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| **Create your own Christmas mobile** |
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| Making Christmas mobiles and balancing them |
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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: ⚠ |
| **Subject(s):** Design & Technology, Engineering**Approx. time:** 90 - 110 minutes |  | **Key words / Topics:** * aesthetics
* balance
* materials
* mobile
* strength
* structures
* triangulation
* Winter
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| **Suggested learning outcomes** |
| * To understand what makes a structure strong.
* To understand the concept of balancing.
* To be able to make a strong, well-balanced and visually attractive Christmas mobile.
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| **Introduction** |
| This is one of a series of resources designed to allow learners to use the theme of the Christmas period to develop their knowledge and skills in Design & Technology and Engineering. This resource focusses on the making and balancing of a winter mobile with hanging decorations.Mobiles add a fun and visually attractive aspect to the festive period. Can you design and make a Christmas mobile that not only looks good, but balances well too? |
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| **Purpose of this activity** |
| In this activity learners will use the theme of the festive season to make a Christmas mobile. They will learn about the principles of balancing and how to create a strong structure. They will then apply this knowledge to create their own product.This activity could be used as a main lesson activity to teach about how to construct strong structures, or about the principles of balancing. It could also be used as part of a wider scheme of learning focusing on making and assembly skills within design and technology, The IET Faraday Resource: Christmas Tree Ornament could also be used in combination with this, to produce one of the hanging ornaments. |
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| **Activity** ⚠ |  | **Teacher notes** |
| **Introduction (5 minutes)**Teacher to explain that learners are going to make a Christmas mobile for the festive period.**Activity (75 – 90 minutes)**Teacher to proceed through the presentation demonstrating each step shown, one at a time, allowing learners to complete before moving on to the next stage.* Collect the resources needed.
* Make the hanger (5 mins)

The learners construct the main mobile frame.* Decide what type of decoration to make:
* Fir Cones (15 mins)

Decorate fir/pine cones. Add a hanging loop.* Little Fir trees (10 mins)

Make a small tree to hang on your mobile.* Clay Star (10 mins)

Make a steampunk star to hang on your mobile.* Pipe Cleaner Star (10 mins)

Use a pipe cleaner or two to make a fuzzy star.* Getting the balance right (10-15 mins)

Developing understanding about counterbalancing the ornaments on the mobile * Hanging the decorations (10-15 mins)

**Reflection and plenary (10-15 minutes)**Share the mobiles produced with the group or as a class. What went well? What could be better? Encourage learners to self-assess their own work and peer assess that of others, giving feedback as appropriate. |  | A completed mobile would be useful to explain the process alongside the slides. When providing the resources to learners, start with the parts for the mobile frame. 6 lollipop sticks and 5 rubber bands. The rest of the resources can be supplied to the learners while they make the frame, as needed. It may assist to make the hangar step-by-step with the class or group.The time needed and resources required for this activity will vary depending on the types and quantities of decorations to be made. As there are four suggestions, the instructions could be printed out for learners follow. (Slides 4-8)* Fir/pine cones. Cones that have been collected previously and allowed to dry out are best. They take paint well if dry and can look effective with decoration. Keep the hanging loops long.
* Small fir trees. These are simple to construct.
* Clay star. This will be a heavy element for the mobile. The impact of different weights of decoration will be discussed later. Bolts do not have to be used if not available.
* Pipe cleaner star. Learners may need additional assistance with measuring the length of the pipe cleaner to split into 5.

**Getting the balance right and hanging decorations**It is recommended that the teacher takes the learners through this and discusses with them, using slides 9-14 of the teacher presentation. The hanging loops may need to be extended to get the best effect.**Development/Variations**Using natural materials will give a different, more designer effect. Mix in some shop bought decorations if time is short. |
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| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| * Provide a completed mobile for reference.
* Pre-make the hanging loops.
* Provide pre-made decorations for hanging to the mobile.
 |  | * Learners could also create different combinations of shapes or ornaments of their own design.
* Research methods of increasing the strength of the mobile.
* Design and make a mobile for an alternative theme, e.g. Summer or someone interested in a sport.
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| **Resources** ⚠ |  | icon-doc**Required files** icon-pdficon-ppt |
| For the mobile frame:* Sticks
* Rubber bands

Depending on the type of decoration:* Pipe cleaners
* Fir cones
* Paint
* Air drying clay
* Bolts
* Sequins
* Pompoms
* Hanging thread
 |  |  Christmas mobile presentation |
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| **Additional websites** |  |  |
| * **The Craft Patch blog and Best ideas for kids:** Ideas for other decorations that could be made using glue to assemble them. <https://www.thecraftpatchblog.com/popsicle-stick-christmas-crafts/> & <https://www.thebestideasforkids.com/popsicle-stick-christmas-crafts/>
* **Activity Village – Christmas star decoration:** How to make a six-pointed star using glue. <https://www.activityvillage.co.uk/christmas-star-decoration>
* **YouTube - Ideas for mobiles:** <https://www.youtube.com/watch?v=YHl4J8vFa4s>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Show and analyse examples of existing Christmas mobiles. How do you think they were made? What works well about them and what could be improved upon?
 | **Extension** (Options)* Learners could also create different combinations of shapes or ornaments of their own design.
* Research methods of increasing the strength of the mobile.
* Design and make a mobile for an alternative theme, e.g. Summer or someone interested in a sport.

**Plenary*** Share the mobiles produced with the group or as a class. What went well? What could be better? Encourage learners to self-assess their own work and peer assess that of others, giving feedback as appropriate.
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| **The Engineering Context** film |
| * Engineers need to understand how structures are balanced effectively. This is important when building structures such as scaffolding and bridges.
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| **Curriculum links**  |
| **England: National Curriculum**Design & Technology * KS2 1b, 2a, 2b
 | **Northern Ireland Curriculum**Technology & Design* Manufacturing – selecting and using materials fit for purpose
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| **Scotland: Curriculum for Excellence**Technologies* TCH 1-04b
* TCH 1-10a
 | **Wales: National Curriculum** Design and Technology* KS2 Skills: Designing 3
* KS2 Skills: Making 1, 3
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| **Assessment opportunities** |
| * Formal teacher assessment of the finished mobile.
* Peer and/or self-assessment of completed mobiles.
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