EXPLOSION ENGINEERING WITH THE BLAST AND IMPACT DIAGNOSTICS LAB

TALKING POINTS

KNOWLEDGE

1. What is an explosion?
2. What is a load, and what is unique about the loads created by explosions?

COMPREHENSION

3. What types of sensors is the team using to measure explosions, and what data are provided by each sensor?
4. What does Sam R. mean when he says that 'blast waves scale quite nicely'? And how does this characteristic of explosions help the team?

APPLICATION

5. The team talks about their research making people safer. How do you think the results of their experiments could be applied to protect lives?
6. Given that the Blast and Impact Diagnostics Lab investigates explosives, safety is a very serious consideration. If you oversaw safety in the lab, what precautions would you take to ensure that experiments are conducted safely?

SYNTHESIS

7. What material properties do you think affect how a structure responds to an explosion? How would you test your theories?
8. What properties of soil do you think may increase or decrease the risk from a buried explosive? How would you test this?

EVALUATION

9. Explosives research in the 1940s focused on large-scale explosions and the effects far from the centre of detonation. This lab is studying smaller explosions and the effects close to the source. Why do you think this change of focus has occurred? Consider changes in technical capabilities and patterns of warfare.

ACTIVITIES YOU CAN DO AT HOME OR IN THE CLASSROOM

Create a slideshow to explain the work being done at the Blast and Impact Diagnostics Lab to 11-12-year-olds. What is being studied? What methods are being used? Why is this research important?

Remember that younger children will have less background knowledge than you, so consider:

- How will you simplify information without it becoming inaccurate?
- What words and phrases will you need to explain?
- Which aspects of the research will your audience find most interesting?
- How will you make your slideshow engaging? Think about your use of images, text, videos, sound, etc.

MORE RESOURCES

- Watch Sam C. and Sam R. conducting explosions and learn how their research has the potential to save lives: **www.sheffield.ac.uk/news/new-blast-laboratory-help-protect-against-terrorist-attacks-1**
- The ICE has great resources about civil engineering: **www.ice.org.uk/what-is-civil-engineering/inspire-the-next-generation/educational-resources**
- This video from the University of Sheffield shows the huge range of topics covered by civil and structural engineering: **www.youtube.com/watch?app=desktop&v=_q-bTpdGuvo&t**
- According to the Women's Engineering Society (**www.wes.org.uk**), less than 13% of engineers in the UK are women. We need more women engineers! Learn about some of the women engineers at the University of Sheffield: **www.sheffield.ac.uk/engineering/about/wall-women**
- This article provides good advice for aspiring engineers: **www.forbes.com/sites/mitsubishiheavyindustries/2021/01/26/advice-for-young-engineers-be-open-minded-and-keep-learning/?sh=2047859c6238**
- The B1M YouTube channel has videos about a wide variety of engineering and construction projects: **www.youtube.com/channel/UC6n8I1UDTKP1IWjQMg6_TwA**