

MATERIALS SCIENCE WITH PROFESSOR JOSHUA ROBINSON

TALKING POINTS

KNOWLEDGE:

1. How thin is graphene?
2. What exciting properties does graphene have?

COMPREHENSION:

3. Why are ultra-thin materials so exciting for science and industry?

APPLICATION:

4. Can you list some of the technologies and industries that might benefit from Joshua and his team's research?
5. Cindy mentions that there have been times when she has lost confidence in herself. How do you regain your confidence when you need to? Who can support you when you face a challenge?

ANALYSIS:

6. What does the development of these materials mean for the future of our planet? Can you find some examples in medical science and technology that might benefit from Joshua and the team's research?

SYNTHESIS:

7. Alexander talks about the Sloan Foundation which recognises active students of colour in higher education. Why are initiatives such as this important for the scientific community? How do you think the scientific community could encourage more diversity and inclusion in different research fields?

EVALUATION:

8. Joshua highly recommends getting into a lab and exploring the possibilities. Do you think this is the only way to advance your hopes of becoming a materials scientist? If not, what are some other ways you can think of?
9. The team highlights how important it is to be creative and to value your own personal experiences. When were you last creative when facing a task or problem? What qualities and personal experience would you bring to a research team like Joshua's?

ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

- Write a brief article or create a presentation about graphene. Aim to trace its history from inception to the present day. Consider the why, what and how of graphene – maybe even move on to considering other 2D materials that have future potential.
- Alexander and Cindy have provided some information about their current experience and hopes for the future. Imagine you are a PhD researcher in Joshua's lab and you have been asked to provide some words for Futurum – consider what would be most helpful to budding materials scientists when compiling your responses.

MORE RESOURCES

• SciTech Now - 2D Tech

Watch this video of Joshua talking about his research and the potential of 2D materials:

www.youtube.com/watch?v=Y3eR32PoeuE&ab_channel=wpsu

- TeachEngineering (www.teachengineering.org) has a webpage dedicated to having a fun look at material science. Have a read through and take a look at some of the activity sheets: www.teachengineering.org/curriculum/browse?q=materials+science
- Graphenea considers all things graphene. Reading through this website will help you to better understand the possibilities behind this truly amazing material: www.graphenea.com/pages/article-graphenea
- Find out more about The Sloan Foundation which funds research and education in STEM and which Alexander mentions in the article: sloan.org

HEAD TO JOSHUA'S FUTURUM WEBPAGE FOR A SPANISH TRANSLATION OF HIS ARTICLE:

www.futurumcareers.com/extraordinarily-small-materials-with-extremely-large-applications