

Declining Balance



Teacher Notes and Answers

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Worksheet



Student



30 min

Introduction

Teacher Notes: Encourage students to watch the video. Students can be shown how to use logarithms for some questions to obtain a 'precise' answer, however the intention is to understand that declining balance is non-linear. The taxation question (4) is a slightly simplified version of the ATO's actual process so that items do not depreciate 'for every'.

"Price is what you pay, value is what you get" [Warren Buffet]. When it comes to finance, value is not what you assign, rather what someone else is prepared to pay. If that amount is less than what you paid, the item has depreciated. Items depreciate at different rates, this activity focuses on the declining balance method.



Example Calculations

Sample Question

The rate at which something depreciates often depends on its current value. Suppose you paid \$40,000 for a new car back in 2014. In 2015 the car may have been valued at \$36,000. Your car is now worth \$4,000 less than what you paid, its value has declined or depreciated. If the car continued to depreciate at this rate it would have no value in 10 years. This is generally not the case. Depreciation often occurs as a percentage of its value. From 2014 to 2015 the car depreciated by 10%. If the car depreciates by a further 10% in 2016, the amount is based on its 2015 value of \$36,000. So in 2016 the car depreciated by \$3,600. This type of depreciation is called the reducing balance method.

Create a table to determine what the car will be worth in 2021. Watch the video to see different ways these amounts can be calculated and to check your answer.

Year	2014	2015	2016	2017	2018	2019	2020	2021
Value	\$40,000	\$36,000						
Depreciation	\$4,000	\$3,600						

Question: 1.

Emily buys a new gaming console for \$2,400. The console depreciates at a rate of 25% based on the declining balance. What will the gaming console be worth in 4 years? **Answer: \$759.38 m**

Question: 2.

Rodney purchases a new bicycle for \$3,600. The bicycle depreciates at a rate of 20% based on the declining balance.

- What will the bicycle be worth in 3 years? **Answer: \$1,843.20**
- How much does the bicycle depreciate in the 4th year? **Answer: \$368.64**

- iii) How many years does it take for the bicycle is worth less than \$1,000?

Answer: 5 years. Student may recursion, lists or a more formal approach, logarithms.

Question: 3.

Anja purchases a new car for \$70,940. The car depreciates at a rate of 15% per year based on the declining balance.



- i) Complete the table of values for the first 8 years.

Answer: See table

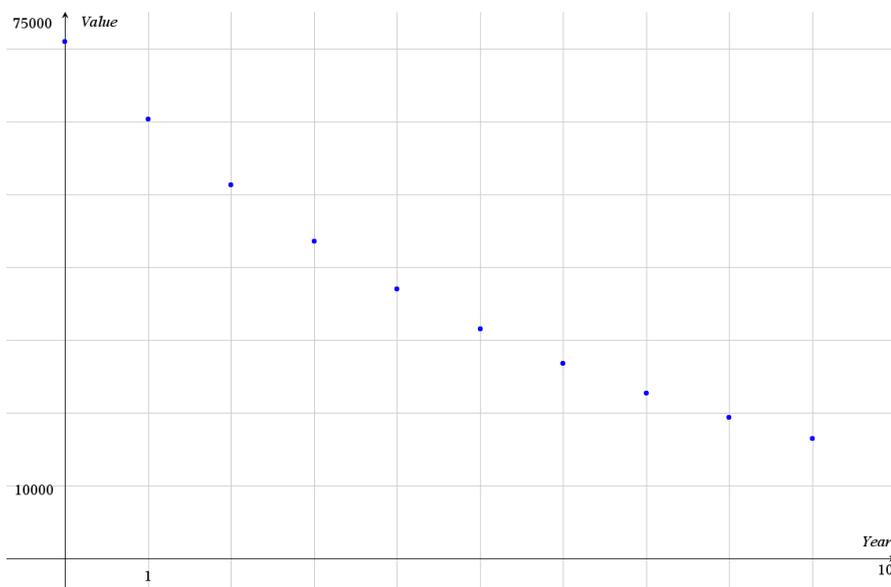
- ii) Plot the value as a function of time for the first 8 years.

Answer: See graph

- iii) How long does it take for the vehicle to reach half its value?

Answer: Students may use the graph, table, recursion or logarithms for a precise value. 4.27 years

Year	0	1	2	3	4	5	6	7	8
Value	\$70,940	\$60,299.00	\$51,254.15	\$43,566.03	\$37,031.13	\$31,476.46	\$26,754.99	\$22,741.74	\$19,330.48



Question: 4.

Melissa spent \$2800 on a new laptop for work. She claims the depreciation of the laptop on her tax return at a rate of 50% per year. Melissa gets a tax refund of \$0.30 per dollar claimed. When the laptop is worth less than \$200 the amount is placed in a category called the Low Value Asset pool. When this occurs the remaining balance is depreciated in full. Complete the table below to see how much money Melissa gets back each year on the value of her laptop. [The first year has already completed.]

Year	1	2	3	4	5
Value	\$2800.00	\$1400.00	\$700.00	\$350.00	\$175.00*
Depreciation	\$1400.00	\$700.00	\$350.00	\$175.00	\$175.00
Tax Refund	\$420.00	\$210.00	\$105.00	\$52.50	\$52.50

*The laptop is worth less than \$200.00 so the remaining balance is claimed in full.