S2 Home Economics Practice Paper 2 | Nutrition labels, protein needs, budgeting, food safety, laundry, spending

Junior Secondary Home Economics

S2 Home Economics practice paper 2 with solutions: nutrition labels, protein needs, meal budgeting, unit cost, food safety temperatures and household spending percentages.

1. Nutrition labels and energy calculations (16 marks)

The nutrition label of a breakfast cereal gives per 100 g: energy 480 kcal, protein 6.0 g, fat 18.0 g, carbohydrate 66.0 g, sodium 320 mg. Each pack weighs 250 g.

#	Question	Answer and marking notes
1	(a) Calculate the total energy in one 250 g pack, in kcal. (3 marks)	Answer: 480 x 2.5 = 1200 kcal.
2	(b) How much protein does one pack contain? If the daily protein requirement is 55 g, what percentage of the daily requirement does one pack provide? (4 marks)	Answer: protein 6.0 x 2.5 = 15.0 g; 15.0 / 55 x 100 = 27.3%.
3	(c) Using energy factors of 4 kcal/g for protein, 9 kcal/g for fat and 4 kcal/g for carbohydrate, calculate the energy in 100 g and the percentage difference from the label value. (5 marks)	Answer: 6.0 x 4 + 18.0 x 9 + 66.0 x 4 = 450 kcal; the difference is 30 kcal, i.e. 30 / 480 x 100 = 6.3%.
4	(d) Calculate the sodium in one pack. The WHO daily sodium limit for adults is 2000 mg. What percentage of the limit does one pack give, and how much sodium remains? (4 marks)	Answer: sodium 320 x 2.5 = 800 mg; 800 / 2000 x 100 = 40.0%; the remainder is 2000 - 800 = 1200 mg.

2. Protein and dietary requirements (16 marks)

A Secondary 2 student weighs 50 kg. The recommended protein intake is 1.0 g per kg of body weight. He takes 12 g of protein at breakfast and 20 g at lunch.

#	Question	Answer and marking notes
5	(a) Calculate his daily protein requirement and how much protein his dinner still needs. (4 marks)	Answer: daily requirement 50 x 1.0 = 50 g; dinner needs 50 - 12 - 20 = 18 g.
6	(b) One egg contains 6.5 g of protein. If eggs are the main protein source at dinner, what is the minimum number of whole eggs needed? (4 marks)	Answer: 18 / 6.5 = 2.77 eggs; eggs are counted in whole units, so at least 3 eggs (giving 19.5 g of protein).
7	(c) A 250 mL carton of milk contains 8 g of protein. If he drinks two cartons in a day, what percentage of his daily requirement is provided? (4 marks)	Answer: 8 x 2 = 16 g; 16 / 50 x 100 = 32.0%.
8	(d) Firm tofu contains 8 g of protein per 100 g. What mass of tofu provides 20 g of protein, and how much of a 300 g box is left? (4 marks)	Answer: 20 / 8 x 100 = 250 g; 300 - 250 = 50 g left.

3. Meal budgeting and unit cost (18 marks)

A family weekly shopping list: 5 kg of rice for 78 dollars, 12 eggs for 36 dollars, 2 L of milk for 42 dollars and 1.5 kg of vegetables for 27 dollars.

#	Question	Answer and marking notes
9	(a) Calculate the total spending on this weekly list. (4 marks)	Answer: 78 + 36 + 42 + 27 = 183 dollars.
10	(b) Calculate the price per kilogram of rice and of vegetables. (4 marks)	Answer: rice 78 / 5 = 15.60 dollars; vegetables 27 / 1.5 = 18.00 dollars.
11	(c) Calculate the price of one egg and the price of 100 mL of milk. (5 marks)	Answer: egg 36 / 12 = 3.00 dollars; milk 42 / 2000 x 100 = 2.10 dollars.
12	(d) If the same list is bought once a week, what is the spending for four weeks, and how much of a 3000 dollar monthly food budget is left? (5 marks)	Answer: 183 x 4 = 732 dollars; 3000 - 732 = 2268 dollars left.

4. Food safety and temperature control (18 marks)

The Centre for Food Safety states that chilled storage should be at 4 C or below, frozen storage at -18 C or below, and that 4 C to 60 C is the danger zone.

#	Question	Answer and marking notes
13	(a) What is the temperature span of the danger zone, and does a room temperature of 25 C fall inside it? (4 marks)	Answer: 60 - 4 = 56 C; 25 C lies between 4 C and 60 C, so it is inside the danger zone.
14	(b) To cool 2 kg of food from 25 C to 4 C, how much energy must be removed if the specific heat capacity is 3.2 kJ/(kg C)? (5 marks)	Answer: 2 x 3.2 x 21 = 134.4 kJ.
15	(c) Reheated leftovers must reach 75 C at the centre. Starting from 25 C and rising 9 C per minute, what is the minimum heating time in whole minutes? (4 marks)	Answer: (75 - 25) / 9 = 5.56 minutes, so 6 whole minutes.
16	(d) What is the difference between the chilled and frozen settings? If a power cut raises the freezer to -10 C, is the -18 C requirement still met? (5 marks)	Answer: 4 - (-18) = 22 C; -10 C is 8 C above the -18 C limit, so the requirement is not met.

5. Laundry and fabric care (16 marks)

The care label of a cotton shirt states: maximum washing temperature 30 C, do not bleach, tumble dry low. The dryer power is 1.2 kW.

#	Question	Answer and marking notes
17	(a) A load of laundry weighs 10.5 kg. The washing machine takes at most 7 kg per cycle and uses 42 L of water per cycle. How many cycles are needed and how much water is used? (4 marks)	Answer: 10.5 / 7 = 1.5, so 2 cycles are needed; 42 x 2 = 84 litres.

#	Question	Answer and marking notes
18	(b) Each cycle uses 30 mL of detergent and one bottle holds 1.5 L. How many cycles does a bottle last, and how many times can this load be washed? (4 marks)	Answer: 1500 / 30 = 50 cycles; 50 / 2 = 25 washes.
19	(c) Each cycle heats 42 L of water from 20 C to 30 C. Given a specific heat capacity of 4.2 kJ/(kg C), calculate the energy used per cycle. (4 marks)	Answer: 42 x 4.2 x 10 = 1764 kJ.
20	(d) Low-heat drying takes 1 hour per batch and electricity costs 1.5 dollars per kWh. Calculate the electricity used and the cost. (4 marks)	Answer: 1.2 x 1 = 1.2 kWh; 1.2 x 1.5 = 1.80 dollars.

6. Household spending and percentages (16 marks)

A household earns 24000 dollars a month. Spending: housing 9600, food 5400, transport 1800 and other items 7200 dollars.

#	Question	Answer and marking notes
21	(a) What percentages of the income go to housing and to food? (4 marks)	Answer: housing 9600 / 24000 x 100 = 40.0%; food 5400 / 24000 x 100 = 22.5%.
22	(b) What is the combined spending on food and transport, and what percentage of the income is it? (4 marks)	Answer: 5400 + 1800 = 7200 dollars; 7200 / 24000 x 100 = 30.0%.
23	(c) If the household wants to save 15% of its income, what is the saving target, and by what percentage must other spending fall to reach it? (4 marks)	Answer: 24000 x 0.15 = 3600 dollars; 3600 / 7200 x 100 = 50.0%.
24	(d) If rent rises by 5%, how much more is spent on housing each month, and what percentage of income does the new housing cost take? (4 marks)	Answer: 9600 x 0.05 = 480 dollars; 9600 + 480 = 10080 dollars, 10080 / 24000 x 100 = 42.0%.