



The perfect Plecticle

Challenge 1

D&T topic area: Graphics

Students will learn how to:

- challenge their creative thinking
- sketch, draw and be imaginative in short bursts
- design a product that is used by more than one person.

Differentiation

Enrichment: Use strategies that generate a variety of design ideas quickly as a direct response to the design criteria.

Put shapes, colour and images onto a PowerPoint presentation and play it on a loop.

Intervention: Provide a sketch of the empty box, to scale, plus a set of specification points.

Provide positive verbal feedback and encouragement at all times.

STARTER

Put a plastic cup on every table in the class. Ask students, in small groups, to spend two minutes thinking of as many different uses for the cup as they can. After two minutes, bring the class together and encourage students to share their ideas, recording some on the board.

TEACHING SEQUENCE

Activity 1 – Exploring possibilities

This exercise is designed to develop **thinking** and **drawing** skills among students. Explain that the names below do not exist. The students' task is to sketch what they think each could be. Students should complete each sketch in **three** minutes, putting as much information in them as possible.

CLOMO

TISCAL

BRAMBET

SKENT

Activity 2 – Design analysis

Students should now compare their sketches with other members of the class, not from the same work table. Students should think about the following questions: Have they drawn similar images? Which was the hardest to draw? Why do they think this was so? How could they improve their sketches?

Activity 3 – The perfect Plecticle challenge

Introduce students to the perfect Plecticle challenge to design a new product that will improve the way they and their families live their lives. The only restrictions imposed on their design is that the product has to fit in a box measuring 300mm x 300mm x 300mm. Encourage students to use the thinking and drawing skills they employed in the previous activities to come up with a range of possible ideas before deciding on a final design.

PLENARY

- Ask students to follow the theme of designing a product for a broader group of people such as a sports team, a pop group, a choir or even a school class, analysing what the specific needs of each group will be.
- Think about what designs could be used on the box itself once the product has been thought of and designed. This could be done as a mood board exercise.

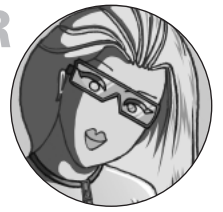
Homework

Complete the perfect Plecticle challenge.

Main outcomes

1. Reinforcement of sketching skills.
2. Choosing the best aspects of their designs to develop their ideas further.





Ambient sounds

Challenge 2

D&T topic area: Systems and control

Students will learn how to:

- forward think by using Mind Maps to create a more advanced product
- respond to a specific design brief and sketch in short specified time periods
- analyse other technologies to assist in their own designing.

Differentiation

Enrichment: Make a selection of music players available for use as a stimulus for initial designs.

Intervention: Encourage students to observe how others are tackling the activities.

STARTER

Provide students with a variety of examples (images or objects) of music players that have been used over the past 10 years. Take 10 minutes to think about how these music players have evolved and how designers have improved on the basic concept of playing music.

TEACHING SEQUENCE

Activity 1 – Quick design exercise

Try to source the following items (from home or school): a record player, cassette player, mini disc player, CD walkman, mini radio, MP3 player. Display the six existing methods of playing music and ask students to discuss the following questions: How are each of the players powered? To whom would the players be most suited? Think about durability - what is going to last the longest and why? What elements have stayed the same throughout each design?

When students have identified the most effective features of all the previous designs, ask them to Mind Map up to 10 ideas in 20 minutes of what the next step in listening to music might be.

A Mind Map is simply a lot of words and pictures on a page. When asked to design something students tend to concentrate on one design and therefore seldom explore lots of possibilities. Further information on mind maps can be found on:

http://en.wikipedia.org/wiki/Mind_map
http://www.mycoted.com/creativity/techniques/mind_map.php <http://www.londongt.org/think-link/>

Activity 2 – Ambient sounds challenge

Introduce students to the Ambient sounds challenge. The challenge does not require students to create a new product from scratch but explore a range of existing products. The emphasis needs to be on the way the music player will function and not the specific electrical circuits that represent how. Explore the variety of circuits, such as smell, sound, fingerprint or eye recognition. Students should respond to the challenge brief by designing their new music player on one side of A3 paper. You may want to encourage students to consider the following questions: How will it be activated, perhaps by voice, or reading thoughts? Could it be a computer that scans the eye and then plays music tracks? Could a small device be implanted in someone's head to pick up transmissions from a central point? Would the device be handheld?

PLENARY

Think about how the new product could be used by more than one person. Could it be placed in a public space?

Homework

Complete the Ambient sounds challenge.

Main outcomes

1. Student realisation of product analysis.
2. Reinforcement of sketching skills.
3. Choosing the best aspects of existing designs to develop their own ideas.



Enviromenta

Challenge 3

D&T topic area: Product design

Students will learn how to:

- write a specification
- consider social and moral aspects when designing
- realise that, as designers, we have a responsibility towards the environment.

Differentiation

Enrichment: Invite teachers from other departments to talk about current environmental issues and how they are being addressed.

Intervention: Give students a copy of the challenge with the key specification points highlighted.

STARTER

Students should spend five minutes discussing reasons for the following problems and how people are trying to deal with them:

- diminishing natural resources
- solar radiation
- ozone depletion
- overcrowding

TEACHING SEQUENCE

Activity 1 – Design analysis

Remaining in their groups, ask students to develop their initial thoughts on the following two problems: ozone depletion and diminishing fuel resources. Students should complete a research task to answer these questions:

1. How are the world problems currently being addressed?
2. Which of the problems is most pressing?
3. What would students do to solve them?

Activity 2 – Writing a specification

Introduce students to the initial ideas of the challenge (see overleaf). Students should read through the challenge and highlight the key

words and sentences. These can then be put into a list to form the specification. Remind students that the specification is a list of what the product must do, be and have in order to be successful to the client or end-user.

Activity 3 – Enviromenta challenge

Introduce students to the challenge brief to design a device that will help to solve one of the two key world problems that have been identified. The specification they produced in Activity 2 should form the basis for their design development. Remind students they should refer back to it during the design process to ensure they are meeting the requirements they set.

Evidence of environmental research is also important. Encourage students to think about how the device will take this knowledge of the environmental issues and affect the people causing the problems: kinetic energy, so it is activated by the movement of the super-heroine; thought-recognition processes that then directly affect others; wind power, caused by movement through the air.

EXTENSION

A supporting lesson plan is available on www.audiinnovation.org.

Homework

Complete the Enviromenta challenge.

Main outcomes

1. Students understand how to include effects on the environment when designing.
2. Students write a design specification.



Technology Pod

Challenge 4

D&T topic area: Resistant materials

Students will learn how to:

- challenge their creative thinking
- sketch, draw and be imaginative in short bursts
- look at existing ways of travelling to extreme locations to collect materials and data.

Differentiation

Enrichment: Have available some draft examples of the challenge to inspire the class but encourage students not to copy the overall design.

Intervention: Provide positive verbal feedback and encouragement at all times.

STARTER

In **three** minutes, ask students to list as many different modes of transport as possible, including vehicles that travel by land, sea and air. Which of these could be used by up to six people? If students could combine two of these modes of transport, which would they choose and why?

TEACHING SEQUENCE

Activity 1 – Exploring possibilities

This exercise is designed to help focus students on the task at hand. Encourage students to use the internet, books or magazines to help conduct their initial research.

- Investigate current ways of achieving a similar, fast journey to the one in the challenge.
- Investigate existing super-strong materials and how students could improve them.
- Look at existing ways of providing comfortable and practical travel. You could encourage students to investigate space vehicles as they are forms of multi-task vehicles, but remind them that they are thinking about how this could be applied on earth and not in space.

Activity 2 – Quick design exercise

Ask students, in pairs, to consider these three extremes. Extreme Heat, Extreme Cold and Extreme Depth. Spend two minutes sketching three vehicles that could cope with each of these themes. Remind students that the function of the vehicle is just as important as the aesthetics. Students should then combine the three drawings.

Activity 3 – Technology Pod challenge

Introduce students to the Technology Pod challenge (see overleaf). This activity will offer students the opportunity to look at existing, modern transport designs as a means of inspiration and then combine the most effective elements of these to create a new product. To aid them in their design, encourage students to particularly consider existing transport methods used by scientists, which may include lorries, vans, helicopters, planes, hovercraft and even their own legs! Remind students that their design should be realistic as this has the potential to be developed in the near future.

PLENARY

A team of three students could complete this challenge. There are three drawings to complete and an A4 sheet of explanations to create. All three students could design the outside of the craft and then split to provide the other parts of the challenge.

Homework

Complete the Technology Pod challenge.

Main outcomes

1. Using exemplar ideas to assist with designing.
2. Reinforcement of sketching skills.
3. Develop detailed criteria for designs and use these to explore design proposals.



AthleTex

Challenge 5

D&T topic area: Textiles

Differentiation

Extension: Extend the Starter by asking students to produce a brainstorm of their selected Textile through independent internet research.

Intervention: For the written work in Activity 1, use a simplified list of words.

STARTER

Split the class into groups of three or four and issue students with information about a form of Smart, Techno or Futuristic Textiles. A variety of information is available on www.audiinnovation.org. Each group can produce notes or diagrams, or just discuss the information gained. Bring the class back together. Ask individual volunteers to go under the 'spotlight' and share what they have learned with the rest of the group.

TEACHING SEQUENCE

Activity 1 – Emotional response

Give each group of students a list of words that reflect different emotions on Post-it notes. Also provide pencils and a piece of designer's work (examples at www.audiinnovations.org). The piece should be quite 'funky' and original in order to inspire students.

Ask students to look at the item and choose five words from the supplied list, or write down their own five words that reflect their feelings towards the image. Students should stick these words on the image and feed back to the whole group why they chose the words and how the product, and therefore the designer, affected them.

Activity 2 – Design developments

Give each student a piece of A4 paper and display the images from Activity 1 around the classroom for the whole group to access. Then

ask students to design a unisex lightweight waterproof jacket. Each student has three minutes and should be encouraged to look at the work of the designers used in Activity 1. After three minutes each student passes their design to the student on their left, who then has two minutes to improve the idea making as many changes as required (annotation should be encouraged). This should continue until all the students in the group have made their own design decisions to each initial idea. Finally, discuss the changes made and how the designs have been improved.

Activity 3 – The AthleTex challenge

Introduce students to the AthleTex challenge (see overleaf). Show students some examples of spec drawings or fashion illustrations to improve communication techniques and ask them to work in pairs for 10 minutes to create a range of exciting possibilities in the form of flat drawings.

PLENARY

Ask students to feed back in pairs some of their positive responses to the challenge and how their ideas could be developed further.

Homework

Complete the AthleTex challenge.

Main outcomes

1. Understand the challenge set and how to tackle it with independence.
2. Sketch a range of initial design ideas and discuss their positive and negative aspects.
3. Select positive aspects of their designs and develop them further with confidence.





Herolicious!

Challenge 6

D&T topic area: Food technology

Differentiation

Extension: Instigate a teacher-led discussion regarding gender and age bias towards certain ingredients with a view to the nutritional values and their importance in everyday snacking.

Intervention: Place a list of different titles on the board for the starter to encourage students to think about how people are differentiated, for example hobbies, jobs, likes, dislikes, age, favourite food, brands they use.

STARTER

Divide the class into groups of three or four and supply each group with an image of a person. Use a range of genders, ages and fashion styles. Ask each group to brainstorm what the person represents from looking at the image in four minutes. Then select some groups to feed back their client profile to the class, giving reasons for their choices.

TEACHING SEQUENCE

Activity 1 – Nutrition knowledge

Write down a selection of ingredients on the board (approximately 10) that are currently used in snack bars. Ensure that each ingredient is accompanied by a nutritional description, including protein, carbohydrate, calcium and fat. Then cover up the board and give students **three** minutes to recall the information they have just learned, writing it down on a piece of paper. Ask students to then swap papers with the person on their left and, using a different colour pen, try to fill in any further information that they think has been overlooked.

Display the board again and ask each student to place their initials next to their first three favourite ingredients. Girls use one colour, boys another to enable students to see gender divide.

Activity 2 – Packaging analysis

Place a range of packaging samples and a large sheet of paper on each desk. The packaging can range from food product packaging to various product design packaging in plastic, wood, textiles etc. In groups of 4–6 students have two minutes at each station to write their thoughts about the packaging. Then each group feeds back their thoughts about one of the samples.

Activity 3 – The Herolicious! challenge

Introduce students to the Herolicious! challenge (see overleaf). Show students examples of client profiles or refer back to the Starter activity to give them some initial ideas, which will help them to select their role model. A range of ideas for the snack food should then be developed for their chosen role model. The packaging should be addressed when the product is finalised.

PLENARY

Ask students to discuss some of their initial design ideas in pairs and talk about how they can develop them further.

Homework

Complete design ideas and final design sheet with ingredients, packaging design, and reference to chosen client.

Main outcomes

1. Understand the challenge set and how to tackle it with independence.
2. Analyse packaging ideas in order to develop their own with confidence.
3. Use examples from other designers or student feedback to improve their own work.