

Aim - To test the properties of materials and understand why they are used

Watch this short BBC clip first

<https://www.bbc.co.uk/bitesize/topics/z4339j6/articles/zx8hhv4>

Why are different materials used in my Joe Wicks PE kit?

Have you ever wondered why sports kit manufacturers use all the different materials they do? They are always telling us that their kit is the best and that they have used super scientific materials to make their trainers faster or their t-shirts better to train in than anyone else's.

Well now is your chance to find out why they use the materials they do.

For this investigation you will need your trainers and PE t-shirt.
(It doesn't have to be your school PE kit, in case you are wondering!)

You are going to investigate the properties of each material and work out why they are used.

The Investigation

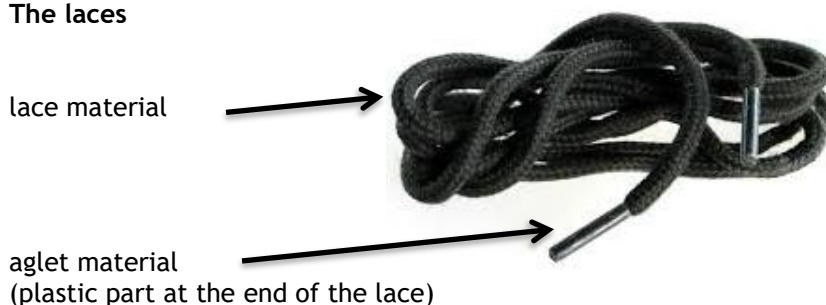
Remember to be safe when doing this test and wash your hands after investigating your trainers.

Look at each different material used in your trainers and PE t-shirt. Be a scientist and look closely, use your hands to feel the materials and use your eyes to examine the material.

The trainer



The laces



You have lots to think about!

Tests

- Hardness: Feel the object to see how hard or soft it is. For example, metal would be very hard 5 and cotton wool would be not very hard 1.
- Flexibility: Carefully bend the object to test its flexibility. Cotton t-shirt material would be very flexible 5 and concrete would be not very 1.
- Bounciness: Does it feel bouncy when you try to squash it or when you wear it? A Powerball or tennis ball would rate very bouncy 5 and a piece of wood would rate not very 1.
- Breathability: Does it have lots of tiny visible holes (look very closely) and does it feel cool when you wear it (it lets out heat and sweat easily)? A net would rate as very breathable 5 and Wellington boot would rate as not very 1.

Remember to be safe when doing this test and wash your hands after investigating your trainer.

Results

To save printing, you can draw this table or you could create your own on a computer or tablet.

Material	Property			
	hardness 1-5	flexibility 1-5	bounciness 1-5	breathability 1-5
t-shirt				
trainer upper				
trainer midsole				
trainer sole				
trainer laces				
lace aglets				

5 is very ... and 1 is not at all ...

Conclusion

Why do you think why each material was chosen to make the object? I have done one for you.

t-shirt	The t-shirt is soft, flexible, and breathable because you need to be able to move easily in it and keep cool while you are exercising. It doesn't need to be bouncy, as it isn't used on your feet where the bounce is needed when you are exercising.
trainer upper	
trainer midsole	
trainer sole	
trainer laces	
lace aglets	