Key Stage 1 – *Visual Information* – Theme Guide

Children investigate how we derive information from different sources. They create graphs and charts and make general statements. They use data-loggers to explore environmental conditions. They organise objects using branching databases. They explore how computers might sort objects, noting the process of Repeat. They build eSafe practice.

Learning objectives for the term
To understand that information exists in many different forms.
To understand that information in graphs can be simpler to understand than written text.
To understand that the tools within graphing software can be used to present detailed information clearly. *Include labels on axes.*
To understand that mistakes are easy to make when gathering and recording information.
To understand that technology can sense conditions around us.
To understand technology can record changes in conditions around us and we can use this to make general statements. *Consider why the data-logger uses a continuous line to show the results.*
To understand objects can be sorted according to a property.
To understand that yes/no questions can provide useful information and can help us make decisions.
To understand that branching databases can be used to organise objects and to identify them using yes/no questions.
To understand computers use repeated processes to sort objects.
On-going Learning Objectives
To talk about the choices they made. Revisit and refine their work.
To log on to the school system and save, locate and edit work using their own space; understand how and when to print.
To ask permission before taking or using images of others.
To use technology safely and increasingly respectfully, knowing how to respond if anything they access makes them feel uncomfortable or worried.

Vocabulary – see Glossary for definitions (for terms in blue)	
pictogram, *bar chart,* *line graph,* *sensor,*	*algorithm,* *repetition,* *branching database,* *data-logger*

Possible resources for this theme (further resources are suggested with the explanatory notes below. Note that these are examples and not formal recommendations.)	
Pictogram / Bar Chart software • 2Count and 2Graph (as part of 2Simple Purple Mash) • Maths City 2 (as part of 2Simple Purple Mash) • RM Starting Graph • JIT5 Chart / Pictogram (as part of J2E) **Branching Database Software** • Ask Oscar • Textease Branch • 2Question (as part of 2Simple Purple Mash) • JIT5 Branch (as part of J2E)	**Data-loggers** • TTS Log-Box • EasySense Vu (Data Harvest) • Primary V-Log8 (Data Harvest) **iPad apps for 'sensing'** • Decibel X • Free Lux / Light meters (several available) • Too Noisy Starter • Free Seismometer apps (several available) **Tool for creating a sign or label** • Powerpoint • Book Creator app (iPad / Android / Windows) • 2Simple tools (as part of Purple Mash) • JIT5 Mix (as part of J2E)

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Primary Computing Scheme online materials that are referenced in this guide can be accessed from:
http://www.hertsforlearning.co.uk/user/login

You will need to be logged into your school account and have a current subscription to the Primary Computing Scheme to gain access. The materials can be accessed from the *My Resources* link at the top/right of the screen, once you are logged in.

Key learning objectives (some objectives might be used for more than one lesson)
To understand that information exists in many different forms.
• Where do we get information from? How can technology tell us things? Create a mind-map or similar to show how technology can give us information or "tell us things". (Television, radio, screens in school reception, at a station, in airports, calculator, self-checkout scanner in supermarket, road signs etc.) • How do people with different needs access information from technology. For example, talk about subtitles on TV/films, speech support on tablets/iPads® or in some writing software and use of graphics to convey meaning without words. • Pupils use a suitable program or app to create a sign or label to convey information, thinking about how other people will understand it and being able to explain what they have done to make it understandable (e.g. the use of images.) You could link this to another topic or subject area.
To understand that information in graphs (e.g. pictograms, bar charts etc.) can be simpler to understand than written text.

• Link to maths and/or science. Show some different examples of graphs, for example collection targets, temperature charts etc. and ask questions that children can answer from the graphs. You could quickly produce your own using simple graphing software or use ready-made examples. E.g.:
  ○ Temperatures across a year – what is the coldest / warmest month?
  ○ PTA funding target – how much more do we need to raise?
  ○ TV viewing figures – what is the most popular programme?
  ○ School lunch choices. Which choice is most popular today?
  ○ Etc.
• Which sort of graph do you find most useful to answer specific questions and make generalisations? Try to show the same data displayed in different ways, e.g. in a bar chart and a line graph.

To understand that the tools within graphing software can be used to present detailed information clearly. *Include labels on axes.*

• Pupils collect data, where possible that links to another subject such as science. They enter the data into simple software.
• Examples could include:
  ○ Transport used to get to school.
  ○ Pets in the class.
  ○ Favourite TV programme or website.
  ○ Eye or hair colours in the class.
• Pupils use a primary-friendly graphing tool to present the data as information in graphs etc. making sure they name and label the graph so that other users can understand its meaning. See suggested software above.

To understand that mistakes are easy to make when gathering and recording information.
• Check their own and others' graphs for mistakes. They verify the data which they and their peers have used to make their graphs and charts. • Talk about the advantages and disadvantages of using technology for graphing. How do the graphs and charts help us? Is it easier to make a graph using a computer, or with pencils and paper? Why? • Some graphing tools for children allow you to instantly change the type of graph, using the same data. Pupils could try creating different types of graph for the same data and talk about which they think is most effective.

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To understand that technology can sense conditions around us.

- Technology can 'sense'. For example just as we can say whether a sound is loud or soft, a sound sensor can show the difference between loud and soft sounds and can display this is different ways, such as using colours or numbers.
- There are many different 'sensing' apps available for tablets / iPads and even some that are web based and use devices attached to a desktop / laptop computer. Many or free or low cost. See examples above.
- Most tablets / iPads® are able to 'sense' sound volume levels, light intensity and vibration/movement.
- Display some of these tools on the board to explore how we use them and how they display the information they are sensing. For example, many sound sensing apps work with a 'needle' moving clockwise around a dial, the louder the sound is.
- If data-loggers are available in school, these may also be used, particularly if they are the types that display live data on the logger screen. Some data-loggers have software that can also display live data when the device is connect to a desktop or laptop computer.
- Where might we use technology like this in the world around us? Examples might include:
  - Burglar alarms might have movement sensors to detect when someone is in the room.
  - The school car-park barrier might have a sensor to detect when a car is near, to trigger the barrier to open.
  - Thermometers / temperature sensors are found in a wide variety of systems, e.g. we have a thermostat at home to turn the heating on if it falls below a certain temperature.
  - Babies' bath thermometers.
  - Smoke alarms.
  - Supermarket doors open when you approach – they have a sensor that can detect a person approaching.

To understand that some technology can record changes in conditions around us and we can use this to make general statements. *Consider why the data-logger uses a continuous line to show the results.*

- Use an app (as described above) or data-logger to measure and record, for example, volume and/or light levels around the school.
- If data-loggers are available, you can usually set them to log across a specific period of time, so you could record the changes in temperature or light intensity across a whole day.
- Use the data collected to make a graph or chart and from this, draw conclusions.
- Where would data-logging technology be used in the world around us? (Particularly used in tracking and predicting weather conditions.)

To understand how objects can be sorted according to a property.

- To illustrate the concept, sort objects such as LEGO® bricks according to different criteria; colour, size etc. Carry out a simple sorting activity using physical objects.
- Demonstrate the question that we ask ourselves each time we take an object to sort it. Using just two colours of brick, show how we would ask ourselves the question, "Is it blue or red?" and we would respond by thinking, "If it's blue, it goes in the blue pile, if it's red, it goes in the red pile."
- As a class, discuss how a computer might carry out this task. A computing device goes through the same process when sorting objects. Think about where computing devices might sort objects in the wider world (e.g. on a factory production line or product packing line.)
- Play being a computer, carrying out a repeated sort activity. (For example, for each object the computer would ask the key question and then organise that object into one of the two groups.)

To understand that yes/no questions can provide useful information and can help us make decisions.

- Play yes/no questioning games to identify objects (for example twenty questions). Commercially available yes/no games might be used or you could just have one child choose to be a famous person or household object, which they keep secret. Their peers ask yes/no questions until they can identify the person or object the first child is being.
- Pupils write down the instructions (algorithm) for an imaginary robot to follow, in order to repeatedly sort objects into two piles. You could use the LEGO® example above or imagine the robot is in a factory, sorting sweets to pack into certain packages, or sorting vegetables to be packed according to size.
- Show how the instructions with the yes/no questions can be presented as a simple flow chart, that branches where the question is asked into two possible pathways, one for yes, one for no.

To understand that branching databases can be used to organise objects and to identify them using yes/no questions.

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- Create a branching database linked to a topic. This is often linked to science and identification keys.
- Start unplugged. Consider the questions which would be asked in order to sort certain objects and how the answer to the yes/no question leads on to the next question. This could be done on paper, using sticky-notes on a board etc. or using a program/app if available. Use to identify a set of objects.
- Pupils try following the branches to see how effective they are in identifying the objects.
- Together, review the questions they have used and consider how they could be improved.

To understand that computers use repeated processes to sort objects. Review some branching databases. Use a branching database.

- The above activities leads into children using a branching database program to explore some ready-made examples (which are usually provided with the software,) independently, to sort and identify objects related to an area of learning. See above for examples of branching database software.
- Reinforce that the repeated process is the yes/no questioning.

On-going Learning Objectives

To talk about the choices they made. Revisit and refine their work in the light of comments and suggestions from peers.

To log on to the school system and save, locate and edit work using their own space; understand how and when to print.

To ask permission before taking or using images of others.

To use technology safely and increasingly respectfully, knowing how to respond if anything they access makes them feel uncomfortable or worried.

Suggested independent task – any open-ended activity (2-3 sessions) enabling the children to demonstrate their computing capability around the knowledge and understanding provided in the term

- Use appropriate software to organise some existing data in a simple pictogram/chart. Use this to make some general statements about the data.
- Use a branching database to identify specific objects.
- Suggestive a “better” alternative for one of the questions in the branching database.

Other considerations:

Does the task provide for children to work at different levels?
Is there support available for children to select if they wish?
Are there opportunities for the children to review and develop their work?
Is there an opportunity for the children to evaluate the finished task?

- Pupils could work in groups to collect data, using an app or data-logger, from around the school. For example, they could detect different volume levels. They then, individually, use a simple graphing tool to present this data and write some conclusions which they can draw by looking at their graphs / charts.
- Ideally for the database activity you will create a simple branching database using a suitable program. Pupils use it to run through the series of yes/no questions.
- Put one or two questions which could be improved into the database, which children might identify and improve.
- See the sample independent task in the assessment area of the computing scheme online space, for this learning theme.

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