

# Research in Schools Activity



Apples to Excellence – the importance of diet to achievement

## Introduction to this resource pack

This resource pack is designed to help pupils and teachers at Key Stage 2 to understand the importance of research so that children and young people develop a better understanding of how evidence is created. It could aid and supplement the teaching of Relationships Sex and Health Education (RSHE) and science curricula.

This pack will help you to think about research and how it can be used to answer questions and understand the world around us.

### Outcomes

Pupils will:

- begin to understand what research is
- what happens during a simple research study
- begin to think about the impact that research has on them and the wider population

## Using this pack



**Designed for  
a group of up to 40**



**Take approximately  
one hour to complete**

This pack is designed to be used as a standalone activity, with all necessary resources included. Links to additional background and supporting information are provided where they may be useful.

It is designed for a group of up to 40 and should take approximately one hour to complete. There are additional extended discussions and activities included at the end of the pack. These need to be considered and prepared in advance.

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# 1. Information for teachers



## What research is and why it is important

There is an irrefutable link between the health of children and their education outcomes. There are countless factors involved in this, and understanding the effect of any one of these factors alone can be very difficult. [This link to the Child Health and Wellbeing Network North East and North Cumbria's Facts of Life Report](#) displays a strong cross-section of the available evidence. This explains why it is important that we continue to investigate the evidence linked to children and young people's outcomes. Researching how we can improve children's health and wellbeing is vital. Therefore, continuing to develop the evidence base should be at the forefront of every classroom practitioner's mindset.

Research is a process in which new knowledge is created by the collection of, and the examination of, evidence. Research uses facts and evidence to show or understand something, and is different from guessing or hearsay.

Research is important in education because it helps educators and policymakers develop, evaluate, and improve educational practices. It helps teachers know what methods work and how to refine and tweak their practice.

## 2. Activity details



### i. Introduction



#### What is research and why is it important?

**Discussion point:** What is research? Research is 'the collecting of information about a particular subject aimed at the discovery and interpretation of facts'; therefore, research can give you the answer to a question like this.

**Discussion point:** For example, understanding the importance of knowing what the best treatment for asthma is, historical events (James Lind, vaccines) and the world around us.

**Discussion point:** How does research differ from rumour or hearsay? Research is about gathering actual evidence and facts, rather than relying upon what we think we know.

**Outcome:** Research tells us information we can't know otherwise, and some of these findings affect our health and well-being.



### Introduce the research question



#### The research question

We want to know if **eating fruit** affects a person's **test scores**.





### Does eating fruit improve your test scores?

**Discussion point:** Encourage pupils to share their views and opinions, and explore why they think this to be the case or not. For example, we know a good diet is linked to good health, but is good health linked to learning? Pupils may come to a range of conclusions but, do we KNOW any of these are true?



### Is this an important 'fact' to know?

- Explore reasons why this is an important question.
- If we know that diet affects children's test scores, we can maximise scores by controlling our diet.



### What do we need to do to answer this question?

Discuss *approach*. We need to know whether each pupil eats fruit, and their recent test scores. We can compare these to see if there is a difference.



### How might we do it?

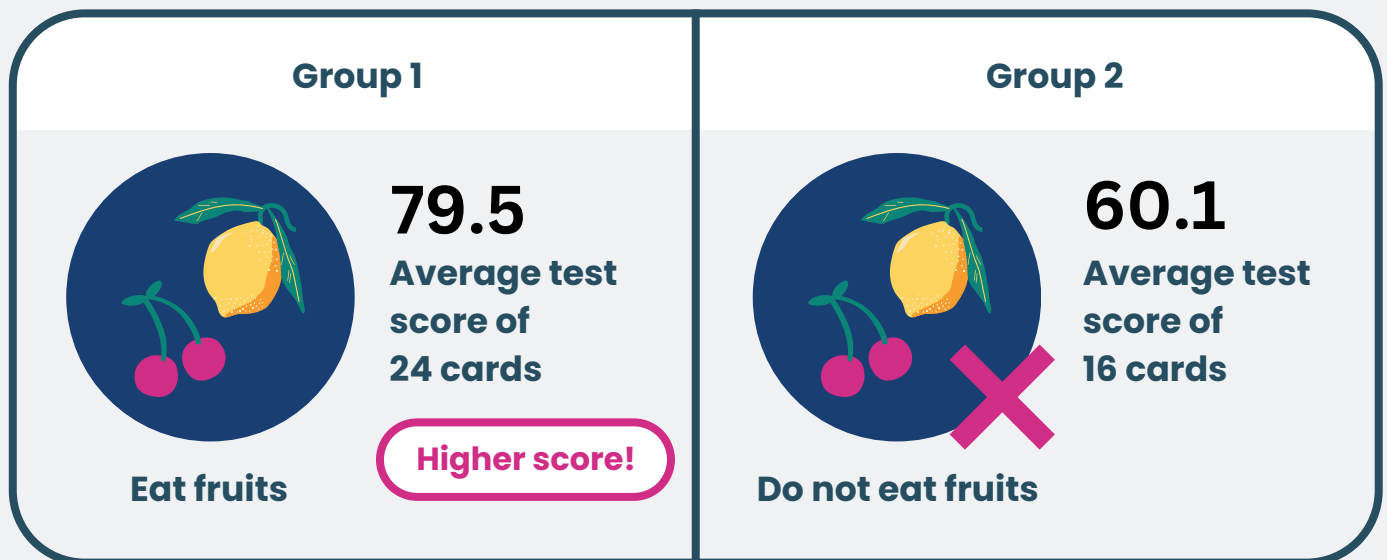
Researchers need to have a clear plan of how they will answer the question. This plan is sometimes called a protocol.

Here is a very simple plan to answer this question.

- Pupils are sorted by who does/doesn't eat fruit into 2 groups.
- Test scores for each group are identified and also recorded. The mean test scores for each group are then compared to answer our question.

## ii. Conduct study to answer the research question

- **Hand out activity character cards:** In a KS2 group of 40 pupils, provide one card per pupil. For smaller classes, you may need to assign two cards to some pupils (resources in [Appendix](#)).
- **Read the Card:** Each pupil takes turns reading their activity card, sharing their name and whether they eat fruits.
- **Find Test Scores:** Look up the test scores in the dataset spreadsheet (resources in [Appendix](#)).
- **Enter Details:** Pupils can work individually or in small groups to input their information into the activity sheet (resources in [Appendix](#)).
- **Calculate Averages:** Each pupil or group calculates the average (mean) test scores for those who eat fruit and those who don't.
- **Compare Averages:** Compare the average scores of the two groups to answer the research question:



**?** What does this tell us about the effect of eating fruit on test scores?

This study does suggest **a link** between eating fruit and increased test scores.



**So, if we ask everyone to eat fruit, can we say it will improve their test scores?**

- We now know that there appears to be a link between these two factors.
- However, it does not tell us that eating fruit actually causes the increase, or indeed if it is the only cause. There may be many factors that affect someone's test scores.
- Just because we can find a link between two things doesn't mean it's the only link or that one thing determines the other.
- We can still recommend that people should eat fruit as there is a link between eating fruit and improved test scores.
- Highlight the difference between saying 'there is a link' and saying 'eating fruit WILL increase your test scores'.

### iii. Plenary Discussion

- Review what research is and why it is important.
- We have conducted a simple study to try to answer an important question linking two things (eating fruit and test scores).
- We have identified that there is a link, but that does not mean that one **causes** the other.
- If we want to know if one does cause the other, we will have to carry out further research.
- This is often the nature of research, we continue to improve our knowledge and understanding, while recognising we may never know or understand everything. *There is always more research that can be done!*

## iv. Extension



**We don't know that we will get the same result if we carry this out with other groups, or the entire population. Why do you think this is? What might you need to do if you wanted to be more sure?**

- We cannot know something about another group or the whole population by carrying out a study into a small group because not all groups are the same. The outcome of a small study should not be applied to other groups or the entire population.
- Explore one or two examples to illustrate the impact of using groups that do not represent the population if you are looking for answers to questions that affect everyone. If we were in an all girls or boys school for example, or only choosing your friends to study.
- The larger and more diverse the group you use for your study, the more likely the results will be accurate with other groups and larger populations. Researchers use statistics to help them determine how many people they might need in a study to be confident that the answer can be applied to everyone, and these studies can require many thousands of people to take part!

### Optional extended activity – to undertake research within own class



**Ask what might you want to know about yourselves as a class? For example, are girls taller than boys at this age?**

Explain that if we want to know something about our class, we can carry out the research on ourselves. This is what we're now going to do, and pupils will collect and record their own data, calculate averages and find the answer.

In pairs or groups of three, children measure each other and add their details to a single spreadsheet or table that is displayed for the entire class.

Pupils copy data onto their own spreadsheet or table and calculate the average for their class to answer the question.



In line with schools and research current safeguarding, GDPR and ethics policies, it is important that we consider pupils' safety, privacy and consent.

A discussion about the importance of data remaining **anonymous** should take place.



For example, if information is being collated in a table, the table should reference **pupil numbers, as opposed to names** to safeguard data. By doing so, we are actively explaining to pupils the measures that researchers would put in place, when conducting larger population-based enquiries.

Pupil No.	Height	Arm span
Pupil 1		
Pupil 2		
Pupil 2		

The NSPCC ([click here](#)) also contains additional information which could support a discussion of this nature.

We need to consider that when doing research with real people, it is really important that we consider safety, privacy and consent. Please see [Useful References](#) (on the next page) for a child-friendly video about GDPR.

## 3. Useful References



### **BBC report on child height and poor diet**

<https://www.bbc.co.uk/news/health-54828544>

### **Child-friendly YouTube video about GDPR (6m 10s)**

<https://www.youtube.com/watch?v=VII6V1MgZgY>

### **Health Foundation report: Does Childhood Obesity Hinder Human Capital Development**

<https://www.health.org.uk/what-we-do/a-healthier-uk-population/health-as-an-asset/the-social-and-economic-value-of-health-2017/does-childhood-obesity-hinder-human-capital-development>

### **Lancet Study: Clustering of adverse health and educational outcomes in adolescence following early childhood disadvantage**

[https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(23\)00029-4/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(23)00029-4/fulltext)

## 4. Appendices



### i. Relevant NIHR links to DfE’s RSHE Policy

NIHR recognises that a school’s curriculum is already significantly overloaded. The purpose of this suite of documents is to provide supporting documents to help supplement a school’s Relationships, Sex and Health Education compulsory programme of study. Supporting NIHR materials will enable teachers to scaffold classroom learning activities to not only achieve learning objectives set by the Department for Education (DfE), but to also simultaneously further pupils’ understanding of research and the NHS (particularly those described in the [‘Physical health and mental wellbeing’](#) section of the DfE’s RSHE policy).

#### Primary school

Relevant NIHR links to DfE’s RSHE Policy	Key learning outcomes by the end of primary school
Physical health and fitness	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• the characteristics and mental and physical benefits of an active lifestyle.</li> <li>• the importance of building regular exercise into daily and weekly routines and how to achieve this; for example walking or cycling to school, a daily active mile or other forms of regular, vigorous exercise.</li> <li>• the risks associated with an inactive lifestyle (including obesity).</li> <li>• how and when to seek support including which adults to speak to in school if they are worried about their health.</li> </ul>
Healthy eating	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• what constitutes a healthy diet (including understanding calories and other nutritional content).</li> <li>• the principles of planning and preparing a range of healthy meals.</li> <li>• the characteristics of a poor diet and risks associated with unhealthy eating (including, for example, obesity and tooth decay) and other behaviours (e.g. the impact of alcohol on diet or health).</li> </ul>

<p>Drugs, alcohol and tobacco</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• the facts about legal and illegal harmful substances and associated risks, including smoking, alcohol use and drug-taking.</li> </ul>
<p>Health and prevention</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• how to recognise early signs of physical illness, such as weight loss, or unexplained changes to the body.</li> <li>• about safe and unsafe exposure to the sun, and how to reduce the risk of sun damage, including skin cancer.</li> <li>• the importance of sufficient good quality sleep for good health and that a lack of sleep can affect weight, mood and ability to learn.</li> <li>• about dental health and the benefits of good oral hygiene and dental flossing, including regular check-ups at the dentist.</li> <li>• about personal hygiene and germs including bacteria, viruses, how they are spread and treated, and the importance of handwashing.</li> <li>• the facts and science relating to allergies, immunisation and vaccination.</li> </ul>
<p>Basic first aid</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• how to make a clear and efficient call to emergency services if necessary.</li> <li>• concepts of basic first-aid, for example dealing with common injuries, including head injuries.</li> </ul>

## Secondary school

<p><b>Relevant NIHR links to DfE's RSHE Policy</b></p>	<p><b>Key learning outcomes by the end of secondary school</b></p>
<p>Physical health and fitness</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• the positive associations between physical activity and promotion of mental wellbeing, including as an approach to combat stress.</li> <li>• the characteristics and evidence of what constitutes a healthy lifestyle, maintaining a healthy weight, including the links between an inactive lifestyle and ill health, including cancer and cardio vascular ill-health.</li> <li>• about the science relating to blood, organ and stem cell donation.</li> </ul>

<p>Healthy eating</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• how to maintain healthy eating and the links between a poor diet and health risks, including tooth decay and cancer.</li> </ul>
<p>Drugs, alcohol and tobacco</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• the facts about legal and illegal drugs and their associated risks, including the link between drug use, and the associated risks, including the link to serious mental health conditions.</li> <li>• the law relating to the supply and possession of illegal substances.</li> <li>• the physical and psychological risks associated with alcohol consumption and what constitutes low risk alcohol consumption in adulthood.</li> <li>• the physical and psychological consequences of addiction, including alcohol dependency.</li> <li>• awareness of the dangers of drugs which are prescribed but still present serious health risks.</li> <li>• the facts about the harms from smoking tobacco (particularly the link to lung cancer), the benefits of quitting and how to access support to do so.</li> </ul>
<p>Health and prevention</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• about personal hygiene, germs including bacteria, viruses, how they are spread, treatment and prevention of infection, and about antibiotics.</li> <li>• about dental health and the benefits of good oral hygiene and dental flossing, including healthy eating and regular check-ups at the dentist.</li> <li>• (late secondary) the benefits of regular self-examination and screening, the facts and science relating to immunisation and vaccination.</li> <li>• the importance of sufficient good quality sleep for good health and how a lack of sleep can affect weight, mood and ability to learn.</li> </ul>
<p>Basic first aid</p>	<p>Pupils should know</p> <ul style="list-style-type: none"> <li>• basic treatment for common injuries.</li> <li>• life-saving skills, including how to administer CPR.</li> <li>• the purpose of defibrillators and when one might be needed.</li> </ul>

There are, therefore, clear links between NIHR's organisational purpose and that of the DfE's RSHE curriculum outcomes. Both organisations can enable the other to:

- a) increase pupil and staff knowledge of NIHR
- b) increase a pupil's understanding of research and how they can become involved in research and how research may impact on their health care
- c) enable pupils to become better equipped to manage themselves and others as they mature and grow.

Depending upon how a setting organises its RSHE curriculum, will depend upon the frequency in which the resources may need to be used. The DfE cites: 'Schools have flexibility to design and plan age-appropriate subject content...' However, it would be our recommendation that when 'facts' are taught - teaching staff make links to 'what the research tells us and why...' and whether there are any limitations to the research.

Through the regular use of this approach, it is hoped that, nationally, pupils will become more skilled at questioning why they may be receiving medicine from the doctor, or why it might be important to receive a certain vaccines or immunisations at a particular time in their life.

## ii. Links to printable activity sheets

Download individual PDF files by clicking on each of the following links:

- [Dataset sheet](#) (for looking up test scores)
- [Activity blank sheet](#) (for pupils to complete and calculate average test scores)
- [40 activity character cards](#)
- [Activity slide deck](#) (as a guide for teachers to carry out the activity)