

GLOSSARY OF KEY TERMS

Definitions of key terms taken from the GET-IT Glossary www.getitglossary.org

Term	Definition
Allocation	The process of assigning participants in a study to treatment comparison groups
Association	A relationship between two variables in a study, e.g. between having received a particular treatment and having experienced a particular outcome
Baseline characteristics	Descriptive information about the participants in a study collected at the beginning of the study
Bias	A type of error that may affect the results of a study because of weaknesses in its design, analysis or reporting
Blinding	In treatment comparisons, actions intended to prevent study participants or the researchers from knowing which participants received which treatments
Comparison group	A group of participants in a study allocated to receive one or more different treatments, usual care, or placebo
Conflicts of interests	Vested interests (financial or academic) that may compromise a person's objectivity in designing, conducting or interpreting research
Confounders	In treatment comparisons, any factors other than the treatments being compared which may affect the health outcomes being measured
Double blinding	Actions intended to prevent two or more groups of people involved in a study knowing which participants received which treatment
Eligibility criteria	Characteristics used to decide whether people are eligible to participate in a study and should be invited to participate
Outcome	In treatment comparisons, a good or bad event or development that can happen after a treatment, and is measurable in studies
Peer review	An editorial process for assessing the quality and importance of research reports submitted for possible publication
Placebo	An inert substance, device or procedure used as a comparator in studies assessing the effects of a treatment
Placebo effect	Desirable effects that are or could be caused by an 'inactive' treatment, presumed to act psychologically through suggestion
Random allocation	The process of assigning participants in a study to treatment comparison groups using a chance process, like drawing lots, to protect against bias
Random error	In treatment comparisons, a type of error that may affect the results because too few events or outcomes have been observed to provide a reliable measure of the treatment effects
Randomised trial	A category of studies comparing two or more treatments in which random allocation is used to assign participants to treatment comparison groups
Reproducibility	The extent to which the results of studies are confirmed in the results of subsequent studies
Study	An investigation using specified methods to answer a research question; e.g. about the effects of treatments
Treatment	Any preventive, therapeutic, rehabilitative or palliative action intended to improve the health or wellbeing of individuals or communities

FOR RESOURCES THAT ACCOMPANY THIS OVERVIEW AND MORE LESSON PLANS visit www.cebm.net/ebmforunder18s



- Lesson plan and teaching notes – an in-depth plan of the session with associated commentary
- PowerPoint file that accompanies the lesson
- Student wordsearches
- Treatment allocation cards
- Results collation worksheet and spreadsheet as an optional method of gathering and processing data

Evidence-Based Medicine for Under 18s

Applying critical thinking to health claims and making better decisions



Can drinking cola help students concentrate?

An overview of a lesson aimed at Key Stage 3 students

Full details and accompanying resources can be found at www.cebm.net/ebmforunder18s



Development of critical thinking skills is implicitly embedded in the National Curriculum in England, particularly in the sciences, where students build scientific understanding through experimentation and analysis alongside the learning of factual content.

The CEBM's EBM for under 18s project is supporting the creation of resources that emphasise opportunities to teach critical thinking using health claims, opportunities that can be lost due to focus on factual knowledge of such topics, especially where there are few direct links to classroom-based experiments.

This lesson was piloted with Key Stage 3 students at Lingfield College, Surrey; we would welcome further feedback on the lesson plan and resources. Please send your feedback to sarah.pannell@phc.ox.ac.uk

The CEBM is part of the Nuffield Department of Primary Care Health Sciences at the University of Oxford where it aims to develop, teach and promote evidence-based health care through a variety of methods.

KEY CONCEPTS

This lesson highlights ideas associated with the following key concepts:

- 1.2 – Anecdotes are unreliable evidence
- 1.3 – Association is not the same as causation
- 2.1 – Treatments should be compared fairly
- 2.2 – Comparison groups should be similar
- 2.5 – People should not know which treatment they get
- 2.6 – Peoples' outcomes should be assessed similarly
- 2.14 – Fair comparisons with few people or outcome events can be misleading

Further information about these concepts can be found on www.testingtreatments.org

A full lesson plan, teaching notes, PowerPoint presentation and student worksheets to accompany this overview can be found on www.cebm.net/ebmforunder18s

AIMS

During this session, students will:

- Identify claims made in advertising
- Describe how trials can be used to test claims
- Explain the role of blinding in trials

NATIONAL CURRICULUM LINKS

Working scientifically themes:

- Objectivity
- Modification of early explanations
- Prediction
- Calculation of results
- Evaluation of data

Subject links:

- Biology: nutrition & digestion

EQUIPMENT LIST

- Three or more types of cola (i.e. regular, diet, caffeine free)
- One cup per student
- Methods of allocating treatment groups
- PowerPoint
- Lesson plan
- Teaching notes
- Printed wordsearch sheets
(www.cebm.net/ebmforunder18s)

SAFETY

As this activity involves consumption of soft drinks, it should take place outside of a science lab.

Allergies of participants should be checked and participants given the opportunity to opt out. Local risk assessment is the responsibility of the teacher.

Can drinking cola help students concentrate?

A lesson exploring critical thinking about health claim



Coca-Cola advertisement, 1905



5 min

ENGAGE

Discussion:

- What claim is being made in the Coke advert from 1905?
- How could this claim be tested?

5 min

EXPLORE

- Students design a simple trial linked to the claim in the Coke advert.

15 min

EXPLAIN

- Students participate in a small trial using word searches as a test for how active the brain is.
- Having completed a 'baseline' test, students are allocated to different groups to drink their 'treatment'.

10 min

ELABORATE

- Introduce the concept of blinding and ask students whether they believe the trial they are participating in has been blinded.
- Discuss the influence that participant background may have on the outcome of trials.

15 min

EVALUATE

- Collect and analyse results from the trial. Students could also calculate % change.
- Reveal the 'treatments' – is the outcome what students expect?
- Review the trial; discuss with students whether they consider the results sufficient evidence to support or refute the claim made in the advert.

EXTEND

The activities can be extended for more able students through more in-depth questioning and discussion, covering topics such as:

- The effect of different chemicals in the cola on the brain
- Recruitment of participants for trials – who participates and why?
- Ethics of trials, e.g. is a randomised trial always best?
- Certainty of evidence collected