SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

Mission Carbon Emissions	Grade 7 -

Game Instructions

Introduction
You and your classmates are citizens of a town or city. The choices that you make, as individuals and as decision-makers for your city, affects your city's carbon footprint.

What you'll need:
Per group (8 students max.):

1 deck of Mission Carbon Emissions Game cards
2 bins – one labelled "active carbon - atmosphere", the other labelled "stored carbon - ground"
50 Marbles (or many similar small objects to represent carbon units)

Preparation:

If cards have not been pre-printed and cut, download the card file and print each deck as follows:

Download the premade game cards file. The file contains images for 10 red cards, 4 purple cards, 5 yellow cards, 3 light blue cards, 5 green cards, and 5 black cards.

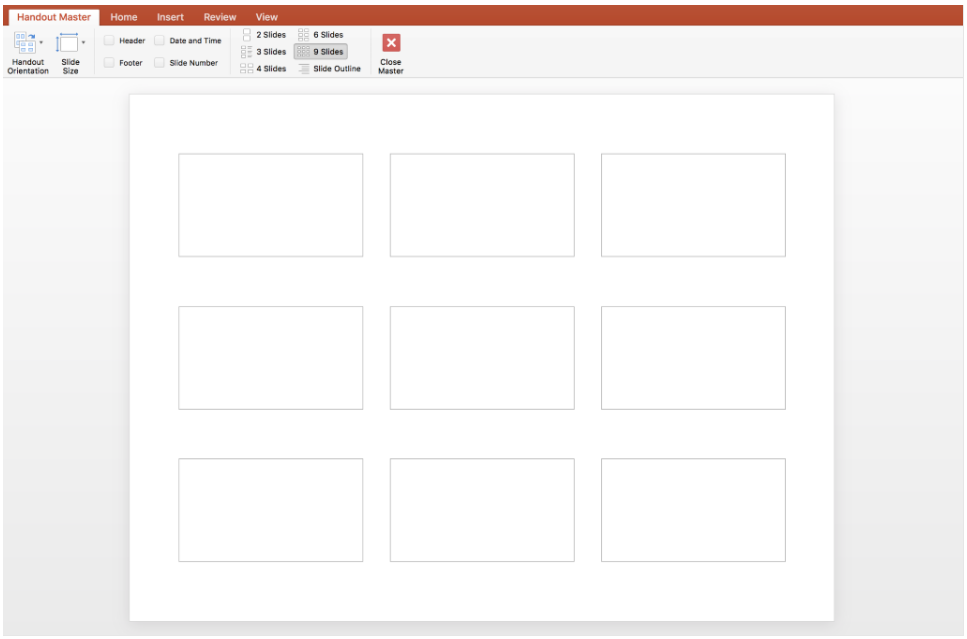
Recommended deck (100 cards per deck):

Print 5 copies of the red cards (50 total)
Print 5 copies of the purple cards (20 total)
Print 2 copies of the orange cards (10 total)
Print 2 copies of the green cards (10 total)
Print 2 copies of the black factory cards (10 total)

Optional: Print 2 copies of the light blue cards (6 total)
Optional: Print 100 copies of the card back design (100 total)

**Note: one deck can be used for a group of up to 8 students, so to conserve ink and paper, only print one deck per 8 students in your classroom (e.g., 4 decks can accommodate a class of up to 32 students).

To further conserve ink and paper, you can print multiple cards per page by selecting View Handout Master, changing the handout orientation to Landscape, deselecting Header, Footer, Date and Time, and Slide Number, and selecting 9 slides per page (if using Microsoft Powerpoint). Other slideshow software may require different settings to print more than one image per page.



Once made, these cards can be reused.

Separate and shuffle the factory cards. Draw one factory card and place it face up on the table.

Shuffle the remaining factory cards into the main deck.

Place the deck of cards face-down on the table as a draw pile.

Place the two bins on the table within easy reach of all students. Place 40 marbles in the stored carbon – ground bin, and 10 marbles in the active carbon – atmosphere bin.

How to Play:

Each player draws 3 cards to start.

On their turn, a player plays one card from their hand by placing it onto a discard pile and completing the action described on the card.

Exception: Factory and Factory Upgrade cards are played face-up on the table and kept on the table (not on the discard pile). When a factory or factory upgrade is played, it is added to the town or city (kept in play) and the effects described on the card are resolved at the end of every round.

Players end their turn by drawing a new card from the draw pile. Players should start and end their turn with three (3) cards in their hand.

There are **5 types of cards** that might be drawn.

First off are the 3 **main types**: **positive action cards** (purple borders), **neutral action cards** (ex: yellow borders) and **negative action cards** (ex: red borders). These actions represent the choices and behaviours of the citizens in your city.

- Positive Action Cards will instruct you to move a certain amount of carbon marbles from the atmosphere bin to ground bin.
- Neutral Action Cards will instruct you to do nothing.
- Negative Action Cards will instruct you to move a certain amount of carbon marbles from the ground bin to the atmosphere bin.

For example:

- Positive Action: plant trees (move 3 carbons from atmosphere to ground)
- Neutral Action: travel by bike (no action)
- Negative Action: transport food from another town (move 5 carbons from ground to atmosphere)

The **4th type** of card has to do with **power plants**. When factories and factory upgrades are played, they are placed face-up on the table (not on the discard pile) so that that we can resolve their effects at the end of every round.

- Non-Green Energy Factories (black border): Playing this card will add a factory to the city.
- Clean Energy Upgrades (green border): Upgrades replace (sit on top) of another pre-existing factory in your city. If all of the factories in your city are already upgraded to a greener option, a Clean Energy Upgrade can be played as a new factory.

The **5th type** of card are "event cards". These are more specific actions, for example, disasters discarding cards already in play, or allowing the player to search the deck for a particular type of card. Play an event card by placing it on the discard pile and resolving the instructions written on the card.

Ending a Round:

After every round (after all students played a card once), the factories in your town will come into play, and move carbon marbles from the ground to the atmosphere (unless you manage to turn it into a green source of energy, which would not move any carbon around). This happens after every round.

Ending the Game:

The game ends after 10 of rounds, or if they run out of ground/stored carbon in the stored carbon – ground. Running out of stored carbon is akin to running out of fossil fuels.

Compare the number of marbles in each bin. How much carbon remains in the stored carbon – ground bin as fossil fuels?

Discussion:

How did your choices affect your city? How much carbon remains in the stored carbon – ground compared to the active carbon – atmosphere bin. How many factories converted to "greener" energy production? How did the conversion affect carbon emissions?

Which positive actions affected carbon emissions the most? The least?
Which negative actions affected carbon emissions the most? The least?

Are there any choices you can make in your life that might have an impact on greenhouse gas emissions, whether positively or negatively? Can you think of any changes you can make to your habits that might have a positive impact?