

## Teacher Activity H: Working with very large or very small values

The standard unit of length is the metre, but lengths that are much larger or much smaller can also be re-expressed in two ways:

- by using a different unit (e.g. km)
- by using standard form (scientific notation) that involves using powers of ten (e.g.  $10^3$ ).

a) In this example, which way of expressing the values do you think is most effective? Why? (The table shows five possibilities for pairs of values.)

*The thickness of a human hair is about \_\_\_\_\_, and the diameter of a white blood cell is about \_\_\_\_\_.*

	Thickness of human hair	Diameter of white blood cell
1	0.0001 m	0.000 01 m
2	0.1 mm	0.01 mm
3	0.1 mm	10 $\mu$ m
4	100 $\mu$ m	10 $\mu$ m
5	$10^{-4}$ m	$10^{-5}$ m

b) In this example, which way of expressing the values do you think is most effective? Why?

*The power rating of a typical charger for a mobile phone is around \_\_\_\_\_, The power rating of a typical electric oven is \_\_\_\_\_. The output of a single generator in a power station is around \_\_\_\_\_.*

	Mobile phone charger	Electric oven	Power station generator
1	5 W	3000 W	200 000 000 W
2	5 W	3 kW	200 MW
3	5 W	$3 \times 10^3$ W	$2 \times 10^8$ W

Further information: *The Language of Mathematics in Science: A Guide to Teachers of 11-16 Science*, Section 2.6 Dealing with very large and very small values (pp 20-21)

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