

Getting there: More miles for your money

Description

With high fuel costs, many freight and logistics companies are looking at ways to reduce running costs. Fuel efficiency is also environmentally desirable. Based on information and guides provided by the Department of Transport, this topic introduces the cost benefits of improving the aerodynamics of the cab section of the truck.

Resources

Calculators, access to a spreadsheet.

Activity 1: Fuel efficiency

Activity 2: How much can you save?

Trucks come in all shapes and sizes, but the majority can be categorised into three different types.



A rigid truck usually has a cab and a large container box.



An articulated truck is made up of two parts. The front part, called a tractor, pulls the trailer.



A draw-bar truck is usually a rigid truck that is connected to a trailer by a bar.

Various modifications can be made to each of the truck types. **Fuel efficiency**, a calculator activity, explores the fuel efficiency effects of one of these modifications on the three types of truck. It provides an introduction to the topic and requires pupils to grapple with the concepts of miles per gallon and percentage increase and with converting litres to gallons. It uses the idea of distance travelled as a concrete model for fuel efficiency. It may be worth mentioning that the figures provided are estimates as the actual distance travelled is likely to depend on a variety of factors including the steepness of the roads, the weather conditions and the speed travelled.

How much can you save? is a more advanced activity and is likely to extend over two periods. The initial problem is a highly complex one and the activity as presented breaks this down into smaller steps. The activity works best with pupils in groups of three, each working with one of the types of truck. Each group needs a copy of the **How much can you save?** cut up sheet or a set of the cards already laminated so that they can discuss how to arrange the calculation processes to achieve the desired result. They then work out the savings for each modification, using the **How much can you save?** information sheet and sharing out the work. A whole class discussion at this point will confirm the results.

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The second part of the activity involves using the **How much can you save?** spreadsheet. The group enters all of their savings calculations and then uses the spreadsheet to work out the payback time for each modification. They discuss how to choose the fastest payback and the best long term investment and they record this on their spreadsheet. An alternative approach is to use the calculator or a spreadsheet throughout the whole of this activity. Using their final results and analysis, the pupils compose a letter to Yorky Trucks Limited setting out their recommendations for improving the fleet. Alternatively, the groups can each be encouraged to prepare a PowerPoint presentation of their recommendations for the rest of the class.

The mathematics

These activities involve using calculators and spreadsheets to work on conversions and percentages in the context of a complex multi-step problem. Considerable mathematical thinking is involved in breaking down the problem into simpler steps, keeping track of the constituent parts and analysing the final results.

Source of information: Aerodynamics for Efficient Road Freight Operations, FreightBestPractice, Department for Transport

