

Sophia Chen (2018), *Kilogram Redefined. The Metric System Overhaul Is Complete, Wired*

This week we're going to include something a little different. Last week we spoke to the science writer Sophia Chen and asked her some of the questions you suggested to us. The video is available at [this link](#). Watch the video and see what you learn about science journalism. One of our summary questions this week will be:

What one thing did you learn from the interview?

We'd be really grateful for feedback on the video – you can submit this anonymously [here](#) – it will only take a minute and helps us to keep the project running and to keep it improving for you.

Sophia mentioned her favourite article to write was '*Kilogram Redefined. The Metric System Overhaul Is Complete*' and we're going to read that this week. The article can be accessed [here](#).

There are no sections, so we'll simply list the summary questions rather than presenting them in a Cornell-notes style. Do try to make use of Cornell notes in your own note-taking though – there does seem to be some benefit in *note-taking by hand* as described in [this piece by the Learning Scientists](#).

COMPREHENSION QUESTIONS

1. How long does it take light to travel 1m?
2. How can the American kilogram standards gain mass over time?
3. Why is 'Le Grand K' made out of a Platinum-Iridium alloy?
4. Why is Patrick Abbott fastidious about dirt around the 1kg blocks?
5. Why is the new method for standardising the kilogram an improvement?

There is another article linked to Sophia's that provides an earlier view on the redefinition of the kilogram and the battle between two experimental teams to provide an experiment that could most precisely define the unit. Read [this article](#) too. Just as a reminder, do still try to and use Cornell notes to make notes as you go along.

COMPREHENSION QUESTIONS

1. Why is the cleaning process of 'Le Grand K' so extensive?
2. What does the author mean in this sentence "Relative to the *témoins* and to the national standards, Le Grand K has been losing weight — or, by the definition of mass under the metric system, the rest of the universe has been getting fatter."?
3. What are the seven fundamental units?
4. What is outgassing?
5. Why does the definition of the kilogram have a bearing on the stated brightness of lightbulbs?

6. Why has it taken so long to redefine the kilogram so that it doesn't depend on a physical object?
7. Why don't we define the kilogram in terms of a set number of Hydrogen atoms?
8. What was Team Avagadro's plan for redefining the kilogram?
9. The author writes "*If this sphere were the size of Earth, Nicolaus says with sotto voce awe, "the distance from the highest mountains to the deepest oceans would be 4 meters."*" What does this mean?
10. Why did Team Avagadro's plan initially fail?
11. What does the future look like for Team Avagadro?
12. What was Team Planck's plan for redefining the kilogram? (Note: The watt balance has since been renamed the Kibble balance after the death of the balance's inventor, Bryan Kibble.)
13. What are the advantages of Team Planck's experiment over Team Avagadro's?
14. What are the advantages of Team Avagadro's experiment over Team Planck's?
15. Why was the original definition of the metre 'wrong'?

SUMMARY QUESTIONS (submit these, along with your own SKIM-READ questions and answers to thomas.millichamp@warwick.ac.uk)

What one thing did you learn from the interview with Sophia Chen?

Why do we need to have a 'standard' for the kilogram?

How does a Kibble balance work? And what is its advantage over 'Le Grand K'?

Whilst we know now that Team Planck 'won' the race to redefine the kilogram, after reading everything this week, are you Team Avagadro or Team Planck? Explain why.

FURTHER READING

This [older article](#) by Sophia discusses the changing of the standard of the second and the Kelvin too.

[This is another](#) one of Sophia's favourite articles, looking at atomic clocks.