CHAPTER 18

Inventories

18.1 Introduction

The main purpose of this chapter is to explain the accounting principles involved in the valuation of inventory and biological assets.

Objectives

After finishing this chapter, you should be able to:

- define inventory in accordance with IAS 2;
- explain why valuation has been controversial;
- describe acceptable valuation methods;
- describe procedure for ascertaining cost;
- calculate inventory value;
- explain how inventory could be used for creative accounting;
- explain IAS 41 provisions relating to agricultural activity;
- calculate biological value.

18.2 Inventory defined

IAS 2 *Inventories* defines inventories as assets:

(a) held for sale in the ordinary course of business;

(b) in the process of production for such sale;

(c) in the form of materials or supplies to be consumed in the production process or in the rendering of services.[1]

The valuation of inventory involves:

(a) the establishment of physical existence and ownership;

(b) the determination of unit costs;

(c) the calculation of provisions to reduce cost to net realisable value, if necessary.[2]

The resulting evaluation is then disclosed in the financial statements.

These definitions appear to be very precise. We shall see, however, that although IAS 2 was introduced to bring some uniformity into financial statements, there are many areas

where professional judgement must be exercised. Sometimes this may distort the financial statements to such an extent that we must question whether they do represent a 'true and fair' view.

18.3 The controversy

The valuation of inventory has been a controversial issue in accounting for many years. The inventory value is a crucial element not only in the computation of profit, but also in the valuation of assets for statement of financial position purposes.

Figure 18.1 presents information relating to Coats Viyella plc. It shows that the inventory is material in relation to total assets and pre-tax profits. In relation to the profits we can see that an error of 4% in the 2001 interim report inventory value would potentially cause the profits for the group to change from a pre-tax profit to a pre-tax loss. As inventory is usually a multiple rather than a fraction of profit, inventory errors may have a disproportionate effect on the accounts. Valuation of inventory is therefore crucial in determining earnings per share, net asset backing for shares and the current ratio. Consequently, the basis of valuation should be consistent, so as to avoid manipulation of profits between accounting periods, and comply with generally accepted accounting principles, so that profits are comparable between different companies.

Unfortunately, there are many examples of manipulation of inventory values in order to create a more favourable impression. By increasing the value of inventory at the year-end, profit and current assets are automatically increased (and vice versa). Of course, closing inventory of one year becomes opening inventory of the next, so profit is thereby reduced. But such manipulation provides opportunities for profit-smoothing and may be advantageous in certain circumstances, e.g. if the company is under threat of takeover.

Figure 18.2 illustrates the point. Simply by increasing the value of inventory in year 1 by £10,000, profit (and current assets) is increased by a similar amount. Even if the two values are identical in year 2, such manipulation allows profit to be 'smoothed' and £10,000 profit switched from year 2 to year 1.

According to normal accrual accounting principles, profit is determined by matching costs with related revenues. If it is unlikely that the revenue will in fact be received, prudence dictates that the irrecoverable amount should be written off immediately against current revenue.

It follows that inventory should be valued at cost less any irrecoverable amount. But what is cost? Entities have used a variety of methods of determining costs, and these are explored later in the chapter. There have been a number of disputes relating to the valuation of inventory which affected profits (e.g. the AEI/GEC merger of 1967).[3] Naturally, such circumstances tend to come to light with a change of management, but it was considered important that a definitive statement of accounting practice be issued in an attempt to standardise treatment.

Figure 18.1 Coats Viyella plc

	2000	*2001 (Half year)*
Pre-tax profits (losses) (£m)	(29.9)	9.9
Inventory(£m)	304.2	320.2
Total assets (£m)	1,321.8	1,310.4

Figure 18.2 Inventory values manipulated to smooth income

		Year 1		*Year 1*
				With inventory inflated
Sales		100,000		100,000
Opening inventory	—		—	
Purchases	65,000		65,000	
Less: Closing inventory	5,000		15,000	
COST OF SALES		60,000		50,000
PROFIT		40,000		50,000
		Year 2		*Year 2*
				With inventory inflated
Sales		150,000		150,000
Opening inventory	5,000		15,000	
Purchases	100,000		100,000	
	105,000		115,000	
Less: Closing inventory	15,000		15,000	
COST OF SALES		90,000		100,000
PROFIT		60,000		50,000

18.4 IAS 2 *Inventories*

No area of accounting has produced wider differences in practice than the computation of the amount at which inventory is stated in financial accounts. An accounting standard on the subject needs to define the practices, to narrow the differences and variations in those practices and to ensure adequate disclosure in the accounts.

IAS 2 requires that the amount at which inventory is stated in periodic financial statements should be the total of the lower of cost and net realisable value of the separate items of inventory or of groups of similar items. The standard also emphasises the need to match costs against revenue, and it aims, like other standards, to achieve greater uniformity in the measurement of income as well as improving the disclosure of inventory valuation methods. To an extent, IAS 2 relies on management to choose the most appropriate method of inventory valuation for the production processes used and the company's environment. Various methods of valuation are theoretically available, including FIFO, LIFO and weighted average or any similar method (see below). In selecting the most suitable method, management must exercise judgement to ensure that the methods chosen provide the fairest practical approximation to cost. IAS 2 does not allow the use of LIFO because it often results in inventory being stated in the statement of financial position at amounts that bear little relation to recent cost levels.

At the end of the day, even though there is an International Accounting Standard in existence, the valuation of inventory can provide areas of subjectivity and choice to management. We will return to this theme many times in the following sections of this chapter.

18.5 Inventory valuation

The valuation rule outlined in IAS 2 is difficult to apply because of uncertainties about what is meant by cost (with some methods approved by IAS 2 and others not) and what is meant by net realisable value.

18.5.1 Methods acceptable under IAS 2

The acceptable methods of inventory valuation include FIFO, AVCO and standard cost.

First-in-first-out (FIFO)

Inventory is valued at the most recent 'cost', since the cost of oldest inventory is charged out first, whether or not this accords with the actual physical flow. FIFO is illustrated in Figure 18.3.

Average cost (AVCO)

Inventory is valued at a 'weighted average cost', i.e. the unit cost is weighted by the number of items carried at each 'cost', as shown in Figure 18.4. This is popular in organisations holding a large volume of inventory at fluctuating 'costs'. The practical problem of actually recording and calculating the weighted average cost has been overcome by the use of sophisticated computer software.

Figure 18.3 First-in-first-out method (FIFO)

	Receipts			*Issues*			*Balance*		
Date	*Quantity*	*Rate*	*£*	*Quantity*	*Rate*	*£*	*Quantity*	*Rate*	*£*
January	10	15	150				10		150
February				8	15	120	2		30
March	10	17	170				12		200
April	20	20	400				32		600
May				2	15	30			
				10	17	170			
				12	20	240			
				Cost of goods sold		560			
				Inventory			8	20	160

Figure 18.4 Average cost method (AVCO)

	Receipts			*Issues*			*Balance*		
Date	*Quantity*	*Rate*	*£*	*Quantity*	*Rate*	*£*	*Quantity*	*Rate*	*£*
January	10	15	150				10		150
February				8	15	120	2		30
March	10	17	170				12		200
April	20	20	400				32		600
May				24	18.75	450			600
				Cost of goods sold		570			
				Inventory			8	18.75	150

The following is an extract from the J Sainsbury plc 2008 Annual Report:

Inventories
Inventories are valued at the lower of cost and net realizable value. Inventories at warehouses are valued on a first-in, first-out basis. Those at retail outlets are valued at calculated average cost prices. Cost includes all direct expenditure and other appropriate attributable costs incurred in bringing inventories to their present location and condition.

Standard cost

In many cases this is the only way to value manufactured goods in a high-volume/high-turnover environment. However, the standard is acceptable only if it approximates to actual cost. This means that variances need to be reviewed to see if they affect the standard cost and for inventory evaluation.

Retail method

IAS 2 recognises that an acceptable method of arriving at cost is the use of selling price, less an estimated profit margin. This method is only acceptable if it can be demonstrated that the method gives a reasonable approximation of the actual cost.

IAS 2 does not recommend any specific method. This is a decision for each organisation based upon sound professional advice and the organisation's unique operating conditions.

18.5.2 Methods rejected by IAS 2

Methods rejected by IAS 2 include LIFO and (by implication) replacement cost.

Last-in-first-out (LIFO)

The cost of the inventory most recently received is charged out first at the most recent 'cost'. The practical upshot is that the inventory value is based upon an 'old cost', which may bear little relationship to the current 'cost'. LIFO is illustrated in Figure 18.5.

Figure 18.5 Last-in-first-out method (LIFO)

	Receipts			*Issues*			*Balance*		
Date	*Quantity*	*Rate*	*£*	*Quantity*	*Rate*	*£*	*Quantity*	*Rate*	*£*
January	10	15	150				10		150
February				8	15	120	2		30
March	10	17	170				12		200
April	20	20	400				32		600
May				20	20	400			
				4	17	68			
				Cost of goods sold		588			
				Inventory			8		132

May closing balance = [(2 × 15) + (6 × 17)]

US companies commonly use the LIFO method as illustrated by this extract from the Wal-Mart Stores Inc 2008 Annual Report:

> **Inventories**
> The Company values inventories at the lower of cost or market as determined primarily by the retail method of accounting, using the last-in, first-out ('LIFO') method for substantially all of the Wal-Mart Stores segment's merchandise inventories. Sam's Club merchandise and merchandise in our distribution warehouses are valued based on the weighted average cost using the LIFO method. Inventories of foreign operations are primarily valued by the retail method of accounting, using the first-in, first-out ('FIFO') method. At January 31, 2008 and 2007, our inventories valued at LIFO approximate those inventories as if they were valued at FIFO.

If the LIFO method were to give a result significantly different from that reported using FIFO, then the effect would have to be quantified as in the Wal-Mart 2001 Annual Report:

	2001	*2000*
	$m	$m
Inventories at replacement cost	21,644	20,171
Less LIFO reserve	202	378
Inventories at LIFO cost	21,442	19,793

The company's summary of significant accounting policies stated that the company used the retail LIFO method. The LIFO reserve shows the cumulative, pre-tax effect on income between the results obtained using LIFO and the results obtained using a more current cost inventory valuation method (e.g. FIFO) – this gave an indication of how much higher profits would have been if FIFO were used.

Replacement cost

The inventory is valued at the current cost of the individual item (i.e. the cost to the organisation of replacing the item) rather than the actual cost at the time of manufacture or purchase. This is an attractive idea since the 'value' of inventory could be seen as the cost at which a similar item could be currently acquired. The problem again is in arriving at a 'reliable' profit figure for the purposes of performance evaluation. Wild fluctuation of profit could occur simply because of such factors as the time of the year, the vagaries of the world weather system or the manipulation of market forces. Let us take three examples, involving coffee, oil and silver.

Coffee. Wholesale prices collapsed over three years (1999–2002) from nearly $2.40 per pound to just under 50 cents. This was the lowest level in thirty years and, allowing for the effects of inflation, coffee became uneconomic to sell and farmers resorted to burning their crop for fuel. The implication for financial reporting was that the objective was to increase the inventory unit cost by 100% by forcing the price back above $1 per pound. What value should be attached to the coffee inventory? 50 cents or the replacement cost of $1 which would create a profit equal to the existing inventory value?

Oil. When the Gulf Crisis of 1990 began, the cost of oil moved from around $13 per barrel to a high of around $29 per barrel in a short time. If oil companies had used replacement cost, this would have created huge fictitious profits. This might have resulted in higher tax payments and shareholders demanding dividends from a profit that existed only on paper. When the Gulf Crisis settled down to a quiet period (before the 1991 military action), the market price of oil dropped almost as dramatically as it had risen. This might have led to fictitious losses for companies in the following financial year with an ensuing loss of business confidence.

This scenario was not unique to the Gulf Crisis and we see the same situation arising with fluctuations in the price of Arab Light which moved from $8.74 per barrel on 31 December 1998 to $24.55 per barrel on 31 December 1999 and down to $17.10 on 31 December 2001 (www.eia.doe.gov). A similar surge occurred in 2008 with prices varying from $40 to $140.

Silver. In the early 1980s a Texan millionaire named Bunker Hunt attempted to make a 'killing' on the silver market by buying silver to force up the price and then selling at the high price to make a substantial profit. This led to remarkable scenes in the UK, with long lines of people outside jewellers wanting to sell items at much higher prices than their 'real' cost. Companies using silver as a raw material (e.g. jewellers, mirror manufacturers, and electronics companies, which use silver as a conductive element) would have been badly affected had they used replacement cost in a similar way to the preceding two cases. The 'price' of silver in effect doubled in a short time, but the Federal Authorities in the USA stepped in and the plan was defeated.

The use of replacement cost is not specifically prohibited by IAS 2 but is out of line with the basic principle underpinning the standard, which is to value inventory at the actual costs incurred in its purchase or production. The IASC *Framework for the Preparation and Presentation of Financial Statements* describes historical cost and current cost as two distinct measurement bases and where a historical cost measurement base is used for assets and liabilities the use of replacement cost is inconsistent.

Although LIFO does not have IAS 2 approval, it is still used in practice. For example, LIFO is commonly used by UK companies with US subsidiaries, since LIFO is the main method of inventory valuation in the USA.

18.5.3 Procedure to ascertain cost

Having decided upon the accounting policy of the company, there remains the problem of ascertaining the cost. In a retail environment, the 'cost' is the price the organisation had to pay to acquire the goods, and it is readily established by reference to the purchase invoice from the supplier. However, in a manufacturing organisation the concept of cost is not as simple. Should we use prime cost, or production cost, or total cost? IAS 2 attempts to help by defining cost as 'all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition'.

In a manufacturing organisation each expenditure is taken to include three constituents: direct materials, direct labour and appropriate overhead.

Direct materials

These include not only the costs of raw materials and component parts, but also the costs of insurance, handling (special packaging) and any import duties. An additional problem is waste and scrap. For instance, if a process inputs 100 tonnes at £45 per tonne, yet outputs only 90 tonnes, the output's inventory value **must** be £4,500 (£45 × 100) and not £4,050 (90 × £45). (This assumes the 10 tonnes loss is a normal, regular part of the process.) An adjustment may be made for the residual value of the scrap/waste material, if any. The treatment of component parts will be the same, provided they form part of the finished product.

Direct labour

This is the cost of the actual production in the form of gross pay and those incidental costs of employing the direct workers (employer's national insurance contributions, additional pension contributions, etc.). The labour costs will be spread over the goods' production.

Appropriate overhead

It is here that the major difficulties arise in calculating the true cost of the product for inventory valuation purposes. Normal practice is to classify overheads into five types and decide whether to include them in inventory. The five types are as follows:

- Direct overheads – subcontract work, royalties.
- Indirect overheads – the cost of running the factory and supporting the direct workers, and the depreciation of capital items used in production.
- Administration overheads – the office costs and salaries of senior management.
- Selling and distribution overheads – advertising, delivery costs, packaging, salaries of sales personnel, and depreciation of capital items used in the sales function.
- Finance overheads – the cost of borrowing and servicing debt.

We will look at each of these in turn, to demonstrate the difficulties that the accountant experiences.

Direct overheads. These should normally be included as part of 'cost'. But imagine a situation where some subcontract work has been carried out on *some* of a company's products because of a capacity problem (i.e. the factory could normally do the work, but due to a short-term problem some of the work has been subcontracted at a higher price/cost). In theory, those items subject to the subcontract work should have a higher inventory value than 'normal' items. However, in practice, the difficulty of identifying such 'subcontracted' items is so great that many companies do not include such non-routine subcontract work in the inventory value as a direct overhead. For example, if a factory produces 1,000,000 drills per month and 1,000 of them have to be sent out because of a machine breakdown, since all the drills are identical it would be very costly and time-consuming to treat the 1,000 drills differently from the other 999,000. Hence the subcontract work would *not* form part of the overhead for inventory valuation purposes (in such an organisation, the standard cost approach would be used when valuing inventory). On the other hand, in a customised car firm producing twenty vehicles per month, special subcontract work would form part of the inventory value because it is readily identifiable to individual units of inventory.

To summarise, any regular, routine direct overhead will be included in the inventory valuation, but a non-routine cost could present difficulties, especially in a high-volume/high-turnover organisation.

Indirect overheads. These always form part of the inventory valuation, as such expenses are incurred in support of production. They include factory rent and rates, factory power and depreciation of plant and machinery; in fact, any indirect factory-related cost, including the warehouse costs of storing completed goods, will be included in the value of inventory.

Administration overheads. This overhead is in respect of the whole business, so only that portion easily identifiable to production should form part of the inventory valuation. For instance, the costs of the personnel or wages department could be apportioned to production on a head-count basis and that element would be included in the inventory valuation. Any production-specific administration costs (welfare costs, canteen costs, etc.) would also be included in the inventory valuation. If the expense cannot be identified as forming part of the production function, it will not form part of the inventory valuation.

Selling and distribution overheads. These costs will not normally be included in the inventory valuation as they are incurred after production has taken place. However, if the goods are on a 'sale or return' basis and are on the premises of the customer but remain

the supplier's property, the delivery and packing costs will be included in the inventory value of goods held on a customer's premises.

An additional difficulty concerns the modern inventory technique of 'just-in-time' (JIT). Here, the customer does not keep large inventories, but simply 'calls off' inventory from the supplier and is invoiced for the items delivered. There is an argument for the inventory still in the hands of the supplier to bear more of this overhead within its valuation, since the only selling and distribution overhead to be charged/incurred is delivery. The goods have in fact been sold, but ownership has not yet changed hands. As JIT becomes more popular, this problem may give accountants and auditors much scope for debate.

Finance overheads. Normally these overheads would never be included within the inventory valuation because they are not normally identifiable with production. In a job-costing context, however, it might be possible to use some of this overhead in inventory valuation. Let us take the case of an engineering firm being requested to produce a turbine engine, which requires parts/components to be imported. It is logical for the financial charges for these imports (e.g. exchange fees or fees for letters of credit) to be included in the inventory valuation.

Thus it can be seen that the identification of the overheads to be included in inventory valuation is far from straightforward. In many cases it depends upon the judgement of the accountant and the unique operating conditions of the organisation.

In addition to the problem of deciding **whether** the five types of overhead should be included, there is the problem of deciding **how much** of the total overhead to include in the inventory valuation at the year-end. IAS 2 stipulates the use of 'normal activity' when making this decision on overheads. The vast majority of overheads are 'fixed', i.e. do not vary with activity, and it is customary to share these out over a normal or expected output.

The following is an extract from the Agrana Group 2007/8 Annual Report:

> **Inventories**
> Inventories are measured at the lower of cost of purchase and/or conversion and net selling price. The weighted average formula is used. In accordance with IAS 2, the conversion costs of unfinished and finished products include – in addition to directly attributable unit costs – reasonable proportions of the necessary material costs and production overheads inclusive of depreciation of manufacturing plant (based on the assumption of normal capacity utlisation) as well as production-related administrative costs. Financing costs are not taken into account. To the extent that inventories are at risk because of prolonged storage or reduced saleability, a write-down is recognised.

If this expected output is not reached, it is not acceptable to allow the actual production to bear the full overhead for inventory purposes. A numerical example will illustrate this:

Overhead for the year	£200,000	
Planned activity	10,000	units
Closing inventory	3,000	units
Direct costs	£2	per unit
Actual activity	6,000	units

Inventory value based on actual activity		
Direct costs	3,000 × £2	£6,000
Overhead	$\frac{3{,}000 \times £200{,}000}{6{,}000}$	£100,000
Closing inventory value		£106,000

Inventory value based on planned or normal activity		
Direct cost	3,000 × £2	£6,000
Overhead	3,000 × £200,000 / 10,000	£60,000
Closing inventory value		£66,000

Comparing the value of inventory based upon actual activity with the value based upon planned or normal activity, we have a £40,000 difference. This could be regarded as increasing the current year's profit by carrying forward expenditure of £40,000 to set against the following year's profit.

The problem occurs because of the organisation's failure to meet expected output level (6,000 actual versus 10,000 planned). By adopting the **actual activity basis**, the organisation makes a profit out of failure. This cannot be an acceptable position when evaluating performance. Therefore, IAS 2 stipulates **the planned or normal activity model** for inventory valuation. The failure to meet planned output could be due to a variety of sources (e.g. strikes, poor weather, industrial conditions); the cause, however, is classed as abnormal or non-routine, and all such costs should be excluded from the valuation of inventory.

18.5.4 What is meant by net realisable value?

We have attempted to identify the problems of arriving at the true meaning of cost for the purpose of inventory valuation. Net realisable value is an alternative method of inventory valuation if 'cost' does not reflect the true value of the inventory. Prudence dictates that net realisable value will be used if it is lower than the 'cost' of the inventory (however that may be calculated). These occasions will vary among organisations, but can be summarised as follows:

- There is a permanent fall in the market price of inventory. Short-term fluctuations should not cause net realisable value to be implemented.
- The organisation is attempting to dispose of high inventory levels or excessively priced inventory to improve its liquidity position (quick ratio/acid test ratio) or reduce its inventory holding costs. Such high inventory volumes or values are primarily a result of poor management decision making.
- The inventory is physically deteriorating or is of an age where the market is reluctant to accept it. This is a common feature of the food industry, especially with the use of 'sell by' dates in the retail environment.
- Inventory suffers obsolescence through some unplanned development. (Good management should never be surprised by obsolescence.) This development could be technical in nature, or due to the development of different marketing concepts within the organisation or a change in market needs.
- The management could decide to sell the goods at 'below cost' for sound marketing reasons. The concept of a 'loss leader' is well known in supermarkets, but organisations also sell below cost when trying to penetrate a new market or as a defence mechanism when attacked.

Such decisions are important and the change to net realisable value should not be undertaken without considerable forethought and planning. Obsolescence should be a decision based upon sound market intelligence and not a managerial 'whim'. The auditors of companies always examine such decisions to ensure they were made for sound business reasons. The opportunities for fraud in such 'price-cutting' operations validate this level of external control.

Realisable value is, of course, the price the organisation receives for its inventory from the market. However, getting this inventory to market may involve additional expense and effort in repackaging, advertising, delivery and even repairing of damaged inventory. This additional cost must be deducted from the realisable value to arrive at the net realisable value.

A numerical example will demonstrate this concept:

Item	*Cost* (£)	*Net realisable value* (£)	*Inventory value* (£)
1 No. 876	7,000	9,000	7,000
2 No. 997	12,000	12,500	12,000
3 No. 1822	8,000	4,000	4,000
4 No. 2076	14,000	8,000	8,000
5 No. 4732	27,000	33,000	27,000
	(a) 68,000	(b) 66,500	(c) 58,000

The inventory value chosen for the accounts is (c) £58,000, although each item is assessed individually.

18.6 Work-in-progress

Inventory classified as work-in-progress (WIP) is mainly found in manufacturing organisations and is simply the production that has not been completed by the end of the accounting period.

The valuation of WIP must follow the same IAS 2 rules and be the lower of cost or net realisable value. We again face the difficulty of deciding what to include in cost. The three basic classes of cost – direct materials, direct labour and appropriate overhead – will still form the basis of ascertaining cost.

18.6.1 Direct materials

It is necessary to decide what proportion of the total materials have been used in WIP. The proportion will vary with different types of organisation, as the following two examples illustrate:

- If the item is complex or materially significant (e.g. a custom-made car or a piece of specialised machinery), the WIP calculation will be based on actual recorded materials and components used to date.
- If, however, we are dealing with mass production, it may not be possible to identify each individual item within WIP. In such cases, the accountant will make a judgement and define the WIP as being x% complete in regard to raw materials and components. For example, a drill manufacturer with 1 million tools per week in WIP may decide that in respect of raw materials they are 100% complete; WIP then gets the full materials cost of one million tools.

In both cases **consistency** is vital so that, however WIP is valued, the same method will always be used.

18.6.2 Direct labour

Again, it is necessary to decide how much direct labour the items in WIP have actually used. As with direct materials, there are two broad approaches:

- Where the item of WIP is complex or materially significant, the actual time 'booked' or recorded will form part of the WIP valuation.
- In a mass production situation, such precision may not be possible and an accounting judgement may have to be made as to the average percentage completion in respect of direct labour. In the example of the drill manufacturer, it could be that, on average, WIP is 80% complete in respect of direct labour.

18.6.3 Appropriate overhead

The same two approaches as for direct labour can be adopted:

- With a complex or materially significant item, it should be possible to allocate the overhead actually incurred. This could be an actual charge (e.g. subcontract work) or an application of the appropriate overhead recovery rate (ORR). For example, if we use a direct labour hour recovery rate and we have an ORR of £10 per direct labour hour and the recorded labour time on the WIP item is twelve hours, then the overhead charge for WIP purposes is £120.

EXAMPLE ● A custom-car company making sports cars has the following costs in respect of No. 821/C, an unfinished car, at the end of the month:

Materials charged to job 821/C	£2,100
Labour 120 hours @ £4	£480
Overhead £22/DLH × 120 hours	£2,640
WIP value of 821/C	£5,220

This is an accurate WIP value provided *all* the costs have been accurately recorded and charged. The amount of accounting work involved is not great as the information is required by a normal job cost system. An added advantage is that the figure can be formally audited and proven.

- With mass production items, the accountant must either use a budgeted overhead recovery rate approach or simply decide that, in respect of overheads, WIP is *y*% complete.

  For example, the following is an extract from the Palfinger AG 2006 Annual Report:

  > **Inventories**
  > Materials and production supplies are valued at floating average cost, or at a standard cost in the case of materials supplied by Group companies. Besides direct materials and production costs, goods from in-house production also contain appropriate shares of materials and production overheads. Valuation is at budgeted production costs.

EXAMPLE ● A company produces drills. The costs of a completed drill are:

	£	
Direct materials	2.00	
Direct labour	6.00	
Appropriate overhead	10.00	
Total cost	18.00	(for finished goods inventory value purposes)

The company accountant takes the view that for WIP purposes the following applies:

Direct material	100% complete
Direct labour	80% complete
Appropriate overhead	30% complete

Therefore, for one WIP drill:

Direct material	£2.00 × 100% = £2.00
Direct labour	£6.00 × 80% = £4.80
Appropriate overhead	£10.00 × 30% = £3.00
WIP value	£9.80

If the company has 100,000 drills in WIP, the value is:

100,000 × £9.80 = £980,000

This is a very simplistic view, but the principle can be adapted to cover more complex issues. For instance, there could be 200 different types of drill, but the same calculation can be done on each. Of course, sophisticated software makes the accountant's job mechanically easier.

This technique is particularly useful in processing industries, such as petroleum, brewing, dairy products or paint manufacture, where it might be impossible to identify WIP items precisely. The approach must be consistent and the role of the auditor in validating such practices is paramount.

18.7 Inventory control

The way in which inventory is physically controlled should not be overlooked. Discrepancies are generally of two types: disappearance through theft and improper accounting.[4] Management will, of course, be responsible for adequate systems of internal control, but losses may still occur through theft or lack of proper controls and recording. Inadequate systems of accounting may also cause discrepancies between the physical and book inventories, with consequent correcting adjustments at the year-end.

Many companies are developing in-house computer systems or using bought-in packages to account for their inventories. Such systems are generally adequate for normal recording purposes, but they are still vulnerable to year-end discrepancies arising from errors in establishing the physical inventory on hand at the year-end, and problems connected with the paperwork and the physical movement of inventories.

A major cause of discrepancy between physical and book inventory is the 'cut-off' date. In matching sales with cost of sales, it may be difficult to identify exactly into which period of account certain inventory movements should be placed, especially when the annual inventory count lasts many days or occurs at a date other than the last day of the financial year. It is customary to make an adjustment to the inventory figure, as shown in Figure 18.6. This depends on an accurate record of movements between the inventory count date and the financial year-end.

Auditors have a special responsibility in relation to inventory control. They should look carefully at the inventory counting procedures and satisfy themselves that the accounting

Figure 18.6 Adjusted inventory figure

	£
Inventory on 7 January 20X1	XXX
Less: Purchases	(XXX)
Add: Sales	XXX
Inventory at 31 December 20X0	XXX

arrangements are satisfactory. For example, in September 1987 Harris Queensway announced an inventory reduction of some £15 million in projected profit caused by write-downs in its furniture division. It blamed this on the inadequacy of control systems to 'identify ranges that were selling and ensure their replacement'. Interestingly, at the preceding AGM, no hint of the overvaluation was given and the auditors insisted that 'the company had no problem from the accounting point of view'.[5]

In many cases the auditor will be present at the inventory count. Even with this apparent safeguard, however, it is widely accepted that sometimes an accurate physical inventory take is almost impossible. The value of inventory should nevertheless be based on the best information available; and the resulting disclosed figure should be acceptable and provide a true and fair view on a going concern basis.

In practice, errors may continue unidentified for a number of years,[6] particularly if there is a paper-based system in operation. This was evident when T.J. Hughes reduced its profit for the year ended January 2001 by £2.5–3 million from a forecast £8 million.

18.8 Creative accounting

No area of accounting provides more opportunities for subjectivity and creative accounting than the valuation of inventory. This is illustrated by the report *Fraudulent Financial Reporting: 1987–1997 – An Analysis of U.S. Public Companies* prepared by the Committee of Sponsoring Organizations of the Treadway Commission.[7] This report, which was based on the detailed analysis of approximately 200 cases of fraudulent financial reporting, identified that the fraud often involved the overstatement of revenues and assets with inventory fraud featuring frequently – assets were overstated by understating allowances for receivables, overstating the value of inventory and other tangible assets, and recording assets that did not exist.

This section summarises some of the major methods employed.

18.8.1 Year-end manipulations

There are a number of stratagems companies have followed to reduce the cost of goods sold by inflating the inventory figure. These include:

Manipulating cut-off procedures

Goods are taken into inventory but the purchase invoices are not recorded.

The authors of *Fraudulent Financial Reporting: 1987–1997 – An Analysis of U.S. Public Companies* found that over half the frauds involved overstating revenues by recording revenues prematurely or fictitiously and that such overstatement tended to occur right at the end of the year – hence the need for adequate cut-off procedures. This was illustrated by Ahold's experience in the USA where subsidiary companies took credit for bulk discounts allowed by suppliers before inventory was actually received.

Fictitious transfers

Year-end inventory is inflated by recording fictitious transfers of non-existent inventory, e.g. it was alleged by the SEC that certain officers of the Miniscribe Corporation had increased the company's inventory by recording fictitious transfers of nonexistent inventory from a Colorado location to overseas locations where physical inventory counting would be more difficult for the auditors to verify or the goods are described as being 'in transit'.[8]

Inaccurate inventory records

Where inventory records are poorly maintained it has been possible for senior management to fail to record material shrinkage due to loss and theft as in the matter of Rite Aid Corporation.[9]

Journal adjustments

In addition to suppressing purchase invoices, making fictitious transfers, failing to write off obsolete inventory or recognise inventory losses, the senior management may simply reduce the cost of goods sold by adjusting journal entries, e.g. when preparing quarterly reports by crediting cost of goods and debiting accounts payable.

18.8.2 Net realisable value (NRV)

Although the determination of net realisable value is dealt with extensively in the appendix to IAS 2, the extent to which provisions can be made to reduce cost to NRV is highly subjective and open to manipulation. A provision is an effective smoothing device and allows overcautious write-downs to be made in profitable years and consequent write-backs in unprofitable ones.

18.8.3 Overheads

The treatment of overheads has been dealt with extensively above and is probably the area that gives the greatest scope for manipulation. Including overhead in the inventory valuation has the effect of deferring the overhead's impact and so boosting profits. IAS 2 allows expenses incidental to the acquisition or production cost of an asset to be included in its cost. We have seen that this includes not only directly attributable production overheads, but also those which are indirectly attributable to production and interest on borrowed capital. IAS 2 provides guidelines on the classification of overheads to achieve an appropriate allocation, but in practice it is difficult to make these distinctions and auditors will find it difficult to challenge management on such matters.

The statement suggests that the allocation of overheads included in the valuation needs to be based on the company's normal level of activity. The cost of unused capacity should be written off in the current year. The auditor will insist that allocation should be based on normal activity levels, but if the company underproduces, the overhead per unit increases and can therefore lead to higher year-end values. The creative accountant will be looking for ways to manipulate these year-end values, so that in bad times costs are carried forward to more profitable accounting periods.

18.8.4 Other methods of creative accounting

Over- or understate quantities

A simple manipulation is to show more or less inventory than actually exists. If the commodity is messy and indistinguishable, the auditor may not have either the expertise or the will to verify measurements taken by the client's own employees. This lack of auditor measuring knowledge and involvement allowed one of the biggest frauds ever to take place, which became known as 'the great salad oil swindle'.[10]

Understate obsolete inventory

Another obvious ploy is to include, in the inventory valuation, obsolete or 'dead' inventory. Of course, such inventory should be written off. However, management may be 'optimistic'

that it can be sold, particularly in times of economic recession. In high-tech industries, unrealistic values may be placed on inventory that in times of rapid development becomes obsolete quickly.

This can be highly significant, as in the case of Cal Micro.[11] On 6 February 1995, Cal Micro restated its financial results for fiscal year 1994. The bulk of the adjustments to Cal Micro's financial statements – all highly material – occurred in the areas of accounts inventory, accounts receivable and property and, from an originally reported net income of approximately $5.1 million for the year ended 30 June 1994, the restated allowance for additional inventory obsolescence decreased net income by approximately $9.3 million.

Lack of marketability

This is a problem that investors need to be constantly aware of, particularly when a company experiences a downturn in demand but a pressure to maintain the semblance of growth. An example is provided by Lexmark[12] which was alleged to have made highly positive statements regarding strong sales and growth for its printers although there was intense competition in the industry – the company reporting quarter after quarter of strong financial growth whereas the actual position appeared to be very different with unmarketable inventory in excess of $25 million to be written down in the fourth quarter of fiscal year 2001. The share price of a company that conceals this type of information is maintained and allows insiders to offload their shareholding on an unsuspecting investing public.

18.9 Audit of the year-end physical inventory count

The problems of accounting for inventory are highlighted at the company's year-end. This is when the closing inventory figure to be shown in both the statement of comprehensive income and statement of financial position is calculated. In practice, the company will assess the final inventory figure by physically counting all inventory held by the company for trade. The year-end inventory count is therefore an important accounting procedure, one in which the auditors are especially interested.

The auditor generally attends the inventory count to verify both the physical quantities and the procedure of collating those quantities. At the inventory count, values are rarely assigned to inventory items, so the problems facing the auditor relate to the identification of inventory items; their ownership; and their physical condition.

18.9.1 Identification of inventory items

The auditor will visit many companies in the course of a year and will spend a considerable time looking at accounting records. However, it is important for the auditor also to become familiar with each company's products by visiting the shop floor or production facilities during the audit. This makes identification of individual inventory items easier at the year-end. Distinguishing between two similar items can be crucial where there are large differences in value. For example, steel-coated brass rods look identical to steel rods, but their value to the company will be very different. It is important that they are not confused at inventory count because, once recorded on the inventory sheets, values are assigned, production carries on, and the error cannot be traced.

18.9.2 Ownership of inventory items

The year-end cut-off point is important to the final inventory figure, but the business activities continue regardless of the year-end, and some account has to be taken of this. Hence, the

Figure 18.7 Treatment of inventory items

Sales	*In inventory*	*Loading bay*
If invoiced to customer	Delete from inventory	Inventory not counted
If credited (i.e. returned)	Include	Include
If not invoiced/credited	Include unless accounting entry falls into this year	Include
Purchases		
If invoiced to company	Include in inventory	Include in inventory
If credited (i.e. to be returned)	Delete from inventory	Delete from inventory
If invoiced/credited	Include unless accounting entry falls into next year	Include

auditor must be aware that the recording of accounting transactions may not coincide with the physical flow of inventory. Inventory may be in one of two locations: included as part of inventory; or in the loading bay area awaiting dispatch or receipt. Its treatment will depend on several factors (see Figure 18.7). The auditor must be aware of all these possibilities and must be able to trace a sample of each inventory entry through to the accounting records, so that:

- if purchase is recorded, but not sale, the item must be in inventory;
- if sale is recorded, purchase must also be recorded and the item should not be in inventory.

18.9.3 Physical condition of inventory items

Inventory in premium condition has a higher value than damaged inventory. The auditor must ensure that the condition of inventory is recorded at inventory count, so that the correct value is assigned to it. Items that are damaged or have been in inventory for a long period will be written down to their net realisable value (which may be nil) as long as adequate details are given by the inventory counter. Once again, this is a problem of identification, so the auditor must be able to distinguish between, for instance, rolls of first quality and faulty fabric. Similarly, items that have been in inventory for several inventory counts may have little value, and further enquiries about their status should be made at the time of inventory count.

18.10 Published accounts

Disclosure requirements in IAS 2 have already been indicated. The standard requires the accounting policies that have been applied to be stated and applied consistently from year to year. Inventory should be sub-classified in the statement of financial position or in the notes to the financial statements so as to indicate the amounts held in each of the main categories in the standard statement of financial position formats. But will the ultimate user of those financial statements be confident that the information disclosed is reliable, relevant and useful? We have already indicated many areas of subjectivity and creative accounting, but are such possibilities material?

In 1982 Westwick and Shaw examined the accounts of 125 companies with respect to inventory valuation and its likely impact on reported profit.[13] The results showed that the effect on profit before tax of a 1% error in closing inventory valuation ranged from a low

Figure 18.8 Impact of a 5% change in closing inventory

Company:	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*
	£m	*£m*	*£m*	*£m*	*£m*	*£m*	*£m*	*£m*
Actual inventory	390.0	428.0	1,154.0	509.0	509.0	280.0	360.0	232.0
Actual pre-tax profit	80.1	105.6	479.0	252.5	358.4	186.3	518.2	436.2
Change in pre-tax profit	19.5	21.4	57.7	25.2	25.5	14.0	18.0	11.6
	Impact of a 5% change in closing inventory (%)							
(i) Pre-tax profit	24.3	20.0	12.0	10.0	7.1	7.5	3.5	2.7
(ii) Earnings per share	27.0	25.0	12.0	9.3	8.4	6.9	3.4	3.4

Key to companies:
1 Electrical retailer
2 Textile, etc., manufacturer
3 Brewing, public houses, etc.
4 Retailer – diversified
5 Pharmaceutical and retail chemist
6 Industrial paints and fibres
7 Food retailer
8 Food retailer

of 0.18% to a high of 25.9% (in one case) with a median of 2.26%. The industries most vulnerable to such errors were household goods, textiles, mechanical engineering, contracting and construction.

Clearly, the existence of such variations has repercussions for such measures as ROCE, EPS and the current ratio. The research also showed that, in a sample of audit managers, 85% were of the opinion that the difference between a pessimistic and an optimistic valuation of the same inventory could be more than 6%.

IAS 2 has since been strengthened and these results may not be so indicative of the present situation. However, using the same principle, let us take a random selection of eight companies' recent annual accounts, apply a 5% increase in the closing inventory valuation and calculate the effect on EPS (taxation is simply taken at 35% on the change in inventory).

Figure 18.8 shows that, in absolute terms, the difference in pre-tax profits could be as much as £57.7 million and the percentage change ranges from 2.7% to 24%. Of particular note is the change in EPS, which tends to be the major market indicator of performance. In the case of the electrical retailer (company 1), a 5% error in inventory valuation could affect EPS by as much as 27%. The inventory of such a company could well be vulnerable to such factors as changes in fashion, technology and economic recession.

18.11 Agricultural activity

18.11.1 The overall problem

Agricultural activity is subject to special considerations and so is governed by a separate IFRS, namely IAS 41. IAS 41 defines agricultural activity as 'the management by an entity of the biological transformation of biological assets for sale, into agricultural produce or into additional biological assets'. A biological asset is a living animal or plant.

The basic problem is that biological assets, and the produce derived from them (referred to in IAS 41 as 'agricultural produce'), cannot be measured using the cost-based concepts that form the bedrock of IAS 2 and IAS 16. This is because biological assets, such as cattle for example, are not usually purchased, they are born and develop into their current state. Therefore different accounting methods are necessary.

18.11.2 The recognition and measurement of biological assets and agricultural produce

IAS 41 states that an entity should recognise a biological asset or agricultural produce when:

- the entity controls the asset as a result of a past event;
- it is probable that future economic benefits associated with the asset will flow to the entity;
- the fair value or cost of the asset can be measured reliably.

Rather than the usual cost-based concepts of measurement that are used for assets, IAS 41 states that assets of this type should be measured at their fair value less estimated costs of sale. The only (fairly rare) exception to this general measurement principle is if the asset's fair value cannot be estimated reliably. In such circumstances a biological asset is measured at cost (if available). However market values would usually be available for biological assets and agricultural produce.

The following is an extract from the 2005 Holmen AB annual report:

> Past practice was for Holmen's forest assets to be stated at acquisition cost adjusted for revaluations. According to IFRS, forest assets are to be divided into growing forest, which is stated in accordance with IAS 41, and land, which is stated in accordance with IAS 16. The application of IAS 41 means that growing forest is to be valued and stated at its fair value on each occasion the accounts are finalized. Changes in fair value are taken into the statement of comprehensive income. In the absence of market prices or other comparable values, biological assets are to be valued at the present value of the future cash flow from the assets. The land on which the trees are growing is valued at acquisition cost in accordance with IAS 16.

The change in financial reporting restatement can have a significant impact on the carrying value in the statement of financial position as shown in the Holmen 2004 restated statement of financial position:

Statement of financial position (MSEK)	*31.12.2004*	*IFRS 3*	*IAS 41*	*Total*
Assets				
Intangible fixed assets				
Goodwill	491	32		523
Other	36			36
Tangible fixed assets	12,153			12,153
Biological assets	6,201		2,421	8,622

An implication of the measurement principle that is used is that gains or losses on re-measurement will regularly arise. IAS 41 requires that these be taken to the statement of comprehensive income in the relevant period. Statement of comprehensive income amounts can arise from:

- the initial recognition of a biological asset or agricultural produce;
- the change in fair value of previously recognised amounts;
- the costs associated with the agricultural activity.

The following extracts are from the Precious Woods Group's 2005 Annual Report:

General Valuation Principles according to IAS 41
According to IAS 41, biological assets – in the case of Precious Woods, tree plantations – are to be valued annually at fair value. The gain or loss in fair value of these biological assets is reported in net profit. The measurement of biological growth in the field is an important element of this valuation. Initially, at the start of the plantation cycle, the fair value is equal to the standard costs of preparing and maintaining a plantation including the appropriate cost of capital, assuming efficient operations. Toward the end of the plantation cycle the fair value depends solely on the discounted vale of the expected harvest less estimated point-of-sale costs.

The statement of financial position values of the biological assets have developed as follows:

	$
Carrying amount at beginning of year	32,919,820
Net change in fair value of biological assets before harvest	3,743,660
Fair value biological assets harvested 2005	(133,623)
Personnel costs incurred during the year	1,186,661
Depreciation expense	120,267
Other general costs incurred during the year	387,416
Carrying amount end of year	**38,224,201**

18.11.3 An illustrative example

A farmer owned a dairy herd. At the start of the period the herd contained 100 animals that were two years old and fifty newly born calves. At the end of the period a further thirty calves were born. None of the herd died during the period. Relevant fair value details were as follows:

	Start of period	*End of period*
	$	$
Newly born calves	50	55
One-year-old animals	60	65
Two-year-old animals	70	75
Three-year-old animals	75	80

The change in the fair value of the herd is $3,400, made up as follows:

Fair value at end of the year = 100 × $80 + 50 × $65 + 30 × $55 = $12,900
Fair value at start of the year = 100 × $70 + 50 × $50 = $9,500

IAS 41 requires that the change in the fair value of the herd be reconciled as follows:

	$
Price change – opening newly born calves: 50($55 – $50)	250
Physical change of opening newly born calves: 50($65 – $55)	500
Price change of opening two-year-old animals: 100($75 – $70)	500
Physical change of opening two-year-old animals: 100($80 – $75)	500
Due to birth of new calves: 30 × $55	1,650
Total change	**3,400**

The costs incurred in maintaining the herd would all be charged in the statement of comprehensive income in the relevant period.

18.11.4 Agricultural produce

Examples of agricultural produce would be milk from a dairy herd or crops from a cornfield. Such produce is sold by a farmer in the ordinary course of business and is inventory. The initial carrying value of the inventory at the point of 'harvest' is its fair value less costs to sell at that date. Agricultural entities then apply IAS 2 to the inventory using the initial carrying value as 'cost'.

18.11.5 Land

Despite its importance in agricultural activity, IAS 41 does not apply to agricultural land, which is accounted for in accordance with IAS 16. Where biological assets are physically attached to land (e.g. crops in a field) then it is often possible to compute the fair value of the biological assets by computing the fair value of the combined asset and deducting the fair value of the land alone.

18.11.6 Government grants relating to biological assets

As mentioned in Chapter 15 such grants are not subject to IAS 20 – the general standard on this subject. Under IAS 41 the IASB view is more consistent with the principles of the *Framework* than the provisions of IAS 20. Under IAS 41 grants are recognised as income when the entity becomes entitled to receive it. This removes the fairly dubious credit balance 'Deferred income' that arises under the IAS 20 approach and does not appear to satisfy the *Framework* definition of a liability.

Summary

Examples of differences in inventory valuation are not uncommon.[14] For example, in 1984, Fidelity, the electronic equipment manufacturer, was purchased for £13.4 million.[15] This price was largely based on the 1983/84 profit figure of £400,000. Subsequently, it was maintained that this 'profit' should actually be a loss of £1.3 million – a difference of £1.7 million. Much of this difference was attributable to inventory discrepancies. The claim was contested, but it does illustrate that a disparity can occur when important figures are left to 'professional judgement'.

Another case involved the selling of British Wheelset by British Steel, just before privatisation in 1988, at a price of £16.9 million.[16] It was claimed that the accounts 'were not drawn up on a consistent basis in accordance with generally accepted accounting practice'. If certain inventory provisions had been made, these would have resulted in a £5 million (30%) difference in the purchase price.

Other areas that cause difficulties to the user of published information are the capitalisation of interest and the reporting of write-downs on acquisition. Post-acquisition profits can be influenced by excessive write-downs of inventory on acquisition, which has the effect of increasing goodwill. The written-down inventory can eventually be sold at higher prices, thus improving post-acquisition profits.

Although legal requirements and IAS 2 have improved the reporting requirements, many areas of subjective judgement can have substantial effects on the reporting of financial information.

REVIEW QUESTIONS

1 Discuss why some form of theoretical pricing model is required for inventory valuation purposes.

2 Discuss the acceptability of the following methods of inventory valuation: LIFO; replacement cost.

3 Discuss the application of individual judgement in inventory valuation, e.g. changing the basis of overhead absorption.

4 Explain the criteria to be applied when selecting the method to be used for allocating costs.

5 Discuss the effect on work-in-progress and finished goods valuation if the net realisable value of the raw material is lower than cost at the statement of financial position date.

6 Discuss why the accurate valuation of inventory is so crucial if the financial statements are to show a true and fair view.

7 The following is an extract from the Interbrew 2007 Annual Report:

> **Inventories**
> Inventories are valued at the lower of cost and net realizable value. Cost includes expenditure incurred in acquiring the inventories and bringing them to their existing location and condition. The weighted average method is used in assigning the cost of inventories.
>
> The cost of finished products and work in progress comprises raw materials, other production materials, direct labor, other direct cost and an allocation of fixed and variable overhead based on normal operating capacity. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated completion and selling costs.

Discuss the possible effects on profits if the company did not use normal operating activity. Explain an alternative definition for net realisable value and discuss the criterion to be applied when making a policy choice.

8 The following is an extract from the 2007 Annual Report of SIPEF SA:

> **Auditor's Report**
> The statutory auditor has confirmed that his audit procedures, which have been substantially completed, have revealed no material adjustments that would have to be made to the accounting information included in this press release.
>
> With regard to the valuation of the biological assets, the statutory auditor draws the reader's attention to the fact that, because of the inherent uncertainty associated with the valuation of the biological assets due to the volatility of the prices of the agricultural produce and the absence of a liquid market, their carrying value may differ from their realisable value.

Given the inherent uncertainty applying IAS 41, discuss (a) whether the pre-IAS 41 practice of value at historical cost would be preferable for the statement of financial position and (b) whether the new requirement to pass unrealised gains and losses through the statement of comprehensive income is more relevant to an investor.

EXERCISES

An extract from the solution is provided on the Companion Website (www.pearsoned.co.uk/elliott-elliott) for exercises marked with an asterisk (*).

Question 1

Sunhats Ltd manufactures patent hats. It carries inventory of these and sells to wholesalers and retailers via a number of salespeople. The following expenses are charged in the profit and loss account:

Wages of: Storemen and factory foremen
Salaries of: Production manager, personnel officer, buyer, salespeople, sales manager, accountant, company secretary
Other: Directors' fees, rent and rates, electric power, repairs, depreciation, carriage outwards, advertising, bad debts, interest on bank overdraft, development expenditure for new type of hat.

Required:
Which of these expenses can reasonably be included in the valuation of inventory?

* Question 2

Purchases of a certain product during July were:

July	1	100 units @ £10.00
	12	100 units @ £9.80
	15	50 units @ £9.60
	20	100 units @ £9.40

Units sold during the month were:

July	10	80 units
	14	100 units
	30	90 units

Required:
Assuming no opening inventories:

(i) Determine the cost of goods sold for July under three different valuation methods.
(ii) Discuss the advantages and/or disadvantages of each of these methods.
(iii) A physical inventory count revealed a shortage of five units. Show how you would bring this into account.

* Question 3

Alpha Ltd makes one standard article. You have been given the following information:

1 The inventory sheets at the year-end show the following items:

Raw materials:
100 tons of steel:
Cost £140 per ton
Present price £130 per ton

Finished goods:
100 finished units:
Cost of materials £50 per unit
Labour cost £150 per unit
Selling price £500 per unit

40 semi-finished units
Cost of materials £50 per unit
Labour cost to date £100 per unit
Selling price £500 per unit (completed)

10 damaged finished units:
Cost to rectify the damage £200 per unit
Selling price £500 per unit (when rectified)

2 Manufacturing overheads are 100% of labour cost.
Selling and distribution expenses are £60 per unit (mainly salespeople's commission and freight charges).

Required:
From the information in notes 1 and 2, state the amounts to be included in the statement of financial position of Alpha Ltd in respect of inventory. State also the principles you have applied.

Question 4

Beta Ltd commenced business on 1 January and is making up its first year's accounts. The company uses standard costs. The company owns a variety of raw materials and components for use in its manufacturing business. The accounting records show the following:

		Adverse (favourable) variances	
	Standard cost of purchases	*Price variance*	*Usage variance*
	£	£	£
July	10,000	800	(400)
August	12,000	1,100	100
September	9,000	700	(300)
October	8,000	900	200
November	12,000	1,000	300
December	10,000	800	(200)
Cumulative figures for whole year	110,000	8,700	(600)

Raw materials control account balance at year-end is £30,000 (at standard cost).

Required:
The company's draft statement of financial position includes 'Inventories, at the lower of cost and net realisable value £80,000'. This includes raw materials £30,000: do you consider this to be acceptable? If so, why? If not, state what you consider to be an acceptable figure.

(*Note*: for the purpose of this exercise, you may assume that the raw materials will realise more than cost.)

Question 5

The statement of comprehensive income of Bottom, a manufacturing company, for the year ending 31 January 20X2 is as follows:

	Bottom
	$000
Revenue	75,000
Cost of sales	(38,000)
Gross profit	37,000
Other operating expenses	(9,000)
Profit from operations	28,000
Investment income	
Finance cost	(4,000)
Profit before tax	24,000
Income tax expense	(7,000)
Net profit for the period	17,000

Note – accounting policies

Bottom has used the LIFO method of inventory valuation but the directors wish to assess the implications of using the FIFO method. Relevant details of the inventories of Bottom are as follows:

Date	*Inventory valuation under:*	
	FIFO	*LIFO*
	$000	*$000*
1 February 20X1	9,500	9,000
31 January 20X2	10,200	9,300

Requirement:

Re-draft the statement of comprehensive income of Bottom using the FIFO method of inventory valuation and explain how the change would need to be recognised in the published financial statements, if implemented.

Question 6

Agriculture is a key business activity in many parts of the world, particularly in developing countries. Following extensive discussions with, and funding from, the World Bank, the International Accounting Standards Committee (IASC) developed an accounting standard relating to agricultural activity. IAS 41 *Agriculture* was published in 2001 to apply to accounting periods beginning on or after 1 January 2003.

Sigma prepares financial statements to 30 September each year. On 1 October 2003 Sigma carried out the following transactions:

- Purchased a large piece of land for $20 million.
- Purchased 10,000 dairy cows (average age at 1 October 2003, two years) for $1 million.
- Received a grant of $400,000 towards the acquisition of the cows. This grant was non-returnable.

During the year ending 30 September 2004 Sigma incurred the following costs:

- $500,000 to maintain the condition of the animals (food and protection).
- $300,000 in breeding fees to a local farmer.

On 1 April 2004, 5,000 calves were born. There were no other changes in the number of animals during the year ended 30 September 2004. At 30 September 2004, Sigma had 10,000 litres of unsold milk in inventory. The milk was sold shortly after the year end at market prices.

Information regarding fair values is as follows:

Item	*Fair value less point of sale costs*		
	1 October 2003	*1 April 2004*	*30 September 2004*
	$	$	$
Land	20 m	22 m	24 m
New born calves (per calf)	20	21	22
Six-month-old calves (per calf)	23	24	25
Two-year-old cows (per cow)	90	92	94
Three-year-old cows (per cow)	93	95	97
Milk (per litre)	0.6	0.55	0.55

Required:

(a) Discuss how the IAS 41 requirements regarding the recognition and measurement of biological assets and agricultural produce are consistent with the IASC Framework for the Preparation and Presentation of Financial Statements.

(b) Prepare extracts from the statement of comprehensive income and the statement of financial position that show how the transactions entered into by Sigma in respect of the purchase and maintenance of the dairy herd would be reflected in the financial statements of the entity for the year ended 30 September 2004. You do not need to prepare a reconciliation of changes in the carrying amount of biological assets.

(*ACCA DipIFR 2004*)

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