

CLIMATE CHANGE SPECIES TRUMPS

OBJECTIVE

Students research, discuss and determine the resilience of species to climate change. They explore what makes a species resilient and what makes a species vulnerable, and compare and predict the response of various species to climate change.

OVERVIEW

Climate change resilience is the degree to which a population of a species is able to survive and persist in response to the impact of climate change. Resilience will be determined by tolerance to a changing environment, ability to adapt (behaviour, phenology and genetics) or how well it can track favourable climates by shifting its range. This will depend on a combination of several factors:

- dispersal ability
- reproductive ability
- sensitivity to environmental change
- habitat health
- adaptability

Because there are so many factors involved, including uncertainty over how species assemblages might change as ranges shift with climate, it is very hard to predict how species will be affected. However, doing our best to study and understand the effects of climate change on species, and identifying those that seem least resilient, can help us take the right steps to protect the most vulnerable.

TIME NEEDED

Creating cards: 45 minutes

Playing: 10 minutes plus class discussion

PARTICIPANTS

2–4 players each game.

RESOURCES NEEDED

- Species Trumps card templates (minimum of 20 per pack)
- pens or pencils
- scissors

LEARNING OUTCOMES

- appreciate that different species are impacted in different ways by climate change
- understand the factors that influence the resilience of a species to climate change

CLIMATE CHANGE AND INVASIVE SPECIES

1. Introduce the idea of resilience. Resilience can simply be defined as toughness, to not be affected too much by the outside world, or the ability to bounce back or recover from hardship. Ask the class to suggest things they think are and are not resilient. Steer the class towards animal or plant examples. Ask for ideas of how a plant or animal might be affected by climate change, and what might make them resilient to these impacts. There is more to it than being big and strong.
2. Introduce the four factors of climate change resilience for a species and their population (below). Draw a scale for each factor on the board and think of examples of urban nature species at the extremes. It is important that these ideas are introduced well, with examples, for students to make their Species Trumps cards later on.

Dispersal ability

Ability to either physically move, or disperse seeds. A higher dispersal ability is good for resilience.

Reproductive ability

Rate of reproduction and number of offspring. A higher reproductive ability is good for resilience.

Adaptability

Sensitivity and ability to adapt to change. This might come from being able to change behaviour, phenology, range or even evolve. Species that have very specific needs (such as dietary or habitat), complex life histories, or can't tolerate or adapt to change, will have a low adaptability score. Generalists and species that can adapt quickly will have a high score. A high adaptability is good for resilience.

Habitat health

Available habitat, both where they live now and where their range might move to, and how well connected these areas are. A higher habitat health is good for resilience.

3. Explain that you will now be making Species Trumps cards for urban species, based on their resilience to climate change, giving them scores for each of the factors discussed. The first thing to do is to decide which species you are going to use for the cards. Pick a wide range of urban species (mammals, invertebrates, birds, reptiles and amphibians, and plants). Choosing species can be done as a class or

within groups or pairs. You may want to be more general than species, for example butterflies. Most Species Trumps decks contain a minimum of 30 cards, but 20 might be more manageable. The more cards in a pack, the longer games will last.

4. Each species will need its own Species Trumps card. Use the templates to create the cards, including the species name, an illustration and 'where you might find me' (see example). Ask the students to decide the scores for each species for the four resilience factors, from 0-10. Students must decide an overall resilience score based on the other scores on the card. A low score means high vulnerability, while a high score means low vulnerability. Students should avoid giving too many species maximum scores.
5. Ask students to swap cards among their group and discuss any scores that they don't agree with. If they don't agree, they should explain why a score should be higher or lower, see what the rest of the group thinks and decide together.
6. Once cards have been completed, students are ready to play.

CLASS DISCUSSIONS

- Which species are the most and least resilient to climate change? Why?
- Which species score the highest and lowest for each resilience factor? Why?
- How might an ecosystem or food web be affected by climate change?
- How can we reduce the impact of climate change?
- How can urban areas adapt to climate change?
- How might human populations be affected by climate change? What would our Species Trumps card look like? What features make us resilient?
- How can we act to help less resilient species (see extra activity).

OPTIONAL EXTRA ACTIVITY

Action plan

Ask the students to pick out the five cards with the lowest overall resilience scores from their packs and share these with the rest of the class. Discuss what gives each species its low resilience to climate change. See if different groups choose similar species.

The species chosen are now your priority species, as they have the lowest resilience and are therefore the most likely to suffer.

As a class, decide what actions you can take to help these species. Look at what specifically makes each species have low resilience. Which factors can we influence and act upon and which are harder to help with.

Are there actions that would help a lot of these priority species? Come up with three actions that would help the most species. This is your action plan.

Invasive species

Some species benefit from climate change. Their range might increase, or climatic conditions prove more favourable for them. Some species might be introduced to an area, or naturally migrate to a new range and find that they have no competition. These species can be harmful for the other species in that ecosystem. They are often referred to as invasive species.

Choose a few common invasive species found in urban environments and ask students to create cards for these species. Add these cards to the Species Trumps packs.

Suggested species:

- parakeets
- harlequin ladybirds
- grey squirrel
- Japanese knotweed
- terrapins
- rhododendron
- American bullfrog
- water primrose

EXAMPLE

SPECIES

WHERE YOU MIGHT FIND ME?

Parks and Gardens

DISPERSAL ABILITY 6

REPRODUCTIVE ABILITY 7

ADAPTABILITY 4

HABITAT HEALTH 7

OVERALL RESILIENCE 6