



Dr Hal's Recycling Trumps – Teachers' Notes

PREAMBLE:

Dr Hal's Recycling Trumps was conceived by Dr Hal Sosabowski and researched by Dr Ryan Woodward, Research Fellow in the Waste and Energy Research Group at a well-known UK University.

There are two objectives in getting children to play with any of the Dr Hal's Science Trumps range. For the pupils/players, the objective is probably to win the game, but clearly there is meant to be a learning outcome, sometimes referred to as camouflaged learning. The games are designed to engage the players through gameplay but also to generate discourse and occasionally mild-mannered arguments about why certain trump factors are the values they are. This can form the basis for an excellent post-game classroom discussion. The Recycling Factoids at the foot of the cards are designed to introduce some takeaway learning from the games.

EXPLANATION OF TRUMP FACTORS:

Total Waste Generated, % Recycled Average Commodity Price: were based on figures published by trade organisations, government and recycling companies, these are referenced below. In most instances actual figures were used but on some occasions due to lack of published data an informed assumption was made based on older data or from talking with experts from the Waste Management sector. Two main sources were used for the commodity price, www.letsrecycle.com and www.euro.recycle.net.

Average Commodity Price: this value for materials fluctuates, in particular in 2008 toward the end of which the games were designed, and therefore in most instances an average for 2008 was used.

Green Factor: This figure is based on the environmental impact this item would have if sent to landfill. Those items that biodegrade in landfill and generate greenhouse gases have been given high value along with those items that contain heavy metals and chemicals.

Ease of Recycling: This figure is based on how easy the material is to recycle. Items that are widely recycled in kerbside schemes such as paper and cans are given high values whilst harder items like paint and cooking oil have lower values.

ABBREVIATIONS

- BERR:** Department for Business, Enterprise & Regulatory Reform
- DEFRA:** Department for Environment, Food and Rural Affairs
- ICER:** Industry Council For Electronic Equipment Recycling (ICER)
- WRAP:** Waste & Resources Action Programme

SPECIFIC CARD NOTES:

TYPE 1 PLASTIC (PET)

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

TYPE 2 PLASTIC (HDPE)

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

TYPE 3 PLASTIC (PVC)

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

TYPE 4 PLASTIC (LDPE)

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Derived from euro.recycle.net

TYPE 5 PLASTIC (PP)

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Derived from euro.recycle.net

TYPE 6 PLASTIC (PS)

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Derived from euro.recycle.net

LEAD

Total waste generated: Derived from DEFRA

% recycled: Derived from DEFRA

Average commodity price: Average from 2008 taken from Letsrecycle.com

ALUMINIUM DRINKS CANS

Total waste generated: Derived from Alupro

% recycled: Derived from Alupro

Average commodity price: Average from 2008 taken from Letsrecycle.com

STEEL FOOD CANS

Total waste generated: Derived from Corus

% recycled: Derived from Corus

Average commodity price: Average from 2008 taken from Letsrecycle.com

MOBILE PHONES

Total waste generated: Calculated based on following assumption:

- 1,500,000 phones sold each year
- Each phone assumed to weigh 100 g
- 1,500 tonnes of mobile phones

% recycled: Derived from Resource Recovery Forum

Average commodity price: Derived from euro.recycle.net

COOKING OIL

Total waste generated: Derived from Biodriven

% recycled: From industrial contact

Average commodity price: From industrial contact

NEWSPAPERS

Total waste generated: Derived from Paisley University

% recycled: Derived from Paisley University

Average commodity price: Average from 2008 taken from Letsrecycle.com

CLOTHES

Total waste generated: Derived from Oakdene Hollins

% recycled: Derived from Oakdene Hollins

Average commodity price: Average from 2008 derived from Letsrecycle.com

GREEN GLASS

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

CLEAR GLASS

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

BROWN GLASS

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

GARDEN WASTE

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

Note that the negative figure is due to a gate fee for disposing of garden waste at composting facilities

COMPUTERS & IT EQUIPMENT

Total waste generated: Derived from ICER

% recycled: Derived from ICER

Average commodity price: Derived from euro.recycle.net

ALUMINIUM FOIL

Total waste generated: Derived from Alupro

% recycled: Derived from Alupro

Average commodity price: Average from 2008 derived from Letsrecycle.com

TYRES

Total waste generated: Derived from BERR

% recycled: Derived from BERR

Average commodity price: From industrial contact

Note that the negative figure is due to a fee to dispose of tyres

PAPER DRINKS CARTONS

Total waste generated: Derived from Tetra Pak

% recycled: Derived from Tetra Pak

Average commodity price: From industrial contact

PAPER AND CARDBOARD

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

CDS AND DVDS

Total waste generated: Derived from Recycling Expert

% recycled: From industrial contact

Average commodity price: Derived from euro.recycle.net

CARS AND CAR PARTS

Total waste generated: Derived from European Union

% recycled: Derived from European Union

Average commodity price: From industrial contact

PAINT

Total waste generated: Derived from Community Repaint

% recycled: Derived from Community Repaint

Average commodity price: From industrial contact

FOOD

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Average from 2008 derived from Letsrecycle.com

Note that the negative figure is due to a fee to dispose of the food to a composting facility

ENGINE OIL

Total waste generated: Derived from BERR

% recycled: Derived from BERR

Average commodity price: From industrial contact

WASTE ELECTRICAL & ELECTRONIC EQUIPMENT

Total waste generated: Derived from DEFRA

% recycled: Derived from DEFRA

Average commodity price: Derived from euro.recycle.net

WOOD

Total waste generated: Derived from Wood Recyclers Association

% recycled: Derived from Wood Recyclers Association

Average commodity price: Average from 2008 derived from Letsrecycle.com

Note that the negative figure is due to a fee to dispose of the wood

INK CARTRIDGES

Total waste generated: Derived from empty-cartridges.co.uk

% recycled: Derived from empty-cartridges.co.uk

Average commodity price: Derived from euro.recycle.net

BATTERIES

Total waste generated: Derived from WRAP

% recycled: Derived from WRAP

Average commodity price: Derived from euro.recycle.net

YELLOW TELEPHONE DIRECTORIES

Total waste generated: Based on the following assumption:

28,400,000 directories delivered, Each directory weighs 4 kg

Total weight of directories 113,600 tonnes

% recycled: Data from yell.com

Average commodity price: From industrial contact

