



*Rewarding Learning*

**ADVANCED SUBSIDIARY (AS)  
General Certificate of Education  
January 2014**

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## **Home Economics**

**Assessment Unit AS 1**

*assessing*

**Nutrition for Optimal Health**

**[AN111]**

**MONDAY 13 JANUARY, AFTERNOON**

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**MARK  
SCHEME**

## General Marking Instructions

### Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

### The Purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

**Section A**

			AVAILABLE MARKS
<b>1</b>	<p>State <b>three</b> valuable food sources of water. (AO1)</p> <ul style="list-style-type: none"> <li>• soup</li> <li>• fruit</li> <li>• vegetables</li> </ul> <p>All other valid points will be given credit</p>	[3]	3
<b>2</b>	<p>Identify the disease associated with a deficiency of vitamin B<sub>1</sub> and list <b>three</b> symptoms of this condition. (AO1, AO2)</p> <p>Deficiency disease: beriberi Symptoms:</p> <ul style="list-style-type: none"> <li>• oedema</li> <li>• severe emaciation/wastage of muscles</li> <li>• excessive fatigue</li> </ul> <p>All other valid points will be given credit</p>	[4]	4
<b>3</b>	<p>Outline the potential role of sodium and potassium in the regulation of blood pressure. (AO1, AO2)</p> <ul style="list-style-type: none"> <li>• high sodium intake raises blood pressure; when sodium levels are excessive kidneys cannot excrete enough sodium and thus it builds up in the blood, the sodium attracts and holds water, leading to increased blood volume</li> <li>• high intakes of potassium reduce blood pressure; the more potassium in the body, the more sodium is excreted through urine which means potassium counteracts the effects of a high sodium intake and subsequently lowers blood pressure</li> </ul> <p>All other valid points will be given credit</p>	[4]	4
<b>4</b>	<p>Explain the term glycaemic index in relation to carbohydrate absorption. (AO1, AO2)</p> <ul style="list-style-type: none"> <li>• the glycaemic index (GI) is the classification used to identify which carbohydrates are quickly broken down to glucose after a particular food or beverage is consumed</li> <li>• different carbohydrate-containing foods are digested and absorbed at different rates</li> <li>• a lower glycaemic index suggests slower rates of digestion and absorption of carbohydrates</li> <li>• foods with carbohydrates that break down quickly during digestion and release glucose rapidly into the bloodstream are said to have a high GI</li> </ul> <p>All other valid points will be given credit</p>	[5]	5
<b>5</b>	<p>Why is soluble NSP beneficial in the diet of an adult? (AO1, AO2)</p> <ul style="list-style-type: none"> <li>• lowers blood cholesterol levels both total and LDL; thus lowering the incidence of cardiovascular disease (CVD)</li> <li>• slows down the release of glucose into the bloodstream; can be useful in the management of diabetes</li> <li>• slows digestion; slows the emptying of the stomach, also increases satiety, thus controlling appetite and reducing risk of weight gain</li> </ul> <p>All other valid points will be given credit</p>	[5]	5

6 Discuss **four** functions of fat as a nutrient. (AO1, AO2, AO3)

AVAILABLE  
MARKS

**Mark Band ([0]–[2])**

Overall impression: basic

- inadequate knowledge and understanding of the functions of fat
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss four functions of fat as a nutrient
- quality of written communication is basic

**Mark Band ([3]–[5])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the functions of fat
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss four functions of fat as a nutrient
- quality of written communication is reasonable to good

**Mark Band ([6]–[8])**

Overall impression: very good to highly competent

- clear knowledge and understanding of the functions of fat
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to discuss four functions of fat as a nutrient
- quality of written communication is very good to highly competent

**Examples of suitable points to be discussed by the candidate:**

- concentrated source of energy; 1g of fat provides 37kJ (9kcal), more than double that provided by equivalent amounts of protein or carbohydrate
- fat storage; in the adipose tissue, where it provides insulation to facilitate the maintenance of body temperature and acts as an energy reserve, and around some of the delicate organs to cushion and protect them from physical damage
- essential fatty acids; dietary EFAs and the fatty acids made from them are incorporated into phospholipids in cell membranes and therefore are required for the structure and maintenance of cell membranes
- fat soluble vitamins (A, D, E and K); absorbed along with dietary fat in the small intestine

All other valid points will be given credit

[8]

8

7 Explain the importance of achieving an adequate iron intake at various stages throughout the life span. (AO1, AO2, AO3)

**Mark Band ([0]–[2])**

Overall impression: basic

- inadequate knowledge and understanding of the importance of achieving adequate iron intake
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain the importance of achieving an adequate iron intake at various stages throughout the life span
- quality of written communication is basic

**Mark Band ([3]–[5])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of achieving adequate iron intake
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to explain the importance of achieving an adequate iron intake at various stages throughout the life span
- quality of written communication is reasonable to good

**Mark Band ([6]–[8])**

Overall impression: very good to highly competent

- clear knowledge and understanding of the importance of achieving adequate iron intake
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to explain the importance of achieving an adequate iron intake at various stages throughout the life span
- quality of written communication is very good to highly competent

**Examples of suitable points to be explained by the candidate:**

- children; iron is needed to boost concentration levels and cognitive development; also needed for rapid growth and synthesis of extra blood cells
- infants; iron stores are depleted after 6 months so additional sources are required
- adolescent and post-pregnancy females; may result in the need for additional iron due to heavy periods; to avoid iron deficiency anaemia
- pregnant women; to meet increased blood volume in the last trimester; required during pregnancy to supply the growing foetus, the placenta and the increase in maternal red blood cells
- adults; premenopausal women are at a higher risk of iron deficiency anaemia if dietary intake is inadequate
- older people; may need additional iron due to malabsorption, an inadequate diet or the interaction with other nutrients, older people may also have a limited diet and avoid haem sources for social or economic reasons

All other valid points will be given credit

[8]

- 8 There is no evidence that vitamin supplements do us any good and they may even be doing us harm.

*source: www.independent.co.uk*

Present some of the arguments **against** supplementation, providing examples to support your answer. (AO1, AO2, AO3)

**Mark Band ([0]–[2])**

Overall impression: basic

- inadequate knowledge and understanding of the arguments against supplementation
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to present substantiated arguments against supplementation
- quality of written communication is basic

8

**Mark Band ([3]–[5])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the arguments against supplementation
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to present substantiated arguments against supplementation
- quality of written communication is reasonable to good

**Mark Band ([6]–[8])**

Overall impression: very good to highly competent

- clear knowledge and understanding of the arguments against supplementation
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to present substantiated arguments against supplementation
- quality of written communication is very good to highly competent

**Examples of suitable points to be presented by the candidate:**

- toxicity; vitamin supplements provide a more concentrated source of a specific nutrient than a food source, which poses a greater risk for toxicities and adverse reactions, e.g. increased risk of lung cancer in smokers receiving beta carotene supplements, or teratogenicity (limb defects) of the foetus in pregnancy
- interactions; an excess of one nutrient can interfere with absorption of another, e.g. zinc can interfere with absorption of iron and copper; calcium can inhibit iron absorption; excess intakes of folic acid can mask a deficiency of vitamin B<sub>12</sub> causing neurological damage
- cost; supplements can be expensive for those on a low income, e.g. older people, young families
- development of poor eating patterns; vitamin supplementation is not an adequate substitute for a healthy diet; food is much more nutrient dense, e.g. contains phytochemicals and nutrients perform differently as part of food, than they do when they are isolated

All other valid points will be given credit

[8]

AVAILABLE MARKS

8

**Section A**

**45**

Section B

AVAILABLE  
MARKS

9 Northern Ireland has the highest level of childhood dental decay in the UK.

source: [www.hscboard.hscninet](http://www.hscboard.hscninet)

(a) Propose and justify the dietary advice you would give to parents to help them reduce the risk of tooth decay in their children. (AO1, AO2, AO3)

**Mark Band ([0]–[3])**

Overall impression: basic

- inadequate knowledge and understanding of tooth decay
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to propose and justify the dietary advice to enable parents to reduce the risk of tooth decay in their children
- quality of written communication is basic

**Mark Band ([4]–[7])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of tooth decay
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to propose and justify the dietary advice to enable parents to reduce the risk of tooth decay in their children
- quality of written communication is reasonable to good

**Mark Band ([8]–[10])**

Overall impression: very good to highly competent

- clear knowledge and understanding of tooth decay
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to propose and justify the dietary advice to enable parents to reduce the risk of tooth decay in their children
- quality of written communication is very good to highly competent

**Examples of suitable points to be proposed and justified by the candidate:**

- reduce frequency of sugar consumption; parents should prevent children grazing or sipping on sugary drinks continuously throughout the day; if food or drink is taken too frequently the tooth enamel does not have time to remineralise completely and caries can start to occur
- avoid sticky chewy sweets; these adhere to the teeth increasing the risk of tooth decay compared to foods that clear from the mouth quickly
- include plenty of milk and milk products in the diet of children; these contain calcium which strengthens tooth enamel and the milk sugar, lactose, is less cariogenic (caries causing) than other sugars; they have a neutral pH helping to reduce the acidity level of the mouth
- avoid drinks containing sugars in bottle and feeding cups, especially at night; parents should not put children to bed sucking on cups/bottles as prolonged exposure to drinks containing sugars puts children’s teeth at risk

- increase NSP; this increases the flow of saliva which neutralises the acid in the mouth
- read food labels; parents should read and check for hidden sugars in foods, even those which appear healthy may have a high sugar content

All other valid points will be given credit

[10]

AVAILABLE  
MARKS

10

- (b) Consider the importance of calcium, omega 3 and vitamin C during childhood. (AO1, AO2, AO3)

**Mark Band ([0]–[5])**

Overall impression: basic

- inadequate knowledge and understanding of calcium, omega 3 and vitamin C
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to consider the importance of calcium, omega 3 and vitamin C during childhood
- quality of written communication is basic

**Mark Band ([6]–[10])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of calcium, omega 3 and vitamin C
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to consider the importance of calcium, omega 3 and vitamin C during childhood
- quality of written communication is reasonable to good

**Mark Band ([11]–[15])**

Overall impression: very good to highly competent

- clear knowledge and understanding of calcium, omega 3 and vitamin C
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to consider the importance of calcium, omega 3 and vitamin C during childhood
- quality of written communication is very good to highly competent

**Examples of suitable points to be considered by the candidate:**

Calcium

- formation of skeleton; requirements are high for children because bones are growing rapidly in size and density. Up to 90 percent of peak bone mass is acquired by age 18 in girls and age 20 in boys, which makes childhood and youth the best time to build up bone strength. Inadequate dietary calcium intake before this age can increase the risk of brittle bone disease and osteoporosis
- teeth; development of strong teeth and prevention of dental caries

Omega 3

- cannot be made in the body; omega 3 must be obtained from the diet and best sources are found in oily fish
- cognitive development; omega 3 fatty acids are highly concentrated



in the brain and have been shown to be important for cognitive (brain memory and performance) and behavioural function

AVAILABLE  
MARKS

#### Vitamin C

- structural role; vitamin C helps form collagen which fulfils the structural role in most organs, so therefore is essential during stages of growth and development in this age group
- blood vessels; helps keep children's gums healthy and strengthens their blood vessels, minimizing bruising from falls and scrapes
- heals wounds and prevent infections; vitamin C helps cuts and wounds heal, boosts the immune system, and keeps infection risk lower
- absorption of iron; vitamin C also helps the body absorb iron from non-haem food sources which is essential during periods of rapid growth and development during childhood

All other valid points will be given credit

[15]

15

- 10 (a)** Explain some of the issues affecting food choice and physical activity amongst adolescents which may increase their risk of developing obesity. (AO1, AO2, AO3)

#### **Mark Band ([0]–[3])**

Overall impression: basic

- inadequate knowledge and understanding of food choice and physical activity in relation to obesity
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to explain some of the issues affecting food choice and physical activity amongst this age group and how this could contribute to obesity
- quality of written communication is basic

#### **Mark Band ([4]–[7])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of food choice and physical activity in relation to obesity
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to explain some of the issues affecting food choice and physical activity amongst this age group and how this could contribute to obesity
- quality of written communication is reasonable to good

#### **Mark Band ([8]–[10])**

Overall impression: very good to highly competent

- clear knowledge and understanding of food choice and physical activity in relation to obesity
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question
- demonstrates a very good to highly competent ability to explain some of the issues affecting food choice and physical activity amongst this age group and how this could contribute to obesity
- quality of written communication is very good to highly competent

**Examples of suitable points to be explained by the candidate:**

- lack of physical activity; many adolescents are largely sedentary due to less active leisure activities, less effort used in daily travel, reduced open spaces which has resulted in more time spent indoors; leading to a significant reduction in energy expenditure and subsequently resulting in poor energy balance with subsequent weight gain
- poor food choices; passive over-consumption of fast foods and snacks, typically high in fat and sugar has encouraged weight gain amongst adolescents
- more disposable income; adolescents have greater freedom in food selection, this, together with increased independence can lead to rebelliousness over what is eaten and the rejection of foods considered to be 'healthy'; this can lead to an increased consumption of more energy dense snacks and fast food options which contribute to weight gain
- advertising of foods high in fat and sugar; the advertising of these foods is disproportionately high compared to more natural healthy foods, which fuels the desire for adolescents to try new products and 'fall prey' to clever marketing techniques to boost sales
- using food emotionally; concerns about relationships, bullying, school etc can lead to comfort eating and a cycle of overeating to fill an emotional gap especially if already suffering from low self-esteem

All other valid points will be given credit

[10]

10

- (b) Discuss the specific nutritional requirements of an adolescent.  
(AO1, AO2, AO3)

**Mark Band ([0]–[5])**

Overall impression: basic

- inadequate knowledge and understanding of the specific nutritional requirements of an adolescent
- demonstrates a limited ability to apply appropriate knowledge and understanding to the question
- demonstrates a limited ability to discuss a range of specific nutritional requirements in relation to this age group
- quality of written communication is basic

**Mark Band ([6]–[10])**

Overall impression: reasonable to good

- reasonable to good knowledge and understanding of the specific nutritional requirements of an adolescent
- demonstrates a reasonable to good ability to apply appropriate knowledge and understanding to the question
- demonstrates a reasonable to good ability to discuss a range of specific nutritional requirements in relation to this age group
- quality of written communication is reasonable to good

**Mark Band ([11]–[15])**

Overall impression: very good to highly competent

- clear knowledge and understanding of the specific nutritional requirements of an adolescent
- demonstrates a very good to highly competent ability to apply appropriate knowledge and understanding to the question

- demonstrates a very good to highly competent ability to discuss a range of specific nutritional requirements in relation to this age group
- quality of written communication is very good to highly competent

**Examples of suitable points to be discussed by the candidate:**

- protein; necessary for muscle development and growth spurt
- calcium; needed for skeletal growth, bone assimilates most of its minerals at this stage and achieves most of its final mass, failure to consume adequate calcium could lead to peak bone mass (PBM) not being achieved and subsequently present a greater risk of developing osteoporosis later in life
- iron; both boys and girls have an increased requirement for iron due to the relatively large blood volume during periods of rapid growth, the onset of menstruation presents a further stress in the iron status of adolescent girls; there is also evidence to suggest that borderline iron levels can have adverse effects on cognitive function, this could have implications in terms of learning ability and academic performance
- vitamin D; required for the efficient absorption of calcium, which in turn is required for bone development; there is some concern that some teenagers are not getting enough exposure to sunlight to achieve adequate vitamin D levels
- zinc; is needed for normal growth and sexual development, this mineral is also associated with boosting the immune system
- energy; adequate energy is important as low energy density could limit growth during adolescence, energy is important for the rapid growth spurt and synthesis of new tissue

All other valid points will be given credit

[15]

**Section B**

**Total**

**AVAILABLE  
MARKS**

15

**25**

**70**