

**“your extra
classroom**



design it! make it! take it away!

teacher's resource pack

“Tell me and I forget it – show me and I may remember – let me do it and I learn. Learning through making works!” (Pru Leith)

“Design and Technology is about making things that people want and that work well. Creating these things is hugely exciting: it is an inventive, fun activity” (James Dyson)

“How do you know who you are unless you know where you've come from? How do you know what's going to happen, unless you know what's happened before?” (Tony Robinson)

**“Science is valuable because it meshes with all our lives and allows us to channel and use our spontaneous curiosity”
(Professor Susan Greenfield)**

“Design is the freedom of the individual” (Simon Waterfall)

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learn about it!

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3	19-25	making it! KITS AND COMPONENTS outline of plans and components for each kit available to make, parts can also be used separately within students' own design (p 20)
4	26-37	AFTER THE VISIT some activities which could be done with your group as pre-visit or post visit work. Evaluating the visit, its processes and products, linked to each Key Stage.
5		BOOKING FORM to be returned to us by post or fax – payment due with the form RISK ASSESSMENT Information about making it! and EV2 PUBLIC LIABILITY INSURANCE Information Sheet – (please request copy if required)

INTRODUCTION

making it!

We look forward to welcoming you to the **making it!** hands-on discovery centre based in Mansfield. This introductory pack aims to give you all the information you require to make your visit a stimulating and worthwhile learning experience and your opportunity to use our additional “classroom” for your school. We are here to provide information and interactivity across the curriculum at all Key Stages.

Once you have booked your visit, our Administration Manager will contact you directly to discuss exactly what you want to get out of your time with us, answer your questions and queries and generally ensure you arrive at **making it!** well prepared.

making it! presents you with a series of galleries focussed on industry, manufacturing and technology, demonstrating with the latest hands-on displays the manufacturing process from concept, through design to the end product. Themes include design, prototyping, materials testing, manufacturing process, natural resources, waste management, advertising, marketing, packaging, distribution and communication.

Finally, students take part in manufacturing their own designed model in a timed situation and take back to school the completed creation, as well as the designs and sample components used for further work in class.

Our Mission Statement

“To create an exemplar educational interactive Discovery Centre, visitor attraction and community resource, which is fun, engaging, entertaining and which has the highest level of educational relevance.”

making it! aims to celebrate the inventiveness, ingenuity and entrepreneurship of the region’s industrial past, present and future and wants you to leave with an impression of the creativity and potential of the manufacturing process and a feeling that you have participated in the experience of discovery and had fun doing so.

Background

The **making it!** building is part of the old Mansfield Brewery, housed in the refurbished malt store and Brewery Tower. The exterior is conserved as being of Special Architectural Interest and stands beside the River Maun, which gave Mansfield its name.

Gaining the best learning experience

making it! is conceived in the knowledge that teachers want a meaningful teaching and learning experience. To that end we offer:

- teacher material designed to allow groups a virtual experience of the Centre **before** they arrive (**on our website: www.makingit.org.uk**), understanding what they will see and discover, design and build.
- pre-visit and post-visit suggestions.
- a “classroom” that extends into the Centre.
- An Enabler to accompany your group around the centre to ensure the most meaningful route is taken.
- stimulating things to see and do.
- designs and creations to take away and work on back at school.

We ask the teacher to ensure the group is accompanied by school staff at all times, that these staff are prepared for the visit and are responsible for the good order of the pupils.

Please also note:

- ✘ **No food or drink is allowed in the Centre (except in Education Rooms)**
- ✘ **All mobile phones must be turned off in the Centre.**
- ✘ **No Smoking**

CENTRE FACILITIES

Available to your group:



Galleries: two floors of interactive, hands-on exhibitions with cutting-edge design, divided into themed zones.



Our Hosts and Enablers: at least one of our staff is dedicated to your group throughout their visit, supporting teachers and ensuring a smooth passage through the galleries.



Made@making it!: the last part of your visit involves making a model from a design (either worked on beforehand in school or on arrival at the Centre). Attached to this pack is the full set of potential designs available to make at the Centre **and the list of materials and components used to create designs.**



Certificate: every student will receive a Certificate of Manufacture from the made@makingit! gallery.



Education Centre: fully equipped for teaching, lectures, presentations and workshops, each seating up to 70 pupils as a “classroom”; a place to eat packed lunches in peace and leave possessions in secure Clothing Bins.



Auditorium: a gathering area next to Arrivals, home of temporary exhibitions and available for special events.



Shop: an opportunity to purchase mementos of the visit and also packs of the materials already used in the **making it!** workshop. *You may pre-book your shopping, by ordering in advance as many **making it!** bags of goodies as your group wants. These cost from £1.50 each (details of contents from the Education Office) and will be ready for collection on departure.*

Disabled Access: the centre is accessible to wheelchairs and has provision to assist with both hearing or sight impairment (please ask for full details from our Education Manager).

COSTS AND BOOKING

making it! has been designed to accommodate school and college groups of various sizes up to 120 and will provide a well-supported and relevant experience for each group.

Prices

- £6.75 per student for a three and a half hour visit.
- £7.25 per student for a non-school visit of three and a half hours.
- £9.25 per student for a five hour visit (school and non-school) – **FREE BOX/TIN***
- £0.25 per student if a room is booked for lunch (free for a 5 hour visit)
- **The cost includes a free designed and built creation for every paying visitor, based on a specified number of components, normally retailing at approx. £4.95**

THESE PRICES ARE VALID UNTIL 30.9.2012

Opening Hours for schools and colleges:

- 9.30 am – 5:00 pm
- Monday to Friday during school terms

Special Conditions:

- A group of 70+ students merits the exclusive use of the whole Centre for the visit

Travel:

- **By Coach:** Dedicated coach parking is available adjacent to making it!
- **By Train:** Mansfield Station is a short walk from the Centre and educational groups receive a substantial discount on normal Cheap Day Return fares.

It is essential that all groups, whatever their size, book their visit in advance as numbers entering the Centre are strictly limited.

***A five hour visit will enable students to design and make a label to fix to either a high quality tin or box (given free of charge) in which to package their kit and develop ideas for marketing the product.**

Booking:

To check availability for your visit:

- Telephone our booking line **(01623 473200)** or email us at: **info@makingit.org.uk**

To book your visit:

- Complete the Booking Form **or** visit our website and book on line. Please enclose full payment (if booking less than 1 month in advance) or a deposit of £1 per pupil if booking more than 1 month in advance – the balance is due 4 weeks prior to your visit. **In the event of cancellation: 4 weeks or more in advance of your visit you will get a full refund, 3 weeks you will get 50%, 2 weeks you will get 25% and less than 2 weeks no refund.** Please note that you agree to this, and all other conditions, by signing the Booking Form.

Once your booking is confirmed we will speak to you directly and invite you, as Party Leader, to visit the Centre free of charge in advance of your school visit, which we strongly advise you to do.

RISK ASSESSMENT MADE EASY: We are fully aware of the extensive process teachers now have to go through to ensure satisfactory risk assessment. To make this as easy as possible, we produce for you an EV2 form, already largely completed for you simply to finish and send to your appropriate authority. A copy is enclosed with this pack.

ON ARRIVAL

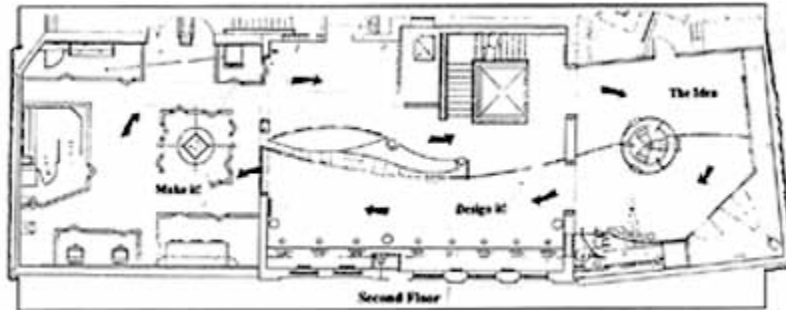
Once you have arrived in Mansfield and either parked your coach or walked from the train station, you will enter the Centre from the Littleworth elevation.

1. Ahead of you will be the Reception Desk: We ask your Party Leader then to inform the Reception Desk of your arrival and sign the group in.

A poster, designed by the group at school, can now be displayed in Reception for the duration of the visit.
2. **Your dedicated Enabler will meet you** and take your group to an Education Room on the ground or first floor mainly using the staircase. A lift is also available for small numbers.
3. **You will now be taken to our Auditorium** . Here you will have the use of this room for your possessions not immediately required and lunch.
4. Depending on the pre-planned structure of the visit and its duration, the group will start their experience either in the galleries or on parts collection, guided by the Enabler who will ensure you get the most from each zone.

THE GALLERIES

The time it takes to tour the two floors of galleries and hands-on interactivities is approximately 80 minutes of a three and half hour visit. A five hour visit will allow for a more leisurely pace and longer spent in each zone, more time to construct the models and an additional design activity (agreed prior to the visit). Breaks for lunch will be planned into the time allocated.



Moving on from the Auditorium, your group will now begin their learning experience through our four comprehensive zones, each packed with information, multi-media introductions and interactivity:

1. **The idea:** an introductory zone showing that every design starts with an **idea** and that throughout history people have used ideas to make life easier or better. See how even the most high tech designs started with someone having an idea, how small changes might be needed to keep up with modern trends, how ideas have to be tried out and how some are great successes and some monumental failures!

To do:

- watch the multi media cartoon
- play “Fame & Failure”- you vote on whether a product is a “hit”, “miss” or “maybe” or decide what the invention was for
- “Trial and Error” introduces you to the concept of process through machinery and children invent their own virtual reality fizzy drink

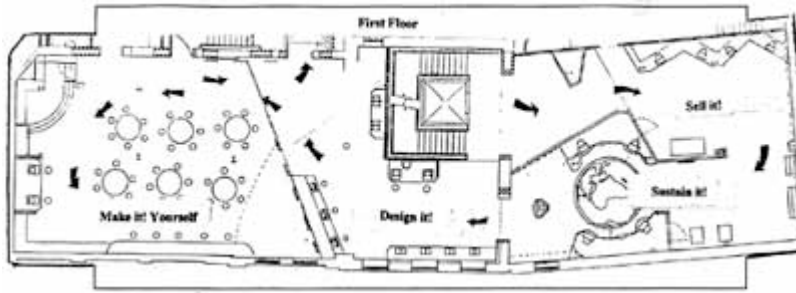
- 2. how to design it!** the world of the designer, the person who takes an idea and shows how it can be developed, what materials will be needed, how design must meet the demands of use, what tools and packaging will be needed and how it will work and be effective.

To do:

- **use modern light box drawing boards, each with a selection of approx. 30 different designs, to trace designs from a mobile phone to a paper aeroplane or a potato masher to an ironing board.**
 - **learn how a CAD (computer aided design) machine works and how you will use one later on**
 - **material choices - look at and examine a range of materials that might be used in the eventual manufacture of various products, including your own.**
- 1. how to make it!** a zone devoted to the practicalities of assembling the product from the design, using assembly lines and testing products.

To do:

- **interact with a Test Tower, where you can test shoes, underwear and other products to destruction**
- **put your head inside the “virtual reality” pods to look at metal, paper and glass being made**
- **can you keep pace with a mechanical conveyor? Try to make a bottle filling machine work under pressure of time**
- **assemble an electrical product from its parts using a robot machine**
- **run a chocolate packaging assembly line**
- **ask experts about how they work in industry**



4. sell it! why would you buy it? An area devoted to the art of advertising and marketing a product, how it is distributed and the use of bar code technology.

To do:

- **multimedia interactivities exploring the process of the marketing, sales and distribution of goods, “ask the expert” and packaging displays**
- **a hands-on challenge which can be done individually or as a group all about using and understanding bar codes**
- **touch screen jigsaws – see what is made locally.**

5. save it or scrap it? The beginning and end of the lifecycle of materials. What natural resources industry uses and what we do with the waste left over – can we dispose of it or recycle it?

To do:

- **enter the world of natural resources and energy sources used in manufacturing locally. Look for and identify the natural resources**
- **Waste Mountain - You are invited to touch items to activate multimedia about domestic waste. Find out about how much waste we produce, how it is disposed of, and how long it takes to break down.**

You will exit through the Wheel of Fortune interactive area, where you can decide whether you will be a “consumer” or “conserver” and consider your impact on the future

6. **designed@making it and made@making it:** two zones which allow students to design and make a model, either from a selection available in the Centre or from their own design.

designed@making it

Your group will have the opportunity to trace the design of their chosen kit and take these back to school for further analysis and enhancement.

As an alternative, designs can be created from scratch in the centre, rather than in advance at school. However, you must allow more time for this on your visit.

made@making it!

In our manufacturing zone, turn these design into reality.

The components needed to make the pre-booked kits are distributed from the Parts store and checked by individual pupils to ensure they have all the necessary components to make their chosen kit.

Within a strict time limit, each group or individual is then challenged to produce the design as a finished product. Enablers will be on hand to assist you with production. Batteries are included in the price if required.

At the end of the manufacturing period the creation should be working and ready to **test and package** and take it all back to school to work on and understand further.

7. **Hit the Headlines!:** with the design and manufacture complete, each visitor or group is now invited to produce their own local newspaper front page on computer. A headline has to be created and then a front page photo taken of the inventors and their creation. Visitors take these away with them as a further memento of their visit.

Making it! AND THE TEACHER

What do you take back to school?

- A design traced from a variety of successful design ideas
- The completed packaged and labelled model built by each student or group
- A newspaper front page designed by each student or group
- A Certificate of Manufacture for each student
- **An unforgettable educational experience which will enhance the teaching and learning process back at school**

How can my school or college best use making it!

- Visit the Centre in advance (strongly advised) and study this Resource Pack or visit our website (www.makingit.org.uk) where you can take your students on a virtual pre-visit tour of what they will see and do
- Decide on the date, length of visit, means of travel and minimum staff support you will need (we recommend 1:8 for juniors, 1:10 for seniors)
- Carry out a full Risk Assessment (see the EV2 enclosed with this pack)
- Make advance decisions about what your students will design and make here and tell us what those designs are so we can have the components ready for you
- Prepare students in class to get the most out of the experience and divide them into groups of about 20 for the visit, each with two adult helpers
- Decide what National Curriculum links you will be targeting
- Produce a poster using your school name (up to 100cm x 50cm) to bring with you and we will display it during your visit on the "Who is Visiting us Today" board
- Decide whether the students or teacher will be responsible for transporting the designs and products back to school. We will provide individual packaging for each student, but can also provide a box/bag for you to carry all of the products.

Alternatives

- Restrict your visit to selected zones to meet a specific teaching and learning objective
- Choose to complete the Gallery Quiz during the visit – 20 questions involving all the galleries (five hour visit only)

Support for teachers from making it!

- Attend a Teacher Pre-View session at the Centre before your visit
- Make use of our prepared EV2 Risk Assessment form
- Our Enablers who will accompany your group from start to finish of your visit, will provide you with help and advice during your visit.
- Provide school and college groups with their own access to the Centre, secure storage of possessions and a dedicated Education Centre
- A free preparatory visit for the Party Leader and colleague
- Links to the National Curriculum
- Copies, on request, of all our design suggestions and a list of components available
- A clear journey through the Centre for your group
- Easy access by road and rail
- Lots of material to take back to school to enable the learning process to continue

Subject	Programme of study	Ref no
D&T	Knowledge, skills and understanding	1a,b,c,d,e
	Working with tools, equipment, materials & components	2a,b,d 3a,b
	Evaluating processes & products	4a,b
	Knowledge & understanding of materials & products	
Science	Ideas & evidence in science	Sc1: 1
	Investigative skills	Sc1: 2a-e, h,i
	Materials and properties	Sc3: 1a,c,d; 2a
	Physical Processes	Sc4 1b, 2a-c, 3a,b
History	Chronological understanding	1b
	Knowledge & understanding of events, people & changes	2b
	Historical interpretation	3
	Historical enquiry	4a
Art & Design	Exploring and developing ideas	1a,b
	Investigating & making art, craft and design	2a,b,c
	Evaluating and developing work	3b
	Knowledge and understanding	4a,b
Geography	Geographical enquiry & skills	1a,d
	Knowledge & understanding of places	3c
	Knowledge & understanding of patterns & processes	4a 5a,b
	Knowledge & understanding of environmental change	
ICT	Finding out things	1a,b,c
	Developing ideas and making things happen	2c,d
	Exchanging & sharing information	3a,b
	Reviewing, modifying & evaluating work	4a,b,c

English & Literacy – teachers will be aware that a Discovery Centre, such as **making it!** will provide scope in the majority of its activities, explorations and learning experiences for all **speaking & listening, reading and writing** areas of the Programme of Study. Additionally, there is an **English Trail** through the Centre.

Mathematics & Numeracy- teachers will be aware that a Discovery Centre, such as **making it!** will provide scope in the majority of its activities, explorations and learning experiences for all **number, shape space & measures and data handling** areas of the Programme of Study. Additionally, there is a **Maths Trail** through the Centre.

Subject	Programme of study	Ref no
D&T	Knowledge, skills and understanding	1a,c
	Working with tools, equipment, materials & components	2a,b,c,e
	Evaluating processes & products	3a-c
	Knowledge & understanding of materials & products	4a,b,c,d
Science	Ideas & evidence in science	Sc1: 1a,b
	Investigative skills	Sc1: 2a,b,c,h
	Materials and properties	Sc3: 1a
	Physical Processes	Sc4 1b, 2a-f, 3a-c
History	Chronological understanding	1b
	Knowledge & understanding of events, people & changes	2a
	Historical interpretation	3
	Historical enquiry	4a,b
	Local history study	7
	Period of British history	11b
Art & Design	Exploring and developing ideas	1a,b,c
	Investigating & making art, craft and design	2a,b,c
	Evaluating and developing work	3b
	Knowledge and understanding	4a,b
Geography	Geographical enquiry & skills	1a,d
	Knowledge & understanding of places	3d,e
	Knowledge & understanding of patterns & processes	4a
	Knowledge & understanding of environmental change	5a,b
ICT	Finding out things	1a,b,c
	Developing ideas and making things happen	2a,b
	Exchanging & sharing information	3a,b
	Reviewing, modifying & evaluating work	4a,b,c

English & Literacy, Maths & Numeracy– teachers will be aware that a Discovery Centre, such as **making it!** will provide scope in the majority of its activities, explorations and learning experiences for all **speaking & listening, reading and writing** areas in English and all **number, shape space & measures** and **data handling** in the Math's Programme of Study. Additionally, there are **English and Maths Trail** through the Centre.

KEY STAGE 3 **making it! curriculum links**

Subject	Programme of study	Ref no
D&T	Knowledge, skills and understanding	1a,b,c,f,g,h
	Working with tools, equipment, materials & components	2b,c
	Evaluating processes & products	3a-c
	Knowledge & understanding of materials & products	4a,d
Science	Ideas & evidence in science	Sc1: 1c
	Physical Processes	Sc4: 2c,2f
History	Knowledge & understanding of events, people & changes	2a
	Historical interpretation	3a
	Historical enquiry	4a,b
	Period of British history	10
Art & Design	Investigating & making art, craft and design	2a,b
	Evaluating and developing work	3b
	Knowledge and understanding	4a
Geography	Geographical enquiry & skills	1a
	Knowledge & understanding of places	3c,d
	Knowledge & understanding of patterns & processes	4a
	Knowledge & understanding of environmental change	5a,b, 6h,i,j,k
ICT	Finding out things	1a,b
	Developing ideas and making things happen	2a,b
	Exchanging & sharing information	3b
	Reviewing, modifying & evaluating work	4a,b,c,d

English & Literacy – teachers will be aware that a Discovery Centre, such as **making it!** will provide scope in the majority of its activities, explorations and learning experiences for all **speaking & listening, reading and writing** areas of the Programme of Study. Additionally, there is an **English Trail** through the Centre.

Mathematics & Numeracy - teachers will be aware that a Discovery Centre, such as **making it!** will provide scope in the majority of its activities, explorations and learning experiences for all **number, shape space & measures and data handling** areas of the Programme of Study. Additionally, there is a **Maths Trail** through the Centre.

KEY STAGE 4 **making it! curriculum links**

Subject	Programme of study	Ref no
D&T	Knowledge, skills and understanding	1a,b,g
	Working with tools, equipment, materials & components	2c,e
	Evaluating processes & products	3a,c,d
	Knowledge & understanding of materials & products	4b,d
History	Knowledge & understanding of events, people & changes	2a 3a
	Historical interpretation	4a,b
	Historical enquiry	10
	Period of British history	
Art & Design	Investigating & making art, craft and design	2a,b
	Evaluating and developing work	3b
	Knowledge and understanding	4a
Geography	Geographical enquiry & skills	1a
	Knowledge & understanding of places	3c,d
	Knowledge & understanding of patterns & processes	4a
	Knowledge & understanding of environmental change	5a,b, 6h,i,j,k

Business Studies – making it! is an excellent vehicle to learn more about several concepts met in the Business Studies Syllabus. It is particularly relevant to the areas of Production and Marketing and there is a **Business Studies Trail** through the Centre.

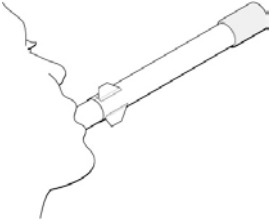
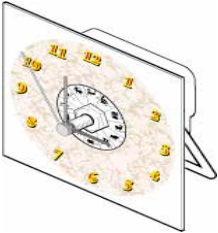
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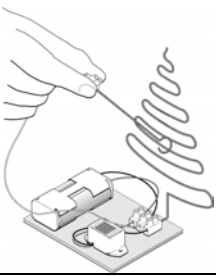
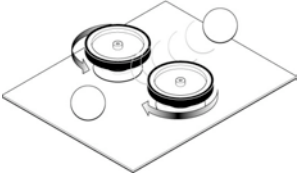
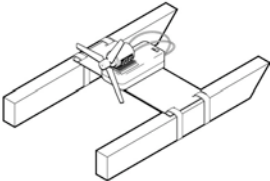

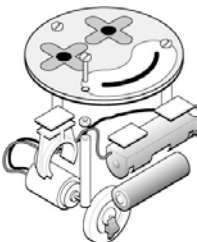
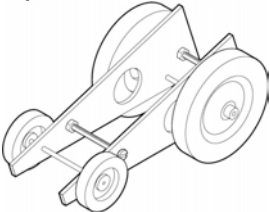
Mathematics - teachers will be aware that a Discovery Centre, such as **making it!** will provide scope in the majority of its activities, explorations and learning experiences for all **number, shape space & measures** and **data handling** areas of the Programme of Study. Additionally there is a **Maths Trail** through the Centre

The making it! kits

There are in excess of eight different design-and-make options available at any one time in the form of component parts.

In order to help you decide, we have drawn up a guide about the kits available to groups including age suitability. National Curriculum links for D & T and Science (see separate sheet) and a brief description of what is involved in the making of the kit.

Kit	Age	Description
My Own Torch	4+	A simple to make LED power torch, with a design to draw and/or colour for the outside. Construction is a simple process and the finished result is a small torch with a press on/off action and small red beam of light.
Rocket 	5+	The rocket body is formed by rolling paper around a plastic tube and finished by adding a soft plastic nose cone and paper fins. It is launched by blowing through the same plastic tube – like a blow pipe. Making these rockets was the most popular activity at the BBC's Tomorrow's World Live Show.
Clock 	7+	The quartz clock movement is fixed to a plastic plate and then the hands are assembled. A paper clock face is coloured/signed and glued to the surface.

<p>Live Wire Challenge</p> 	9+	<p>This is a variation on a traditional electrical wire game – once made this is a game of skill which challenges the user to pass a small wire loop around a contorted wire path without the two touching. Constructed using an electrical circuit.</p>
<p>Ball Launcher</p> 	9+	<p>This device comprises two rapidly spinning wheels driven by a 3 volt electric motors. When a table tennis ball is passed between them, it is nipped and thrown out at high speed.</p>
<p>Boat</p> 	7+	<p>This unusual boat uses polystyrene floats to support a deck. Powered by a small electrical motor driving a propeller, it moves at surprisingly high speeds over water and even a smooth, slippery surface.</p>
<p>High Speed Flyer</p> 	7+	<p>Powered by an electrical motor driving a propeller this is a powerful little flying machine. When suspended by thread it will fly in circles.</p>
<p>Jitter Bug</p> 	9+	<p>This fascinating device, set into motion by an off-centre mass on the motor, is a platform for creative visual design as well as technical modifications which will make it “behave” in thousands of different ways. The bugs are simple for pupils to build, but professional engineers still struggle to explain their behaviour</p>
<p>Speed Machine</p> 	9+	<p>Powered by friction (elastic band), this model runs at relatively high speeds on a smooth surface but, ultimately performance depends on “build quality”. It uses several real engineering parts.</p>
		<p style="text-align: right;">20</p>

<p>Fairground Carousel</p> 	<p>9+</p>	<p>Based on a Victorian Fairground Carousel, this model uses plastics, card and metal components to build a miniature working model of the carousel which is powered by a motor driving a wheel – it can move at a good speed if wired correctly. Fascinating, fun and creative.</p>
<p>Plane Launcher</p> 	<p>9+</p>	<p>Build a powered launch pad, then design your own paper aeroplanes to go higher and faster. Compete with your friends.</p>
<p>Motorised Dragster</p> 	<p>10+</p>	<p>Our “speed machine” enters the 21st century – now powered by an electric motor, six wheels and exciting graphics!</p>
<p>Torch Plus</p> 	<p>7+</p>	<p>Build a torch made with a long cylinder, battery box, bulb holder and bulb. Decorate this to compliment the seasons or a theme you are working on at school.</p>

Lighthouse

9+

Made from a cylinder – children have to build a circuit, using battery box, bulb holder, wires etc.



By choosing to make any of the products above, there are opportunities to cover elements of the programmes of study for D&T and Science. The links below relate directly to the design and make opportunities from a visit to making it!

Design & Technology and Science links of products made at making it!

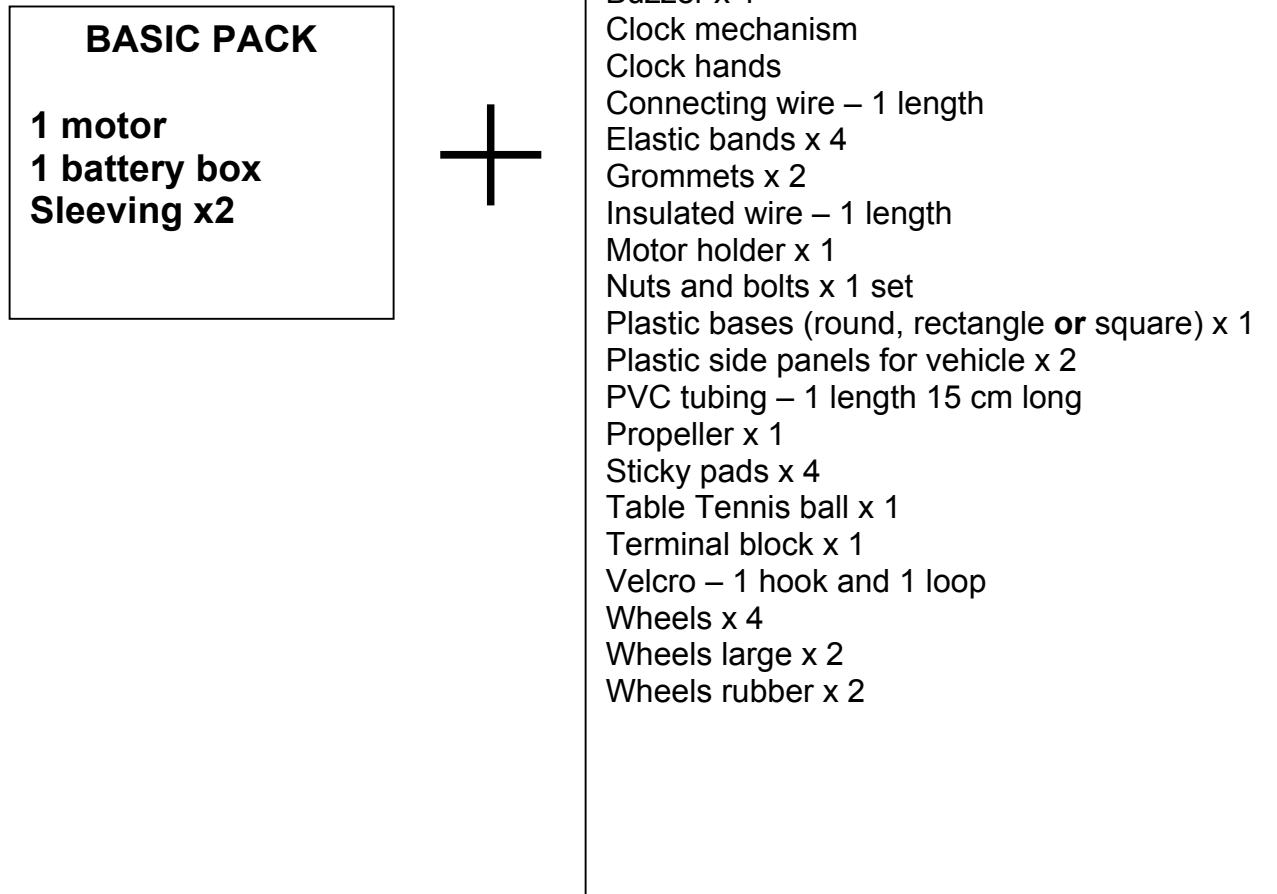
Product	Subject	Key Stage 1	Key Stage 2	Key Stage 3	Key Stage 4
Torch	D&T	1b, 1e, 2d, 2e, 3a, 3b	2d, 2e, 3a-c	N/A	N/A
	Science	Sc4 Light 3a,b	Sc4 Light 3a-d		
Rocket	D&T	1b, 1e, 2d, 2e, 3a, 3b	2d, 2e, 3a-c	2c, 2d, 3b	N/A
	Science	Sc4 Force & motion: 2 a,c	Sc4 Force & motion b,c	Sc4 2 Force and linear motion	
Ball launcher	D&T	N/A	N/A	2c, 2d, 3b	2c-e (if working in groups) 3b-d
	Science			Sc4 Circuits 1c, Force & Motion 2g	
Clock	D&T	N/A	2d, 2e, 3a-c	2c, 2d, 3b	N/A
	Science		N/A	N/A	
Live Wire Challenge	D&T	N/A	N/A	2c, 2d, 3b	2c-e (if working in groups) 3b-d
	Science			Sc4 Circuits 1c	
Fairground Carousel	D&T	N/A	2d,2e,3a-c	2c, 2d, 3b	2c-e(if working in groups) 3b-d
	Science				
Jitter Bug	D&T	N/A	2d, 2e, 3a-c	2c, 2d, 3b	2c-e (if working in groups) 3b-d
	Science			Sc4 Circuits1c Force and motion 2c	
Speed Machine (Buggy or Boat)	D & T	1b, 1e, 2d, 2e, 3a, 3b	2d, 2e, 3a-c	2c, 2d, 3b	2c-e (if working in groups) 3b-d
	Science	Sc4 Force & motion			
*Own product made from component parts.	D&T	1a-e, 2a, 2c-2e, 3a, 3b.	1a-d, 2a-e, 3a-c	1a-h, 2a-e, 3a-c	1a-g, 2a-e, 3a-d
	Science	They could meet range of requirements within Sc4	They could meet a range of requirements within Sc4	They could meet a range of requirements within Sc4	

*There are more opportunities for students if they produce their own product, this will obviously involve a lot more preparation work at school working on ideas, or by booking a full day to do preparation work in our education centre prior to visiting the galleries.

DESIGNING AND MAKING SOMETHING NEW!

Although we offer the opportunity for students to produce a product using a kit, we also recognise that in order for students to be even more creative, we should allow for individual designs and products to be made from our components. If you decide upon this option, this is how it works:

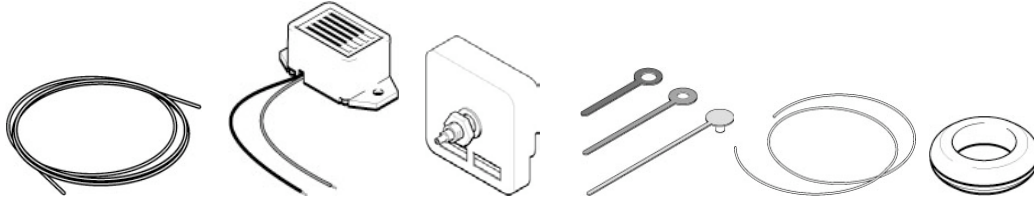
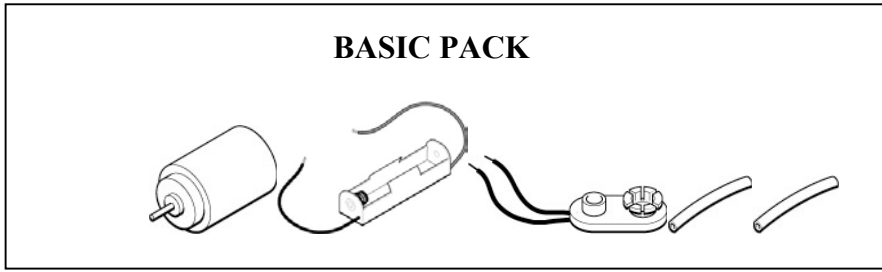
Within the price of the visit each student is entitled to the following choice of components:



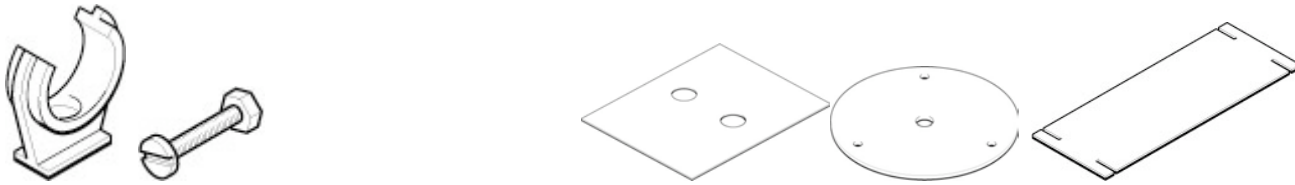
If a group is to build a product, the component list above is multiplied by the number in the group.

If you are undertaking this option, we need to know at least 1 week in advance what components your group is going to need in order for us to ensure your visit meets your requirements.

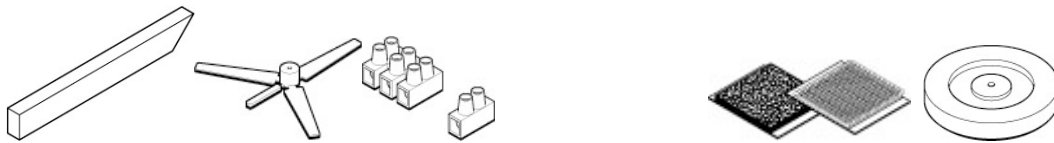
COMPONENT PART ILLUSTRATIONS



Bendy wire	Buzzer	Clock	Clock hands	Connecting wire	Grommet x2
------------	--------	-------	-------------	-----------------	------------



Motor holder	Nuts and bolts			Square plastic base	Round plastic base	Rectangular plastic plate
--------------	----------------	--	--	---------------------	--------------------	---------------------------



	Polystyrene floats	Propeller	Terminal block		Velcro	Plastic wheels
--	--------------------	-----------	----------------	--	--------	----------------

Illustrations not to scale

ACTIVITIES TO TRY AT SCHOOL

These activity suggestions are related to the various zones in the manufacturing process experienced at **making it!** Some could be tried before visiting the Centre and all are suitable to experiment with after the visit.

THE IDEA and DESIGN

MOOD BOARDS

You will have seen descriptions and outline designs of the kits you might be making at the Centre (or you may be designing your own product).

Resources: collect as many pictures as possible from magazines, catalogues and newspapers of products similar to the one you have chosen to make.

Method: make a collage picture of these. This is called a "mood board" and is used by designers to get ideas. Which of your chosen pictures do you like the best? Which do you think was the most successful in terms of sales? Is there any way you can use these ideas to adapt the kit or design you are making?

TESTING

TASTE TEST: MAKING STILL LEMONADE

Resources: 3 similar sized bottles, water, juice of three lemons, caster sugar, food colouring of your own choice.

Method: Take the three empty and sterilised bottles and fill to about three-quarters with cold water. Now add a recorded, but different, amount of lemon juice and sugar to each bottle. Add food colouring.

Test: perform a taste test on a group of volunteers and record their scores for each bottle in relation to flavour and appearance.

TESTING – REFRACTOMETER

This is a test for the concentration of sugar in lemonade.

Resources: several bottles of home made lemonade, a Ray Box or torch, graph paper.

Method: make several bottles of still lemonade, with different amounts of sugar, by the same method as described in a previous experiment. Shine a light through each bottle in turn. Use a Ray Box if you can, but if not, a torch with just a slit of light showing (use tape to make the slit).

Test: shine the light through each bottle and record how much the "ray" bends. This is called "refraction" and the amount it bends varies according to the amount of sugar. Record your results as a graph.

STRENGTH TEST ON VARIOUS MATERIALS

You will see various materials and manufactured products tested at making it! Testing for strength is important to the manufacturer - why?

Resources: strips about 10mm wide and 20cm long of as many different materials as you can find - eg. cotton, shoe lace, leather, paper, card, straw. 2 bulldog clips. Weights and a method of attaching them to a bulldog clip. Graph paper.

Method: attach a bulldog clip to the top and bottom of a sample. Hang the top clip from a secure fixing, suspending the sample.

Test: attach the smallest weight to the bottom clip. Gradually attach more and more weight, recording each time how much weight is used, until the sample breaks (or fails to break even with the heaviest weight).

Plot your results as a graph.

Try the same test wetting the same samples. You could also record how far each sample stretches (its elasticity) before it breaks.

PRODUCTION and ASSEMBLY

LOOKING AT MECHANICAL MOVEMENT

Resources: a group of imaginative students!

Method: this is often used as a Drama exercise.

Every member of the group has to start thinking of the ways he or she could imitate the repetitive movement of a machine or robot. One person starts by standing in the middle of the room and beginning a movement, such as swinging one arm up and down at a regular speed. The next person then joins in by standing close to the first and adding another movement that fits with the first, such as an opposite arm movement. Each member of the group now joins in turn until you have one large moving machine.

If you have the facilities, you could video the experiment and then ask each person to add an appropriate sound as well. Even without a video camera, you could record the sounds onto tape.

ASK THE EXPERT

CAPTURE YOUR OWN EXPERT

Resources: a visitor who works in industry or design and who is willing to come and talk to the group or a volunteer student who is willing to talk about what he or she did at **making it!**

Method: ask your visitor to talk to the group about what exactly their job is, what part they play in producing the finished product and answer any questions. Equally, create your own "expert" student, who can describe how he or she designed and made something themselves, maybe exhibiting the finished product and even making a video of the demonstration.

ADVERTISING and MARKETING

DISSECTING AN ADVERTISEMENT

Resources: a magazine or newspaper advertisement chosen and cut out by each student.

Method: each student is asked to write a "dissection" of the advertisement - their idea of how the advertisement is working or failing, by answering questions like these: What is it trying to sell? To whom? What images is it using? What kind of words is it using? Why? Do you believe its claims? Is it based on fact or opinion? Does it use words like "may", "could" or "possibly"? Why?

MAKE YOUR OWN AD

Resources: materials to draw an advertisement or write an advertising script. You might choose to do this for the lemonade you have made.

Method: choose a product to advertise, but remember you can't use an existing advertisement to promote it. Draw your own original poster advertisement for it OR write a 30 second script for a television advertisement.

SAVE IT OR SCRAP IT

SURVEY YOUR ECO-FRIENDLINESS

Resources: a clipboard, or similar, paper and graph paper.

Method: for your school and/or your home carry out a survey, by asking those people responsible for it to record answers to questions about how environmentally friendly it is: What fuel does it use? How much recycling goes on? Is energy wasted? How much rubbish is thrown away each week? What categories of rubbish are there (eg. tins, bottles, plastic, paper packaging, newspapers, waste food). Find a way to record this information in a way that will display it most clearly and compare and contrast it with the homes of other people.

WASTE WEAVING

Resources: clean plastic bags and sacks.

Method: tear up or cut up the bags into long narrow strips. These can be used to weave rugs, wall hanging or ropes.

PACKAGING

DRINKS PACKAGING

Resources: materials (cardboard, paper, plastic) out of which to make your own packaging for a lemonade drink.

Method: design and make packaging and a label to market a lemonade drink. Remember, it doesn't have to be in a bottle.

EGG DROP CHALLENGE

Resources: plenty of fresh eggs, different types of packaging to wrap an egg in (eg. bubble wrap, paper, cardboard, duster) and a measuring device that reaches to at least 3 meters. Plastic sheet to catch the debris!

Method: choose at least 5 different types of packaging material. Wrap an egg in each and drop it from gradually increasing heights.

Test: What material best protects the egg at the greatest height. Record your results as a graph.

PRINTING

PRINTING TECHNIQUES

Resources: materials to try potato and/or lino printing, computer facilities to print in colour, a newspaper, magnifying glass and, if possible, access to a photocopier.

Method 1: produce your own colour, printed label for the lemonade drink, which can be done as a potato print, lino print or computer aided print.

Method 2: look at a newspaper picture through a magnifying glass and/or enlarge it as much as possible on a photocopier. Notice the dots that make up the picture (pixels). Draw your own "impressionist" picture using only dots or blobs.

MAKING IT!

POST VISIT WORK – KEY STAGE 1

We hope that your students will enjoy their visit to making it! but it does not stop there. In order to conclude the visit we have produced a post-visit worksheet which is a photocopiable resource that you can use back in the classroom.

EVALUATING PROCESS AND PRODUCTS

As with any design and make process, we understand that an integral part of the process is evaluating whether the process and products work.

The following evaluation sheet could help students to evaluate the process that they followed at making it! We have related the evaluation sheet to the National Curriculum section 3 in order to meet your curriculum needs.

How the sheet could be used:-

- ❖ Individually – students could complete the sheet
- ❖ In pairs – they could ask each other and also give feedback on each other's designs and products
- ❖ Group discussion – the questions could be used as a stimulate for the class to discuss their products.
- ❖ Information gathered could be used to find out what the group felt as a whole, e.g how many preferred the design process using paper and pencil and how many preferred using CAD OR pattern sheets.
- ❖ From this ICT and numeracy skills could be developed – pupils could produce simple charts of their group findings.

MAKING IT!

WE HOPE YOU ENJOYED YOUR VISIT TO MAKING IT!

WE NOW WANT YOU TO THINK ABOUT WHAT YOU DID AT MAKING IT!

YOUR NAME:

WHAT DID YOU DESIGN:

HOW DID YOU DESIGN IT – DID YOU USE:-

Paper and pencil (own design)

Computer Aided Design

Traced a pattern (tracing paper/pencil)

If you used the pattern and CAD which did you prefer?
(circle one)

PATTERN/TRACING
PAPER

CAD

Why did you prefer this method?

.....
.....
.....

Was your finished product like your design? YES NO

If not – why was this?

.....
.....

MAKING YOUR PRODUCT

Describe how you made your product – remember to include the materials you used and diagrams if you wish.

What did you enjoy most about making the product?

What was the hardest part of making your product?

IMPROVEMENTS

If you were to make your product again, would you use the same materials?

YES

NO

If not, what would you use instead?

If you were to make your product again, would you put it together in the same way?

YES

NO

If not, what would you do different?

Make a list of other improvements that you could make to your product?

MAKING IT!

POST VISIT WORK – KEY STAGE 2

We hope that your students will enjoy their visit to making it! but it does not stop there. In order to conclude the visit we have produced a post-visit worksheet which is a photocopiable resource that you can use back in the classroom.

EVALUATING PROCESSES AND PRODUCTS

As with any design and make process, we understand that an integral part of the process is evaluating whether the process and products work.

The following evaluation sheet could help students to evaluate the process that they followed at making it! We have related the evaluation sheet to the National Curriculum Section 3a in order to meet your curriculum needs.

How the sheet could be used:-

- ❖ Individually – students could complete the sheet
- ❖ In pairs –they could ask each other and also give feedback on each other’s designs and products
- ❖ Group discussion – the questions could be used as a stimulus for the class to discuss their products.
- ❖ Information gathered could be used to find out what the group felt as a whole, e.g. how many preferred the design process using paper and pencil and how many preferred using CAD or Pattern sheets
- ❖ From this ICT and numeracy skills could be developed – pupils could produce simple charts of their group findings.

MAKING IT!

WE HOPE YOU ENJOYED YOUR VISIT TO MAKING IT!
WE NOW WANT YOU TO THINK ABOUT WHAT YOU DID AT MAKING IT!

YOUR NAME:

WHAT DID YOU DESIGN:

HOW DID YOU DESIGN IT – DID YOU USE:-

Paper and pencil (own design)

Computer Aided Design

Traced a pattern (tracing paper/pencil)

If you used the pattern and CAD which did you prefer?
(circle one)

PATTERN/TRACING
PAPER

CAD

Why did you prefer this method?

.....
.....
.....

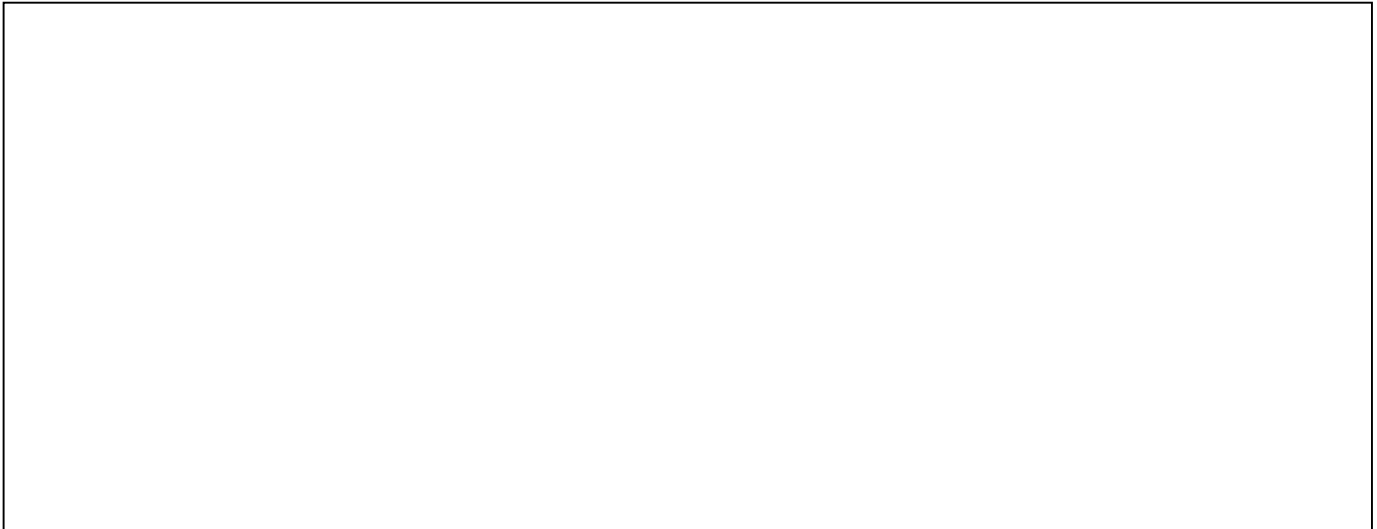
Was your finished product like your design? YES NO

If not – why was this?

.....
.....

MAKING YOUR PRODUCT

Describe how you made your product – remember to include the materials you used and diagrams if you wish.



What did you enjoy most about making the product?



What was the hardest part of making your product?



IMPROVEMENTS

If you were to make your product again, would you use the same materials?

YES

NO

If not, what would you use instead?

If you were to make your product again, would you put it together in the same way?

YES

NO

If not, what would you do different?

Make a list of other improvements that you could make to your product?

SCHOOLS COLLEGES

making it!
BOOKING FORM

Please complete this form and post or fax it to:

making it!
Littleworth
Mansfield
Notts
NG18 1AH

info@makingit.org.uk or Fax: 01623 473201

GROUP NAME:			
PARTY LEADER:			
ADDRESS:			
POST CODE:			
TELEPHONE:			FAX:
E-MAIL:			
VISIT DATE:	1 ST choice	2 nd choice	
DURATION (please circle)	<u>3½ HOUR VISIT</u> (includes sufficient time for a ½ hour lunch break/shopping)	5 HOUR VISIT	
ARRIVAL TIME: (please indicate)			
LUNCH ROOM: Do you require the use of a dedicated area for a lunch break? (Cost: 25p per pupil on a 3½ Hour Visit; Free of charge on a 5 Hour Visit) YES/NO			
Students:	Nos:	Year:	Age:
Tick the box if your school is part of the Children's University <input type="checkbox"/>			
www.childrensuniversity.co.uk			

CONDITIONS OF BOOKING

By using this Booking Form you accept and agree all conditions laid out in our Education Pack and specifically those details on page 7

Please indicate the number of each kit required in the boxes below

KITS, with numbers of students, your group will be making:									
My Own Torch 4-6	Rocket 5-7	Clock 7-10	Boat 7-16	Fairground Carousel 9-16	Jitter Bug 9-16	Speed Machine 9-16	Ball Launcher 9-16	Live Wire Challenge 9-16	Plane Launcher 9-16
Torch Plus 7-16		Lighthouse 9-16	High Speed Flyer 7-16			or Motorised Dragster 10-16			

(THE NUMBERS UNDERNEATH THE KITS ARE AN AGE GUIDE)

If you are unsure which kits you want to make, you need to contact us with these details 3 weeks prior to visit.

YOUR COSTS AND REQUIREMENTS

CHARGEABLE SERVICES:	Nos	TOTAL COST
Use of Lunch Room @ 25p per student		
<u>(An additional 30 minutes above the half hour allocated will be charged at £30.00)</u>		
Pre-Booked Shopping Bags @ £1.50 each		
Pre-Booked Shopping Bags @ £2.00 each		
Tin in which to pack product @ £0.50 each		
Pre-packed picnic lunches @ £3.25 each		
Total Cost of Chargeable Services		£

SPECIAL NEEDS

Do any of your students have Special Needs, such as wheelchair users, auditory or visual impairment? If so, please give brief details and we will contact you before your visit to discuss our facilities:

How did you find out about making it! (please circle)?

information sent to school Internet word of mouth other (please specify below)

PAYMENT – please indicate *group numbers* in spaces provided:

	Nos.	Total Cost
Paying students @ £6.75 (3½ hours) or £9.25 (5 hour)		
INC.BATTERIES		£
Please state no. of Teachers/Assistants attending (Free of Charge)		
Chargeable services (carried forward from above)		£
Total:		£
Less: Deposit included with Booking Form		£
TOTAL BALANCE due four weeks prior to arrival		£

DOES YOUR GROUP INTEND TO VISIT THE SHOP? (if no please state reason why for our research)
YES/NO

I enclose my deposit of £1 per paying visitor (if booked more than 4 weeks in advance), or I enclose full payment (if booking less than 4 weeks in advance) (please delete as appropriate)

Signed:

As Party Leader I have read and agree to the terms and conditions of the making it!
Discover Centre
PLEASE MAKE CHEQUES PAYABLE TO: Making It! Enterprises Limited

THE INFORMATION ON THIS BOOKING FORM IS VALID
UNTIL 30TH SEPTEMBER 2012



RISK ASSESSMENT

HEALTH AND SAFETY AT THE *making it!* CENTRE

The *making it!* Discovery Centre in Mansfield opened in May 2002 and is a multi-million pound, state of the art, hands-on centre based around designing and making. The Centre was funded by the Millennium Commission, New Opportunities Fund, European Union, County and District Councils.

This portfolio should assure all users and employees that it is constructed and fitted to the highest standards and that all the agencies involved, as well as the Fire Service, Planning Authority and HSE, are satisfied with its approach to Health and Safety matters.

Specific areas that visiting groups may wish to include in any Risk Assessment are:

Health and Safety Introduction: a talk is given on arrival to all groups by a member of senior management, which covers procedures in the event of fire or evacuation of the building, first aid, advice that all pupils remain with an Enabler during the visit and are accompanied by a minimum ratio of 1 school teacher/adult to 10 pupils.

Toilets: the Centre has adequate toilets for both male and female visitors, disabled visitors and baby changing facilities.

Fire: the building has been inspected and passed by the Fire Service in all aspects of fire safety and provides internal fire escapes from every floor, half hour resisting fire doors, clearly marked fire exits and fire points. Fire alarms are tested weekly and the Centre has trained Fire Wardens. All staff are trained in evacuation procedures, including those for the disabled.

First Aid: the Centre is equipped with First Aid Kits and staff trained in the provision of emergency first aid.

Disability Awareness: all staff have undergone training in disability awareness and the Centre caters for most forms of physical and educational disability. We need to know in advance of a visit if anyone in the party is disabled.

Interactive Displays: all displays, interactive or static, are maintained to the high standards that the manufacturers work to. We also have our own Technician on site to deal with any breakdown of such displays.

Enablers: these are the *making it!* staff who accompany each group around the Centre and in the Design and Make area. These staff are trained, both by *making it!* and by the Heart of England Tourist Board; the latter organisation have also trained other staff in the Centre. **All Centre staff have had CRB checks carried out.**

Catering Staff: are qualified in Basic Food Hygiene and catering facilities are inspected by the Department of Environmental Health.

Risk Assessment: is carried out by senior management on an on-going basis and records kept of any risks identified, action to be taken and when completed.

All groups are required to bring a register with them of all pupils and adults in the group and a copy of this for the Centre.

**FOR COMPLETION BY PROVIDERS AND TOUR OPERATORS OF
EDUCATIONAL VISITS TOSHIRE/CITY SCHOOLS**

When considering using a provider (e.g Making It!) or tour operator for an educational visit, schools must seek written assurance that the provision complies with LEA policy.

School:Teacher in charge:

Date(s) of visit:Name of Provider: Making it!

The provider providing services to the school named above is asked to give careful consideration to the statements below and sign in the space at the end of the form that the standard of service provided to the school will meet the conditions listed. Please tick all specifications you can meet. Indicate by a cross any you cannot meet. Write N/A against any specifications which do not apply to your provision.

SECTION A – ALL VISITS

Section A should be completed for all visits. Sections B (adventure activities), C (tour operators) and D (expeditions) should be completed if applicable.

Health, Safety and Emergency Policy

- 1. The provider complies with relevant health and safety regulations, including the Health and Safety at Work Act 1974 and associated regulations, and has a health and safety policy and recorded risk assessment, which are available for inspection (the Discovery Centre Risk Assessment Document is attached).

- 2. Accident and Emergency (and incident) procedures are maintained and records are available for inspection

Vehicles

- 3. All vehicles are roadworthy and meet the requirements of relevant regulations in the country in which they are being used. N/A

Staffing

- 4. All reasonable steps are taken to check staff who have access to young people for relevant criminal history and suitability for work with young people and all have satisfactorily passed a CRB check

- 5. There are adequate and regular opportunities for liaison between school staff and provider’s staff and there is sufficient flexibility to make changes in the programme if necessary (and if mutually agreed) and the reasons for such changes will be made known to school and provider staff.

Insurance

6. The provider has public liability insurance for at least £5 million with a clause giving "indemnity to principal" (copy attached)

Accommodation

Not applicable

Section B – Adventure Activities and field Studies in Outdoor Environments

Not applicable

Section C –Tour Operators

Not applicable

Section D - Expeditions

Not applicable

If any of the above specifications cannot be met or are not applicable, please give details:

Sections B, C, D and the Vehicle sections do not apply to this visit to an indoor Discovery Centre in Mansfield Nottinghamshire.

Details of any other accreditation with national governing bodies, tourist boards etc.

Not applicable

Signed: Date:

Name in Capitals: Position in Organisation:

Name and address of the Provider: Making It! Enterprises Limited
Littleworth
Mansfield Notts NG18 1AH

Tel: 01623 473200 Fax: 01623 473201 E-mail: info@makingit.org.uk

Website: www.makingit.org.uk

Thank you for completing this form. Please return it to the teacher and school named overleaf.

Schools requiring advice on the interpretation of information given by providers on this form should contact their LEAs Outdoor Education Advisor.

MAKING IT! DISCOVERY CENTRE

GROUP BOOKING FORM

Please complete all the details below and send to:

Making it! Enterprises Limited, Chadburn House, Weighbridge Road, Mansfield, Notts, NG18 1AH
Fax : 01623 473201

GROUP NAME										
PARTY LEADER										
ADDRESS										
POST CODE										
TELEPHONE					FAX:					
E MAIL										
VISIT DATE		1ST CHOICE				2ND CHOICE				
DURATION (tick)		3½ HOUR VISIT (includes sufficient time for a ½ hour lunch break/Shopping)				5 HOUR VISIT				
ARRIVAL TIME										
LUNCH ROOM : If you require the use of a room dedicated to your group, for storage of coats/bags and for eating lunch, please indicate (there is a charge of £0.25p/person) YES/NO										
NO OF PERSONS IN GROUP						AVERAGE AGE OF GROUP				
For groups of 10 or more it is recommended that the kits you will be making to take away are ordered in advance – please indicate number of each kit required in the boxes below										
Torch Age 4-6	Rocket 5-7	Clock 7-10	Boat 7-16	Lighthouse 9-16	Jitter Bug 9-16	Fairground Carousel 9-16	Ball Launcher 9-16	Live Wire Challenge 9-16	Speed Machine 9-16	Motorised Dragster 10-16
Torch Plus Age 7-16	High Speed Flyer 7-16	Plane Launcher 9-16								
Nos.										

THE NUMBERS UNDERNEATH THE KITS ARE AN AGE GUIDE

If you are unsure of the kit requirements at the time of booking, you will need to notify us at least two weeks prior to your visit

Tick the box if your school is part of the Children's University

www.childrensuniversity.co.uk

COSTINGS AND REQUIREMENTS

Chargeable Services:	Nos.	TOTAL COST (£)
Use of lunch area @ £0.25/person	
(An additional 30 minutes above the ½ hour allocated will be charged at £30.00)		
Pre-booked shopping bags @ £1.50/person	
Pre-booked shopping bags @ £2.00/person	
Tin in which to pack kit @ £0.50/person	
Pre-packed lunch bag @ £3.25/person	
TOTAL CHARGEABLE SERVICES (A)		

GROUP VISIT FEES:	Nos.	£
Paying visitors	@ £7.25 (3½ hours)	
Paying visitors	@ £9.25 (5 hours)	
TOTAL GROUP VISIT FEES (B)		
ADD CHARGEABLE SERVICES FROM ABOVE (A)		
TOTAL FEES PAYABLE FOR GROUP VISIT/SERVICES		
Less: deposit included with booking form (£1 per person)		()
BALANCE DUE 4 WEEKS PRIOR TO VISIT		
Cheques made payable to Making it! Enterprises Limited or alternatively telephone with Credit card details.		

SPECIAL NEEDS: Do any of your party members have special needs, such as Wheelchair, auditory or visual impairment? If so, please give a brief description and we Will contact you before your visit to discuss our facilities.

HOW DID YOU FIND OUT ABOUT MAKING IT! *(please circle)*
Mail Internet Word of mouth Previous visit Advertisement
(please state which article)

DOES YOUR GROUP INTEND TO VISIT OUR SHOP: YES/NO
 (prices from 50p) – **(IF NO PLEASE STATE REASON WHY FOR OUR RESEARCH)**

I enclose my deposit of £1 per paying visitor (if booked more than 4 weeks in Advance) or I enclose full payment (if booking less than 4 weeks in advance), As party leader, I have read and agree to the terms and conditions of booking Attached to this form.

SIGNED **(print name)**
DATE:

THE INFORMATION ON THIS BOOKING FORM IS VALID UNTIL 30TH SEPTEMBER 2012