

# Introduction to Fixperts for teachers



Fixperts

Fixperts is brought to you by FixEd, the network for people who want to fix the future.

Find further teaching resources and information at [www.fixing.education](http://www.fixing.education)



# Introduction to Fixperts for teachers

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## Solving problems for others

Fixperts is a learning programme that challenges young people to create ingenious solutions to every day problems for a real person. Rooted in a creative, human centred design process and often making use of digital tools, it applies design, engineering thinking, practical making skills and storytelling for social benefit.

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## What do students learn from being Fixperts?

- Experience and understand design thinking and methods at human scale
- Make a clear connection between design and problem solving
- Develop skills in observation, ideation, problem-solving and iterative design
- Understand the importance of communication skills through teamwork and storytelling
- See the impact of creative thinking in application through making

Free basic guidelines are available for teachers to use as a basis for their own lesson planning. Full teaching resources, training and support are available under a schools subscription: <http://www.fixing.education/fixperts>

# Why run Fixperts?

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Fixing is a valuable way to think about change in the world. By calling on young learners to ‘fix’ a specific situation for someone, Fixperts makes creative problem-solving relevant, accessible and rewarding.

A Fixperts project offers students the opportunity to collaborate with a real person and identify a real need in someone’s life. They work in teams to research and develop solutions, sketch out ideas, model prototypes and make a final product as a gift to their Fix Partner. The story is captured in a short video and shared with others in the form of a Fix Film.

Fixperts started in 2012 in Kingston University and has now been run in over 30 universities around the world, building an online archive of over 400 films as learners tell the stories of their fixes. You can see a selection at [www.fixing.education/fixperts](http://www.fixing.education/fixperts)

## How does Fixperts work in schools?

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We offer tried and tested guidelines and resources for schools in a number of formats. We offer workshops and enrichment days, as well as training and additional support for teachers.

Using either free or paid resources you can run Fixperts as a one-hour, half day, whole day or half termly project. You can run Fixperts as part of your DT or STEM scheme of work, as an off-timetable day for an entire year group, as an after school club or a one-off workshop.

**Our basic guidelines are free for all. Comprehensive teaching resources are available to subscribers who receive a range of benefits as part of the FixEd network.**

## How does Fixperts link to curriculum ?

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Fixperts successfully delivers learning outcomes relevant to any creative activity including design, engineering and STEM.

While D&T curriculum links are strong, Fixperts is featured centrally in one of the first STEM qualifications in England (AQA, first teaching 2018) and also has clear value in any engineering curriculum. Skills in teamwork and creative problem solving are of value across the curriculum, and specific methods like iterative design and prototyping are transferable also.

Most importantly for us and for our common future Fixperts builds understanding, insight, care and ultimately empathy.

# Fixperts links to Design & Technology

Fixperts component	Outcome	KS3 DT curriculum links
Creative problem solving	Agency, resourcefulness, resilience, risk-taking	"Identify & solve their own design problems & understand how to reformulate problems given to them"
Fixing for someone	Generosity, empathy, social orientation, self-confidence, engagement	"Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture"
Team-work	Collaboration, negotiation understanding	
Communication	Insight, perspective, critical skills	"Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools"
Real, results orientation	Making & technical skills, completion, independence, project-management skills	"Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups"
Open access and sharing	Promotion of an innovation culture	

## Characteristics of a genuine D&T experience within the school curriculum [DATA\*]

\*Design & Technology Association National Curriculum Expert Group for D&T, 2014

### User

Pupils should have a clear idea of who they are designing & making for, considering their needs, wants, values, interests & preferences.

### Purpose

Pupils should be able to clearly communicate the purpose of the products they are designing & making. [These] should be designed to perform one or more defined tasks, [and] evaluated through use.

### Functionality

Pupils should design & make products that work/ function effectively in order to fulfil users' needs, wants & purposes.

### Innovation

When designing & making, pupils need some scope to be original with their thinking. Projects that encourage innovation [have] engaging open-ended starting points for learning.

### Authenticity

Pupils should design & make products that are believable, real & meaningful to themselves & others.

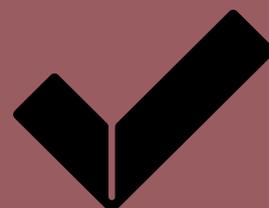
# Fixperts for schools – basic guide & timeline



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# Fixperts for schools: guideline

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## Solving problems for others

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## How do I approach planning to teach Fixperts in my school?

A Fixperts project is structured in 6 stages. You can decide how much time to allocate to each stage - we've run Fixperts in half a day, half a term or even a full term offering opportunities for rich engagement and stretch.

This guideline offers prompts for each stage, referencing activity packs which can be downloaded from your member dashboard.

And don't forget to use the fantastic [film archive](#) for inspiring examples of fixes from around the world!

# Who is involved in running a Fixperts project?

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## Fixperts Facilitator

A teacher, technician or other facilitator such as an older student, the Fixperts Facilitator guides students in their analysis, design, and decision making as they work toward solving a problem.

## Fix Partner

Someone who is open to having conversations about challenges they face in their day-to-day life.

## Fixperts Team

A team of 2-5 learners who can problem-solve, make and improve things for other people. They can designate leads for the roles below, or work more loosely to complete the project.

### Designer

Someone who is a great problem-solver, willing to explore lots of different ideas, learn by trial and error, and take risks in their search for a solution.

### Maker

Someone with a good knowledge of materials and processes, who can lead the team to realise their design ideas using the materials, tools and equipment available.

### Communicator

Someone who is great at documenting and telling a compelling story. The presentation should capture the people, problem and process involved in creating a solution.

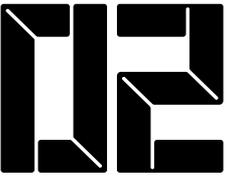
# Fixperts project overview

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## Contextual understanding

- Introduction to Fixperts
- Designing for different bodies and users



## Getting started

- Learning to look
- Identifying a Fix Partner
- How to find a problem



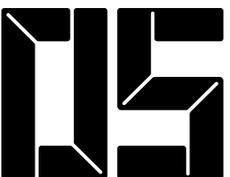
## Designing

- Fix Partner observations
- Problem identification
- Ideation



## Development

- Initial prototyping
- Remote testing
- Improving



## Production

- Fix Partner testing
- Feedback and suggestions from improvements
- Planning modified design



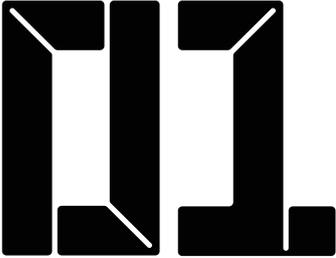
## Presentation

- Making final prototype
- Telling the Fix story
- Presentation
- Celebration!

# 6 stage project timeline

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## Contextual understanding



1-3 lessons

### Activities

- Introduction to Fixperts and fixing [.ppt presentation]
- Designing for a variety of different users - quick exercises based on user scenarios

### Aims

Students will...

- Understand what Fixperts is and the thinking behind it
- Experience designing for different users and their needs
- Develop quick problem solving and prototyping skills

### By the end of this stage, students should...

- Be ready to embark on their own Fixperts project

### Extension suggestions

- Industry expert visit
- Social design research

### Supporting documents

- Introduction to fixing powerpoint presentation
- Customisation activity pack
- Simulations activity pack

## Getting started



1 lesson

### Activities

- Considering how to find a problem
- Identifying a Fix Partner or Brief Challenge film viewing [using Fixperts film archive]
- Writing a design brief
- Documenting the process

### Aims

Students will...

- Develop observation skills to identify problems around them
- Understand the importance of writing a design brief and experience writing a brief for their Fixperts project

### By the end of this stage, students should...

- Have a Fix Partner to work with, or have identified a problem through watching a Brief Challenge film
- Have a written brief statement for their Fixperts project

### Extension suggestions

- Industry expert visit
- Social design research

### Supporting documents

- Starting the fix project activity pack

# Designing



1-3 lessons

## Activities

- Fix Partner observation / Acting out problem
- Generating initial ideas & first quick prototyping
- Testing prototypes & improving designs
- Documenting the process

## Aims

Students will...

- Experience an iterative design process
- Further develop modelling and prototyping skills

## By the end of this stage, students should...

- Have a prototype of a solution ready for testing, either through simulation or with Fix Partner

## Extension suggestions

- Ethnographic methods of user research
- Working with new materials
- Industry expert visit

## Supporting documents

- Design ideas activity pack
- Student log book activity pack

# Development



1-2 lessons

## Activities

- Fix Partner testing / Simulation testing
- Feedback and suggestions for improvements
- Planning modified design & building prototype
- Documenting the process

## Aims

Students will...

- Evaluate their solution using user testing, Fix-Partner feedback and their design brief to assess its effectiveness

## By the end of this stage, students should...

- Have a prototype that answers their design brief and has been tested, modified and improved to meet their user's needs

## Extension suggestions

- Ethnographic methods of user research
- Iterative design processes
- Working with new materials
- Industry expert visit

## Supporting documents

- Student log book activity pack

# Production



Between 1-2 lessons

## Activities:

- Final prototype production
- Documenting the process

## Aims:

Students will...

- Make a final working prototype that solves the problem described in their Brief Statement

## By the end of this stage, students should...

- Have a working prototype produced to the highest level [considering students ability, time and facilities available.]

## Extension suggestions

- Working with new materials
- Model-making
- Branding & marketing your product

## Supporting documents

- Student log book activity pack

# Presentation



1 lesson

## Activities:

- Presentation to group / Fix Partner
- Creation of Fix Story presentation
- Celebration!

## Aims:

Students will...

- Tell the story of their Fixperts project in a clear and engaging way, using documentation they have made throughout the process
- Practice presentation skills

## By the end of this stage, students should...

- Have a documented story of their Fixpert project in the form of a film, a presentation, a folder, a blog or any other medium they choose to use.

## Extension Opportunities

- Story telling
- Film making [can focus on film making on a phone]
- Branding & marketing your product
- Industry expert visit

## Supporting documents

- Student log book activity pack

# Fixperts – introductory workshop 2: Simulations



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# Fixperts introductory workshop 2: Simulations

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## Aims of workshop

- Reveal the importance of creative problem solving to quality of life
- Develop skills in observation, ideation, problem solving and iterative design
- Encourage empathy through experience

## Objectives

- Observe and analyse students experience of performing a task with a restriction to their usual movement
  - Develop solutions to a problem students experience personally
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## Materials

All locally available at low cost; see shopping list

## Duration

Min. 30 minutes, average 1 hour, with extension activity 1 day

## Location

Any classroom that allows contained messy work

## Accompanying resources

Introduction to Fixing [ppt]

Simulations challenge: How to simulate restrictions

Simulations challenge: Describing the problems

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# Workshop outline

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## Introduction

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Time: 10 minutes

Watch the **Introduction to Fixing** presentation together. With each slide direct questions to the class – What's the image? What's the fix? Lead into introducing Fixperts, explaining briefly what Fixperts is. Show one film.

### Context

Understanding types of fixing e.g. repairing something broken, solving a problem, improving a product, customising something to work better for a specific use or changing users' behaviour.

## Activity 1: Simulating restrictions

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Time: 10 minutes

Learners work in pairs. Using the **How to simulate restrictions** guideline, one learner simulates restrictions, the other assists and observes. The restricted learner attempts to perform any given task, for example buttoning a shirt or reading a newspaper, while their partner questions and takes notes. Get learners to discuss as they work: what is the difficulty? How could they break it down? What could make it easier, smoother or more efficient? How does it make them feel?

## Activity 2: Fast prototyping ideas & solutions

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Time: as available

### Sketching Ideas

Ask learners to explore ideas and approaches to solving the difficulty they have experienced. Encourage pairs to use sketching to explain and develop their ideas.

### Modelling prototypes

Using a range of simple modelling materials, ask learners to create quick prototypes of their ideas, testing them to evaluate their effectiveness, and modifying their designs as required.

## Activity 3: Presentation

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Time: as required according to number of students

### Presenting

Learners are given 1 minute each to feed back to the class – what was the restriction, what was the task, where was the difficulty, how they solved it. Allow 5 minutes preparation time so pairs can plan their 'pitch'. Learners could also think of a name for their product. This activity can be adapted depending on size of group and time available, but is an important part of the process and should be included in some form.

### Tutor prompts

If you had time and access to materials, what would you use to make your product? How could you make it more appealing to your user?

## Plenary

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Time: 15 minutes

### Tidy up

Show a full Fixperts film of your choice, for example '[A pen for Donal](#)', and discuss how solutions are often simple and 'low tech' but still can make a huge difference.

# Simulations: shopping list

Here are some suggested materials for simulating restricted movement and modelling students solutions. These can easily be substituted with preferred alternatives.

## **Possible materials for restricting students movements**

Rubber washing up gloves OR heavy duty work gloves  
Lolly sticks  
Cardboard tubes, split to go over knees  
Nylon knee socks with card inserts  
Elasticated bandage strips  
Knee bandages

## **Possible materials for performing tasks**

Button shirts  
Washing up brushes  
Newspapers  
Long socks  
Plasticine 'food'  
Plastic cups, plates and cutlery (both to mimic eating and for modelling)

## **Possible materials for modelling**

Plasticine  
Modelling foam  
Card - scrap boxes are good  
Masking tape  
Duct tape  
Velcro (sticky back is good)  
Pipe cleaners  
Cable ties  
String  
Paper clips  
Rubber bands  
Scissors  
Scalpels  
Pliers  
Bulldog clips  
Wooden skewers and dowel of various thicknesses  
Steel wire rods (easily bendable but with some rigidity)  
Plastic cups, plates and cutlery (both to mimic eating and for modelling)

## **Materials for sketching**

Paper (A4 / A3, sugar paper for team idea development)  
Pencils, markers



# Simulation challenge: Use this worksheet to clearly define the problems so you can come up with the best solutions.

## Describing the problems

Before you start thinking of solutions, try describing as accurately as you can what the problems are. Try using this table to write a brief list:  
What exactly are the difficulties?  
What are the obstacles you encounter?  
What is preventing you from carrying out the task?

Task and restriction	What is difficult?
Opening a drink can with a heavy glove	<ul style="list-style-type: none"><li>- Gripping the ring-pull</li><li>- Keeping hold of the ring-pull without it slipping</li><li>- Keeping the drink from spilling while pulling the ring</li></ul>