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Lets make a start: Benchmarking your Sustainable Journey

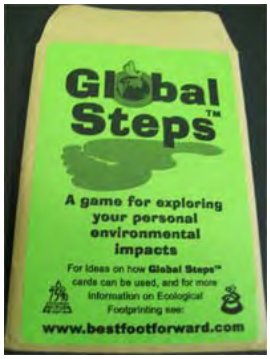
Background:

When looking to bring about behavioural change a benchmark or starting point is required so progress can be monitored and young people take inspiration and move forward. Clarity is also required to determine if we are interested solely in reducing our CO_2 levels, and thus measuring our Carbon-footprint or our broader, Ecological Footprint.

A definition of a carbon-footprint is given as "a measure of the impact our activities have on the environment, and in particular climate change. It relates to the amount of greenhouse gases produced in our day-to-day lives through burning fossil fuels for electricity, heating and transportation etc. The carbon footprint is a measurement of all greenhouse gases we individually produce and has units of tonnes (or kg) of carbon dioxide equivalent." (http://www.carbonfootprint.com)

An Ecological Footprint may be defined as a measure of resource use which highlights where consumption is exceeding environmental limits. The ecological footprint uses units of bioproductive area (global hectares) to assess the nature and scale of the environmental impact of a country, region, community, organisation, product or service.

Three inter-related activities follow. Measuring ecological footprints using a card game. The use of online carbon/ecological footprint calculators and an introduction to earth share.



1. Measuring your Ecological Footprint using Global Steps

Summary:

A great starting point for young people thinking about their impact upon the environment is to begin with a game of Global Steps. This simple card-game involves an analysis of different areas of consumption under the headings Electricity, Food, Heating, Holidays, Transport, Waste and Water.

Global steps enables young people to estimate their personal ecological footprint (the area of land required to sustainably support their lifestyle), and explore their impact on the environment. It also encourages students to consider the steps they would need to take to reduce this impact and the difficulties involved in making changes. It can help focus their efforts on a specific topic rather than taking a splatter-gun approach.

Materials Needed:

Copies of the cards can be purchased online at http://www.bestfootforward.com/global_steps (1 set of 8 playing cards, costing approximately, £3 / 2.5 euro; with a minimum order of 10 packs).

In the absence of the cards your young people can of course devise their own card or board game based on the same principles – rewarding sustainable lifestyles and penalising non-sustainable ones. Using the Eco-School themes may provide suitable 'sections' for sets of cards / questions. The young people can be challenged to write scenarios and may wish to assign scores to behaviour based upon CO_2 emission data.

Duration

A game of Global Steps can easily be completed in 30 - 45 min., and is best used as an introduction and steer for a collection of sustainable living activities to follow. Teachers may wish to allow extra-time for discussions of issues raised by the game itself.

Procedure

Full playing instructions are provided with the cards. You need to be aware that each card can only offer two alternative scenarios, at extremes of the spectrum, and young people may need to make decisions about awarding points somewhere between the two values given. This in itself is a useful mathematical exercise relating to estimation. Maybe they don't do 1 or 2 long-haul flights in year, but equally they don't camp at a campsite that is only a 1 hour drive from home.

Your young people may compete against each other at each area of consumption/lifestyle choice or decide the 'winner' based on their total score. This gives an indication of their personal ecological footprint.

They can then be encouraged to discuss how they could reduce their footprint and the wider political and economic issues that may prevent them from doing this.

Extension/Homework activity

In CarboSchools, a school in France adapted a game of 'snakes and ladders' (Jeu de l'oie) while a school in Italy, redesigned Cluedo to give it an environmental / sustainable living theme.

Young people could compare their own ecological footprints with those of people in other countries with different lifestyles and discuss the changes that will have to be made in the future to reduce our footprints to a globally sustainable level. There is further information about this in Part 3, modeling earth share.

From learning to action

Young people could be encouraged to choose one lifestyle aspect from the cards that they feel they could change in order to reduce their ecological footprint. Alternatively, they could be challenged to make choices to reduce their score to 100. They could keep a record of their progress over a period of time and discuss how successful they have been at the end of the period. They could also think about how they could encourage their families, the school management team and the local community to make it easier for them to reduce their ecological footprints at home, within school and in their locality.

2. Using Online Calculators

A logical next step is to move onto an online calculator that estimates peoples' Carbon footprint or their Ecological footprint. Many of these exist and an interesting exercise in itself is to compare scores between different calculators; ensuring that you compare like with like (ie. selecting 2 Carbon-footprinters or 2 Ecological footprinters). Are you interested in your Carbon emissions or the wider question of your impact on nature's limited resources?

For younger pupils Best Foot Forward offer their own ecological-calculator (http://www.ecologicalfootprint.com) as do WWF (http://footprint.wwf.org.uk) and older pupils may find the scenarios explored in this more detailed analysis interesting (http://www.carbonfootprint.com/calculator.aspx).

The more complex calculators show just how complicated the decisions we need to make are, and the wide variety of factors that can influence the figures. A scientific study comparing 10 US based calculators can be read here, http://www.elsevier.com/authored_subject_sections/P09/misc/EIAR_28.pdf . It concludes that they vary considerably in rationale and many don't publish their data sources; scientifically interesting (weak?) given our increasing interest/reliance upon them.

For schools wishing to monitor their Carbon-footprint, the Carbon Detectives website offer tools and calculators and action plans and the chance to link with other schools across Europe. http://www.carbondetectiveseurope.org

Common to all is a simple message that we are each producing too much CO_2, living beyond our means and the limited resources in our world. Living lifestyles that are not sustainable, in which we would require more than 1 earth to sustain our lifestyles. Regardless of how we calculate it however, if enough people start doing it, we will cut our CO_2 emissions (nationally and internationally) and that can't be a bad thing.

Hopefully some of the activities described in this part of the library will encourage and inform your young people to think about living more sustainable lives and ways in which they can go about this.

By comparing the ecological footprint (demand on natural resources) with bio-capacity (the available supply of natural resources) it is possible to assess the ecological sustainability of current consumption - if demand is greater than supply, the level of consumption is not sustainable. Bio-capacity can be expressed as local bio-capacity or as global average bio-capacity - the latter is referred to as the average 'earth share'.

If everyone lived within their earth share, this would give an environmentally sustainable human existence on earth. Earth share is calculated by dividing the total amount of bio-productive land and sea on Earth by the current population. This gives the average amount of bio-productive land and sea available globally per person.

The final part of these first steps is to provide teachers with a way of modelling 'earth share'. TSN is grateful to Sue Falch-Lovesey (Head of Environment and Outdoor Learning, Norfolk County Council) for sharing this teaching resource with us.

3. Modeling Earth Share – a useful teaching resource

Talking about billions of hectares can be confusing to many young people and the following demonstration to model 'earth share' can powerfully re-enforce the figures.

An eating apple and a sharp knife are required.

The key concept behind an ecological footprint is 'earth share', which means the average amount of bio-productive land available per person on the planet. This can be compared with the current demand per person on bio-productive land.

We start with Planet Earth (represented by an apple). Its surface area is approximately 51 billion hectares; of which the land is approximately 15 billion hectares (30%) and lakes, oceans, rivers and seas the other 36 billion (70%).

Slice your apple such that you can remove approximately one third – this is your land area. Unfortunately not all of the land is 'bioproductive'

Productive land (20%) can provide people with resources. It is capable of supporting moderate forest cover, permanent pasture or arable land.
Unproductive land (10%) is unable to contribute to the earth share. It includes rock, ice and sand desert, degraded land, mountain, tarmac and built-up land.

Taking your smaller apple slice, discard a further one third (unproductive land) and your remaining piece needs to feed 6 billion people (estimated world population in 2002 was estimated to be 6 billion people).

The bioproductive land is only the top surface of the earth, and so the skin should be removed to reinforce this idea for your young people.



Land share is therefore 10 billion hectares of productive land divided by 6 billion people which gives an **earth share of 1.7 hectares per person**.

If productive oceans are added into the equation it increases the average **earth share to 1.9 hectares per person** (– visually you would require just 4% of the original discarded apple to demonstrate this).

Using the prediction of the UN medium population forecast for over 9 billion people in 2050 the average **earth share will decrease to 1.1 hectares per person**.

Source: Wackernagel, M and Rees, W; 1998. *Our Ecological Footprint: Reducing Human Impact on the Earth*. New Society Press, Gabriola Island, BC.
www.ecologicalfootprint.com
** 1 hectare = unit of area equivalent to 10,000m2*

So you have calculated your Ecological Footprint and want to compare with other nations.

Global footprint size of different countries

This shows that many countries are living on the earth's capital, not its interest, while others don't get their fair share. In other words, the earth's **carrying capacity** is being exceeded and we are **living unsustainably**.

The average global citizen footprint is 2.2 hectares; this is already a considerable overshoot from the 2002 value as discussed above.

Average American: 9.6 hectares
Average Australian: 9.4 hectares
Average Canadian: 7.2 hectares
Average W. European: 5.0 hectares
Average African/Asian: 1.4 hectares

If India and China were to reach US consumption levels, global overshoot would increase to 250 per cent. Can the earth continue to run an ecological overdraft for another 50 years without severe implications for people and planet?

If everyone in the world adopted the current rate that the UK is using-up natural resources, we would need three planets to support us, and we only have one (source: *WWF, One Planet Future)*.

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