



Oxford Cambridge and RSA

Friday 14 June 2019 – Morning

A Level in Design and Technology: Fashion and Textiles

H405/02 Problem Solving in Fashion and Textiles

Resource Booklet

Time allowed: 1 hour 45 minutes



INSTRUCTIONS

- You must read this Resource Booklet through before answering any questions.
- The recommended reading time for this Resource Booklet is **35 minutes**.
- This Resource Booklet is to be used when answering all questions.
- The question paper tells you when to refer to the information contained in this Resource Booklet.

INFORMATION

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- This document consists of **8** pages.

The stimulus in this booklet relates to issues and opportunities encountered when engaging in physical activity.



The State of the Health Industry

The **2018 State of the UK Fitness Industry Report** reveals that the UK health and fitness industry is continuing to strengthen. It has more gyms, more members and a greater market value than ever before. There are over 7000 gyms in the UK for the first time, total membership is approaching 10 million and market value is just under £5 billion. This means that 1 in every 7 people in the UK is a member of a gym.

There are many benefits to engaging in physical activity. Not only does it improve energy levels but physical activity also helps to maintain overall health. The keep fit choices available are wide ranging and suit different lifestyles, tastes and incomes. Whether on the road, in the water, on a treadmill or on a yoga mat regular exercise is an increasing trend.

Most Popular Activities for Keeping Fit in the UK

1. Walking for fitness
2. Running/jogging
3. Treadmill
4. Yoga/pilates
5. Weight training
6. Cycling
7. Hiking
8. Swimming

It is generally recommended that adults should take part in 150+ minutes of activity per week. Many choose to do this through a blend of activities rather than selecting one. This helps to maintain interest and avoid boredom.

Running/Jogging

Whilst running is by no means a new phenomenon, it's a trend that is becoming more and more established as a standard lifestyle choice. This is probably because it is free, can be achieved in virtually any environment and location and is an excellent way to achieve cardiovascular fitness.

As with any aerobic activity, running becomes more comfortable when you have the correct clothing that keeps you properly ventilated, lightly insulated and dry. It is generally recommended to use a 'layering' system of clothing. This works well for keeping the runner warm and any layer can be removed as conditions change during a run.

Fig. 1 below shows an example of a running jacket that is used by runners/joggers.



Fig. 1

What Necessitates a Running Jacket?

As many enthusiastic runners will exercise despite weather conditions, one of the more expensive purchases will be the outer jacket. It is impractical to carry along multiple jackets to handle different situations when running. A well-balanced running jacket should fit the following criteria:

JACKET SPECIFICATION	
1.	Breathable
2.	Waterproof
3.	Windproof
4.	Ease of mobility
5.	Portable
6.	Visible

Within a leading sportswear manufacturing company, a design team has been commissioned to look at possible modifications to existing products that might better meet the needs of runners and also look to exploit any other potential gaps in the running/jogging market.

Fig. 2 shows a typical jacket purchased by runners. This particular style is unisex.



JACKET SPECIFICATION			
Style	Semi-fitted unisex	Fabric	100% ripstop nylon
Colour options	Three	Features	Fluorescent zip Back zip pocket Elasticated cuffs Unlined
Sizes	XS–XXL	Cost	£120

Fig. 2

Four Season Runners

The majority of runners tend to run in all four seasons and when running in more inclement conditions require something that offers protection against the elements.

One of the biggest enemies to the runners is wind. Apart from the extra energy required when running into the wind, wind takes heat and moisture away from the body which leads to it cooling. Although in some circumstances this can be beneficial, in others, the rate at which the body is cooled can be too dramatic leading to severe discomfort for the runner. During high aerobic activity in wind, the body needs to find a way of releasing heat and moisture at an acceptable rate.

Taking this and other weather factors into consideration is not only crucial when designing the jacket but is also a key factor when selecting fabrics. Today the majority of running jackets encompass a blend of fibres and use the latest fabric technology to ensure the finished product is fit for purpose.

Controlled tests are often carried out in industry to determine fabric suitability. One of these tests is to establish air permeability and therefore the windproof factor.

Fabric air permeability is a measure to what extent air passes through the fabric. The result depends on weight, thickness and porosity of fabric. Air permeability affects the comfort aspect of a garment in terms of air passage through the fabric. High air permeability per unit area of a fabric gives lower protection against winds, especially for outer-wear garments whereas low air permeability causes heavy body perspiration. In outdoor clothing, it is important that air permeability is as low as possible because the fabric should function as a wind protection.

Running Essentials

The design team conducts market research to establish the items the majority of runners will need to carry with them on an average run. The following were considered essential and are seen below in **Fig. 3**.

1. A form of ID – being able to identify the runner in case of emergency.
2. Wallet/purse/card – to be able to purchase a drink if required.
3. Keys.
4. Drink – to stay hydrated.
5. Mobile phone/portable media player – for contact and music.



Fig. 3

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Carrying Accessories for Running

According to experts, you should never carry anything in your hands while running. It may not seem a problem, but holding your phone, portable media player, keys or water bottle while running is a dangerous habit that can lead to poor running technique and higher risk of injury over time. It isn't always practical to keep these items in a pocket as they may not fit, they can move around causing discomfort or fall out resulting in loss or damage.

Solution for Hands Free Running

There are numerous existing products available to allow the runner to be 'hands free.' Some of these can be seen in **Fig. 4** below:

PRODUCTS	SPECIFICATION	REVIEWS
<p>© SPIBelt, www.spibelt.com. Item removed due to third party copyright restrictions. Link to material: https://spibelt.com/shop/spibelt/spibelt-flex/</p> <p>Running belt</p>	<ul style="list-style-type: none"> £15.99 Secure clip fastening Adjustable Washable Lightweight Expandable pocket 	<ul style="list-style-type: none"> Zipper pull snagged fabric on other clothing Smaller items moved around whilst running Earphone lead gets damaged by the zipper
<p>© Fuel Belt, www.fuelbelt.umplus.com. Item removed due to third party copyright restrictions. Link to material: https://fuelbelt.umplus.com/-/media/sites/fuelbelt/product-images/ergo-womens-belt-pink-pow-wow-1080x645---500066.ashx</p> <p>Hydrating belt</p>	<ul style="list-style-type: none"> £35.99 2 front water bottle pockets Adjustable strap Zip pocket on reverse 	<ul style="list-style-type: none"> Very bulky Velcro fastening not very secure Only one pocket for phone and other belongings
 <p>Hydrating vest</p>	<ul style="list-style-type: none"> £79.99 Lightweight 150g Angled pockets Drawstring pocket closure Adjustable sternum straps Vent mesh fabric 	<ul style="list-style-type: none"> Although lightweight some restriction whilst running Has to be worn under clothing if weather changes quickly and then drinks are difficult to reach
 <p>Shoe pouch</p>	<ul style="list-style-type: none"> Magnetic closure £10.99 Cordura fabric 	<ul style="list-style-type: none"> Can only carry a few small items Difficult to access whilst running Not very secure
<p>© The Running Buddy, sales@buddypouch.com. Item removed due to third party copyright restrictions. Link to material: https://cdn.shopify.com/s/files/1/0181/2933/products/Black-Buddy-Pouch_2_69ee360a-69c3-4298-b75a-68a1465dfbf7_2000x.png?v=1537209119</p> <p>Magnetic running pouch</p>	<ul style="list-style-type: none"> £24.99 Side zipper headphone port Water resistant 2 pockets Magnetic technology 	<ul style="list-style-type: none"> Expensive for a pouch Headphone cable damaged by zipper When full, magnetic function is not secure
 <p>Armband</p>	<ul style="list-style-type: none"> £14.99 Built in grip dots to prevent slippage Lightweight Machine washable Breathable fabric 	<ul style="list-style-type: none"> Slips when running Not easy to access phone Pocket too shallow

Fig. 4

Concept Jacket Design

Following an analysis of the market research findings, the design team has looked into how it can develop a design for a jacket that could incorporate key features to eliminate the need to purchase carrying accessories. The concept jacket design is shown in **Fig. 5** below.

The design team not only needs to consider storage issues but also ensure the jacket is suitable for changeable conditions.

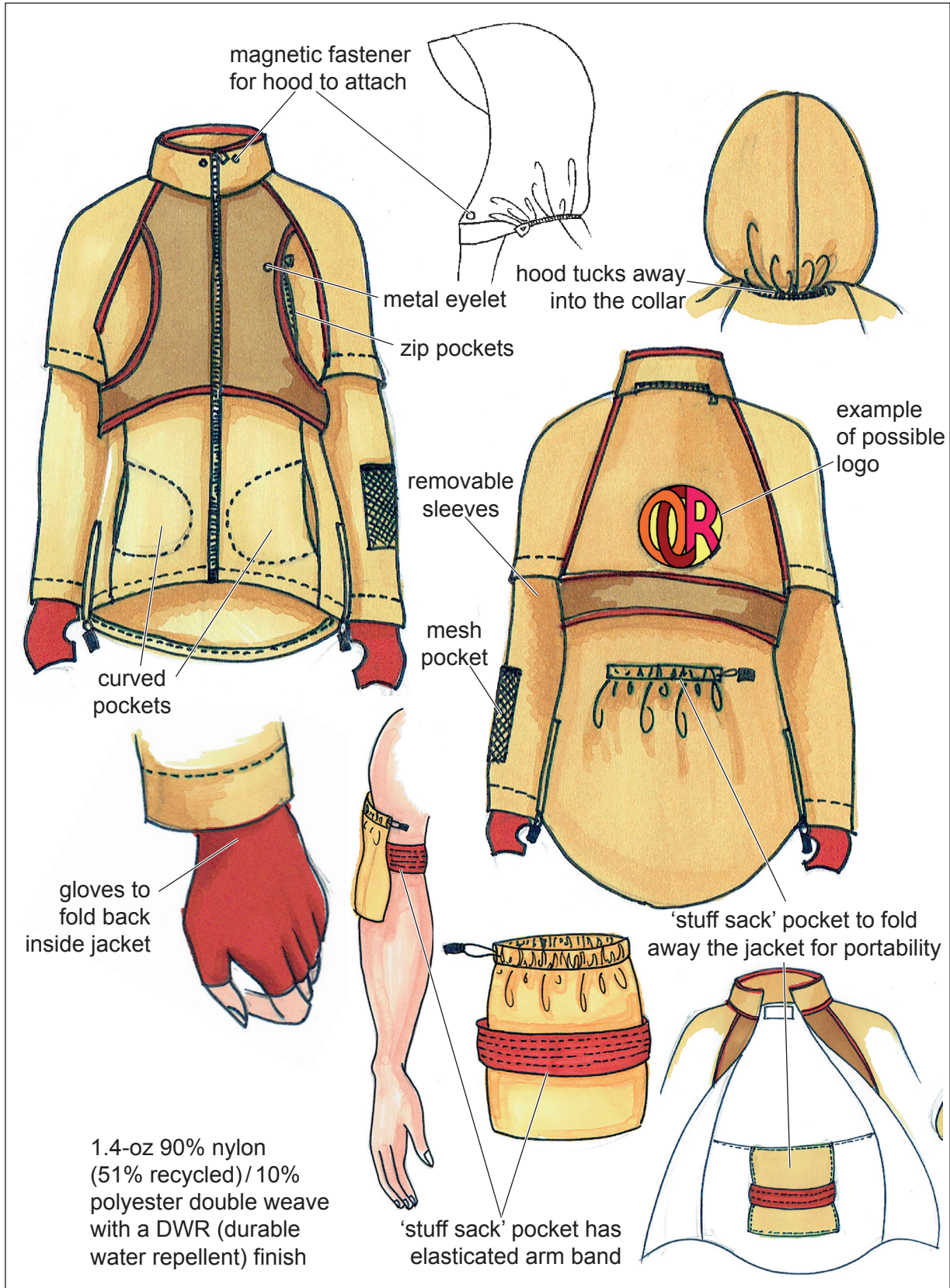


Fig. 5

Corporate Identity

The design team is considering various designs for a logo that could be incorporated into all sportswear clothing and accessories. Following the recent trend for embroidery, the design team has decided a logo should be embroidered onto the jacket design. **Fig. 6** shows three possible artwork ideas that are presented to the embroidery designers to establish feasibility and cost.

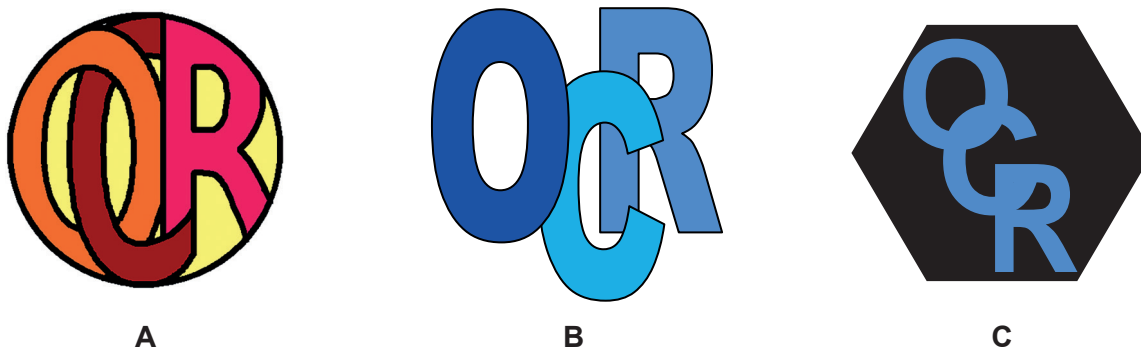


Fig. 6

Taking the Jacket to Market

The sportswear manufacturing company has taken the decision to put the jacket design into live production.

The sales forecasting team has been given predicted sales data over a five year period once the jacket has been launched into the retail market. This sales data is shown in **Fig. 7** below. If the sportswear manufacturer wants to remain competitive within the sportswear market it needs to avoid a plateau or even a decline in sales.

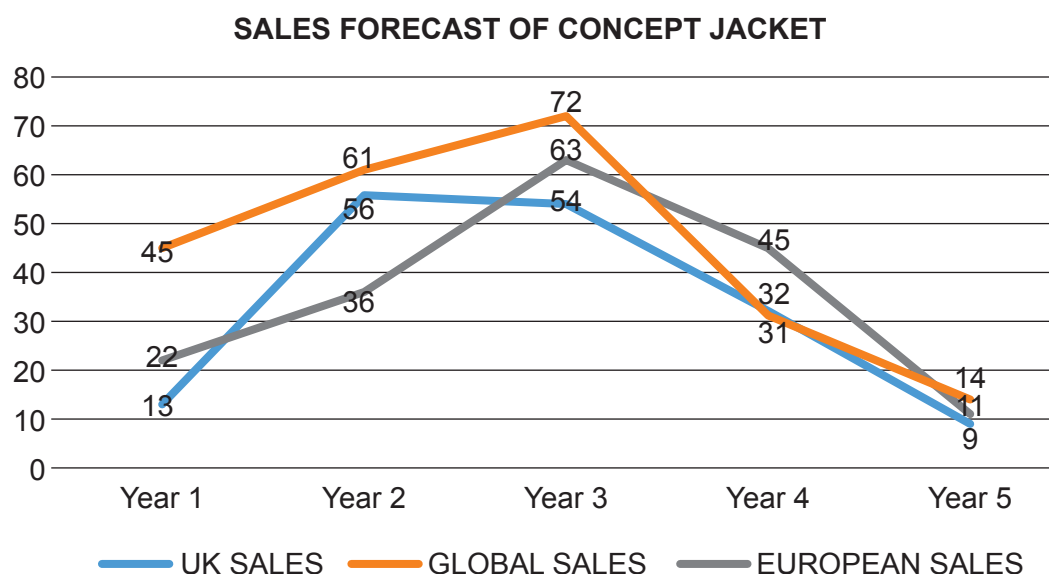


Fig. 7

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