Producing educational resources about electrode manufacturing

Using a board game to explain electrode production and cell assembly

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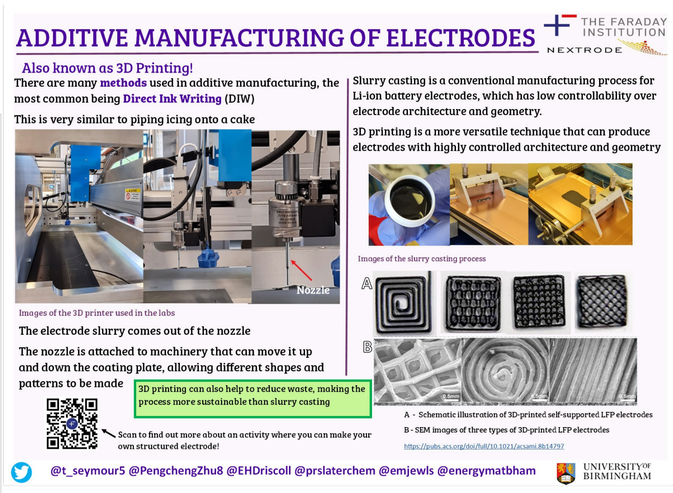
ABSTRACT

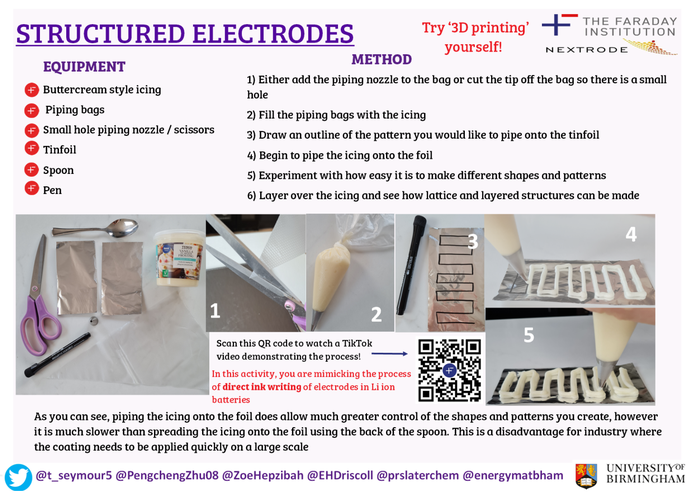
The aim was to produce educational resources for students, allowing them to understand and engage with the process of making electrodes and batteries.

- A battery board game, infographics and TikTok videos outlining the 'try-at-home' activity were created
- As part of the 'Behind the Lab Specs' series, two interviews with post-doctoral researchers at ISIS Neutron and Muon source were filmed and edited.

MOTIVATION

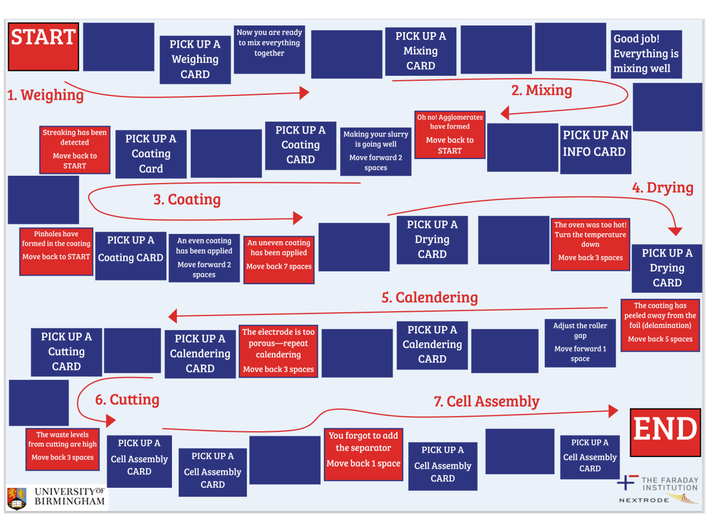
Science can often be confusing and inaccessible to younger students, so the opportunity to develop inventive new educational materials will ensure students of all abilities can engage with the content. [1]. The board game allows students to interact with their peers, learn about the electrode manufacturing process and test their understanding by answering the quick-fire questions added to the playing cards.

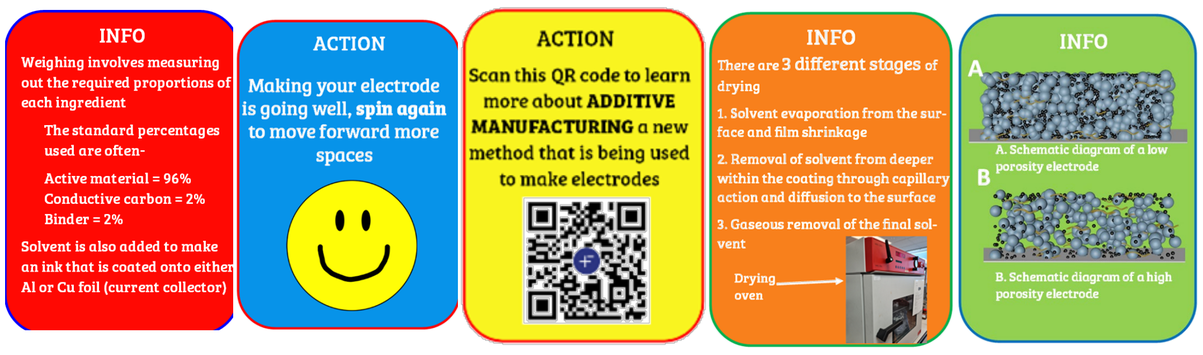




BATTERY BOARD GAME

- The board game is designed to guide students through the seven main stages of electrode manufacturing
- 'Info' cards contain detailed information and QR code links to infographics, videos and websites
- 'Action' cards have true or false and multiple-choice questions that allow the students to test their knowledge as they move around the board
- The red squares on the board are defect squares, including defects such as uneven coatings. Landing on these squares incurs penalties, such as moving back spaces or even moving back to the start.



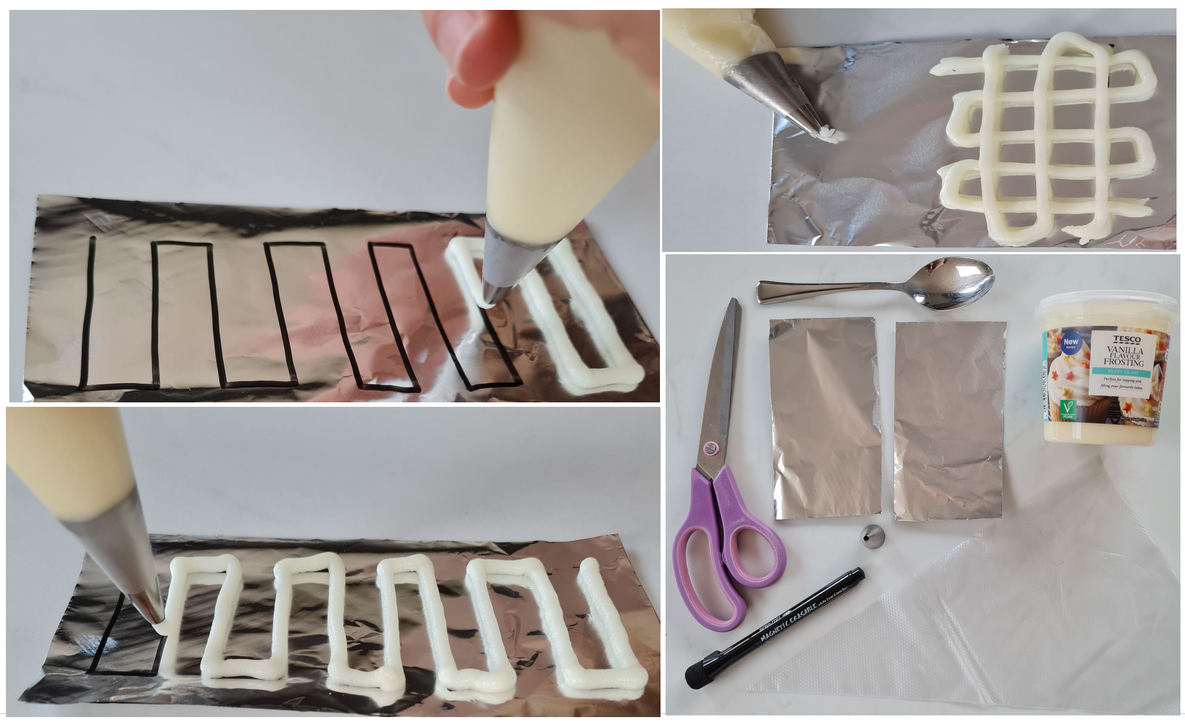


INFOGRAPHICS AND STRUCTURED ELECTRODES

- The infographics focussed on the advances being made in electrode manufacturing, such as optimisation of **thick** electrodes, using **templating to control porosity** and **additive manufacturing** to make **structured** electrodes[2]

Scan to view the 'Structured Electrodes' infographic

Scan to watch the TikTok video demonstrating the activity



CONCLUSIONS

The game was played with undergraduate students and a non-scientific audience; players commented that the game was fun and informative. It was promising that players of all ages were able to answer the questions correctly, proving the educational aspect of the game.

NEXT STEPS

- Test the game in a classroom environment with Year 9+ students
- Expand the board game to include the continued research being conducted by the Nextrode Project
- Relate the board game to the other Faraday projects

INTERN BIO

Tabitha Seymour has just finished her first year studying Chemistry at the University of Birmingham. She is interested in synthetic chemistry and aspires to work in academia to continue the research towards creating a more sustainable future.

REFERENCES

1 - RY. Bayeck, *Project Management Journal*. 2020;51(4):86-100

2 - R.Gonçalvesa, S.Lanceros-Méndez, C.M.Costa, *Electrochemistry Communications*, **135**, 107210,1388-2481, 2022

THE FARADAY INSTITUTION ELECTRODE MANUFACTURING NEXTRODE

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