



## Soil, Dirt and Dust- Teacher's Notes

### Soil, Dirt and Dust

**Note: this is not for the squeamish!**

#### Definitions

**Soil** is the topmost layer of the Earth's crust consisting of unconsolidated products of rock erosion and organic decay, along with bacteria and fungi.

**Dirt** is soil in the wrong place.

**Household dust** is fine, dry loose material found in houses. (See below for gross information about household dust). Approximately 70-90% of it is made of dead skin cells that healthy humans shed every day. The rest is fine soil.

**Skin** The largest organ of our body is skin. (16% of your bodyweight). Skin is the body's first barrier against disease and provides a natural layer of waterproofing. We continuously replace the lost outer layer of dead cells from new cells grown below. It takes about a month for a new cell to work its way to the surface. Humans lose between 30 to 40,000 dead skin cells each hour. We lose 4kg of skin per year.



*Skin texture magnified 400 times*



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### Activity: My dead skin

#### Materials

- Dry skin on the back of a human hand.
- Hand lens or magnifying glass.
- A strip of clear sticky tape about 3cm long.

#### Method

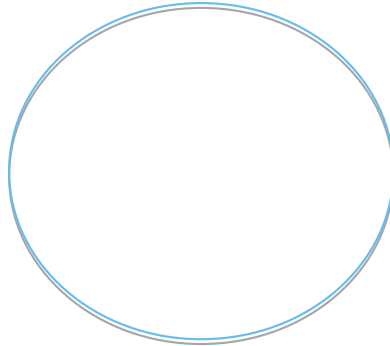
1. Ensure students' hands have been dry for some time, as wet skin does not provide sufficient information.
2. Remind students to hold the glass in front of their eye (resting on their cheekbone) so that they can look through the eyepiece.
3. Then they bring the back of their other hand close to their face until the skin of the back of their hand comes into clear focus. This is usually about 2cm away. The eyepiece has not moved from the cheekbone. Only the object viewed moves.
4. Make sure the skin is well lit and not in shadow. (Usually this means having a light behind you). If classroom illumination is low, move students outside.
5. Sketch what the skin surface looks like in the circle below.
6. Cut off about 3cm of clear Sellotape or sticky tape and view the sticky side with the lens.
7. Place the tape over the skin at the back of your bent elbow. Rub gently and remove.
8. Look at the tape surface and see if it has changed. **The tape will be covered with a fine dusting of dead skin cells.**





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### Observations



*Skin on the back of my hand*

The skin from my hand looked **pale, flaky, made up of many cells.**

The tape had changed. It **was covered with a fine white dusting of dead skin cells.**

**A generous teacher may allow students to study fine the hairs on the back of their hands and view the skin on their knees. Scars and freckles are particularly noteworthy!**

If you lose 30,000 skin cells per hour and you sleep for 8 hours per night, how many skin cells would you lose every night?

$$8 \times 30,000 = 240,000 \text{ cells}$$

### **Gross information about household dust:**

1. When we shower some of our skin cells are washed off and go down the drain. Other dead cells are rubbed away by the towel. Regular washing is important as old dead cells can mix with sweat and create a very attractive meal for bacteria that live on your skin. As these bacteria digest their food they produce a foul smell that we call body odour or BO.
2. Some people wash and exfoliate too much and remove their protective layer of cells. They open their bodies to infection.





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3. House mites are tiny arthropods, which feed on our dead skin cells.
4. Mite faeces (poo) and body parts commonly cause asthma and other allergic reactions.
5. Mites thrive in temperatures over 21°C and humidity over 50%, so our hot sweaty bodies and beds are perfect for them.
6. Up to a third of your pillow could be made of bugs, dead skin, house mites and their faeces. That is why it should be washed regularly and replaced every two years.
7. All bed linens, including pillows, should be washed in very hot water to remove mites and their eggs. Water must be above 50°C. Sheets should be washed at least every two weeks. Pillows should be aired in sunshine to kill mites and decrease humidity.
8. Bed linen should be aired every day - so that's a good excuse for not making your bed but don't just crawl out of it, throw back the sheets to expose the little beasties to drying air.



### Quick class survey

Enter your results a scale of one to five, one being "not at all" and five being "lots",

	1	2	3	4	5
How much did you learn about dust?					
How much did you enjoy the activity?					

Collect all the students results so they may see how their answers varied from others.





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We all did the same experiment. Why do you think our results varied?  
Everybody started with a different level of prior knowledge. Enjoyment is a very personal experience.



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