## **Exploring financial sustainability through maths and statistics**

This resource encourages students to apply their maths skills and knowledge within the context of financial sustainability. Students explore investments/whakangao, Insurance/inihua, KiwiSaver and retirement/whakatā.

This is an integrated, cross-curricular resource, supporting the theme **sustainability** and can be used in multiple ways. Related resources are available for health and social sciences.

Important readings:

* [Financial sustainability resource introduction](http://sortedinschools.org.nz/sorted-resources/financial-sustainability/)
* [Pedagogy and methodology](http://www.sortedinschools.org.nz/teachers/curriculum-info/pedagogical-design/) overview for the frameworks underpinning the development of this resource.

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| **Mathematics and statistics achievement objectives**  In a range of meaningful contexts, students will be engaged in thinking mathematically and statistically. They will solve problems and model situations that require them to:  **Number and Algebra, Level Four**   * Understand addition and subtraction of fractions, decimals, and integers * Find fractions, decimals, and percentages of amounts expressed as whole numbers, simple fractions, and decimals * Apply simple linear proportions, including ordering fractions * Know the equivalent decimal and percentage forms for everyday fractions * Know the relative size and place value structure of positive and negative integers and decimals to three places * Form and solve simple linear equations   **Number and Algebra, Level Five**   * Reason with linear proportions * Understand operations on fractions, decimals, percentages, and integers * Use rates and ratios * Know commonly used fraction, decimal, and percentage conversions * Know and apply standard form, significant figures, rounding, and decimal place value * Form and solve linear and simple quadratic equations   **Geometry and Measurement, Level Four**   * Convert between metric units, using whole numbers and commonly used decimals * Use side or edge lengths to find the perimeters and areas of rectangles, parallelograms, and triangles and the volumes of cuboids.   **Geometry and Measurement, Level Five**   * Select and use appropriate metric units for length, area, volume and capacity, weight (mass), temperature, angle, and time, with the awareness that measurements are approximate * Convert between metric units, using decimals * Deduce and use formulae to find the perimeters and areas of polygons and the volumes of prisms * Find the perimeters and areas of circles and composite shapes and the volumes of prisms, including cylinders | | |
| **Specific learning objectives**  For a detailed list of specific learning objectives, please refer to the [maths assessment rubric.](http://sortedinschools.org.nz/sorted-resources/financial-sustainability/maths-assessment/) | | |
| **Design Brief**  A tiny house/whare is much smaller than a traditional one. More and more people are choosing to build and live in tiny houses/whare because:   * Many people can’t afford to buy a larger house/whare * There isn’t enough land that can be used for housing * Smaller houses/whare are better for the environment. For example, smaller houses/whare use fewer materials. They also use less power to light and heat * Living in a small house/whare can help people to live in a simpler way * People who already own a house/whare can pay off their mortgages faster by selling and buying a tiny house/whare, giving them more money to spend or save.   Ideally, tiny houses/whare are built using materials that are:   * From the immediate area * Safe * Environmentally friendly * Recycled   You have been asked to design a tiny house/whare for a retired person or couple that has a floor area of no more than 35 m².  The house/whare needs to:   * Have sleeping spaces for 3 people * Be able to host at least 6 people * Have the same appliances as a standard house/whare, for example, a washing machine, fridge, and oven * Let in as much sun as possible for heating and light.   As an extension, you may like to limit the weight of the house/whare to 3500 kg.  The following websites provide free house/whare-planning apps that may be helpful for this activity:   * [Planner 5D](https://planner5d.com/?prcode=53b8ac) * [Roomstyler 3D](https://roomstyler.com/3dplanner) | | |
| **Designing a tiny house** | | |
| NEED IT/KNOW IT | LINK IT/THINK IT | EXTEND IT/DEFEND IT |
| Think about your house/whare and the spaces that are in it. **List** the areas that are most important to you.  **Describe** the spaces that you spend the most time in each day.  **Define** [tiny house/whare](https://www.nzgeo.com/stories/tiny-houses/). **Identify** the floor area of most tiny houses/whare. Read [Build Tiny NZ](https://www.buildtiny.co.nz/) for more information.  **List** common features of houses/whare, for example, living spaces and appliances.  **Investigate** what the building rules are for tiny houses/whare, for example, whether you can build one on any piece of land. | **Compare and contrast** the way space is used in a tiny home with the way it is used in a larger home.    [**Interview**](http://sortedinschools.org.nz/sorted-resources/financial-sustainability/questions-for-interview-with-a-grandparent-or-retiree/) a grandparent or retired person about what it is like to be retired. Ask questions about how and where they live (living arrangements) have changed. Record your interview.  **Make connections** between the needs of a retired person and your [tiny house/whare activity](http://sortedinschools.org.nz/api/v1.0/download?filename=building-a-tiny-house&files=280).  **Calculate** the surface area of the geometric shapes used in your tiny house/whare floor plan.  **Calculate** the volume of the geometric shapes used in your tiny house/whare floor plan.  **Explain** the features of your tiny house/whare. Use mathematical equations and symbols to explain your thinking. | **Create** a draft plan of a tiny house/whare. Include a floor plan that identifies key features.    **Create** a final plan of a tiny house/whare. Include a floor plan layout that meets necessary specifications. Include your calculations of surface area and volume.  Use the [activity brief](http://sortedinschools.org.nz/api/v1.0/download?filename=building-a-tiny-house&files=280) to **evaluate** your final tiny house/whare plan. Justify its layout and include any calculations you have made. Get feedback from the grandparent or retired person you interviewed and include this in your evaluation. |
| **Planning for retirement/whakatā: setting a goal** | | |
| NEED IT/KNOW IT | LINK IT/THINK IT | EXTEND IT/DEFEND IT |
| **List** common sources of income in retirement/whakatā.  **List** the financial needs of someone your age and a retiree.  **Describe** the different types of funds provided through KiwiSaver.  [KiwiSaver: Choosing Providers and Funds](https://sorted.org.nz/guides/kiwisaver/kiwisaver-which-fund-suits/).  **Read** this [blog post](https://sorted.org.nz/must-reads/kiwisaver-funds-that-adjust-as-you-age/) and discuss when people should start preparing for retirement/whakatā.  **Investigate** which KiwiSaver fund is best for each of these life stages:   * Starting work/mahi or studying (age 16 to 25) * Working (age 26 to 45) * Getting close to retirement/whakatā (age 46 to 65) | **Compare and contrast** different contributions to KiwiSaver using this [Sorted KiwiSaver calculator](https://sorted.org.nz/tools/kiwisaver-savings-calculator). To do this, you will need to make up a salary and choose different levels of contribution.  Based on your interview with a retired person, **compare and contrast** the financial needs and wants of someone your age and a retiree.  **Investigate** different types of providers of [KiwiSaver plans](https://sorted.org.nz/guides/kiwisaver/kiwisaver-which-fund-suits/) through different management asset firms. Select a provider and **analyse** your KiwiSaver growth in the selected fund type.  **Calculate** the fortnightly and annual KiwiSaver contributions for a person with an income of $48,000 based on these contribution rates:   * 3 % * 6% * 4% * 8% * 10%   **Calculate** the fortnightly and annual KiwiSaver contributions for a person with an income of $80,000 based on these contribution rates:   * 3% * 4% * 6% * 8% * 10% | **Create** a retirement/whakatā plan, using this [Sorted KiwiSaver calculator](https://sorted.org.nz/tools/kiwisaver-savings-calculator), then use this [investor kickstarter](https://sorted.org.nz/tools/investor-kickstarter) to work out which KiwiSaver fund suits you best. **Justify** your choice.  Based on your interview with a retired person, **generalise** whether the needs and wants of the person you interviewed are sustainable.  **Evaluate** the contributions to KiwiSaver that you analysed. **Justify** through mathematical statements which contribution you would choose for the different incomes. |
| **Investing - learning when and what to invest** | | |
| NEED IT/KNOW IT | LINK IT/THINK IT | EXTEND IT/DEFEND IT |
| **Define** financial sustainability.  **Describe** your values, attitudes, behaviours, and skills related to saving, spending and investment/whakangao.  **Read** this [blog post](https://sorted.org.nz/guides/saving-and-investing/about-investing/) and use it as a discussion starter to explore different types of investments/whakangao.  **Investigate** resources you can use to learn about investing.  [Take the Sorted investor kick- start quiz.](https://sorted.org.nz/tools/investor-kickstarter) | **Analyse** the strengths and weaknesses of your [investor personality.](https://sorted.org.nz/tools/investor-kickstarter) **Explain** why you have classified them this way.  **Compare** the interest rates offered for different saving options, for example, term deposits, shares, and KiwiSaver.  **Calculate** the potential return (money earned from investment/whakangao),  or at least two [types of investments/whakangao](https://sorted.org.nz/guides/saving-and-investing/kinds-of-investments/), for example, savings accounts, term deposits, bonds or shares. | Show **evidence** of investing over a short period of time and any money you made in the process.  **Complete** the [Managing debt: Is credit the way to go?](http://sortedinschools.org.nz/api/v1.0/download?filename=managing-debt-is-credit-the-right-way-to-go&files=51) activity.  **Evaluate** the best options short- and long-term options for saving and investing. |
| **Insurance/inihua - knowing your options.** | | |
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| **Read** [this article](https://sorted.org.nz/guides/protecting-wealth/insurance-types/) and **list** the different types of insurance/inihua in Aotearoa New Zealand.  **Describe** different types of house/whare and contents insurance/inihua in Aotearoa New Zealand:  [Insurance Council of New Zealand website.](https://www.icnz.org.nz/understanding-insurance/types-of-insurance/house-and-contents/)  **Watch** [Insuring Your Assets - WestPac NZ](https://www.youtube.com/watch?v=dzP0A5a33lE).  **Identify:**   * Three main types of asset insurance/inihua * Some benefits of having asset insurance/inihua.   **Identify** the items in the [building a tiny house/whare activity](http://sortedinschools.org.nz/api/v1.0/download?filename=building-a-tiny-house&files=280) that can be insured. | **Calculate** the contents value of your [tiny house/whare](http://sortedinschools.org.nz/api/v1.0/download?filename=building-a-tiny-house&files=280).  **Compare** the price of contents insurance/inihua from two or more insurance/inihua providers. [CanStar Blue Rating website](https://www.canstarblue.co.nz/banking-insurance/home-contents-insurance/) can help you to find different providers.  **Analyse** the impact of changing the excess of a contents insurance/inihua policy.  **Analyse** the strengths and weaknesses of different excess amounts for a content policy. **Explain** which option you think is best. | **Justify** your choice of insurance excess in the [insurance/inihua - knowing your options activity](http://sortedinschools.org.nz/api/v1.0/download?filename=insurance-knowing-the-options&files=281), using clear mathematical statements.  **Generalise** about the relationship you can see between the excess level you choose and the cost of an insurance policy. |