

In partnership with Garfield Weston Foundation

EXPLORE: URBAN NATURE

Climate Change Snakes and Ladders

THE
URBAN
NATURE
PROJECT

N NATURAL
HISTORY
MUSEUM

CLIMATE CHANGE SNAKES AND LADDERS

OBJECTIVE

Students understand the impacts of climate change on urban species and how this can be minimised. Students explore the roadmap to carbon neutral urban areas and ones that are resilient to and adapted to the impacts of climate change.

OVERVIEW

The way that climate affects nature is complicated due to the web of interactions that exists between species and the distinct biogeographical features of different areas. This means it is hard to make absolute comments about how climate change impacts urban nature. There are a few general patterns, however, that are common and relevant to urban environments: range shifts to follow climatic conditions, shifts in phenology (life cycle events), non-native species, changes in species assemblages and extreme weather events.

There is a need to explore and investigate how each urban area is impacted by climate change and take positive action so that it can be best protected in the future.

Urban nature is not only impacted by climate change, but also has a critical role to play in mitigating its effects and helping us adapt to such as increased heatwaves and floods. It is very much a two-way relationship – what we can do to protect urban nature and what urban nature can do to protect us.

More than two-thirds of carbon emissions come from towns and cities, according to the UN. To tackle climate change, cities must become more energy efficient. The ultimate aim must be to have carbon neutral urban areas that are resilient to climate change, where urban species and people can thrive - a greater diversity of life means more resilience to climate. Unfortunately, this is not an easy objective and along the way there are numerous compromises to make and barriers to overcome. Sometimes, it comes down to the role of a die. If we keep going though, we will make it.

TIME NEEDED

Making: 1 hour

Playing: 15 minutes

PARTICIPANTS

Small groups

RESOURCES NEEDED

- blank board game grid

LEARNING OUTCOMES

- understand that climate change affects urban species
- appreciate the factors that have a positive and negative impact on carbon emissions

KEY TERM

Carbon sequestration is the long-term storage of carbon in plants, soils, geologic formations and the ocean.

INSTRUCTIONS

This activity follows the basic format of Snakes and Ladders. The board represents a journey to a carbon neutral urban area, that is resilient and adapted to climate. The players are environmentalists working towards this goal.

1. Give a blank 30- or 50-square board game grid to each group. Mark the end square 'Carbon neutral - climate change ready'.
2. In groups, determine actions for positive and negative squares (the ladders and the snakes). Each positive action should be a realistic step that could be taken in an urban environment that either helps reduce carbon emissions, increases the amount of carbon drawn out of the atmosphere, or helps an area adapt to an impact of climate change (increased flooding, for example). As an extra, students can also think about some additional benefits to these actions (habitat creation, air quality, water quality, and health and wellbeing, for example). Each negative action should stop one of these positive actions from happening. See suggestions below for some ideas. For a 30-square board, you will need at least four positive and four negative actions, for 50 squares, at least 6.
3. Each group should discuss and rank their positive and negative actions from most to least impactful. This ranking will help determine how far up or down the board players will move when they land on the actions.
4. Students should now decide in their groups where to place each positive and negative action on the board, and how far up or down the board each 'snake' or 'ladder' moves. As there is limited space on the board, the full descriptions of the actions write on a separate piece of paper, with a numbered key linking them to the relevant square.
5. Once the boards are finished, the game is ready to play. You might want to get the groups to share their boards with each other. When playing, emphasise the need to read the actions fully before moving up or down the board. Students may not agree with some of the actions or weighting of them, so healthy critique and discussion is welcome.

OPTIONAL EXTRA ACTIVITIES

Blank positive squares

Instead of determining in advance the positive actions, these could be left blank, with only the 'ladder' in place. Students that land on these squares can only move up the ladder if they suggest a positive action that is appropriately impactful relative to how far up the board they are moving. This might only work once students have played the game a few times.

Promote their game

Groups could write a promotional blurb or even film an advert for their board game, emphasising its key environmental messages and selling their game on its environmental and educational merits.

Other environmental subjects

This activity could easily be applied to look at pollution, habitat and biodiversity in urban environments, or encompass all these issues in one.

CLASS DISCUSSION

- Whose fault is climate change?
- Who has the most power and influence to make a difference in urban areas? Local councils, individuals, businesses or national governments? What actions can they all take?
- How does climate change affect urban nature? How do animals respond? Do any animals benefit from climate change?
- How does climate change affect humans in urban areas? Do you think this will change in ten years' time?

Examples of positive action squares.

- There are plans to install green roofs on every new building and many current buildings. Green roofs reduce energy use and emissions by keeping buildings warmer in winter and cooler in summer. They also draw down carbon from the atmosphere, provide habitats for wildlife and reduce rainwater runoff.
- The local authority is banning the use of herbicides and pesticides in gardens and urban areas. This will protect plant life and increase carbon sequestration. It will also increase the diversity of plants and insects, and the animals that feed on them. A greater diversity of life means more resilience to climate.
- Planning permission is now required to cover more than 10 per cent of a garden in paving or decking. This maintains greenery that can form a large connected patchwork of habitat for urban nature, soil for water drainage (flood resilience) and carbon storage.
- Public transport is now powered by electric vehicles and hybrid electric cars are common. Energy efficient transport has cut CO² emissions drastically.
- New housing estates are to be built with Sustainable Urban Drainage Systems (SuDS). These manage rainfall to reduce the likelihood of flooding, improve water quality by removing pollutants and provide habitat for plants and animals.
- Cities are increasing their use of renewable energy. Low-carbon sources of energy such as wind and solar power have helped to reduce CO₂ emissions and local air pollution. Renewable energy will play a key role in the decarbonisation of our energy systems.

Examples of negative action squares

- Petrol and diesel cars are not being phased out quickly enough, meaning that towns and cities are polluted with high transport emissions.
- The renewable energy sector is slow to grow, and fossil fuels are still the main energy source. Three-quarters of global greenhouse gas emissions result from the burning of fossil fuels for energy.
- A government scheme to insulate homes has come to an end. Uninsulated houses require more energy to heat, resulting in more fossil fuels being consumed. This negatively impacts the environment, and people's finances and health.
- Consumer goods are still wrapped in single use plastics and excess packaging, which takes a lot of energy to produce and dispose of, resulting in unnecessary carbon emissions.
- Food waste remains a big problem. According to the UN's Food and Agriculture Organization, food waste has a global carbon footprint of about eight per cent of all global greenhouse gas emissions caused by humans. For every kilogramme of food produced, 4.5 kilogrammes of carbon dioxide are released into the atmosphere.
- Consumers are not eating less meat. Livestock are responsible for 18 per cent of the greenhouse gases that cause global warming, more than cars, planes and all other forms of transport put together.

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