

THE HOTDOT PRODUCTION LINE SIMULATION

In this activity, you will work together on a simulated production exercise as you might in manufacturing industry.

You will work in groups of 8-10.

GENERAL BRIEF

You are going to simulate the manufacture and selling of a paper tumble dryer.

You work for a company which makes Hotdot tumble dryers. Your team will have to pay for the raw material, equipment and other charges to manufacture the parts and then assemble and finish the models. Also included in your expenditure will be the workers' wages.

Having made a tumble dryer, it will have to be inspected. If accepted, it is passed on to the sales person. The sales person then sells it to the customer for a maximum of £30. At the end, the accountant will add everything up and see if you have made a profit.

Your team has the task of organising and running itself as a business.

To start, we suggest your team has the following types of worker:

- One supervisor.
- One accountant.
- Two assemblers.
- One cleaner and general worker.
- Two cutters.
- One folder.
- One inspector.
- One painter.
- One salesperson.

There is a separate brief for each of the above jobs.

SUPERVISOR

You are in charge of the team. You are free to organise the production in whatever way is best, and you may change the jobs of your workers. You cannot hire or fire anyone. We suggest you start with:

- One accountant.
- Two assemblers.
- One cleaner and general worker.
- Two cutters.
- One folder.
- One inspector.
- One painter.
- One salesperson.

You can seek the advice of the adult who is leading this simulation if you wish, but this may cost your team as a consultancy fee.

ACCOUNTANT

You must keep a record of all 'money' received and paid by your team, on the Accounting Sheet provided. Your team will receive income on the sale of completed models, up to £30 for each perfect model. Your payments will be:

Raw material <i>(i.e. dryer outlines)</i>	<i>£2 per model</i>
Equipment	
- Scissors	<i>£2 per pair</i>
- Glue sticks	<i>£2 per stick</i>
- Felt tips	<i>£1 per pen</i>
Wages	
- Per worker	<i>£1 per model</i>
Other charges	
- Heat, light, taxes, rates	<i>£4 per model</i>

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SALES PERSON

You take the models to the customer as they are produced and get the best possible price for them. A perfect model is worth £30.

Fill in the Sales Record as you go along, ensuring that you have completed the running total column, and tell your accountant the final cost you have agreed.

CUTTER

You cut around the outside edge of the outlines from the template, one sheet at a time.

PAINTER

You paint the dryers as follows:

Front top panel (do not include nameplate, switches and dial)	Brown
Front bottom panel	Brown
Door rim	Grey

CLEANER AND GENERAL WORKER

You must keep your place of work clean and tidy, and do any other jobs your supervisor may give you.

ASSEMBLER

You glue the tabs and make up the models.

FOLDER

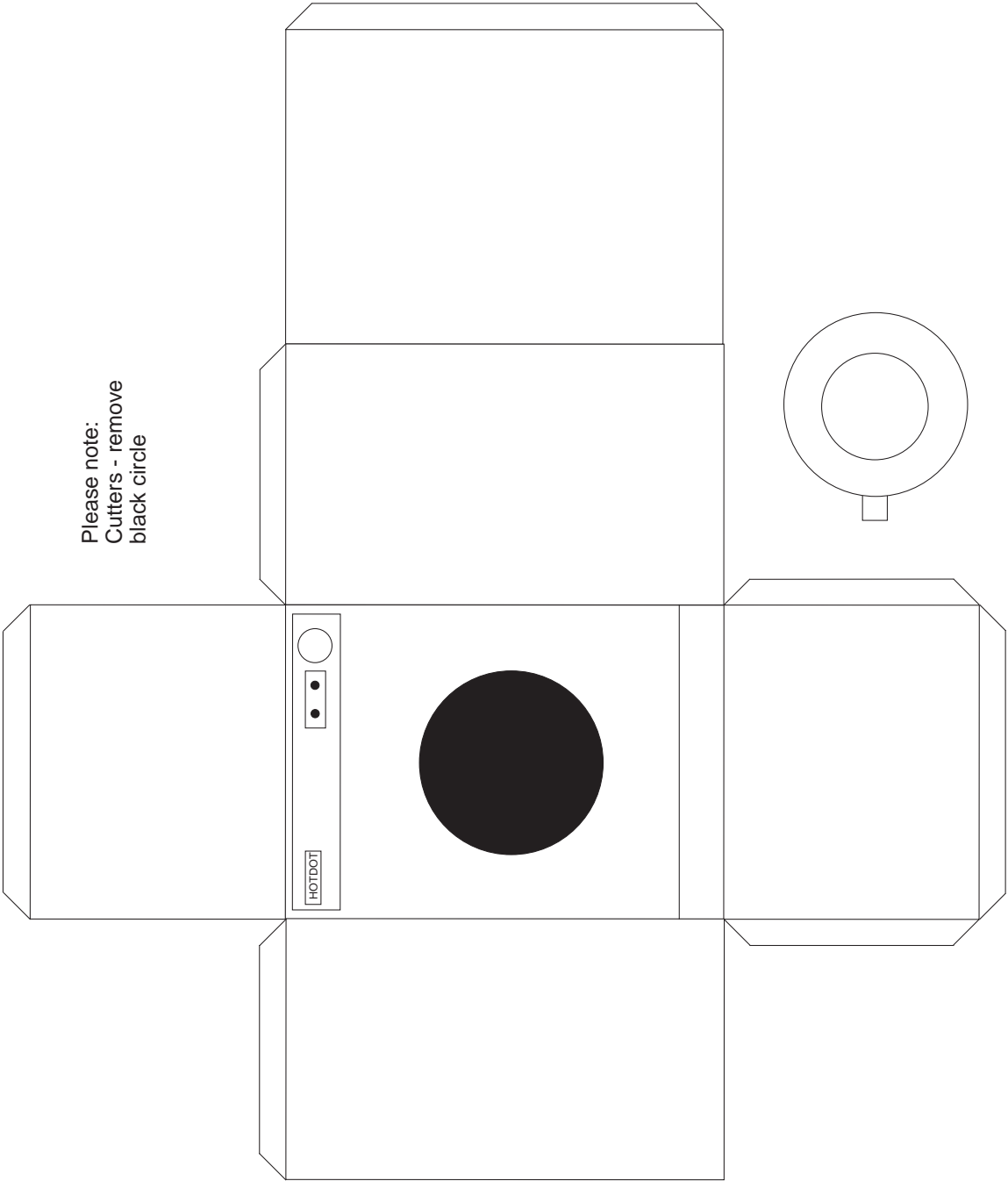
You make neat, straight folds down all the dotted lines.

INSPECTOR

You examine the finished models as they are produced. If you think they are satisfactory, pass them to your salesperson, making a note on your Inspection Record. If you think they are not satisfactory, pass them back to your supervisor so that the faults you have spotted can be put right.

Note any faults on your Inspection Record.

TEMPLATE FOR TUMBLE DRYER



Please note:
Cutters - remove
black circle

ACCOUNTING SHEET

GROUP	SESSION
<p>INCOME</p> <p>Total value of dryers sold</p>	<p>£ _____</p>
<p>PAYMENTS</p> <p>_____ Outlines @ £2 each</p> <p>_____ Scissors @ £2 each</p> <p>_____ Glue sticks @ £2 each</p> <p>_____ Felt tips @ £1 each</p>	<p>£ _____</p> <p>£ _____</p> <p>£ _____</p> <p>£ _____</p>
<p>WAGES</p> <p>_____ workers x _____ models sold x £1</p>	<p>£ _____</p>
<p>OVERHEADS AND TAXES</p> <p>_____ models sold x £4</p>	<p>£ _____</p>
<p>TOTAL PAYMENTS</p>	<p>£ _____</p>
<p>Total income minus total payments</p> <p>£ _____ - £ _____ =</p>	<p>= Profit</p> <p>£ _____</p>

LEADER'S OUTGOING MATERIALS CHECKLIST

GROUP A		GROUP B
	Raw material sheet	
	Pair of scissors	
	Glue sticks	
	Felt tips	

TECHNOLOGY STUDY FILE 9

SALES RECORD

Model Number	Amount Paid For	Running Total*
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

* Running total = Model 1 + Model 2 + Model 3 etc.

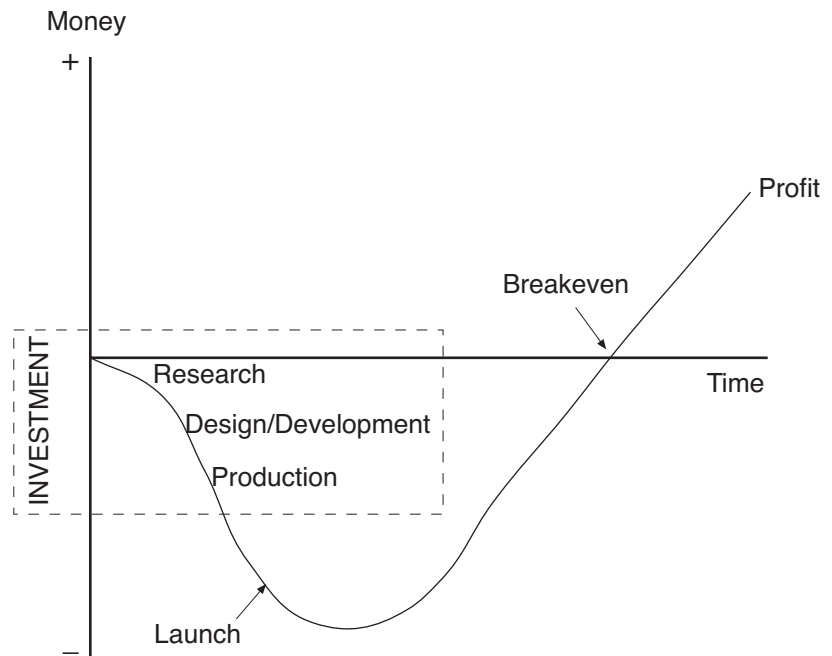
INSPECTION RECORD

Model Number	Pass	Fail	Fault if Failed
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

THE FULL COST OF PRODUCTS

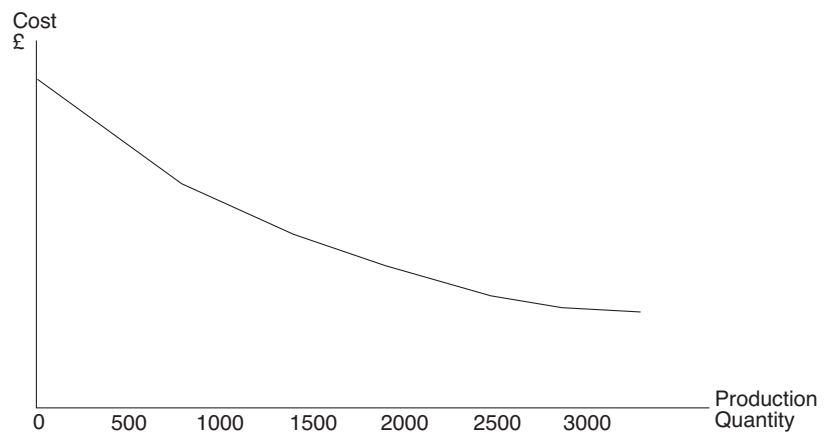
This graph shows where the money goes in developing and making a new product.

1. What does each of these terms mean?
2. Why is money needed for each?
3. Which of the three areas of investment costs most?
4. Why does the graph start going downwards?
5. Why does the graph eventually turn upwards?
6. What does 'breakeven' mean?
7. Some products never reach the breakeven point. Why not?



The second graph shows the relationship between cost and production quantity.

8. How might the selling price of an item vary according to how many are made and why might this be?
9. Why are profits important for future innovation?



MONEY FOR NEW ENGINES

This table shows some of the investment that was needed for the Rover K-series engine project.

Design and development	£28 million
Production <i>New machine tools</i> <i>New aluminium foundry</i> <i>New assembly line</i> <i>Investment with suppliers who make parts of the engine</i>	£100 million £ 30 million £ 30 million £ 40 million

1. What was Rover's total investment in the project?
2. Suppose Rover sold £200 million worth of engines a year and that 10% of this was profit.
 - How much profit would they make per year?
 - How many years would it be before they reached the breakeven point?
3. What effect do you think each of the following might have on the time it takes Rover to breakeven? Explain your answer in each case.
 - A competitor launches a similar engine at the same time.
 - There is a big rise in bank interest rates, just after the engine has been launched. This means that it costs more to borrow money.
 - There is a large rise in the world price of oil, just after the engine has been launched.
4. Rover continued to invest in the K-Series engine, even after it had been launched. Why?

SCALING UP PRODUCTION

If you wanted to make more than one of your product, there are a number of things to consider:

- How many could you sell?
- At what price?
- How much will it cost to make?
- Will you make it the same way as you did the 'one-off'?
- Will you use the same materials?
- Will you use the same equipment?
- Do you need a jig or a special tool?
- Will you work to the same tolerances?

CARRYING OUT MARKET RESEARCH

You need to talk to a number of people about your product. This includes potential customers and 'experts' who could help you.

Plan a strategy to get all of the information you need.

PRODUCTION PLANNING

- Make a list of all of the tasks that have to be done to make your product.
- Put them in the correct order.
- Identify the tasks that could be done at the same time.

Remember to include ordering and delivery times for components that are bought in.

- For each stage, think about:
 - the best way to do it;
 - the equipment and materials needed;
 - the time taken for the task.

Use this information to work out a **production plan** for your product.

USEFUL TOOLS

- Flow charts.
- Block diagrams.
- Critical path networks.