Teaching Resource :

Top tips for your investigations

4. DESIGNING SURVEYS

Guidance for Teachers...

"Designing Surveys" is one of **four interactive resources** designed to explain some of the simple strategies employed by real scientists whilst investigating. They represent good scientific habits which primary school children are able to learn. Exploring these will enhance critical thinking skills and give a major boost to your ESB Science Blast Investigations. Each resource can be used independently of each other. It's important to select the ones that are likely to be relevant to an investigation that you have in mind, and ideally they would be introduced to your class at an early part of the planning process.

Each resource consists of two parts:

1. **An animated video** that explains through example. Each video contains points where it should be paused to allow for class discussion and problem solving.
2. **A small group discussion exercise**. Learning is reinforced by challenging students to apply the new strategies in different contexts. Ready to print materials are available to support this.

The "Designing Surveys" resource introduces **two tips** that raise awareness of the challenges that may be encountered when developing questionnaires. We've called these strategies:

" Be a LEARNER, not a LEADER " & **" Be DATA WISE! "**

The thinking behind these strategies.

Designing questions for surveys may sound like a simple task but for scientific researchers it is a process that can be full of challenges. At ESB Science Blast we think that primary school is a good place to start developing critical thinking skills around this. By engaging with this resource we hope to awaken an awareness for creating more effective surveys in your investigations.

A survey should help you to collect accurate information about what people think or do. However, there is also a lot of psychology that can interfere with this. Our first tip "**Be a learner not a leader**" alerts you to one important aspect of this. **Ideally survey questions should to be neutral**, but that is not always easy, especially if you need to explain the context as part of the question. Quite often questions unintentionally sway peoples answers. For example, if you asked; "Most students think that online lessons don't work. Do you agree?" some people would be swayed by the idea of what "most students" think and be more inclined to agree. If you phrase the question as "Online lessons don't work. Do you agree or disagree with this statement?" there is a better chance that people will express their opinions freely. It's a subtle difference that can have a big influence on the results.

Our second tip "**Be Data Wise**" is there to encourage a bit of **forward thinking**. It's easy to get carried away with writing interesting questions for your survey and not think about what you will eventually do with all the information you collect. We are not saying that ALL information must be presented in graphs and charts, but if this is something you are aiming for it is important to **plan for this at the start**. Through this resource we introduce some of the advantages of restricting and structuring answers (tick boxes, multiple choice answers etc). There are many ways of doing this and our intention is to get students thinking about this creatively. Again, it takes a lot of careful thinking to get the best result.

Guidance for Teachers cont...

Using the Animated Video:

The video is designed to explain the two strategies in an engaging way using the plausible example of a "Homework Habits" survey. It allows you to introduce and discuss the idea of **anonymous** surveys and questionnaires.

There are **three pause points** in the "Designing Surveys" video for you to open up discussion and challenge students to come up with their own solutions before the video explains further.

It is important to emphasise that the aim is to engage students and encourage critical thinking. It is not important that they only come up with the solutions suggested by the animation. We would encourage them to come up with other strategies too.



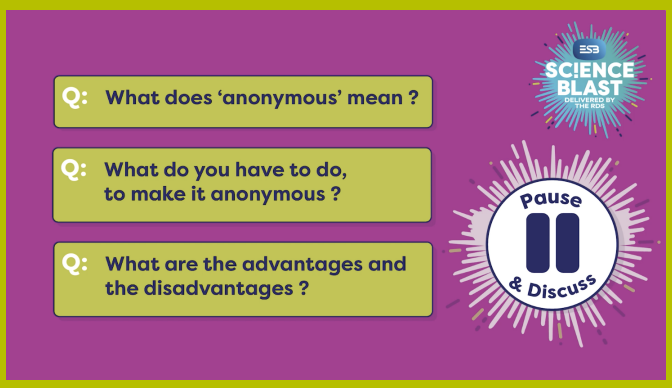
The more people answering your survey the better.

Scientists go to a lot of trouble to ensure that their surveys collect meaningful information. One important strategy is to get **lots** of responses. It will do wonders for the quality of your results.



Conducting an anonymous survey.

Your questions must not ask for any information that can identify the person who answered it, but it is good to discuss if that is enough to ensure anonymity? What about the way you collect the responses? The survey can be handed out on paper (or online), OR you can have someone asking the questions and recording the answers people give. Is that anonymous enough? You may also consider creating a post-box system for returned written responses.



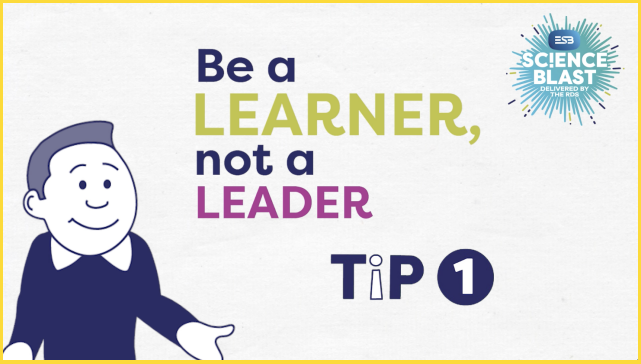
The advantages and disadvantages of making a survey anonymous?

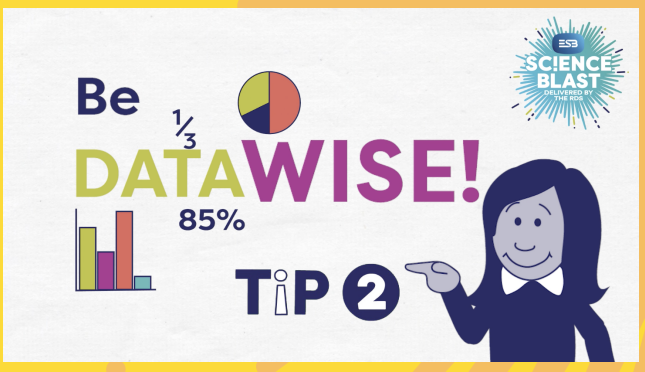
Advantages: It can encourage honesty, especially around sensitive subjects, and may give a more accurate result.

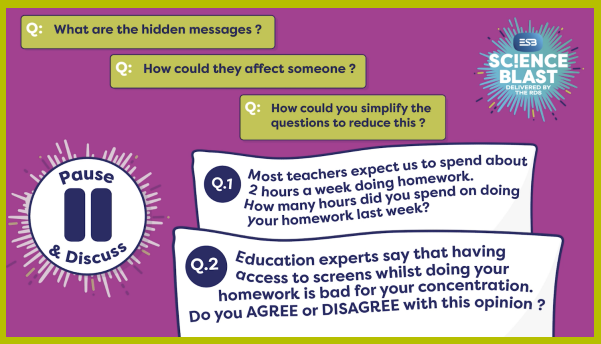
Disadvantages: They are more hassle to step up. There is a risk that some people will not take the survey seriously as they know it cannot be traced to them. Also if someone makes a mistake then you cannot find them to rectify this and that response is wasted.

4. DESIGNING SURVEYS

Guidance for Teachers cont...

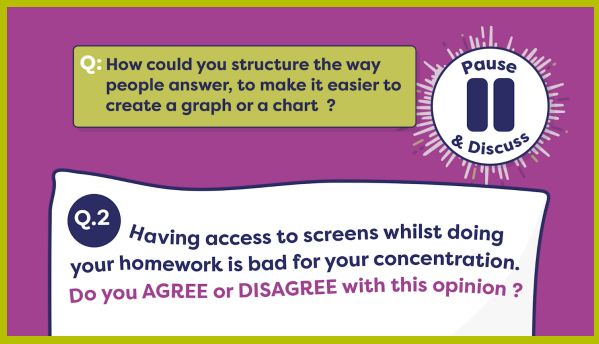






Hidden Messages?

Scientists have demonstrated that people can be strongly influenced by any hint of another opinion buried within a survey question. In this case people would be more inclined to report their views as being in line with '**teachers**' and '**experts**'. This would skew their responses to being closer to 2 hours and agreeing that screens are bad for concentration. The video recommends removing theses references to discover a truer picture of what people think and do.

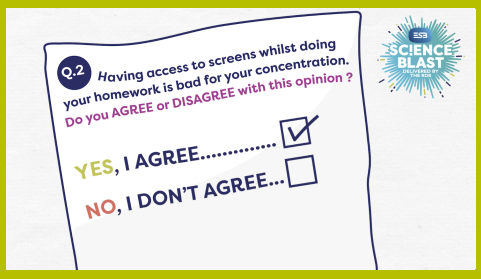


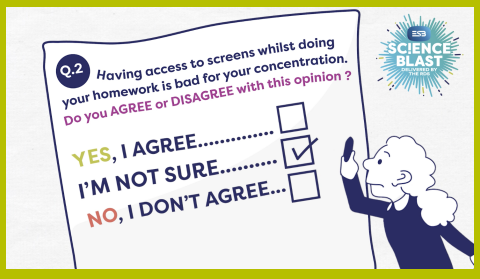
Structured Responses.

There are lots of ways to structure how answers are given. The most common approaches are **tick boxes** or **multiple choice** but there are no golden rules. Encourage your class to look at examples of surveys online and consider imaginative ways of collecting the data they need. The most important thing is that they **give consideration to this matter when designing their questions**.

It is important to point out that **some** scientific surveys deliberately aim to collect detailed explanations of people views. Giving them space to write or talk about it may be the only way to do this. Such surveys tend to ask less people as it takes more work to analyse the information collected.

The animation shows your class how you can build up the complexity of tick box questions to cover all the bases. Predicting all the possible ways that people might want to respond to survey question helps to build critical thinking skills. They will have an opportunity to apply this in the reinforcement exercise that accompanies this resource.







Guidance for Teachers cont...

Using the Learning Reinforcement Exercise.

This exercise challenges your students to apply what they have learned to a ficticious survey containing some deliberate flaws (available as an easy to print pdf document). **Ask you class to consider ways that they can improve this survey.** Ideally your class should be able to discuss it in **small groups** and re-design it collaboratively. These improvements can be reported on in a full class discussion towards the end of the exercise.

The issues that we expect them to debate are described below...



This survey states that it is "anonymous" so this question **should be removed** altogether. The designers **have also not allowed enough space** for someone to write out their full name anyway.



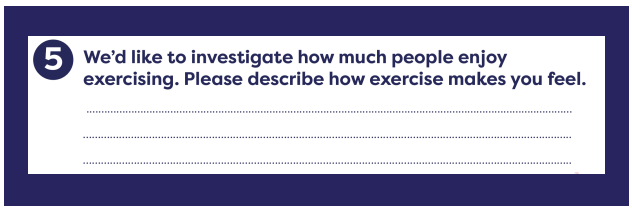
Students can **debate whether this breaches the idea of being "anonymous**. If question 1 is removed then question 2 does not provide enough information to identify someone. Keeping it in may be useful later as it would allow for looking at results for different age groups.



This question contains **leading** information. People will be more inclined to exaggerate their daily activity and tick the middle box. They can also consider if the three tick boxes offer enough choice. They could add more options or be bold and suggest a different structure altogether. Hopefully one that gathers more detailed information but can still lead to the creation of a graph or chart.



Whilst this (initially) avoids any 'leading' content the answer structure needs a lot of work. If offers **no options** for people who play other sports, and what about people who choose not to, or cannot participate in sports at all? However, there are so many possible sports that could be included? How can it be managed without getting too complicated?



This question is asking people to share their opinions in a very open ended way. It will be very challenging (but not impossible) to produce a graph from the wide variety of answers they will receive. Students should attempt to **turn this in to a structured answer.** Encourage them to be inventive and try ideas other than tick boxes and multiple choice answers.