



Generic Venues ~ Motorway Science ~



Institute of *Physics*

Motorway Science

The approach used here is very similar to that in supermarkets. The table top demonstrations are used to draw a crowd of both adults and children. Children are then given goody bags whilst adults are given a quiz sheet.

The ideal Service Station has:

- A manager who likes publicity
- A space for performing the tricks close to where the customers gather. It is best to have two potential areas identified: one outdoors, where you have as much space as you want (such as in the carpark), and an alternative venue inside (in case of bad weather).
- Plenty of children around – it's best to choose weekends, half-terms or school holidays.

Requirements

- Event Team consisting of at least two people, including one person to perform the physics tricks – preferably someone confident, enthusiastic, outgoing and engaging.
- Quiz question sheets (included in this Pack). These could be placed inside the goody bags for easy distribution.
- Answers to the quiz (included below).
- Prizes – Preferably of two types: small give-aways to be awarded immediately for anyone who gets a high proportion of the answers correct, and a major prize to be drawn at random from the correct answers at the end of the day.
- Ingredients for the physics demonstrations (see the 'Physics Tricks' section of this Pack).
- Goody bags (see below for contents) – approximately 250 per day.
- Table and chairs.
- Backdrop (posters, banners or similar) to announce the event.
- Boxes for completed quiz sheets.
- PA system (if outdoors in a large space) – check with the service station in advance that you can get access to a power supply.

Recommended Format

Set up a table near where customers gather and put up some kind of backdrop that announces the event. Have either one person or a team perform physics demonstrations. A crowd will gather, particularly if there are children around. This will provide an opportunity to hand out the goody bags and quiz sheets. Make sure you mention the prize for the quiz!

Your performer (or team) will need to take breaks during the day. At those times, leave quiz sheets and posters advertising the event on the table with a card announcing when the next show will take place.

Arrange for boxes to be placed at the service area exits into which people can drop their completed quiz sheets.

General Hints for Success

- Children will be particularly attracted if you provide simple, highly visual give-aways (such as balloons).
- Motorway service areas provide a great opportunity to perform impressive 'outdoor' tricks which aren't possible at other venues – assuming that the weather is amenable and the car park not too crowded!
- Have alternative dates booked in case of bad weather if an indoor venue isn't available.
- This event format will appeal to a variety of audiences, therefore make sure that the tricks you choose to perform also range across the age groups. It may be worth taking into account the likely audience age when planning the running order of the tricks – younger children are likely to be interested earlier, so do tricks for them first, then move onto more sophisticated tricks as the adults become interested.

Goody bag contents

This activity pack is designed with the 'Science of Motorways' theme of the event in mind. It is aimed at keeping the children amused and entertained by science and motorway related activities during their journey, once they leave the event venue. A balance of free give-aways and activities is recommended.

Freebies can be obtained from a variety of sources: most Universities, Institutions (including the IoP!) and Societies produce give-aways which they may be happy to donate to your event. Simple, cheap things such as balloons and coloured pencils are also popular. An example goody bag used during the pilot version of this event contained:

- colourful (branded) plastic bag donated by the local University
- quiz sheet
- pen and pencil donated by the EPSRC
- magnifying ruler donated by Young Scientist
- stickers donated by Science Year
- activity pack donated by Science Year
- glow badge donated by the EPSRC
- sliding puzzle
- cardboard coaster / beer mat donated by the local University
- Motorway Maze (included in this Pack)
- Motorway Word Search (included in this Pack)

Note that some participants may prefer to post their completed quiz sheet, in which case you should include inside the goody bag an address and deadline for receipt of entries, as well as a reminder of what the prize is.

An evaluation of the pilot version of this event is available from:

www.uwe.ac.uk/fas/graphicscience/projects/science_fast_lane.htm

Name _____ Phone number _____

Motorway Quiz

- Please tick
- Cars can give you electric shocks because:**
 - They contain a big battery
 - They build up static
 - You are wearing synthetic fibres, like nylon
 - Crumple zones are:**
 - Bits of the road that can withstand earthquakes
 - Part of the car designed to compress during an accident
 - Accident black spots
 - Approximately how long would it take Einstein to drive from Glasgow to London at the speed of light?**
 - Less than a second
 - About a minute
 - Nearly an hour
 - The gas in air-bags is:**
 - Nitrogen
 - Helium
 - Carbon monoxide
 - Speed cameras:**
 - Take still photographs
 - Emit radar beams
 - Shoot video
 - You can see cat's eyes because:**
 - They have a bulb inside
 - They're made from phosphorescent (glow-in-the-dark) materials
 - They reflect headlights
 - Diesel engines are different to petrol engines because:**
 - They don't have cylinders
 - They don't have spark plugs
 - They don't have radiators
 - If Einstein is driving at 60 mph, how long is his braking distance?**
 - 5 car lengths
 - 18 car lengths
 - 25 car lengths
 - The travel time from London to Edinburgh in 1730 was:**
 - 6 days
 - 12 days
 - 24 days
 - Grasses and bushes are planted on motorway banks because they:**
 - Reduce soil erosion
 - Muffle traffic noise
 - Absorb carbon dioxide

Motorway Word Search

All the words listed on the right are related to motorways. Can you find each one within the grid?

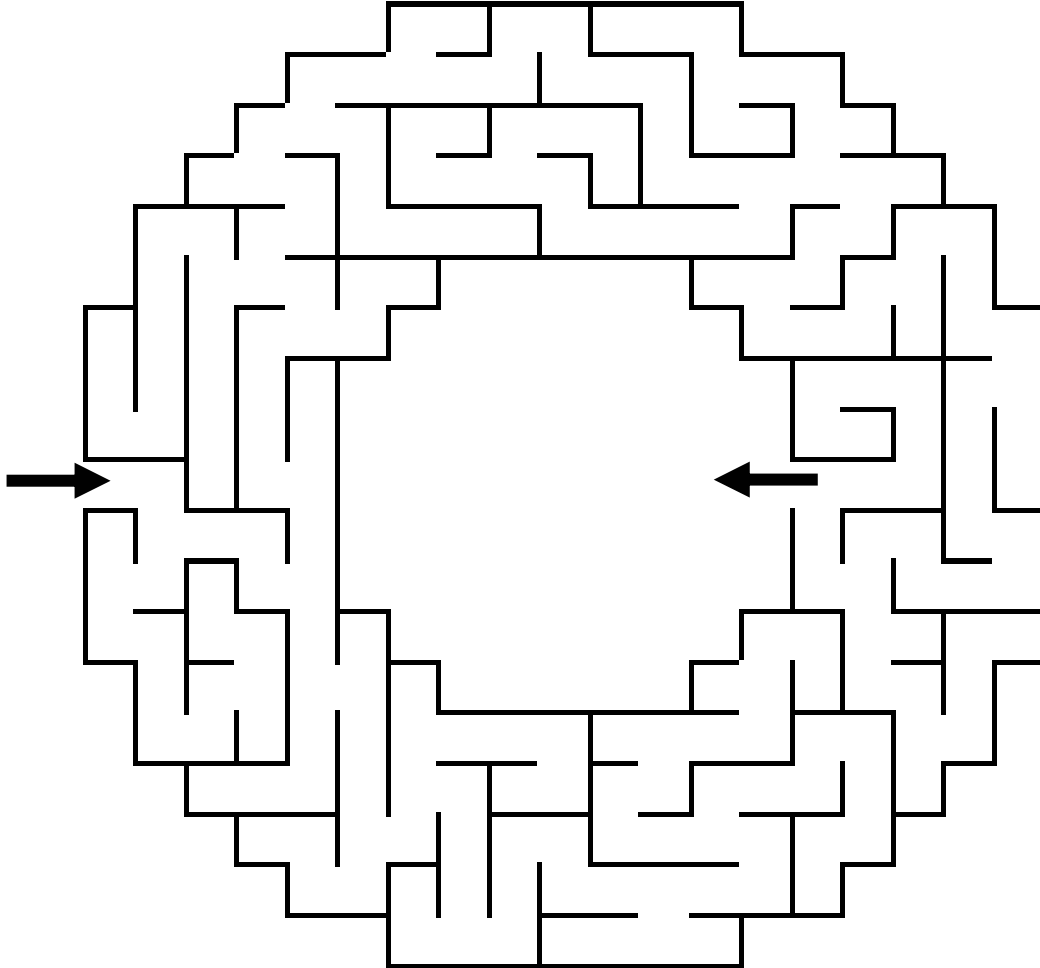
Put a line through each word as you find it. When you are finished you should have 27 letters left over in the grid. Write down these remaining letters in order (left to right, top to bottom) to find the name and description of a famous person.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | A | R | D | S | H | O | U | L | D | E | R | A | E | L |
| B | Y | A | E | E | T | O | W | S | R | A | E | G | K | R |
| T | A | D | E | R | S | H | R | I | N | G | R | O | A | D |
| L | W | I | W | V | O | I | G | N | N | E | N | C | T | R |
| A | R | O | S | I | P | T | E | I | G | D | I | I | R | A |
| N | O | I | T | C | N | U | J | N | L | F | O | N | E | Z |
| G | T | P | P | E | G | D | E | H | F | Y | S | W | V | A |
| I | O | A | K | S | I | S | S | A | P | R | E | V | O | H |
| S | M | R | R | T | S | U | R | C | A | R | A | V | A | N |
| S | S | K | A | A | B | T | S | E | R | Y | T | I | H | L |
| E | P | I | P | T | S | U | A | H | X | E | B | C | U | E |
| K | E | N | R | I | S | T | R | A | I | L | E | R | B | E |
| A | E | G | A | O | L | P | E | T | R | O | L | N | C | H |
| R | D | E | C | N | L | O | R | R | Y | G | T | E | A | W |
| B | L | E | S | E | I | D | R | I | V | E | R | N | P | D |

| | |
|---------------|-----------------|
| brakes | overtake |
| bus | parking |
| caravan | passenger |
| car park | petrol |
| diesel | radio |
| driver | ring road |
| exhaust pipe | seatbelt |
| gears | service station |
| hard shoulder | signal |
| hazard | signpost |
| horn | speed |
| hubcap | traffic |
| junction | trailer |
| lights | tyre |
| lorry | wheel |
| motorway | window |
| overpass | windscreen |

Motorway Maze

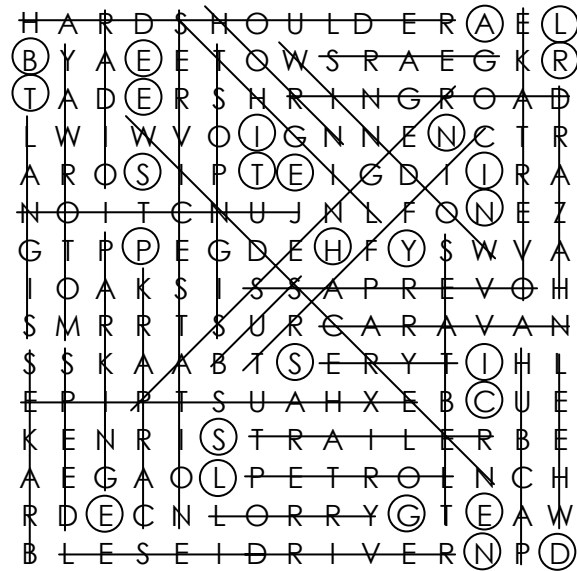
Can you find your way from the outside of the wheel to the inside?



Answers to the Motorway Science Quiz:

1. b 2. b 3. a 4. a 5. b 6. c 7. b 8. b 9. b 10. a

Solution to the Motorway Word Search:



Famous Person:

ALBERT EINSTEIN

PHYSICS LEGEND

Solution to the Motorway Maze:

