|  |  |  |  |
| --- | --- | --- | --- |
| **Session 2: Sports Kit and Equipment Enquiries (materials)** | | | |
| Science curriculum area:  **Properties of Materials** | | i. compare and group together everyday materials on the basis of their properties  ii. give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic | |
| Working Scientifically (**UKS2**) | | i. planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary  ii. taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  iii. recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs  iv. using test results to make predictions to set up further comparative and fair tests  v. reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations  vi. identifying scientific evidence that has been used to support or refute ideas or arguments | |
| Teaching Objectives | | * To investigate and compare the properties of cotton and modern sports materials. * To research the properties of materials used for equipment and prosthetics in Paralympian sports. | |
| Key Vocabulary: materials, properties, fair test, investigate, fitness for purpose, comparison | | | |
| Resources  Sports kit images, football shirts and cotton t-shirts, photos of Paralympian biomechanical prosthetics & wheelchairs, suggested fair tests and sticky-note investigation materials, Internet access & recording equipment. | | | Weblinks  <https://www.youtube.com/watch?v=BxkAAmCTc0I> *- Thermoplastics in Prosthetics, YouTube;* <https://3dprintingindustry.com/news/first-3d-printed-paralympic-cycling-prosthetic-compete-rio-91614/> *- 3D printed cycling prosthetic.* |
| Whole Class: *Have some football shirts available (chn may have football shirts that they can bring in) and a range of sports kit (see images for ideas) or print off the images.* As chn come in have the items of sports kit spread out around the room. Get the chn into gps and see if they can suggest the sport each item of kit is for and some key properties that they think the materials have that make them fit for purpose. Explain that for today’s challenge you will be exploring the science of sports kit materials, specifically the fabrics that football shirts are made from and the properties of Paralympian biomechanical and wheelchair materials and how they impact on disability sport. Give chn, in gps, a football shirt and a cotton t-shirt and ask them to make some observations and note any similarities and differences. Explain that traditionally most sports kit was cotton but that materials development has resulted in players wearing the latest in fabric technology, that combine light-weight materials with wicking properties to keep players dry and cool without being too cold. Manufacturers make claims, such as ‘each Nike™ shirt contains eight recycled plastic bottles, lightweight polyester, mesh panels and laser-cut holes for ventilation, sweat wicking’, which, when it comes to football shirts, comes at a price: often over £50! Ask chn if they think this is worth the money and that you are going to investigate some of these claims. Now look at the images of the biomechanical materials and wheelchairs and watch the first video. Ask chn what sort of properties they think the biomechanical limbs might need and whether it would change from person to person and from sport to sport. Explain that they are going to complete some research on the design and materials used in Paralympian sports to share with the class. | | | |
| Activities: **Sports tops tests**: working in mixed ability gps of 3 get chn to create fair tests to compare a cotton T shirt to a modern football shirt. Two suggested fair tests are included in the resources, but encourage them to suggest other fair tests they could also carry out. Encourage chn to plan and record their investigation using the sticky-note resources and get them to complete a simple table to compare and contrast the two garments using their findings. Encourage chn to draw conclusions. **Paralympian materials:** Get chn to investigate the materials used to create sports wheelchairs (racing and/or basketball), running blades, cycling prosthetics, or another Paralympian prosthetic or piece of equipment. Explain that they need to find out why the materials have been selected and how the design and materials are fit for purpose. Once they have completed their research, chn need to create a 1 minute video clip that sets out what they have discovered. **Possible additional activities** – chn can complete research or investigations into the materials used for various sports balls or bats/rackets and clubs | | | |
| Plenary | Allow the children time to present their findings. Were the tests fair? What do the results suggest? Share some of the videos and ask chn why it is important to get the materials correct and why they think there are guidelines on the use and design of prosthetics and wheelchairs (unfair advantage could be gained). Watch the video about the 3D printed cycling prosthetic and note that science continues to develop new and improved materials and approaches to creating prosthetics. | | |
| Outcomes | Children will   * Identify and compare the properties of sports top materials * Investigate the properties of modern football shirt material in comparison to cotton shirts * Identify the properties of Paralympian biomechanics materials and understand the positive impact they have on disability sport | | |