JUNIOR CYCLE MATHS · FREE REVISION SHEET

Money: income tax, net pay & compound interest

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Learning outcomes (2018 specification): N.2c, U.6. Play the game: **leim.ie/payslip-puzzle.html**

1. Gross pay

Gross pay = pay before anything is taken off. Hours × rate: 38 × €15.50 = **€589**.

Overtime: time-and-a-half = 1.5 × the normal rate; double time = 2 × the normal rate. Only the extra hours get it. 52 weeks or 12 months in a year.

2. Income tax (standard rate)

Gross tax	20% of €40,000 = **€8,000**
− tax credit	€8,000 − €3,750 = **€4,250** tax payable
Net income	€40,000 − €4,250 = **€35,750**

The **tax credit** comes off the **tax**, never off the income. Backwards: (tax + credit) × 5 = gross income.

3. Two rates Higher Level

Up to the **standard rate cut-off point**: 20%. Above it: 40%. €52,000 with a €44,000 cut-off: €8,800 + 40% of €8,000 (€3,200) = €12,000 gross tax, then take away the credits.

4. Net pay

Net pay = gross − income tax − USC − PRSI − pension (and any other deductions). Higher Level may give a deduction as a %: PRSI at 4% of €750 = €30.

5. Compound interest

Each year's interest is worked out on the amount at the **start of that year**.

Year	Start	Interest 5%	End
1	€4,000	€200	€4,200
2	€4,200	€210	€4,410
3	€4,410	€220.50	**€4,630.50**

Quick way: 5% a year → × 1.05 each year: €4,000 × 1.05^3 = €4,630.50. Interest = €4,630.50 − €4,000 = **€630.50**.

Different rates: × 1.03 × 1.04 × 1.05. **Loans:** add the year's interest, THEN take off the repayment.

6. Working backwards Higher Level

Worth €4,410 after 2 years at 5%: €4,410 ÷ 1.05^2 = **€4,000**. Rate from €5,000 → €6,050 in 2 years: 6,050 ÷ 5,000 = 1.21, √1.21 = 1.1, so **10%**.

Classic mistakes: credit taken off the income · 1.5 used for 5% · interest on the first amount every year · interest given when the value is asked · taking 5% off twice to go back.

Exam tip: label each line (gross tax, tax payable, deductions, net pay; end of year 1, 2, 3). Each step earns marks. Give money to the nearest cent.

PRACTICE · 34 QUESTIONS

Have a go

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A. Gross pay and payslips

1. Aoife works 38 hours a week at €14.80 an hour. Find her gross pay for the week. _____
2. Cian earns €16 an hour for a basic 39-hour week and time-and-a-half for overtime. One week he works 44 hours. Find his gross pay. _____
3. Méabh works 4 hours on a Sunday at double time. Her normal rate is €15.50 an hour. How much does she earn for those hours? _____
4. Tadhg earns €680 gross a week. Find his gross pay for a year (52 weeks). _____
5. Ciara earns €42,000 gross a year. How much is that a month? _____
6. A payslip shows gross pay €745.00, income tax €58.40, USC €19.65 and PRSI €29.80. Find the net pay. _____

B. Income tax

7. Find 20% of a gross income of €36,000 (the gross tax). _____
8. Seán earns €36,000 a year and has a tax credit of €4,000. The standard rate is 20%. Find the tax he pays. _____
9. Find Seán's net income in question 8 (no other deductions). _____
10. Róisín earns €52,500 a year with a tax credit of €3,750. Tax is 20%. Find her tax payable. _____
11. Oisín earns €820 gross a week. His weekly tax credit is €75 and tax is 20%. Find his tax for the week. _____
12. Niamh pays €5,100 income tax. Her tax credit is €3,900 and the rate is 20%. Find her gross income. _____
13. *Higher Level:* Eoin earns €58,000. Cut-off point €44,000, rates 20% and 40%, tax credits €4,000. Find his tax. _____
14. *Higher Level:* Gross pay €900 a week; tax €96, USC €27, PRSI 4% of gross. Find the net pay. _____

C. Compound interest

15. €2,000 is saved at 5% compound interest a year. Find the interest for the first year. _____
16. Find the value of the €2,000 in question 15 after 2 years. _____
17. Find the value of the €2,000 after 3 years. _____
18. How much interest is earned altogether in question 17? _____
19. €8,000 earns 2% in year 1 and 3% in year 2 (compound). Find its value after 2 years. _____
20. What do you multiply by to add 3.5% interest? _____
21. Kate borrows €6,000 at 4% compound interest. She repays €2,000 at the end of year 1. How much does she owe at the end of year 2? _____
22. *Higher Level:* After 2 years at 4% compound interest an investment is worth €10,816. How much was invested? _____

D. Putting it together

23. Gross income €48,000; income tax €5,700, USC €1,050, PRSI €1,920. Find the net income. _____
24. €10,000 for 2 years: Account A pays 4% each year; Account B pays 2% then 6%. Which is worth more, and by how much? _____
25. Ella's gross pay of €600 a week goes up by 5%. Find her new gross pay. _____
26. All of Ella's rise is taxed at 20%. How much more take-home pay does she get each week? _____
27. Gross pay €2,900 a month; deductions €610 a month. Find the net pay for a year. _____
28. Income €40,000, tax payable €4,000. What percentage of the income is the tax? _____
29. €1,500 is saved for 3 years at 3% compound interest. Find its value to the nearest cent. _____
30. *Higher Level:* €8,000 grows to €8,820 in 2 years at the same compound rate. Find the rate. _____

Questions 31–34 are on the next page.

EXAM-STYLE · THEN CHECK

Exam corner + answers

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E. Exam-style questions (show your work)

31. **The payslip.** Eoin earns €15.60 an hour for a basic 37-hour week and time-and-a-half for overtime. One week he works 44 hours. (a) Find his gross pay. (b) His weekly tax credit is €76 and tax is 20%. Find his tax. (c) He also pays USC of €18.35 and PRSI of €29.64. Find his net pay.

32. **Nóra's savings.** Nóra invests €12,000. The account pays 2.5% compound interest in years 1 and 2 and 4% in year 3. (a) Find the value at the end of each year. (b) Find the total interest. (c) Is that more or less than 9% of €12,000? Why?

33. **The car loan.** Aaron borrows €4,500 at 6% compound interest a year. He repays €1,500 at the end of year 1 and €1,500 at the end of year 2. How much does he owe at the end of year 3, to the nearest cent?

34. *Higher Level:* Ronan earns €71,000 a year. Cut-off point €44,000, rates 20% and 40%, tax credits €4,000. He pays USC of €2,300 and PRSI at 4% of his gross income. (a) Find his income tax. (b) Find his net income. (c) What percentage of his gross income is taken off altogether?

Answers

A	1. €562.40 · 2. €744.00 · 3. €124.00 · 4. €35,360.00 · 5. €3,500.00 · 6. €637.15
B	7. €7,200.00 · 8. €3,200.00 · 9. €32,800.00 · 10. €6,750.00 · 11. €89.00 · 12. €45,000.00 · 13. €10,400.00 · 14. €741.00
C	15. €100.00 · 16. €2,205.00 · 17. €2,315.25 · 18. €315.25 · 19. €8,404.80 · 20. 1.035 · 21. €4,409.60 · 22. €10,000.00
D	23. €39,330.00 · 24. A, by €4.00 · 25. €630.00 · 26. €24.00 · 27. €27,480.00 · 28. 10% · 29. €1,639.09 · 30. 5%
E	31. (a) €577.20 + 7 × €23.40 = **€741.00** (b) €148.20 − €76 = **€72.20** (c) **€620.81** · 32. (a) **€12,300.00**, **€12,607.50**, **€13,111.80** (b) **€1,111.80** (c) more than €1,080: interest is earned on interest · 33. Y1 €4,770 − €1,500 = €3,270.00; Y2 €3,466.20 − €1,500 = €1,966.20; Y3 × 1.06 = **€2,084.17** · 34. (a) €8,800 + €10,800 − €4,000 = **€15,600.00** (b) PRSI €2,840.00; net **€50,260.00** (c) **29.2%**

Got one wrong? Check: did you take the tax credit off the TAX (not the income)? Did you take off EVERY deduction for net pay? For compound interest, did you work out each year's interest on the NEW amount, and did you give the value or the interest, whichever was asked? Then play **Payslip Puzzle** at leim.ie/payslip-puzzle.html: the "Go back over these" list at the end shows the rule for each mistake.

All questions written by Léim. Léim is independent and not connected with the State Examinations Commission or the NCCA. Tax rates, credits and cut-off points here are examples; the exam always gives you the figures to use.