Topic Exploration Pack

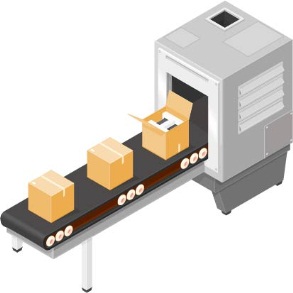
# Appreciation and Depreciation

# **Activity 1**

Complete the table (the first row has been done for you).

| **To** | **Multiply by** |
| --- | --- |
| **Increase by 12%** | **1.12** |
| **Increase by 25%** |  |
| **Decrease by 15%** |  |
|  | **1.06** |
|  | **0.92** |
| **Increase by 4.5%** |  |
| **Decrease by 7.2%** |  |
|  | **0.875** |
|  | **1.093** |
| **Add 4% to a quantity** |  |
| **Take 17% from a quantity** |  |
| **Increase by 10%** |  |
| **Increase by 1%** |  |
| **Decrease by 10%** |  |
| **Decrease by 1%** |  |
|  | **0.5** |
|  | **2.0** |

### Apartment buildingActivity 2

1. A flat is valued at £85 000. It is expected to increase in value by 6% each year.   
   Find the expected value of the flat after a year.
2. A new van costs £18 000. It depreciates by 20% per year. Find its value after 1 year.
3. A woman invests £5000 in a bank account which pays 4% interest per year.   
   Find the value of the investment in 5 years’ time.
4. The value of the machinery in a manufacturing plant depreciates at a rate of 8% per year. If the original value of the machinery is £65 000, find its value 10 years later.



1. A new car costs £15 780. It is expected to depreciate by 20% per year for   
   the first two years, then by 2% per year thereafter.

Find the value of the car after:

* 1. 2 years,
  2. 6 years.



1. A house was bought for £165 000. Two models are suggested for its appreciation.

* Model A is that the value increases at a rate of 4% per year.
* Model B is that the value increases by £8000 per year.

1. Find the expected value of the house in each of the following 5 years under each model.

The house was actually valued for each of the next five years (to the nearest thousand pounds) as follows:

| **Years after start** | **Value** |
| --- | --- |
| 0 | £165 000 |
| 1 | £169 000 |
| 2 | £176 000 |
| 3 | £184 000 |
| 4 | £196 000 |
| 5 | £203 000 |

1. Draw a single graph to compare the expected values under each of the two models with the actual valuations.
2. Explain which model you think is better over this 5 year period.
3. Explain which of the two models you think would be better in the long term, assuming that house prices continue to appreciate.

### Activity 3

1. A car, originally valued at £7240, depreciates in value to £5795 over a period of 1 year. Find the annual percentage rate of depreciation.



1. A painting cost £420. A year later its value is £460.   
   Find the annual percentage rate of appreciation.
2. A boat was purchased for £23 500 in 2006. Ten years later in 2016, it was  
   valued at £14 100. Find the average annual percentage rate of depreciation.





1. An apartment was bought for £185 500 in January 2010. In January 2015, it was   
   valued at £217 600. Work out the average annual percentage rate of appreciation.
2. Mark bought a computer for £725. Three years later, he sold it for £120. Find the average annual percentage rate of depreciation.



1. Maya invests £1000 in a bank account. Twenty years later her investment has  
   increased in value to £1540. Calculate the average annual percentage rate of  
   appreciation.
2. On a particular date in 1996, the price of gold was $400 per ounce. On the same date in 2011 it was $1400 per ounce. Find the average annual percentage rate of appreciation.



1. On the same date in 2014, it was $1210 per ounce. Find the average annual percentage rate of depreciation from 2011 to 2014.
2. A van was bought for £8500 and sold a number of years later for £6300. If the average annual percentage rate of depreciation was 9.5%, work out how many years later the van was sold.
3. A rare stamp was bought for £400 in 2005. A few years later it was valued at £1000.   
   The average annual percentage rate of appreciation was 16.5%. In which year was the valuation carried out?
4. A motorbike was bought for £3750. During the first year after it was bought it depreciated by 25%.



1. Find the value of the motorbike after 1 year.

For the following four years it depreciated at a rate of 12% per year.

1. Work out the value of the motorbike after 5 years.
2. Calculate the average annual percentage rate of depreciation over the whole of the 5 year period.