Evidence Hunter

ACTIVITY PACK
The Evidence Hunter activities are designed to give young people the opportunity to explore claims they encounter – online, in the news, in advertising, or among their friends – using evidence to evaluate them.
Included in this guide

• Instructions on how to run the Evidence Hunter activities.
• Discussion points and questions to help participants understand how, why and when to ask for evidence, and to encourage them to think critically about claims they see in day-to-day life.
• Five examples of claims from five different sources (an advertisement, a newspaper headline, a celebrity endorsement, a scientific study and a scientific review) and a set of evidence items that may or may not support them. These will form the basis of the Evidence Hunting activity.
• You will need to provide: a print-out of the resource pack (claims, sources and items cut out), tokens of two different colours (for example Post-it notes) and a stack of newspapers or magazines.

Definitions

Claim
A statement that suggests something is true

Evidence
The available information indicating whether or not a claim is true
The Claims

In the attached resource pack there are five claims from five different sources. These will be explored during the Evidence Hunting activities. Here’s a guide to each claim:

1. ‘Meet your fitness goals with tea’
   Source: Bootea tea advertisement
   The company uses this claim to sell its product.

2. ‘Jupiters moon Europa almost certain to be home to alien life’
   Source: Headline on a newspaper website
   The news article is reporting a scientist’s opinion.

3. ‘Charcoal toothpaste whitens your teeth’
   Source: Nicole Scherzinger, a celebrity
   This is an endorsement based on personal experience.

4. ‘Social media users copy friends eating habits’
   Source: ScienceDaily, a science news site
   This claim comes from a single piece of research.

5. ‘Being kind to others makes you happier’
   Source: University of Oxford
   This claim is concluded from several research results.
Activity One

The claim examples in this pack are taken from five sources:

1. AN ADVERTISEMENT
2. A NEWSPAPER
3. A CELEBRITY
4. ONE PIECE OF RESEARCH
5. THE SUMMARY OF SEVERAL PIECES OF RESEARCH

• Claims should be printed and stuck up to create five stations within the activity area. Do not include the sources at this stage.

• Give participants a set of 10 tokens each – these are their ‘trust tokens’.

• After moving around the room and considering each claim, participants must allocate their trust tokens to the claims they think are most likely to be true. For example, out of 10 tokens they might place 7 under the claim they believe the most and 3 under another claim they think could also be true. They may put all tokens under one claim, or allocate them evenly across all five of the claims.
• Now pin up the source next to each claim. Give each participant 10 more tokens of a different colour. Ask them to think about how much they trust each source. They will then repeat the first exercise. Now they know who made the claim, their allocations may change.

Discussion
Look at the results - why did participants trust one claim more than another?

For example, you might find that they are more likely to trust claims that they can relate to or have experienced themselves.

Discussion
Is there a big difference between the results of the two exercises?

Why do they trust one source more than another?

Did participants think about whether there might be evidence for the claims?

What do they consider to be ‘evidence’?
• Divide into groups. Each group is given a set of printed website excerpts. These are in the style of web browser windows.

• Having just discussed the definition and concept of evidence, groups will read through these excerpts and identify those that they think represent the strongest evidence.

• Each excerpt can be one of the following types:

  - **TYPE ONE**
    - Something that sounds ‘sciencey’ but isn’t actually evidence

  - **TYPE TWO**
    - One person’s experience

  - **TYPE THREE**
    - One scientific study

  - **TYPE FOUR**
    - Multiple news stories about one scientific study

  - **TYPE FIVE**
    - Multiple scientific studies compiled and analysed
Discussion

Why did the groups pick these examples as the strongest evidence?

Can they describe the different types of evidence they’re looking at?

What are the limitations of each type of evidence?

The accompanying evidence guide (p10-14) will help you lead a discussion about this.

Has the evidence changed their minds about which claims they believe?

No matter the claim or source, we must always look for the evidence.
Evidence Guide

WHAT DOES ‘GOOD EVIDENCE’ LOOK LIKE?

Use this guide to help lead the group in a discussion about types of evidence.

Type 1: Something that sounds ‘sciencey’ but isn’t actually evidence

Terms like ‘free radicals’ and ‘detox’ can make people say “that sounds complicated - it must be based on science!”, but this is often not the case and can mask a lack of real scientific evidence.

Did you know?

Researchers carry out experiments, collect and examine results, and compare these with the results of other experiments to work out how things work or how well they work. They will write a paper to describe what they did and submit it to an academic journal where it can be reviewed and published, so that other researchers can do the same.
Type 2: One person’s experience

Journalists often use anecdotes or personal stories to make their articles seem more relevant to people’s lives. They are usually presented as case studies of individuals’ experiences, which may not include any facts or figures.

While research may well confirm the experience, we still have to do that research. What we observe and experience individually helps us decide what research to do, but shouldn’t be used in its place.

It’s important to ask questions - while you might hear one person saying “it worked!”, what about the cases where it didn’t work?

Did you know?

**Vested interests** can distort research in different ways, from directly biasing an experiment towards a particular outcome, to subtly influencing which result the research report emphasises. So it’s important to find out who funded what you’re looking at and ask whether it might have had an influence or not. In scientific journals, academics should always disclose their ‘interests’. Equally, celebrity endorsements and testimonies should be questioned if it appears that they are trying to influence the reader to buy a particular product and ask whether the result aligns with their interest.
Type 3: One scientific study

A well-designed and carefully carried-out experimental study can provide strong evidence. However, if it stands alone as the basis for a claim it’s important to ask questions of its quality:

- How large was the study?
- Did they include appropriate controls?
- What was the question that the researchers wanted to answer?
- Was it published in a respected, peer-reviewed journal?
- Who produced the research - was it done independently?

Did you know?

Peer review is the process by which the scientific community gives feedback on the quality of new research before it can be published. It is the academic publishing standard for knowing whether scientific results are valid, significant and original, and checks that the researchers’ assertions are supported by the results of the study.

Many of the claims we see online may not have come from research published in a peer reviewed journal, so always ask: has this been peer reviewed? If not, why not?
Sometimes if a piece of research hits the headlines its results can be misunderstood by reporters and the actual findings can be overlooked or exaggerated. On top of this, when the public sees the same single study reported in several newspapers, its reliability can be exaggerated - the 'if everyone is saying it, it must be true' effect.

If reading about scientific findings in a newspaper or online news site, it’s important to find and check the original published paper. We should then ask the same questions we would ask of any scientific study.

Did you know?
The ‘illusory truth effect’ is a psychological phenomenon whereby the more times we hear something, the more accurate we think it is. The human brain finds it easier to process phrases and ideas that are familiar, meaning that we trust claims more readily if they are repeated over time or across several sources.

Read more:
Type 5: Multiple scientific studies compiled and analysed

The strongest kinds of evidence are systematic reviews and meta-analyses. These filter and analyse results from only the highest quality studies in order to scientifically test a claim.

Did you know?

**Systematic reviews** collect and analyse all of the relevant and available data to assess the strength of the current evidence. They follow detailed quality control guidelines to weed out poor quality studies. Similarly, a **meta-analysis** is a statistical method which pools together data from different studies on the same subject to get the most complete possible picture of the existing evidence.
Activity Three

- Hand out magazines, newspapers, or browse websites that give examples of the kind of places we might encounter claims in day-to-day life.
- Get participants to search through and identify claims where they might want to ‘Ask for Evidence’.
- Ask them to think about where they might go to find out if there is evidence behind the claim.

Discussion

Where can we go to search for the evidence behind a claim?

Participants might regularly use Wikipedia - this can be a useful resource, but it’s important to check that information is cited.

Google is also a useful tool, but ask questions of the results.

Remember to check the source - don’t just trust the headlines.

Find out if claims are correctly reported from a peer-reviewed paper.
• This is an optional take-home activity for those participants who would like to become Evidence Hunters and demonstrate their new skills.

• Ask participants to spend the next week looking out for claims for which they would like to ‘Ask for Evidence’ - two or three if possible.

• Get them to research whether there is evidence behind these claims, and write down whether they think the claims are valid, based on this evidence. They must be able to present this reasoning to their activity leader at a following session to demonstrate their new Evidence Hunter skills.
Further Information

Ask for Evidence: working out what’s reliable evidence

www.askforevidence.org/help/evidence

This collection helps answer common questions about evidence and how to identify the most reliable information.

Ask for Evidence: help by subject

www.askforevidence.org/help/categories

A range of resources, organised by subject, from Sense about Science and other organisations to help make sense of the claims you might encounter online.

I don’t know what to believe

www.senseaboutscience.org/activities/i-dont-know-what-to-believe/

This booklet explains how scientists present and judge research using the peer review process, and how the public can make sense of science stories.

I’ve got nothing to lose by trying it

www.senseaboutscience.org/activities/ive-got-nothing-to-lose-by-trying-it/

Every day there are news reports about medical breakthroughs and wonder drugs. This guide explores how the public can ask for evidence to help weigh up claims and make decisions about healthcare.

Making sense of statistics

www.senseaboutscience.org/activities/making-sense-of-statistics/

This guide isn’t a lesson in statistics, but a source of questions you can ask and pitfalls to avoid. Knowing something about statistics can help us test and debunk claims and get closer to working out what the figures might be telling us.
Resources
Claim

A statement that suggests something is true

Evidence

The available information indicating whether or not a claim is true
Social media users ‘copy’ friends eating habits
Jupiter’s moon Europa ‘almost certain’ to be home to alien life
Being kind to others makes you happier
WWW. OX.AC.UK/NEWS/2016-10-05-BEING-KIND-OTHERS-DOES-MAKE-YOU-HAPPY-CONCLUDES-LARGE-SCALE-REVIEW-EVIDENCE
Charcoal toothpaste whitens your teeth
Nicole Scherzinger (singer and TV celebrity)
Meet your fitness goals with tea.
Resource Pack References

Type 1: Something that sounds ‘sciencey’ but isn’t actually evidence

1. https://metro.co.uk/2015/10/30/black-toothpaste-cleans-your-teeth-using-charcoal-5468881/

Type 2: One person’s experience

8. https://twitter.com/JamilletteG/status/994662299829850112

Type 3: One scientific study

11. www.nature.com/articles/ncomms15964
Type 4: Multiple news stories about one scientific study

Alien headlines

https://www.dailystar.co.uk/news/latest-news/jupiter-moon-europa-almost-certainly-21453593

https://www.ibtimes.co.uk/alien-life-mars-jupiters-moon-europa-certainty-claims-space-scientist-1675411


Social media influencing eating habits headlines


https://metro.co.uk/2019/12/04/social-media-is-causing-eating-disorders-in-young-boys-and-girls-study-claims-11265727/


Type 5: Multiple scientific studies compiled and analysed

www.ox.ac.uk/news/2016-10-05-being-kind-others-does-make-you-happy-concludes-large-scale-review-evidence

Black toothpaste cleans your teeth using charcoal

The new Curaprox formula is made with a base ingredient of activated carbon (charcoal) which is said to absorb and remove stains without wearing away tooth enamel.

Apparently this is better than typical whitening toothpastes, whose abrasive particles and bleaching agents erode the enamel.

As extra reassurance, a blue optical filter in the Black is White (mint with citrus) and White is Black (mild mint) toothpaste reduces yellow discolouration.

Its enzymes, meanwhile, are said to ‘enhance antibacterial and antiviral function’ to prevent tooth decay.

And the calcium in it ‘effectively fills exposed holes in the tooth’s surface’ to reduce sensitivity and build up enamel and shine.

But it’s black!!?

Kindness makes you happier and here is why

Within the confines of the brain, you’ll find that chemical releases are found. Chemical releases such as serotonin can promote mood elevation.

Well, when someone gives, out of the goodness of their heart, something as simple as a helping hand the brain reacts in a positive manner.

Dopamine rushes through the body, and the brain signals a certain type of “high” or elation as a result.
The new Curaprox formula is made with a base ingredient of activated carbon (charcoal) which is said to absorb and remove stains without wearing away tooth enamel. Apparently this is better than typical whitening toothpastes, whose abrasive particles and bleaching agents erode the enamel. As extra reassurance, a blue optical filter in the Black is White (mint with citrus) and White is Black (mild mint) toothpaste reduces yellow discolouration. Its enzymes, meanwhile, are said to ‘enhance antibacterial and antiviral function’ to prevent tooth decay. And the calcium in it ‘effectively fills exposed holes in the tooth’s surface’ to reduce sensitivity and build up enamel and shine.

But it’s black!!?

British scientist says it is ‘almost a racing certain’ that the icy seas on Jupiter’s moon Europa ae home to alien life that are ‘octopus-like creatures’

Monica Grady, the Chancellor at Liverpool Hope University, suggests the icy seas beneath Europa’s surface is a prime location to find beings with similar intelligence to the marine animal.

‘When it comes to the prospects of life beyond Earth, it’s almost a racing certainty that there’s life beneath the ice on Europa,’ she said.

While the oceans are beneath Europa’s surface, the exterior is basically made up of frozen seawater.

This means that below its icy exterior, there’s likely to be a vast salty sea containing large amounts of sodium chloride.

Professor Grady says that by looking at the bigger, interplanetary picture, Earth’s own ecological situation is brought into sharp focus.

She says: ‘We could be all there is in the galaxy. And if there’s only us, then we have a duty to protect the planet.’
In the last week Donna Fairall has left a coffee voucher on a stranger’s car, ordered a Christmas hamper for a needy family and offered to babysit for friends with a newborn baby.

Donna says she enjoys being kind to other people, friends and strangers whenever she can. “It makes me feel valued as a person, humbled, maybe a little less selfish” says the creative arts director from Coffs Harbour.

The secret to perfect pearly whites is to make them black first

Nicole Scherzinger shares her secret behind her perfectly white smile.

The X Factor judge said she brushes her teeth with a powdered form of the substance, which is said to remove toxins and stains and kill bacteria.

Revealing her unusual beauty regime, the 38 year old singer told the Mail: ‘I’d much rather brush my teeth with coal. Makes your teeth whiter.’

Although she refers to the whitener as coal the ingredient used in a variety of products on the market is activated charcoal.
So how does the 18-year-old prep for the runway? That's easy: Tea galore! "I usually start my day off with a cup of detox tea," Jenner revealed to E! News. "I have like 12 cups a day."

Kendall Jenner Shares Her Fashion Week Diet & Beauty Secrets

After this crazy weekend, I'm so stocked to start my 28 day teatox @skinnymintcom even Frida is going to work on her body this week lol

"LOVEMOM" for 20% off storewide, valid till 13th May only!

#SkinnyMint #Teatox #UltimateTeatox
ABSTRACT

This study examined whether four perceived norms about Facebook users’ eating habits and preferences predicted participants’ own food consumption and BMI.

In a cross-sectional survey, men and women university students were asked to report their perceptions of Facebook users’ consumption of, and preferences for, fruit, vegetables, energy-dense snacks and sugar sweetened beverages (SSB), their own consumption of and preferences for these foods, and their BMI.

Multiple linear regression revealed that perceived descriptive norms and perceived frequency norms about Facebook users’ fruit and vegetable consumption were significant positive predictors of participants’ own fruit and vegetable consumption.

Conversely, perceived injunctive norms about Facebook users’ energy-dense snack and SSB consumption were significant positive predictors of participants’ own snack and SSB consumption.

However, perceived norms did not significantly predict BMI. These findings suggest that perceived norms concerning actual consumption and norms related to approval may guide consumption of low and high energy-dense foods and beverages differently.

Social media influences eating habits

Survival of Radioresistant Bacteria on Europa’s Surface after Pulse Ejection of Subsurface Ocean Water

We briefly present preliminary results of our study of the radioresistant bacteria in a low temperature and pressure and high-radiation environment and hypothesize the ability of microorganisms to survive extraterrestrial high-radiation environments, such as the icy surface of Jupiter’s moon, Europa.

AIM

In this study, samples containing a strain of Deinococcus radiodurans VKM B-1422T embedded into a simulated version of Europa’s ice were put under extreme environmental and radiation conditions using a specially designed experimental vacuum chamber.

METHOD

The samples were irradiated with 5, 10, 50, and 100 kGy doses and subsequently studied for residual viable cells. We estimate the limit of the accumulated dose that viable cells in those conditions could withstand at 50 kGy.

CONCLUSION

Combining our numerical modelling of the accumulated dose in ice with observations of water eruption events on Europa, we hypothesize that in the case of such events, it is possible that putative extraterrestrial organisms might retain viability in a dormant state for up to 10,000 years, and could be sampled and studied by future probe missions.
ABSTRACT

Generous behaviour is known to increase happiness, which could thereby motivate generosity. In this study, we use functional magnetic resonance imaging and a public pledge for future generosity to investigate the brain mechanisms that link generous behaviour with increases in happiness.

Participants promised to spend money over the next 4 weeks either on others (experimental group) or on themselves (control group).

Here, we report that, compared to controls, participants in the experimental group make more generous choices in an independent decision-making task and show stronger increases in self-reported happiness. Generous decisions engage the temporo-parietal junction (TPJ) in the experimental more than in the control group and differentially modulate the connectivity between TPJ and ventral striatum. Importantly, striatal activity during generous decisions is directly related to changes in happiness.

These results demonstrate that top–down control of striatal activity plays a fundamental role in linking commitment-induced generosity with happiness.

A neural link between generosity and happiness

HYPOTHESIS

Habitual tea consumption is associated with more healthy years of life and longer life expectancy.

METHOD

The analysis included 100,902 participants of the China-PAR project with no history of heart attack, stroke, or cancer. Participants were classified into two groups: habitual tea drinkers (three or more times a week) and never or non-habitual tea drinkers (less than three times a week) and followed-up for a median of 7.3 years.

RESULTS

Habitual tea drinkers who maintained their habit in both surveys had a 39% lower risk of incident heart disease and stroke, 56% lower risk of fatal heart disease and stroke, and 29% decreased risk of all-cause death compared to consistent never or non-habitual tea drinkers.

In a subanalysis by type of tea, drinking green tea was linked with approximately 25% lower risks for incident heart disease and stroke, fatal heart disease and stroke, and all-cause death. However, no significant associations were observed for black tea.

Tea drinkers live longer
New research suggests that social media, particularly platforms with a strong focus on image posting and viewing, is associated with disordered eating in young adolescents.

In the study, which is published in the International Journal of Eating Disorders, researchers examined data on 996 grade 7 and 8 adolescents. Behaviors related to disordered eating were reported by 51.7% of girls and 45.0% of boys, with strict exercise and meal skipping being the most common.

A total of 75.4% of girls and 69.9% of boys had at least one social media account, and Instagram was the most common.

A greater number of social media accounts, and greater daily time spent using them, were associated with a higher likelihood of disordered eating thoughts and behaviors.

ABSTRACT

The aim of this study was to determine the surface roughness changes of tooth enamel after brushing with charcoal toothpaste.

Thirty specimens were brushed using distilled water (the first group), Strong® Formula toothpaste (the second group), and Charcoal® Formula toothpaste for four minutes and 40 seconds (equivalent to one month) and for 14 minutes (equivalent to three months) using a soft fleece toothbrush with a mass of 150 gr.

The roughness was measured using a surface roughness tester, and the results were tested with repeated ANOVA test and one-way ANOVA.

The value of the surface roughness of tooth enamel was significantly different (p<0.05) after brushing for an equivalent of one month and an equivalent of three months.

Using toothpaste containing charcoal can increase the surface roughness of tooth enamel (which can be bad for teeth!).
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A greater number of social media accounts, and greater daily time spent using them, were associated with a higher likelihood of disordered eating thoughts and behaviors.
Researchers conclude that being kind to others causes a small but significant improvement in subjective well-being. The review found that the effect is lower than some pop-psychology articles have claimed, but also concluded that future research might help identify which kind acts are most effective at boosting happiness.

The claim that ‘helping makes you happy’ has become a staple of pop psychology and self-help manuals. Performing ‘random acts of kindness’ has been touted as a sure-fire way of boosting your mood — doing good makes you feel good, as well as benefiting others. But do these claims stack up, or are they ‘too good to be true’?

In order to find out, a team from the universities of Oxford and Bournemouth carried out a systematic review of the scientific literature. They analysed over 400 published papers that had investigated the relationship between kindness and happiness, and identified 21 studies that had explicitly put the claim to the test – that being kind to others makes us happier. They then conducted a ‘meta-analysis’, which statistically combines the results of these previous studies.