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| **Make a Christmas star lantern** | | | |
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| A graphics project that makes a wonderful Christmas star lantern  **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: ⚠ | | | |
| **Subject(s):** Design & Technology, Engineering, Mathematics  **Approx. time:** 80 - 120 minutes |  | | **Key words / Topics:**   * Net * Template * Support * Lantern * Fold * Light |
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| **Suggested Learning Outcomes** |  | |  |
| * To know how nets and templates are used to make the parts of a graphic product * To be able fold and glue parts together to make a lantern shaped like a Christmas star | | | |
| **Introduction** |  | |  |
| This is one of a series of resources designed to allow learners to use Christmas themes to develop their knowledge and skills in Design & Technology and Engineering. This resource focusses on the making of a lantern shaped like a Christmas star using folded card and paper. Nets are used for the main parts of the lantern. Nets are important as they allow 3D objects to made when folded. | | | |
| **Purpose of this activity**  In this activity learners will use nets to make parts from card and paper, which they then assemble into a lantern shaped like a Christmas star.  This activity could be used as a main lesson activity to teach learners how to use templates and nets to make useable objects.  Alternatively, it could be used as one of several activities within a wider scheme of learning focussing on the use of maths to understand the use of nets or the principles of structures in Engineering. | | | |
| **Activity** |  | | **Teacher notes** |
| **1. Introduction (5-10 mins)**  Teacher to explain that learners are going to work with templates and nets to make a lantern shaped like a Christmas star.  Teacher to hand out equipment needed for the task to learners.  **2. Making the lantern demonstration (25-35 minutes)**  Teacher to demonstrate the steps shown in the teacher presentation and listed below:   * Step 1 – Using two ‘make a Christmas star lantern handout 1’ sheets, clearly identify the solid and dotted cutting lines. ⚠Cut out the ten frame strips. Score, fold and glue the ten strips. * Step 2 – Using the build template on ‘Make a Christmas star lantern handout 2’, place five strips in the correct sequence and glue together where shown on the presentation. Repeat steps 1-2 to make the second frame. * Step 3 – ⚠Cut the solid lines on ‘Make a Christmas star lantern handout 3’ to make the five supports. Roll the strips onto a pencil and glue together. Let the glue dry. * Step 4 – Glue the rolled supports into the positions shown on the presentation, then glue the frames together. * Step 5 – Attach the points of the star frames together leaving one point open. This can be achieved using staples, paperclips, or glue. * Step 6 – Cover one side of the lantern with paper. Glue the paper onto the supports and let the glue dry. Trim the paper leaving a small overlap all around the star. * Step 7 – Fold in and glue the paper overlaps then repeat steps 6-7 to cover the second side. * Step 8 – Cut out the side template on the ‘Make a Christmas star lantern handout 3’. Use the template to ⚠ cut out ten side pieces. * Step 9 – Cover eight sides on the lantern and leave the top gap open. |  | | This activity could be carried out individually or in pairs.  If thick card is available folding may not be necessary at step 1 – in which case cut the card to the width of the fold indicated on the activity sheet.  At step 2, make sure the strips are evenly placed on the template so that the points meet together.  At step 4, ensure a strong glue is used to attach the supports to the frame, such as a hot glue gun if learners have been trained how to safely use one. Alternatively, a quick setting adhesive could be used, making sure the area is well ventilated and following the requirements of the schools COSHH risk assessment. The supports need to be positioned as shown in the presentation.  At step 5, depending on availability, use either staples for a quick fastening method or paperclips, sticky tape or glue to attach the tips together.  At step 6, baking, greaseproof or tracing paper all work well. Ensure the frame is fully covered with glue to allow the paper to stick evenly.  At step 9, ensure the paper side pieces are fully covered with glue to allow the paper to stick evenly across the gaps.  At step 10, use whichever light source is available. Note that the PP3 9V battery and LED option will be permanently on.  Learners could decorate the star lantern as time allows. |
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| * Step 10 – Insert the lights into the lantern. Learners could use either bottle fairy string lights, a small torch or a PP3 9V battery with a LED attached across the terminals – these could be suspended from a piece of string, held with sticky tape. * Step 11 – Glue the top side pieces to the lantern and then use sticky tape to attach the string. * Hang up and test the Christmas star lantern.   **Differentiation** |  | |  |
| **Basic** |  | | **Extension** |
| Provide learners with card sections pre-cut on a guillotine and/or pre-cut templates. |  | | Learners to create and add their own designs to the lantern or use coloured paper to create different effects. |
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| **Resources** |  | | **Required files** icon-docicon-pdficon-ppt |
| * Projector/whiteboard * Scissors * Glue sticks * Sticky Tape * Card * Tracing, baking or greaseproof paper * Small torch/PP3 9V battery and LED/Bottle fairy string lights. |  | | icon-ppt Make a Christmas star lantern presentation  icon-pdf Make a Christmas star lantern handout sheets 1-3. |
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| **Additional websites** |  | |  |
| The following websites can be used for additional background information or to aid with the activity:     * **YouTube –** From our family to yours, Disney Christmas Advert 2020: <https://www.youtube.com/watch?v=eFJms_VUklI> * **BBC Bitesize** **– What are nets?:** <https://www.bbc.co.uk/bitesize/topics/zt7xk2p/articles/z247tv4> | | | |
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| **Related activities (to build a full lesson)** |  | |  |
| **Starters**   * Watch the YouTube video, Disney Christmas Advert 2020, about the star lantern <https://www.youtube.com/watch?v=eFJms_VUklI>. * Discuss how maths techniques can be used to make nets of 3D objects. Watch BBC Bitesize video about nets <https://www.bbc.co.uk/bitesize/topics/zt7xk2p/articles/z247tv4>.   **Main**   * ACTIVITY: Make a Christmas star lantern | | **Plenary**   * Learners hang up and test their Christmas star lanterns. * Peer review, giving feedback on the star lantern. | |
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| **The Engineering Context** film |
| Engineers use nets to allow them to make scale models of buildings and other structures, as well as packaging for products. They use templates when making products in small quantities to save time marking out, to ensure that all the products are similar and to check that components are the correct size. |

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| **Curriculum links** | |
| **England: National Curriculum**  Design & Technology   * KS3 2a, 2b, 3c | **Northern Ireland: Curriculum**  Technology & Design   * KS3 Knowledge, understanding and skills: Manufacturing – selecting and using materials fit for purpose; safe use of a range of tools and processes appropriate to materials, demonstrating accuracy and quality of outcome. |
| **Scotland: Curriculum for Excellence**  Technologies   * TCH 3-10a, TCH 4-09a | **Wales: National Curriculum**  Design and Technology   * KS3 Skills: Making 1, 2, 3, 4 |
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| **GCSE D&T**  AQA D&T   * 3.1.6.1, 3.2.2, 3.2.4, 3.2.5, 3.2.8, 3.3.9   Edexcel D&T   * 1.9, 1.1.7, 2.7.4, 3.2.1, 3.2.2, 3.6.3, 3.7.2, 3.7.3   Eduqas D&T   * 2.1 Core: 8 * 2.2 Core: 1, 2, 4   OCR D&T  5.1a, 5.4, 7.2, 7.5 | **GCSE Engineering**  AQA Engineering  3.4.2, 3.6 |
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| **Assessment opportunities** | | |
| Regular questioning throughout the activity, peer review of the lanterns, formal teacher assessment of completed work. | | |
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| **Personal, learning & thinking skills (PLTS)** | | |
| * Self-manager * Effective participator * Reflective learner * Creative thinker | | |
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