HAWKER COLLEGE
Engage | Inspire | Achieve

MA1
Consumer arithmetic

Goals

This week the work is on

- Wages and Salaries
- Overtime
- Allowances
- Commission and Other Income
- Government payments
- Taxation
- Budgeting

Theoretical Components

Resources:
PDF file: Week 5/6 Notes and Exercises

Knowledge Checklist
- What is a wage, what is a salary?
- Time-and-a-half, double time, and holiday loading
- Gross income, net income
- Commission
- Receiving an allowance
- Terminology associated with taxation; gross income, net income, taxable income, tax rates, deductions, Medicare levy
- Calculating income
- Calculating tax
- What is a budget and why is it important?

Order
1. Read through the notes and examples
2. Work through the exercises
3. Complete the investigation at the end of the booklet.
4. Complete the reflection at the end of the booklet
5. Come and see your teacher and make sure you are up to date.

Practical Components

Work through the exercises and show the completed tasks to your teacher.

Be sure to ask for help as you need for the successful completion of all tasks.

Remember to regularly check Google Classroom for messages.

Investigation

Complete the task at the end of the booklet and submit your work for checking. 😊

Other

Google classroom --- Complete the Worksheet on **Earning Money**

WAGES AND SALARIES

People earn money in different ways. However, the most common sources of income people receive are wages and salaries. Let's start by defining these terms.

A **wage** is an amount paid to an employee at a certain rate. It may be calculated as a fixed task-based amount, or at an hourly rate, or based on the quantity of work done (e.g. piecemeal work). So, if you are paid per hour, your wage will increase the more hours you work.

In contrast, a **salary** is a fixed income that is based on a fixed number of working hours. People normally sign a contract with an agreed salary amount before they start working with a company. An employee may receive a weekly, fortnightly, or monthly salary. The employee will receive the same amount of income each time period, regardless of whether they work more or less hours, as it is thought this will be averaged out. A salary is normally written as an annual amount. However, it can be helpful to calculate how much money you'll receive each week, to help you set a budget for your spending. Similarly, you may want to work out how much money you will earn in a year based on the amount you get paid fortnightly. So, let's look at some examples of how to solve questions involving salaries and wages.

> Remember
>
> - There are 52 weeks in a year.
> - There are 2 weeks in a fortnight.
> - There are 26 fortnights in a year.

Example

Mary worked at a childcare centre for 37 hours and got paid $16.40 per hour. Calculate her earnings for the week.

Solution

Weekly earnings = hours worked x wage per hour

= 37 x $16.40

= $606.80

1. Christa earns $21 per hour working as a receptionist. If she works 19 hours per week, how much is her weekly wage?

2. Find the annual salary of a worker whose weekly pay is $307. Assume that there are 52 weeks in the year.

3. Noah's annual salary is $90 282. If Noah gets paid monthly, calculate his monthly income, giving your answer correct to the nearest cent.

4. Dave has a job that pays him $21 per hour. Assume a working week of 38 hours.

   a) Calculate his weekly income.

   b) Calculate his fortnightly income

   c) Calculate his annual income.

   d) Calculate his monthly income (to the nearest cent).

5. Han earns $18.00 per hour from 9am-5pm and $27.00 per hour outside business hours (assume Han has paid breaks). Calculate his income, to the nearest cent, for the shifts that he worked between the following times:

    a) 9am to 5pm

    b) 11am to 4pm

    c) 6am to 4pm

    d) 10am to 11pm

    e) 5am to 10pm

6. Neil's contract is based on a 30-hour working week and an hourly rate of $20. Amelia's contract is based on an annual salary of $33 040.

    a) What is Neil's weekly income?

    b) What is Amelia's weekly income (to the nearest cent)?

    c) Who has the higher weekly income? Amelia or Neil?

    d) How much higher is Amelia's weekly income compared to Neil's?

Overtime refers to any hours worked by an employee that exceed their normally scheduled working hours. While a generalized overtime definition refers simply to those hours worked outside of the standard working schedule, overtime commonly refers concurrently to the employee's remunerations of such work.

Common overtime rates

Time-and-a-half: payment to an employee at 1.5 times their usual hourly rate.

Double time: payment to an employee at 2 times their usual hourly rate.

Example

If the normal rate is 13.40 per hour:

A) What is the time-and-a-half rate? Give your answer correct to two decimal places.

Think: We need to work out what 1.5 times the normal rate is.

Do:

$$13.40 \times 1.5 = 20.1$$
$$= \$20.10 \text{ (to 2 d.p.)}$$

B) What is the double rate? Give your answer correct to two decimal places.

Think: We need to work out what two times the normal rate is.

Do:

$$13.40 \times 2 = 26.8$$
$$= \$26.80 \text{ (to 2 d.p.)}$$

EXERCISE 2

1. If the normal rate is $13.40 per hour:

   a) What is the time-and-a-half rate? Give your answer correct to two decimal places.

   b) What is the double time rate? Give your answer correct to two decimal places.

2. A computer operator is paid $20.50 per hour. She works 9 hours per day, Monday to Friday, and 5 hours on Saturday, for which she is paid time-and-a-half. Calculate her weekly wage.

3. A trainee nurse works 36 hours at an ordinary rate of $17.44 and 10 hours at time-and-a-half. Calculate her total pay.

4. On a long weekend, a waitress is paid time-and-a-half on Sunday and double time on Monday. How much does she earn for working 9 hours on each of the days if her normal wage is $17.54 per hour?

5. A chef earns $23.10 per hour, but is paid time-and-a-half for working after 8:00 p.m. on weekdays and any time on weekends. The timesheet below shows the times he worked last week. Complete the table, then calculate the chef's total pay for the week.

Day	Start time	Finish time	Normal hours	Overtime hours
Monday	12:00 noon	6:00 p.m.		
Tuesday	12:00 noon	6:00 p.m.		
Wednesday	12:00 noon	7:00 p.m.		
Thursday	12:00 noon	10:00 p.m.		
Friday	12:00 noon	12:00 midnight		
Saturday	4:00 p.m.	12:00 midnight		
Sunday	4:00 p.m.	10:00 p.m.		
		Total hours		

Allowances

When we talk about receiving an allowance, we can either talk about receiving an allowance from our employer or from the government. You'll see more about government allowances in a later chapter.

Let's focus now on the types of allowances you commonly receive from your employer.

Holiday loading

A holiday loading is a payment employees receive when they take paid annual leave. In Australia, the award rate is 17.5% in addition to your regular rate of pay. So basically you're getting paid to take holidays- sounds awesome right?!

There are a couple of reasons why holiday loadings were introduced

Since you generally spend more money when you are on holidays than when you are at work, holiday loadings help people with lower incomes afford to take holidays (especially since they are unable to earn overtime when they aren't working).

It encourages employees to take holidays. Theoretically, a person could "save up" all their annual leave and then take a year off which wouldn't be very helpful to a business who would have to pay the person who is away + someone to fill their role.

Allowances

Just like you may receive a weekly allowance from your parents, allowances in terms of employment are additional amounts of money employers pay their employees for various work-related expenses. This may include a car or travel allowance, a tool allowance or a uniform allowance depending on your job.

Depending on your job, there are also allowances that you might be paid to do dangerous or unpleasant work. For example, you might be paid an extra allowance, on top of your salary, to work high up on a tall building, or for doing work that requires deep sea diving.

Example

Neil, a miner, receives allowances of $1.40 per hour for working in confined spaces, 70 cents per hour for being exposed to potentially toxic substances during work, and 80 cents per hour for the noise caused by general mining operations. Calculate the total value of Neil's allowances when he works 38 hours.

| **Hide Solution** | ▶ Watch video | Try this problem! |

Sum the three hourly allowances. Then multiply this by the total number of hours worked.

$$= (1.4 + 0.7 + 0.8) \times 38 \text{ dollars}$$

Evaluate the sum.

$$= 2.9 \times 38 \text{ dollars}$$

Use your calculator to evaluate.

$$= 110.20 \text{ dollars}$$

EXERCISE 3

1. A worker receives an allowance of $0.50 per hour for performing unpleasant work. What is the total value of this allowance if he works 37 hours?

2. Maria, a window cleaner, receives a height allowance of $0.90 per hour. If her normal hourly rate is $24.80, find:

a) Her normal weekly wage without allowances (assuming a 35 –hour working week).

b) Her gross weekly income (including allowances).

c) Her annual gross income if she works every week of the year.

3. Calculate the holiday loading for a worker who is given 17.5% of 4 weeks normal pay, and earns:

    a) $3760 in 4 weeks. Round your answer to 2 decimal places if necessary.

    b) $2150 in a fortnight. Round your answer to 2 decimal places if necessary.

    c) $650 a week. Round your answer to 2 decimal places if necessary.

    d) $150000 per year. Round your answer to 2 decimal places if necessary.

4. James, a pest inspector, is paid $17.00 per hour. In addition, he is paid allowances of $1.50 per hour for being exposed to potentially toxic substances, 50 cents for exposure to potentially dangerous insect bites and 70 cents for wet work. Assuming a 39 –hour working week, find:

    a) His weekly wage before allowances.

    b) His gross weekly income including allowances.

    c) His holiday loading at 17.5% of 4 weeks' normal income.

    d) The total amount he will receive when he takes his 4 weeks' holiday.

COMMISSION

What is Commission?
A commission is a fee paid to an agent as compensation for executing a transaction. It is calculated either as a percentage of the transaction value or as a flat fee.

How Does Commission Work?
Example

Let's assume you would like to purchase 100 shares of Company XYZ at $35 per share, and your broker charges a 2% commission to make the trade.

The shares themselves would cost $3,500 ($35 x 100 shares), but the broker would also need to be paid for finding someone to sell the shares to you. For their services, they would charge $70 ($3,500 x 2%). The total cost of the transaction would be $3,500 + $70 = $3,570.

Four months later, you decide to sell your XYZ shares. Now selling at $50, you would receive $5,000 ($50 x 100 shares) from the sale. But once again, the brokerage would take 2% ($100), so the actual proceeds from the transaction would total $4,900 ($5,000 - $100).

EXERCISE 4

1. Calculate the income earned for the following amounts of piecework:

   a) washing 24 cars at $10 per car

   b) baking 26 croissants at $7 per croissant

   c) sewing 84 shirts at $8 per shirt

2. A process worker earns $3 for each article assembled. Calculate the number of articles he has to assemble to earn $2400.

3. Sally is paid 7% on the first $2600 of goods sold and 1% on any value thereafter. Goods to the value of $15400 are sold.

   a) Calculate the commission earned on the first $2600 of goods sold.

   b) Calculate the commission earned on the amount of goods sold in excess of $2600.

   c) What is the total commission earned?

4. Dave sold motorbikes to the value of $66000 in one week. His pay for the week was $2434, which comprised a retainer plus a commission of 2.9% on his sales. What retainer was Dave paid?

5. Sally is paid a retainer of $210 per week plus a commission based on her weekly sales. In one week, she sells $9800 worth of lighting. Her total pay for the week was $504.

        a) How much commission did she earn?

        b) What is Sally's commission rate? Give your answer as a percentage.

6. Amelia earns a weekly retainer of $300 plus a commission of 4.6% based on sales of airline tickets. If she is aiming to earn $1183.20 each week, what value of ticket sales must she achieve?

WHAT DO YOU GET TAXED ON?

We've already learnt about people earning wages and salaries. However, most people don't get to keep all of the money they earn. They must pay tax, which is a percentage of their income paid to the government based on their taxable income. Taxes are used to fund public projects like schools, hospitals and roads. Depending on where you work, each year you or your employer will have to lodge a tax return, so knowing how to calculate your taxable income is important.

You'll need to know the difference between your GROSS income and your NET income. Your gross income is all the money you earn. Your NET income is the amount you actually get paid AFTER tax is taken out. Think of this fishing analogy to help you remember: if you lifted your net out of the gross ocean, all the tax and deductions would drain away and all that would be left in the net is the big, juicy amount of money you get paid.

Terminology

Gross income: the amount of income you receive before tax and deductions.

Net income: the amount of income you receive after tax and deductions.

Taxable income: the income you are required to pay tax on.

Tax rates: The different tax amounts people are required to pay. This varies depending on your taxable income.

Deductions: expenses that are directly related to earning your income which you are allowed to subtract from your gross income. These include uniform expenses, vehicle and travel expenses, self-education expenses, as well as charitable donations.

Medicare levy: a tax of 2% of one's taxable income paid by most Australian taxpayers that is used to provide Australian residents with access to public health care.

Calculating Your Income

Each pay period (whether it's weekly, fortnightly, or monthly), your employer will take out a percentage of your income as tax, which is based on your gross income. However, you may have deductions that you can subtract from your gross income, which in turn will reduce your taxable income. If this is the case, and you have paid more tax than you needed to, you may be eligible for a tax return.

However, prior to lodging tax returns, it's also helpful to be able to calculate your net income, so you know how much money you will RECEIVE each pay period. To do this, you need to subtract the amount of tax you are required to pay from your gross income. Then you can divide this net amount to find your weekly net wage, monthly net wage etc.

Examples

1. Calculate the net **weekly** wage of a carpenter who must pay 16% tax on an annual salary of $38080. Give your answer correct to two decimal places.

Think: What would his annual net salary be? Remember that there are $52 weeks in a year.

Do: His annual net salary would be 100−16, or 84% of his gross income:

$0.84 \times 38080 = \$31987$

Then, to calculate his net weekly income:

$\$31987.20 \div 52 = \$615.14$

2. Sharon is a project manager with a taxable income of $89192. Throughout the year, her employer has deducted $412 per week in tax instalments.

The taxable income rates for individuals is provided in the table.

Taxable income	Tax on this income
0 – $18,200	Nil
$18,201 – $45,000	19 cents for each $1 over $18,200
$45,001 – $120,000	$5,092 plus 32.5 cents for each $1 over $45,000
$120,001 – $180,000	$29,467 plus 37 cents for each $1 over $120,000
$180,001 and over	$51,667 plus 45 cents for each $1 over $180,000

a) *Calculate the tax payable to the nearest cent.*

Sharon's taxable income lies in the range of $45001 - $120000.

This means she needs to pay $5092 plus an additional amount, found as follows.

$89192 exceeds $45000 by $44192. This amount is taxed at 32.5 cents in the dollar.

$44192 × 0.325 = $14362.40

Thus the total tax payable is $5092.00 + $14362.40 = $19454.40

b) *Calculate the Medicare Levy, which is 2% of taxable income.*

The taxable income is $89192. We can find 2% of this amount.

$\frac{2}{100}$ × 89192 = $1783.84

Medicare Levy is $1783.84

c) *Is Sharon entitled to a refund?   Sharon needs to pay the total of her tax and the Medicare Levy but she has already paid $412 each week.*

Thus she has paid $412 × 52 = $21424 already.

Her tax and Medicare Levy come to $19454.40 + $1783.84 = $21238.24

Now $21424 - $21238.24 = $185.76

Thus Sharon is entitled to a refund of $185.76

1. For a gross income of $52000, calculate the net income when tax is $11100.

2. If tax is stated as being 15.9 cents in the dollar, what percentage tax is this?

3. Medicare Levy is charged at 2% of taxable income. Calculate the Medicare levy on a taxable income of $60000.

4. Calculate the net weekly wage of a carpenter who must pay 16% tax on an annual salary of $38080. Give your answer correct to two decimal places.

5. Calculate the percentage of gross income going to taxes, correct to 2 decimal places, when:

(Note: Don't forget to include the percentage symbol where required)

      a) gross income is $56000 and income tax is $15000

      b) gross income is $49000, income tax is $13000.

6. Amelia's employer deducts a percentage of her income in tax. She sees the fortnightly amount deposited into her account is $1964 and knows that she earns an annual gross income of $63830.00 .

      a) Use the amount deposited in her account to calculate her net annual income.

      b)   Hence, calculate the rate at which she is being taxed. Give your answer to the nearest whole percentage.

7. Use the tax table provided below to answer the following questions.

Taxable income	Tax on this income
0 – $18,200	Nil
$18,201 – $45,000	19 cents for each $1 over $18,200
$45,001 – $120,000	$5,092 plus 32.5 cents for each $1 over $45,000
$120,001 – $180,000	$29,467 plus 37 cents for each $1 over $120,000
$180,001 and over	$51,667 plus 45 cents for each $1 over $180,000

Calculate the tax payable, to the nearest cent, on a taxable income of:

a) $5347

b) $22968

c) $78671

8. Dave is a teacher who earns an annual salary of $78600. He earns an additional $4660 per year from private tutoring. He is allowed various tax deductions (for resource books etc.) amounting to $852 and he has paid tax instalments of $18430 during the year. Find:

a) his taxable income

b) tax on taxable income

c) 2% Medicare levy

d) tax on taxable income plus Medicare levy

e) the tax refund or amount still owing

9. Sally earns an annual income of $50000. With tax deductions of $1300 and having already paid $7900 in tax instalments throughout the year, calculate her:

a) taxable income

b) tax payable to the nearest cent.

c) Medicare levy (2% of taxable income).

d) the tax refund or tax payable amount.

Greg is 18 years old and is investigating the real cost of owning and running a second-hand car.

- He wants to buy a 2016 Holden Barina for $15000
- He will need to take out a personal loan to cover the cost of the car. The personal loan has an interest rate of 7% p.a. simple interest and he wants to repay the loan in 3 years.
- He wants to get comprehensive insurance and gets a quote for $1150 a year.
- He budgets that it will cost approximately $600 a year for services. He also allows $400 a year for repairs and tyres.
- The car has a fuel consumption of 7L/100km. Greg estimates that he will travel around 15000 km in a year. He is budgeting on the average price of fuel being $1.80 per litre.
- Greg contacted the transport authority and found that the cost of the registration (including compulsory third-party insurance) will cost $800 a year.
- He decides to get a basic membership for roadside assistance. The membership deal for 18-year-olds is $44.

a) Complete the following table.

Budgeting for a car	
Total paid for car	
Personal loan interest rate	
Term of loan (years)	
Fuel consumption rate (L/100km)	

Costs	Annual cost	Weekly cost
Loan interest		
Loan repayment		
Insurance		
Services, repairs and tyres		
Fuel		
Registration		
Roadside assistance		
Total cost of car		

b) What is the cost of Greg's car per week?

c) Greg earns $324 per week from his apprenticeship. He decides that he really can't afford that much of his pay going towards a car. What is the difference in the cost per week if:

    i.   he decides to get 3rd party property insurance for $240 a year, instead of comprehensive.

    ii.   he decides to go with a different car that costs $8000 and has a fuel consumption of 8 L/100 km. He stays with the 3rd party property insurance on this car and all the other costs are approximately the same.

MARKING RUBRIC

CRITERIA	EXPECTATIONS	POSS	MULT	GIVEN	TOTAL
Practical	Student completes practical work of the brief to an acceptable standard set by the teacher.	2	3		/6
Investigation	Student completes the investigation task of the brief to an acceptable standard set by the teacher.	2	2		/4
Reasoning and Communications	Student responses are accurate and appropriate in presentation of mathematical ideas in different contexts, with clear and logical working out shown.	4	-		/4
Concepts and Techniques	Student submitted work selects and applies appropriate mathematical modelling and problem-solving techniques to solve practical problems, and demonstrates proficiency in the use of mathematical facts, techniques and formulae.	4	-		/4
Submission Guidelines					
Timeliness	Student submits the practical work and investigation by the set deadline. See scoring guidelines for specific details.	2	-		/2
		FINAL			/20

Student Reflection:

How did you go with this week's work?

What was interesting?

What did you find easy?

What do you need to work on?