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| **Make a flapping bat** |
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| Making a flapping bat for a Halloween decoration |
| **Subject(s):** Design & Technology, Engineering**Approx timings:** 60-80 minutes (plus paint drying time) |  | **Key words / Topics:** * Halloween
* bats
* decorations
* iterative design
* painting
* testing
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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 origins of Halloween and how it is celebrated today.
* To be able to make a flapping bat decoration for Halloween.
* To be able to test and balance the bat decoration to make it work well.
* To understand how iterative design works and is how it is used.
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| **Introduction** |  |  |
| This is one of a series of resources that are designed to allow learners to use the theme of Halloween to develop their knowledge and understanding in Design & Technology and Engineering. This resource focusses on learners making a flapping bat decoration for Halloween. |
| **Purpose of this activity**In this activity learners will make use of the theme of Halloween to make a flapping bat decoration. They will learn about the history of Halloween and why bats are an important part of it. They will then learn how to make a simple mechanism for a flapping bat. Finally, they will test and adjust their flapping bat and observe how it works.This activity could be used as a main lesson activity to teach about basic marking out, testing and model making skills. It could also be used as part of wider scheme of learning focussed on designing and making products within a Halloween-themed context, alongside other IET Halloween themed resources. |
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| **Activities** |  | **Teacher notes** |
| **Introduction (5-10 minutes)**Teacher to use presentations slides 3 and 4 to introduce the aim of the activity and the Halloween theme.Teacher to outline the health and safety considerations given on slide 2.**Bats (5-10 minutes)**Teacher to use presentation slide 5 to explain why bats and bat imagery are used as part of Halloween.**Making a flapping bat (50-60 minutes) ⚠**Teacher to introduce the task of making a flapping bat.Teacher to demonstrate, and learners to follow, the steps shown on presentation slides 7-17.* Step 1 - Cut the shapes out of the template. Two wings are needed. **⚠**
* Step 2 - Holding the templates still, draw round them onto the card or cardboard.
* Step 3 - Cut out the shapes, taking care to follow the line. **⚠**
* Step 4 - Paint the shapes. Let the shapes dry before putting them together.
* Step 5 - Stick the wings onto the body using sticky tape, making sure they line up. The bases of the wings should follow a line like the one marked as dotted on the template. Fold the wings in the opposite direction and attach another piece of tape.
* Step 6 - Make a hole in the ‘chest’ of the bat. Use about 600 mm of string to loop through the hole. Tie at the top and make a loop at the bottom. **⚠**
* Step 7 - Using the rest of the string, make two big loops (500 mm of string each) and loop them through the notches in the wings.
* Testing 1 - Try the flapping bat by threading the two loops onto a stick or tree branch. It will probably hang a little with its wings up and body hanging down. Gently pull and release the string attached to the body to make it flap the wings.
* Step 8 - There are two places to add weight - the tips of the wings and the end of the hanging loop. Use some sticky tape so the weights can be moved around. Use pennies and 2p pieces or similar.
* Testing 2 - Try the flapping bat again. Learners might have to adjust the weights by using 2p pieces instead of 1p pieces. They may have to move the weights on the wings further out or in, or move the weights backwards or forwards.
 |  | **Introduction** Explain the theme and origins of Halloween to learners.Learners could be asked what they already know about Halloween and what they would like to learn about it during this activity.**Making a flapping bat**The activity must be carried out in line with the school’s risk assessment for the cutting method used.The template required is the Activity Sheet.The choice of material will change the outcomes considerably. Try making a bat in the available materials before letting the students do this.Step 1 to 3 - It can be difficult to cut some of the tighter or inside cuts for the wings. If using craft knives this is where problems can occur.Step 4 - Matt black spray paint can be used and will produce the best results. However, poster or acrylic paint will work well too and may be easier/more enjoyable for learners.Step 5 - Black sticky tape has been used here but clear tape would work well too. Lining up the tip of the wings is very important for a straight bat. The position of the base of the wings is less critical but it should be more or less horizontal and half way up the bat’s ‘chest’. It is even better if the tape touches down the middle of the join to make a hinge.Step 6 - Very bright yellow string has been used here so it can be seen where to put the string, but it would be better to use black wool for the final display. The hole could be made with a hole punch or a sharp instrument. Care should be taken either way.Step 7 - The string could be longer or shorter depending on where the bats are to be hung.Testing 1 - Results will vary in any group so the need for testing is realistic. Refer to industrial practice.Step 8 - Adding weight to the bat could be done with coins, washers or sticky tack. The example bat needed a penny on each wing, quite close to the end, and a 2p at the end of the loop hanging down.Testing 1 and 2 – the bat needs some weights to make it hang better and flap more like a bat. Emphasise that having to change the weighting is not failure but the correct way of testing an idea until it is the best it can be. This could be an opportunity to discuss what is meant by iterative design with learners.Finished examples are shown on slides 18 and 21 (this shows an example in use). |
| **Differentiation** |  | **Teacher notes** |
| **Basic** |  | **Extension** |
| * Pre-cut the shapes from the templates.
* Pre-mark and/or cut the shapes on the cardboard.
* Pre-cut the lengths of string required.
 |  | * Make another bat from thin painted plywood to make it more weatherproof.
* Cut out shapes to make another type of animal - for example, birds or pterodactyls.
* Research more about bats and how they act.
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Printed template
* Good quality card (corrugated or grey card)
* String
* Small change, 1p or 2p pieces, washers or small weights
* Scissors
* Sticky tape
* A stick to hold the bat
* Black paint
* Pencil
* Googly eyes (optional)
* Craft knife
 |  | icon-ppt Primary Presentation – Make a flapping baticon-pdf Activity Sheet – Make a flapping bat |
| **Additional websites** |  |  |
| * **History.com – Halloween:** <https://www.history.com/topics/halloween/history-of-halloween>
* **Learn more about bats:** <https://www.bats.org.uk/about-bats> , <https://www.wildlifeonline.me.uk/questions/answer/what-should-i-do-if-i-find-an-injured-bat>
* **Origami bat making video:** <https://www.youtube.com/watch?v=cfkwqasux6o>
* **Origami flapping bat:** <https://www.origamiway.com/origami-flapping-bird.shtml>
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| **Supporting starter and plenary ideas** |  |  |
| **Starters** (Options) * Discuss the theme of Halloween and how it links into this activity.
* Create a group mind map of scary ideas for Halloween.
* Discuss how bats and bat imagery is used when celebrating Halloween.
 | **Plenary*** Evaluate the outcomes of the making activity. What went well (WWW) and even better if (EBI).
* Make a class video of the bats flapping for the school website and social media.
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| **The Engineering Context**  |
| * Engineers can learn a lot from nature in terms of how to design and make products and structures. For example, how bats fly and ‘see’ in the dark – this is similar to the principles of sonar and radar.
* Iterative design is a key strategy for engineers to use when designing and producing ideas for products.
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| **Curriculum links**  |
| **England: National Curriculum**Design & Technology KS2* generate, develop, model and communicate their ideas through discussion, prototypes
* select from and use a wider range of tools and equipment to perform practical tasks
 | **Northern Ireland Curriculum**The World Around us KS2* 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.
* The causes and effect of energy, forces and movement.
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| **Scotland: Curriculum for Excellence**Technologies* TCH 2-05a
* TCH 2-09a, TCH 2-12a
 | **Wales: National Curriculum** Primary – Science and Technology* Design thinking and engineering offer technical and creative ways to meet society’s needs and wants.
* The world around us is full of living things which depend on each other for survival.
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| **Assessment opportunities** |
| * Formal teacher assessment of bats made.
* Self/peer assessment of bats made.
* Informal assessment of practical skills used.
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