

QUANTUM TECHNOLOGY WITH DR JAN MOL

TALKING POINTS

KNOWLEDGE

1. In simple terms, what is quantum technology?
2. What different ways does Jan use to hold individual atoms and molecules for his experiments?

COMPREHENSION

3. Why is a quantum computer faster than a regular computer?
4. How would you describe the challenge of moving individual atoms and molecules around?

APPLICATION

5. If you could shrink any current technology down to the nanometre scale, what would you choose and why?
6. Apart from addressing climate change and reducing energy bills, what are some other benefits of recycling waste heat and turning it into electricity?

ANALYSIS

7. How is quantum technology different to regular technology, and why?
8. How has quantum technology impacted our day-to-day lives?

SYNTHESIS

9. What do you think would happen to our energy consumption if we could store information on DNA rather than banks of hard drives?
10. How do you think a big advance in the availability of quantum computers would affect the value of cryptocurrencies?

EVALUATION

11. If we start storing information using DNA, what are the implications for how long that information will last? Do you think an alien archaeologist in the distant future would find out more or less about us from DNA storage than from books or hard drives?

CREATIVITY

12. How could a nanometre-sized biosensor that measures cholesterol levels and connects to a phone app change people's lifestyle choices?

ACTIVITIES

- Imagine you had to communicate Jan's research to another class who had never heard about it before. Create a poster explaining what he does and how he does it. Think about the different applications of his research and use images and simple text to communicate these complicated ideas.
- Look around your house or classroom for electronic devices, and make a list of them using the table below. Use the internet to find out if any of these devices rely on quantum mechanics to operate. You already know that phones, laptops and fluorescent lightbulbs do, but find out more about how they do and list the key principles.

DEVICE	KEY PRINCIPLES
Fluorescent lightbulb	Heisenberg uncertainty principle

MORE RESOURCES

If you want to try out some quantum experiments at home, check out this page which has instructions:

spookyactionbook.com/category/diyquantum/