

STEM Clubs Week



The national STEM Club sessions, hosted by STEM Learning, provide an opportunity for young people, families and schools to take part in club activities.

This collection of suggested activities, reading material and videos has been compiled to support the Sport and Exercise theme of the national STEM Clubs Week 2021.

They have been chosen for their suitability for STEM clubs, at home, outside and in the classroom and are matched to the daily themes.



STEM Clubs Week 2021 – 21-25 June

This free, week-long, virtual event is a celebration of STEM Clubs across the country.

Throughout the week, we will be bringing you an exciting timetable of virtual sessions designed to inspire young people, including talks, fun challenges, webinars - plus our competition below! You can watch all webinars, activities, demonstrations, talks and case studies here:



https://www.youtube.com/playlist?list=PLhgK74tFscGUo0zwEtx4h6S_y62TU1_7

Social Media

Please share photos or videos of activities that you take part in:

Twitter [@STEMClubs](https://twitter.com/STEMClubs) [#STEMClubs](https://twitter.com/STEMClubs) [#STEMClubsWeek](https://twitter.com/STEMClubs)



<https://www.stem.org.uk/stem-clubs/activity-sets>



Technology, performance analysis and match stats

Human Kite

Age Range	7-11, 11-14
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Taking inspiration from the Born to Engineer video from Angelo Grubisic, an aeronautical engineer who combines his love for engineering with a passion for extreme sports. This activity supports students to increase their understanding of flight and how engineers use nature to inspire their ideas. Students will have the opportunity to build, test and evaluate their own creations.

Activity Download Link	https://www.stem.org.uk/rxfyp8
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Provider	Born to Engineer
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In Top Gear

Age Range	11-14
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In this activity students use data to investigate how changes in technology have led to improved performance in cycling. They research footwear to see how materials of different properties can be combined for specific purposes and carry out a practical investigation to define the optimum design of a bat. Students then use attributes analysis to see how varying the individual elements of game will affect its nature. Groups of students finish the pod by conducting a small practical investigation to test or improve a piece of equipment of their choice.

Activity Download Link	https://www.stem.org.uk/rxun6
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Provider	Nuffield Foundation
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Sporting Performance

Age Range	11-14
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Ready, set go! Playing sport is a fundamental part of our society, but how will it change in the future? Which new technologies and innovations will help us to get the most out of our favourite activities? This is a collection of sport technology related activities, which stretch across many of the themes covered by STEM Clubs week.

Activity Download Link	https://www.stem.org.uk/rxg7no
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Provider	STEM Learning
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Computer games vs Sport:

Age Range	14-19
<p>The activity allows the students to explore social, ethical, economic and health issues relating to the use of Nintendo Wii compared to doing real sports and present their findings in a persuasive, coherent and focused argument. Students identify arguments for and against the topic, researching information needed to support those arguments and presenting the findings.</p>	
Activity Download Link	https://www.stem.org.uk/rx32bb
Provider	The Institution of Engineering and Technology (IET)



Health, wellbeing and sport psychology

Exercise: Working It to the Bone

Age Range	14-19
<p>A Catalyst article looking at the benefits of exercise and how it affects bone structure and hence physical fitness. Furthermore, obesity in Britain is on the rise and so the population is encouraged to do regular exercise, not only for cardiovascular and respiratory health, but also for general well-being. But what effects does exercise have on bones, and why is this so important.</p>	
Activity Download Link	https://www.stem.org.uk/rxuo5
Provider	Catalyst Magazine

The Systems Physiology of Exercise

Age Range	14-19
<p>This Catalyst article looks at the effect exercise has on the body. Poor fitness contributes to poor life expectancy, and inability to exercise reduces quality of life in the ill or aged. Scientists hope to understand the mechanisms which limit 'exercise tolerance' which would contribute to enhanced performance for the sportsperson and to good health and to quality and length of life for everyone.</p>	
Activity Download Link	https://www.stem.org.uk/rxxjb
Provider	Catalyst Magazine

Performance Enhancing Drugs

Age Range	16-19
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Question: should the use of performance enhancing drugs be permitted in sport? Anti-doping authorities and campaigners argue that performance-enhancing drugs undermine the spirit of sport. If they were allowed, the most successful athletes may not be the fastest or strongest, but those who have the best medical team. So, would sport be undermined by athletes pumping themselves full of drugs? Or is doping in the tradition of what competitors have always done: pushing the boundaries of human endurance? The activity contains information, further reading and web links which allow students to understand and debate the issues.

Activity Download Link	https://www.stem.org.uk/rxvny
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Provider	Institute of Ideas
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Anatomy, physiology and biomechanics

Super Athletes

Age Range	7-9
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Investigate the human body to design a super athlete. Explore the variations in the size of body parts and how this may affect performance in sport. Follow the character Fizzy as she sets the pupils a series of questions to investigate.

Activity Download Link	https://www.stem.org.uk/rx33h8
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Provider	Wellcome Trust
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What affects your heart rate?

Age Range	7-11
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This activity has a set of videos and a practical investigation, Professor Brian Cox joins a teacher to find out how to set up and run an investigation to find out how exercise affects heart rate. He then joins the class carrying out their experiment, who look at variation in heart rate across the class before and after exercise, as well as how long it takes their heart rate to return to normal.

Activity Download Link	https://www.stem.org.uk/rxbo82
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Provider	The Royal Society
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Training in Space

Age Range	7-14
<p>In this activity pupils will be able to discuss various ways of simulating gravity in space and the importance for maintaining a healthy body for the return to Earth. Working in teams of four, pupils should choose their favourite exercise or sport and adapt it for space. They should identify the forces required for their activity and design a way of simulating these forces in space. By the end of the time available pupils should aim to produce a poster detailing how their activity works and if possible, find a way of demonstrating their activity.</p>	
Activity Download Link	https://www.stem.org.uk/rx35ts
Provider	UK Space Agency

Wetsuits for paratriathletes

Age Range	11-14
<p>This challenge is an opportunity for students to explore, experiment and innovate whilst designing a specialised wetsuit for paratriathletes who need specialised equipment to allow them to compete. Whilst the development in technology of prosthetic limbs, racing wheelchairs and handcycles has been substantial, no such developments have been made with wetsuits for paratriathletes.</p>	
Activity Download Link	https://www.stem.org.uk/rx33fy
Provider	STEM Learning



Anatomy, physiology and biomechanics

Mission X: train like an astronaut

Age Range	8-12
<p>Mission X is an international educational challenge that focuses on health, science, fitness, and nutrition and encourages pupils to train like an astronaut! Mission X is designed for students aged 8-12, but open to all ages. The challenge is supported by a set of physical and educational hands-on classroom activities, developed by space scientists and fitness professionals working with real astronauts!</p>	
Activity Download Link	https://www.stem.org.uk/missionx/activities
Provider	ESA, ESERO, UK space Agency

Tim Peake – Can you get fat in space?

Age Range	7-14
<p>Celebrity chef, Heston Blumenthal, asks us the question, “Can you get fat in space?”. He explains that, due to being in a weightless environment, astronauts' muscles do not need to work as hard as on Earth, and so the fat on their bodies could increase. However, he also tells us that as food floats inside the astronauts' stomachs, they feel fuller more quickly, and that astronauts are required to exercise for two hours a day to maintain their muscle and bone mass. Heston says that it is much more likely for Tim Peake to come back to Earth thinner rather than fatter, and so he challenges children to design a meal that will give Tim the right nutrients to ensure that this does not happen.</p>	
Activity Download Link	https://www.stem.org.uk/rx347n
Provider	UK space Agency



Everything sport

Turf Troubles

Age Range	7-11
<p>The activities are set in a real-life context, that of a sports company who wish to provide a turf surface suitable for a range of activities. Information is required on suitable grass types and the best growing conditions. They also need to know how much water will be needed, and the effects of soil type.</p>	
Activity Download Link	https://www.stem.org.uk/rxxer
Provider	Centre for Industry Education Collaboration (CIEC)

Design a sports glove

Age Range	11-16
<p>In this resource, students design a new glove for use in a sport of their choice. Students may find it helpful to talk with local people who partake in their chosen sport. The P.E. department may be able to suggest suitable contacts. They must decide what are the most important properties to include in the design of their glove. Students can then choose what activities and research to do accordingly. They may also think of their own experiments or research to carry out, as well as exploring the aesthetic aspects of design.</p>	
Activity Download Link	https://www.stem.org.uk/rx33g2

Provider	STEM Learning
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Olympic Quests

Age Range	11-16
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Quest 1, students have the chance to develop ideas about the javelin, one of the original Olympic sports and still a part of the modern Olympics today. Students have the chance to find out about the history of the javelin and about how an understanding of aerodynamic forces plays an important part in explaining how the modern javelin works.

Quest 2, students have a chance to investigate a physiological measurement of heart rate, analyse their own data, and compare their data with data from top athletes.

Quest 3 is a series of mini challenges based on measurements such as time, distance and windspeed. Students consider the most appropriate methods for a range of sports scenarios. Questions enable students to refer to accuracy and precision of measurements.

Activity Download Link	https://www.stem.org.uk/rxvmx
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Provider	Sheffield Hallam University, Centre for Science Education
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