

# About the Alu D&T Challenge

The **Alu D&T Challenge** has been created to inform and enthuse young people about aluminium, its use in our everyday lives, and the valuable contribution it can make towards a more sustainable way of life. These resources have been developed following extensive research to identify the 'best fit' with the secondary school curricula across the UK, and at every stage of their development they have been tested with, and by, teachers.

## THE DESIGN CHALLENGES

The **Alu D&T Challenge** is centered around three design challenges, each of which focuses on different uses for aluminium. Students can choose to design:

- an accessible vehicle for the future
- a garden building for a creative home worker
- or a new way to use aluminium in packaging.

## PRIZES

**Category winners (awarded to the best design by either an individual or team in each category):**

- a Standard Magnetic MODI Classpack and a Mini Mambo Drone for their school
- £100 of vouchers for the winning students (shared between team members).



## STUDENT LEARNING

The Challenge and its resources are designed for students aged 11–14, but can also provide useful skills-building exercises for older students to support their further study. The resources help students' design and technical knowledge, allowing students to get creative and put their design skills to work.

The challenges will build students' understanding of:

- the importance of sustainable, recyclable design
- the role product designers play in shaping the world around us
- the role aluminium can play in the context of sustainable and recyclable design.

## DELIVER THE CHALLENGE

The resources are designed to be flexible. You can choose how long to take over the design challenges, and they can be

delivered in a range of settings, whether:

- in D&T lessons
- as an extracurricular project
- to support a D&T or STEM club
- or to enter our competition, with a chance for students to win great prizes for themselves and their school.

Make use of our PowerPoint and the information presented in this booklet to help you deliver the Challenge.

## ENTER THE COMPETITION

To be eligible for the competition, students must be in years 7–9 (England and Wales), 8–10 (Northern Ireland) or P7–S2 (Scotland) on 22 December 2017, the closing date of the competition. Students can enter individually or in teams of up to four and can respond to more than one design challenge.

Further information on how to enter can be found on page 9 in this booklet.



**Runners up (one per category):**

- an Expert Magnetic kit and a Mini Mambo Drone for their school
- £75 of vouchers for the winning students (shared between team members).

**Shortlisted finalists:**

- a 3Doodler 3D pen for their school.

The judges may decide to make additional awards at their discretion in any, or all, of the categories.

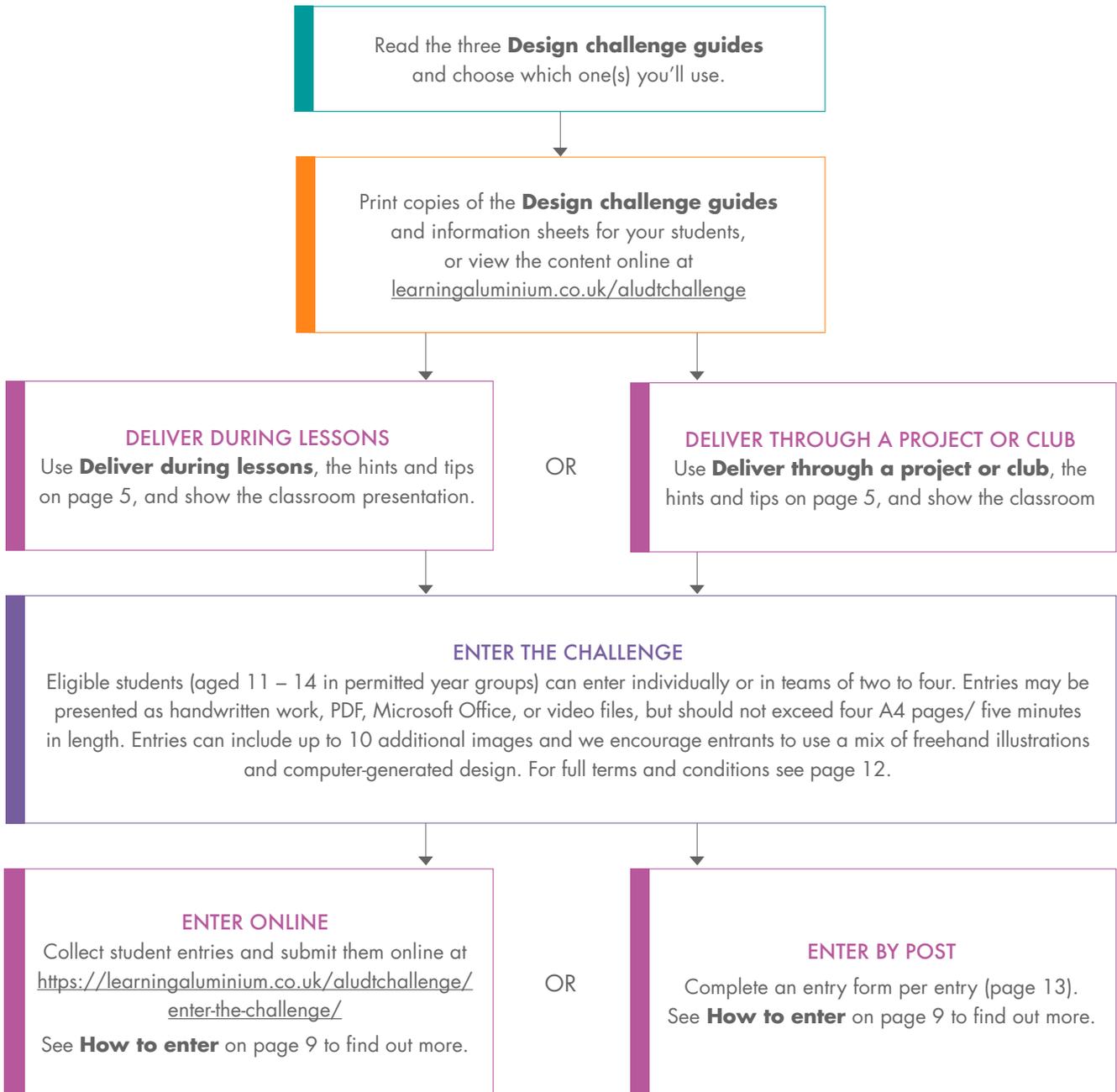
**Plus:**

- all schools entering the competition will receive a certificate
- shortlisted finalists, winners and runners up will receive a named certificate.

Winners and their teachers will also be invited to a prize-giving ceremony Celebration Event on 7 March 2018 at the Thinktank Science Museum in Birmingham. For more information on these amazing prizes, see the Terms and conditions on page 12, and check out our website: <https://learningaluminium.co.uk/aludtchallenge/>

# Getting started

## THE PROCESS



# Getting started

## ABOUT THE THREE DESIGN CHALLENGES

Each of the three design challenges will help build key skills throughout the design and technology curriculum. However, the focus of each challenge can make them particularly suitable for exploring and developing certain interests or design techniques.

### AN ACCESSIBLE VEHICLE FOR THE FUTURE

An exciting and forward-looking design challenge based on an important and current industry issue.

Great for:

- considering how designers in industry approach their responsibility to the environment
- understanding how specific consumer needs can be addressed through design
- engaging vocational learners interested in mechanical engineering or the automotive industry.

Find the **Design challenge guide** on page 14.

### A GARDEN BUILDING FOR A CREATIVE HOMEWORKER

An accessible and creative brief to help budding designers bring out their own flair and imagination.

Great for:

- exploring architectural ideas and graphics techniques
- creating creative and inspiring designs, balancing personalising detail with environmental considerations
- allowing students to practise hands-on modelling techniques.

Find the **Design challenge guide** on page 15.

### A NEW WAY TO USE ALUMINIUM PACKAGING

A graphics-based challenge that extends creative and technical thinking.

Great for:

- 'rethinking' a current product or problem to create individualised design briefs and specifications
- challenging students considering further study in product design
- exploring graphics and computer-aided design.

Find the **Design challenge guide** on page 16.



## HINTS AND TIPS

- Encourage students to answer the brief with an original design.
- Help students be creative, but make sure they keep checking the brief; don't let them lose sight of their users' needs.
- Give your students opportunities to carry out independent research – the best entries are the ones where students have really read up on their chosen challenge and understand their potential customers and the materials they are using.
- Refer to **What the judges are looking for** (page 17), which includes a handy checklist for creating a great entry – the more boxes they can tick, the stronger their entry.
- Encourage students to look at the past successful entries (pages 18-20), so that they can see what a good entry looks like.
- Help students think of their own original ideas and explanations – we don't want them to copy the examples!
- Watch the **Aluminium Life Cycle** film, get advice from previous winners and lots more at <https://learningaluminium.co.uk/about/film-hub/> or by checking out our [YouTube channel](#).
- Encourage students to see what our sponsors are up to. See more details on page 26.

**Finally – and most importantly – please encourage every student to enter, and do send their work in to us! We love seeing how students have tackled the Alu D&T Challenge and we're delighted to receive entries from students of all abilities within the age range. We send every participating school and all shortlisted students a certificate to reward them for their efforts.**

# Getting started

## SUSTAINABILITY

**All designs should address the 6Rs of sustainability.**

In each category, entries should state and explain how every one of the 6Rs is used in the design. It's not enough to say that a product will be easy to repair, for example. We want to know how!

<b>Rethink</b>	<p>What real need can this product satisfy?</p> <p>What benefits do we need to deliver?</p> <p>How could this product be made more effectively, efficiently and sustainably?</p>	<b>Repair</b>	<p>What parts of your design might break or wear out?</p> <p>How could these parts be repaired or replaced?</p> <p>Who might do this, and where?</p>
<b>Refuse</b>	<p>What materials are usually used in products like this?</p> <p>Do these materials harm the environment?</p> <p>What materials can we use that are less harmful?</p>	<b>Reuse</b>	<p>Which parts could be reused at the end of the product's life?</p> <p>How will the product be taken apart?</p> <p>How might someone reuse each part?</p>
<b>Reduce</b>	<p>How can the design be simpler than existing products?</p> <p>How can it use fewer materials, while still being safe and fit for purpose?</p> <p>What features don't people need?</p>	<b>Recycle</b>	<p>Which parts or materials can be recycled at the end of the product's life?</p> <p>How would these products be recovered?</p> <p>How might they be reprocessed into new things?</p>

## KEY QUESTIONS

Use these questions to help your students to get the most from the design challenges.

**Before they start sketching ideas, help students find out more and put people first.**

- *What is the need we are addressing?*
- *What improvements, changes or benefits do we want to deliver?*
- *What else do we need to find out?*
- *How can we find out more?*

**Make sure students use plenty of illustrations and labels.**

- *What are the key features of your design?*
- *How is your design original?*
- *What research has helped you come up with your ideas?*

- *How will your design work?*
- *How does your design deliver real benefits for its users?*
- *How did you arrive at your final design? (I.e. include and explain initial sketches in addition to computer-generated designs.)*

**Students should show how they are using aluminium (and other sustainable and recyclable materials).**

Help students put aluminium at the heart of their design.

- *Which parts of your design are aluminium, and why?*
- *How will each part be formed, joined and finished?*
- *Why is aluminium a good choice for this part?*
- *What other materials will your design use? (I.e. plastics, textiles, composites or biocomposites, natural materials.) Why will you use them?*