



Phizzi focus

Using technology when working scientifically

When carrying out enquiry work linked to the areas of physics in the National Curriculum there are many opportunities for children of all ages to develop working scientifically skills linked to the collection and analysis of data. The increasing availability of technology in primary schools provides a wide range of opportunities for children to measure a broad range of physical quantities to help them in answering their scientific questions. This Phizzi focus includes inspiration and links for teachers to plan opportunities for young learners to use technology when working scientifically around physics themes.

Apps for measuring

There are a wide range of measuring apps that can be downloaded to tablets in schools for children to use when carrying out enquiries, many of which are freely available. Children can use tablets to measure quantities such as the brightness of light, and volume and pitch of sound.

Key Stage	Quantity to measure	Possible lines of enquiry	Available apps
KS1	Brightness	<ul style="list-style-type: none"> Which materials are best for curtains to block the light? 	Lux: Light Meter FREE Age rating: 4+
	Volume	<ul style="list-style-type: none"> Which materials are best for making ear defenders? 	Decibels: Elegant Sound Level Meter Age rating: 4+
KS2	Brightness	<ul style="list-style-type: none"> Which sunglasses are best for protecting our eyes? Which materials reflect the most light? How does the brightness of sunlight change over time? 	Lux: Light Meter FREE Age rating: 4+ Arduino Science Journal Age rating: 4+
	Volume	<ul style="list-style-type: none"> What factors change the sound produced by musical instruments? How do sounds change as you move further from the source? How does the volume of sound in our classroom change over time? 	Decibel X Age rating: 4+ Arduino Science Journal Age rating: 4+
	Pitch	<ul style="list-style-type: none"> What factors change the sound produced by musical instruments? How does the length of a boom whacker/tuning fork affect the pitch of the sound it produces? 	Arduino Science Journal Age rating: 4+

It is important to select appropriate apps for the age group of children you are working with. Children in Key Stage 1 can use measuring apps when investigating how materials affect light and sound, for example the Decibels: Elegant Sound Level Meter allows younger children to measure the volume of sound to the nearest 10dB and then capture photos of their measurements to record their data whereas apps such as Decibel X will enable older children to record measurements to one decimal place. The table (previous page) suggests some free apps that could be used in the primary classroom.



Data analysis

The National Curriculum for computing aims that all Key Stage 1 and 2 children should understand and apply the fundamental principles and concepts of computer science for data representation. Providing opportunities for children to use simple spreadsheets to organise and analyse the data they collect when working scientifically is an effective way to develop their computing skills while making it easier for them to deal with larger data sets.

Spreadsheet software also provides efficient opportunities for Key Stage 2 children to create bar charts, line graphs and scatter graphs in an efficient manner so that they can analyse trends in their data and use these charts and graphs to help them draw conclusions and evaluate their data.

Data loggers

The National Curriculum explicitly states that Key Stage 2 children should make systematic and careful measurements and, where appropriate, take accurate measurements using standard units, using a range of equipment, including data loggers.

There are a range of data loggers available that are designed for use in primary schools that are compatible with PC, Mac, iPad, Android tablets and Chromebooks. These data loggers come with a range of sensors such as voltage, temperature, light, sound, timing mats and heart rate sensors, which can link to a wide range of National Curriculum science statements. Schools that do not have access to this equipment can still provide data logging opportunities for children while they are carrying out observing over time enquiries by using free apps such as [Arduino Science Journal](#).



Data loggers in action

“At our school we use EasySense Vu+ data loggers. We find that features of the data loggers and the software package grow with the children in our school and are quite intuitive and easy to use for both children and teachers.

Key Stage 1 children can easily use the pictogram, blocks and bars representation to collect simple data to help them answer their scientific questions, working with age-appropriate numbers so they can apply their maths skills to their science enquiries. It is really helpful that they can be used to gather stand-alone measurements as well as having the data logging facility that allows children to collect data over time.

Having been regularly given opportunities to use the data loggers in Key Stage 1, we find that our Key Stage 2 learners become confident in using them independently and will often plan to use them to collect data when planning their own enquiries. Having the ability to adjust the settings so that children are working with measurements to the appropriate place value means that children can collect data that they are able to work with.

The accompanying software that allows real-time data to be displayed on the interactive whiteboard helps to engage the whole class in preliminary tests and demonstrations by recording data and using it to answer questions.”

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