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| **Sketch your own football pitch** |
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| Designing a football arena for the moon |
| **Subject(s):** Design and Technology, Engineering**Approx time:** 50-70 minutes |  | **Key words / Topics:** * annotation
* atmosphere
* design brief
* football
* gravity
* moon
* roof
* sketching
* stadium
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| **Stay safe** Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for: • ensuring that any equipment used for this activity is in good working condition• behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others  Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠ |
| **Suggested Learning Outcomes**  |  |  |
| * To understand the main considerations when designing sports stadia
* To be able to design a stadium for playing football on the moon
* To be able to present design ideas as annotated sketches
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| **Introduction** |  |  |
| This is one of a series of resources that are designed to allow learners to use the theme of football on the moon to develop their knowledge and skills in Design & Technology and Engineering. This resource focusses on learners designing a stadium for playing football on the moon. |
| **Purpose of this activity**In this activity learners will make use of the theme of football on the moon to design a future football stadium for playing the game on the moon. They will think about the main design considerations and requirements for the stadium. They will then produce annotated sketches of their idea. This activity could be used as a main lesson activity to develop designing, annotating and sketching skills. It could also be used as part of wider scheme of learning focussed on the engineering challenges associated with living and playing sports on the moon. |
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| **Activity** |  | **Teacher notes** |
| **Introduction (5-10 minutes)**Teacher to introduce the theme of playing football on the moon. Teacher to use slide 3 of the presentation to introduce and discuss the design brief with learners.Teacher to discuss the additional considerations for playing on the moon shown on presentation slides 7-10.**Researching (15-20 minutes)**Learners to research the given stadia shown (and potentially others at the teacher direction).Teacher to ask directed questions such as how many people do they hold? What are the good points that could be used? What needs to be changed? How could we alter it for use in space?Teacher to discuss the additional considerations for playing football on the moon shown on presentation slides 7-10.**Designing (30-40 minutes)**Teacher to set the task of designing a stadia for playing football on the moon. This should include regular prompts to drive the design process. For example:* How will it differ to regular football?
* Can the players use the roof for the game?
* How will the layout of the pitch differ – think about the time the ball will be in play – players will need a rest.
* How could the design of the goals alter? If the arena is fully enclosed, could they replicate other sports? This may require internet research on other sports.
* How would the lines on the pitch change? Do they need the current layout? What are the lines actually for if the ball cannot go out of play?

Learners to sketch ideas and fill out the activity sheet as the discussions happen – this should be scaffolded to support progression. Learners to use the worksheet handout to record their responses. |  | **Existing stadiums**Slide 5 of the teacher presentation gives examples of existing stadia for learners to look at and analyse. These are: Wembley Stadium (London, England), Camp Nou (Barcelona, Spain), Olympic Stadium (Munich, Germany). Discuss the main defining features of each and where they could be modernised or improved. E.g. for Camp Nou – holds a lot of people but little cover from the weather.**Design brief** Discuss the requirements of the design brief and other design considerations with learners. How could they meet these? Learners may wish to jot down some initial thoughts and ideas.**Designing** Questioning or discussion points could be delivered at the start to allow learners to plan their designing, or interjections applied during the designing to make the learners think as they go.Internet research to look at the kinds of goals used in other sports – teacher may need to discuss internet searching, online safety and successful search criteria methodology. ⚠ |
| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| * Provide partially completed arena designs for weaker learners to add to and improve.
* Provide card or paper cut outs of different arena elements that they could assemble to produce a finished design.
 |  | * Make a card scale model of the stadium.
* Design a stadium for playing other sports on the moon, such as athletics, rugby, cricket or netball. How would the requirements of these differ from football?
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Pens or pencils
* Coloured pencils
* Rulers
* Paper
* Computer and internet for research
 |  |  Presentation – Sketch your own football pitchicon-doc Handout – Sketch your own football pitch |
| **Additional websites** |  |  |
| * **Natural History Museum – Facts about the Moon:** <https://www.nhm.ac.uk/discover/factfile-the-moon.html>
* **YouTube – If the football World Cup was on the moon:** <https://www.youtube.com/watch?v=o5tD7eP8izE>
* **YouTube - Two astronauts play football on the moon:** <https://www.youtube.com/watch?v=z3Lt0PRt0Dk>
* **YouTube - Football pitch length and area:** <https://www.youtube.com/watch?v=jvY-AzDr0qg>
* **Can you play football in space?:** <https://www.trendhunter.com/trends/astronauts-play-football>
* **Best 25 stadiums in the World:** <https://www.thesun.co.uk/sport/football/11560043/tottenham-best-stadiums-football-world-poll/>
* **YouTube - Throwing a ball in space:** <https://www.youtube.com/watch?v=nMqZ4iYnjf8>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Watch the video – if the football World Cup was on the Moon <https://www.youtube.com/watch?v=o5tD7eP8izE>
* Discuss the specific problems that would be faced by the players, referee and spectators when playing football on the moon.
* Analyse examples of existing sports stadia.
 | **Plenary*** Evaluate each design against the design brief requirements, listing improvements that could be made.
* Self/peer assess the creativity of each design.
* Produce a class display of the ideas drawn.
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| **The Engineering Context**  |
| * Travelling and potentially living on the moon presents all sorts of challenges for engineers to overcome. For example, how will we breathe, how will we cope with much lower gravity, how will we play sports and keep fit, how will we develop the facilities to live happy, healthy and fulfilling lives?
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| **Curriculum links** |
| **England: National Curriculum**Design & Technology * Identify and solve their own design problems and understand how to reformulate problems given to them.
 | **Northern Ireland Curriculum**Technology & Design* Communication – use of free-hand sketching and formal drawing techniques and ICT tools (including 3D modelling).
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| **Scotland: Curriculum for Excellence**Technologies* I can apply a range of graphic techniques and standards when producing images using sketching, drawing and software.
* TCH 3-11a
 | **Wales: National Curriculum** Design and Technology* Use given design briefs, and where appropriate, develop their own to clarify their ideas for products
* Be creative and innovative in their thinking when generating ideas for their products
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| **Assessment opportunities** |
| * Formal teacher assessment of completed design sketches.
* Self/peer assessment of completed design sketches.
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