

## How do mammalian whiskers help animals to sense their surroundings?

### Engaging pupils in real-world research

Through the mechanism of the Royal Society [Partnership Grants Scheme](#), and based on a Royal Society APEX-funded research project, *Morphology, mechanics, and movement of mammalian whiskers*, undertaken by Dr Robyn Grant at Manchester Metropolitan University, and supported by the [Primary Science Teaching Trust](#), we are hoping to engage schools across the UK to take part in a new initiative to engage young people and their teachers with real world research. The project will involve up to 15 primary schools exploring sensory perception of their surroundings.

#### Overview

Dr Robyn Grant's research will explore how differences in whisker shape, orientation and number affect whisker mechanics, using novel mathematical algorithms. Eventually she will make recommendations for tactile robot sensor design and control, which has applications for robotic exploration in environments where visual information is either unreliable or restricted, such as in marine archaeology, environmental monitoring and search and rescue operations.

The schools involved in this project will be working in parallel to compare whisker touch sensing to human fingertip sensing. They will gain an understanding of the importance of touch in animals, humans, and robots. Data collected from the schools will be statistically compared to MMU's research findings in animals and robots.

The students will be working with local STEM partners and Dr Robyn Grant will provide overall supervision of the project, engaging with the teachers and students virtually or in person where feasible. Additionally, Dr Grant's team will be developing interdisciplinary virtual workshops for all the schools taking part in this extended research project, containing aspects of natural science, design, maths, and robotics.

#### Outcomes

- By undertaking this study, students will be contributing to a genuine research programme undertaken by the Manchester Metropolitan University.
- Students will gain a greater understanding of how mammals use their whiskers to sense their surroundings and how this can be applied to other settings, hopefully encouraging a lifelong interest in applied biology.
- The project has excellent curriculum links throughout the National Curriculum, and staff at the Primary Science Teaching Trust will provide teaching materials related to this project. By engaging with genuine research, it will hopefully inspire pupils to pursue a career in science.
- As a teacher, the project provides examples for many curriculum areas helping to scaffold learning. Through working in collaboration with each other, their STEM partners and with the support of Dr Robyn Grant, they will have an excellent opportunity for CPD.
- Schools will be able to develop long lasting relationships with STEM partners.
- Through the Royal Society Partnership Grant, schools will have ownership of their equipment to allow other practical work beyond and in addition to this project.
- Schools will be encouraged to visit their local museums, zoos and wildlife parks to learn more about direct observation of animals.
- Throughout the project, the team at MMU will encourage career discussions relating to animals, zoos, robotics, biosciences, maths, and computing providing teachers and pupils with an insight into the interdisciplinary nature of science research.