessica Tjandra

Dr Eleonora D'Elia (Imperial College London) introduces Materials Science and why it is such a varied (and accessible) subject.

https://youtu.be/9BDS6X_DeNI

Suggested age range: 11-14, 14-16, 16-18

Resource description

In this video, Dr Eleonora D'Elia, a teaching fellow at Imperial College London, gives an introduction on what materials science is all about and how it is all around us. She starts by highlighting what materials scientists do in different industries, then gives a few examples of smart materials. Lastly, she explains how a student can apply for a Materials degree in different universities in the UK and what Materials graduates do after completing their degrees.

- Introduction 0:00
- About Dr Eleonora D'Elia and how she got into materials science 0:48
- What is materials science? 3:22
- All about chocolate 4:51
- Dinosaurs' hearts 6:37
- Smart fabrics 7:31
- Smart materials in nature – butterflies and seashells 8:47
- Superlight materials – aerogels 13:10
- Self-healing materials 14:49
- Shape-changing materials 17:23
- Sensing materials 19:57
- How materials science saves lives 22:47
- Materials for aerospace applications 23:03
- Biomaterials and bioglass 24:31
- How a student can apply for a Materials degree 26:40
- Job opportunities as a materials scientist 27:55
- Conclusion and Q&A 28:52

Using the resource at home

- This resource can be used to introduce the field of materials science. This can be followed by an at-home experiment of other smart materials, such as the cornstarch-water experiment (<https://www.youtube.com/watch?v=mYTerCbDUzE>). This experiment shows how non-Newtonian fluid works. The cornstarch solution's viscosity increases with applied force, so it behaves as a liquid without any force (e.g. at rest) and as a solid with applied force (e.g. when punched/stirred).

Some activities to try at home

These are suggested activities to help back up the resources on this website. Discover Materials

cannot be held responsible for any injury caused as a result of trying these

Try out this cornstarch-water experiment: mix 1 part water with 2 parts cornstarch in a bowl. Try mixing it with a spoon. Try punching the solution with your fist. Do you agree that this is a smart material? Why?

https://www.exploratorium.edu/science_explorer/ooze.html

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Other similar materials include silly putty and kinetic sand.

Where to find examples for class

SHALL I PUT IN THE SORT OF THINGS THAT TEACHER / FAMILIES SHOULD LOOK FOR IF THEY WANT TO GET HOLD OF SOME OF THE SMART MATERIALS?

Further Questions?

Please email: info@discovermaterials.uk or leave comments in the comments box below on how you used the resource, what else you would like to see and how you think it could be improved.

To look at the [Notes for Teachers](#) for ideas of how this topic can be explored in the classroom.