*This is an example of a possible Excellence answer - possibly E7 as there are aspects that are disjointed.*

| Claim 1 states “Blue light is destroying your sleep”. The source is Block Blue Light, a company that markets products for the public. This is clearly biased as the source has a vested interest in encouraging readers to buy their products. The word ‘your’ in the claim specifically targets the reader in a way scientifically valid articles would not. Emotive statements such as: “*You simply cannot escape it*”, “destroying your sleep”, and “*you are damaging your eyes from chronic exposure to harmful light*” inspires fear, possibly compelling people to buy the product/s.  “*Drastically lowers sleep quality*” and “*causes serious sleep disruption*” are not backed up by any data, nor do they accurately measure or indicate the extent to which blue light affects sleep.  Further unverified statements such as “*Damaging your eyes from chronic exposure to harmful blue light*” seek to play on the fears of the reader, without explaining or providing evidence to support the idea that blue light is harmful. Harmful is a vague term that would be difficult to quantify. If blue light really was harmful, wouldn’t we need to be protected from it in the same way as with ultraviolet radiation, and not just at night? White light generally contains all colours of the spectrum, so suggesting that a natural component of visible light is harmful seems exaggerated. Exaggerations do not support science related claims in information. By comparison, scientifically valid information makes tentative statements that are backed up by data or other evidence, and recognise the possibility that they could be corrected in the face of new evidence.  The article does refer to melatonin and identifies it correctly as a hormone, which is involved in the sleep-wake cycle. It also refers to ‘symptoms’ and ‘macular degeneration’ which could incorrectly lead the reader to consider the source as medically reliable.  In comparison, claim 2 from Harvard Health - a website affiliated with Harvard Medical School states that “Blue light reduces ability to sleep”. The language is far more tentative - avoiding making sweeping statements or using emotive language. It does identify blue light as ‘environmentally friendly’ - perhaps a strange term to use but at least not biased as with claim 1 “harmful”. It later qualifies this as blue light is beneficial during the day, and provides reasons why we are now more exposed to blue light in the evenings. Harvard Health refers to recognised units of measurement for light such as Lux, and Lumens. Harvard - backs up issues with blue light with a detailed and step by step description of melatonin linked to circadian rhythms and measured values (8 lux) suggesting this has been tested. This article cites presumably qualified individuals such as Dr. Charles Czeisler of Harvard Medical School. As a doctor at a medical school, he is likely to be reliable. A quick google search suggests he has worked for over 40 years in the field of sleep medicine. The statements are again more tentative: “*and researchers have linked short sleep to increased risk for depression, as well as diabetes and cardiovascular problems*.” cf the definitive, yet unqualified, statements from claim 1.  Whereas article 1 unequivocally identifies blue light as the detrimental cause of sleep issues, article 2 states: “*The fact that the levels of the hormone were about the same in the two groups strengthens the hypothesis that blue light is a potent suppressor of melatonin*”. In this way, article 2 demonstrates three important features of scientific validity, which serve to support the science related claims in the information:   * The falsifiable nature of science - that it is possible that new evidence could disprove the claim * Recognising that alternative explanations may be possible * Is tentative, acknowledging that the conclusion could change   This article refers to two other experiments. One from Harvard with green vs blue light, and another cited from the University of Toronto. Data associated with the studies is provided, but the University of Toronto paper wasn’t linked. However it could be found online. The sample size was only 9 (4 male, 5 female), which raises some questions about the validity of the findings based on this particular study. A much larger sample size would confer greater reliability. The method was listed which means it is could be tested by others - another important criteria of scientific validity.  *HHP brings trustworthy, accessible, and actionable health information to a global audience. All HHP content is reviewed by an HMS physician or faculty expert. We deliver clinically accurate content in easy-to-understand language. Our goal is to inspire and help people be — and stay — healthy, and to help empower people to manage health conditions should they occur.* However, they do charge for their publications, although 2000 are free. *Proceeds from our paid products and subscriptions support the HMS mission to educate the next generation of physicians, and to champion research and scholarship aimed at eradicating disease and improving health worldwide.*  In summary:   | Source: Block Blue Light, a company that markets products for the public | Source: Harvard Health - a website affiliated with Harvard Medical School. It does encourage paid subscriptions but also makes 2000 articles freely available | | --- | --- | | Claim: Blue light is destroying your sleep | Claim: Blue light reduces ability to sleep | | Clearly demonstrates bias and vested interest  Uses language that may lead a reader to consider the article to be medically credible  Makes bold statements without any tentative nature  Lacks evidence  lacks objectivity  Uses emotive language  Provides no scientific evidence or other sources to support the claim | Does not encourage purchases, although it does give an estimated cost of glasses to reduce blue light, it is not marketing their own product. Seems to be providing logical information to better inform the reader  Statements are tentative  Provides data with appropriate scientific units of measurement  Language is factual and seems reasonable and rational  Cites other research articles and qualified medical professionals |   By evaluating the language and science conventions used in claim 1 and 2, it is clear that claim 2 is far more scientifically credible. Despite referring to some scientific terms, the nature of the writing, emotive language, lack of evidence or scientific data, as well as clear bias and vested interest show claim 1 incorporates few features which would support validity. | A - intended purpose  M - explains science convention not used  A - science related claim  E - linking to tentative nature of science  A - science related claim  A - use of science language  No purpose mentioned  A - science language  M - further explains use of science language and conventions  Students not expected to search for further information  M - highlighting the tentative nature of science  E - justifying the article through the use of science conventions as described in the unpacking on the NCEA website  M- highlighting a science convention  Linking article to use of a science convention  Low A - purpose is copied from the article, but is identified  The purpose is not made clear  This is a good way to show basic understanding and would be evidence for high A or low M as links are limited and evidence from the article is not included.  A judgement of validity is not required for this assessment |
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