Best Practice Guidance
Guidance on using mathematics in science

Context

Mathematical literacy is a key skill in understanding, analysing and communicating science.

The position of ASE

- Opportunities for developing mathematical skills for science should be central to all science curricula.

- The mathematical skills used in learning science need to be taught in science contexts.

- Where possible the language and procedures used by teachers in science lessons when teaching mathematical skills should reflect those used in mathematics lessons. See the ASE publication Language of Mathematics in Science.

Best practice should seek to include

- Explicit use of mathematical skills during science activities. Primary colleagues who teach both mathematics and science to the same children will be in a stronger position to refer to these skills.

- A common approach to teaching mathematical skills by different teachers teaching science in the same school.

- In primary education, a balance needs to be maintained between time spent developing scientific understanding in science lessons and developing mathematical skills. Science lessons are not an excuse to teach more mathematics, but to use mathematics in the learning of science.

- In secondary education, teachers should be aware of the mathematical skills children bring to science lessons from their primary schools. These are from both the mathematics curriculum and the mathematical skills children will have used in primary science lessons e.g. presenting data using tables and graphs, measurement, and the use of units.

- Awareness that science can provide a context for learning mathematical skills and promoting collaboration between mathematics and science teachers.

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- That when teaching new mathematical skills in science, we should use familiar science contexts (and vice versa). This reduces the conceptual demand while the skills are insecure.

The mathematical skills used in science include:

- Collecting data

- Doing calculations and representing values

- Choosing how to represent data

- Drawing charts and graphs

- Working with proportionality and ratio

- Dealing with variability

- Looking for relationships between variables

- Scientific models and mathematical equations

Examples where scientific understanding could be developed through an understanding of mathematics are:

- Finding a mean and other ways of dealing with variability in data

- Finding a value from a graph which has not been measured directly

- Calculating an unknown value from two measured values e.g. speed

- Rank order a series of values to find a trend or pattern

These can be introduced and practised during the primary phase and become increasingly important during the secondary years.

Links

[Mathematical skills in science](#)
Resources for science teaching linked to the four areas of: algebra, graphs, arithmetic and numerical computation and handling data. The link implies that these materials are for students taking Triple Science, however these skills are important for all.

[NCETM Primary magazine teaching resources](#)

[NCETM Secondary magazine teaching resources](#)

[Cross curricular topics](#) resources organised by primary age group, have some science activities that lend themselves to developing mathematical skills

Two 'Primary Science' journal articles illustrating the power of mathematics in science (for ASE Members)

1. [Science + Maths = a better understanding of science!](#)
2. [Cornflour gloop and fizzy potions …making counting count!](#)

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