

Climate Change & Energy Transition

The Climate and Energy Fund is an educational partner of the NHM Vienna.



Climate Change & Energy Transition

Material for the follow-up of guided activity tours at the NHM Vienna

Guided activity tours at the NHM Vienna (80 minutes)

Weather, Climate, Energy

Warm, cold, sunny and stormy - we all feel what the weather is like right now. But what was it like 1000 years ago or at the time of the dinosaurs, and what will it be like in 100 years? In a group, the children examine rocks for traces of temperature, wind and precipitation. They assemble a big jigsaw puzzle of the Earth and see what happens when people travel by plane, when cows fart or wind turbines generate electricity.

Climate change and energy transition

From the first days of the Earth until today the climate has always been in constant change. What factors determine and influence the climate or strengthen and weaken processes? The guided activity tour of the geological-palaeontological collection explores these questions. On our large Earth display board the students can attach climate elements - and thus influence various processes: what happens if fossil fuels that have been produced and stored over millions of years are burned within a few decades? What will change if renewable energies are used instead?

The material in detail

The Earth

Page 1: Weather, Earth (1/4)

Page 2 to 4: Carbon dioxide and methane, Earth (1/4)

Page 5: Carbon dioxide, solar radiation (short-wave)

Page 6: The Sun, solar radiation (short-wave), thermal radiation (long-wave)

Page 7: Landscapes

Page 8: Trees, fossil deposits, icebergs

Page 9: Mountain, volcano, animals

Page 10: Snow cover for mountain/volcano, stream, animals, plankton

Page 11-13: Clouds, precipitation (rain, snow) and evaporation

Human impact

Page 14: Houses, aircraft, cattle

Page 15: Power stations, cars, buses

Page 16: City, power stations, cars, refuse

Page 17: Roads, ships, aircraft

Page 18: Exhaust fumes

Adapting to climate change

Pages 19 to 20: Greening

Renewable energy

Pages 21 to 22: Renewable energy, electric power symbol (e.g. for e-cars)

Suggestions for classroom follow-up

- Preparation: cut out all elements
- Name elements: place the cut elements on the table and as a group search for terms, write down terms and place word cards next to the elements.
- Difference between weather and climate: what is the weather like today? Students name terms, place cards with weather symbols (page 1) on the table, then discuss the difference between weather and climate.
- Assigning elements: the students arrange the elements according to different criteria, then discuss their choices e.g.: Which elements belong to nature, which are related to humans (pages 5 to 13, 14 to 22)?
- What effects does human activity have on the climate:
Lay out elements on pages 14 to 17, discuss the effects on the climate and write them on word cards; assign exhaust fumes (page 18) and/or carbon dioxide and methane (pages 2 to 5)
- Renewable energy: what will change if renewable energy is used to a greater extent and if there is a transition to e-mobility? Add elements from pages 21 and 22 and discuss impact (e.g. reduce number of exhaust fumes)
- Climate system: using all elements step by step
Variant 1: first "build" the Earth as it presents itself without humans, then add the human elements; as a final step lay out and note down possible solutions (renewable energy, e-mobility, different ways of saving energy)
Variant 2: From the origin of the Earth to the future
Hand out all the elements to the students, tell them the story from the origin of the Earth until today; with every step the students lay out the appropriate elements. While they lay out the elements, discuss the respective influence on the climate system (e.g. plants: photosynthesis). As a final step, design scenarios for the future using the existing elements and add new ideas and suggestions from the students in the form of sketches or word cards.

Ways of breaking down the activities:

The Earth: assemble the 4 quarters of the globe (pages 1 to 4)

The Sun as a motor for climate on Earth (pages 5 and 6)

Oceans and continents (page 7, page 9, page 10)

Water cycle (pages 8, 10, 11, 12, 13)

Plants and animals: Production of carbon dioxide, oxygen production (pages 7 to 9, pages 2 to 4)

Natural sources of greenhouse gases (GHG), natural carbon cycle (pages 8 to 10, pages 2 to 5, page 18)

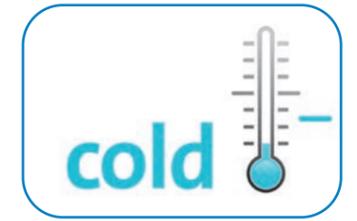
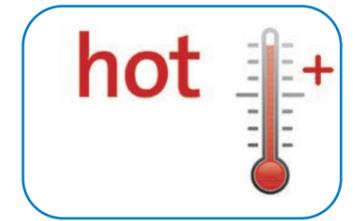
What role does the ground play with regard to the climate, albedo (pages 5 to 13)

What are human-induced changes? Add elements pages 14 to 18, assign carbon dioxide/methane (pages 2 to 5)

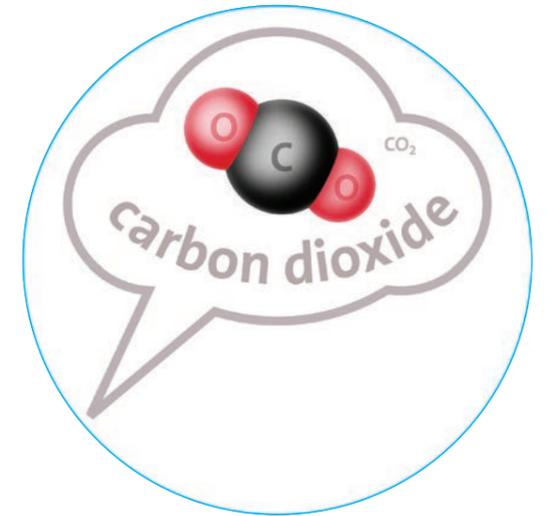
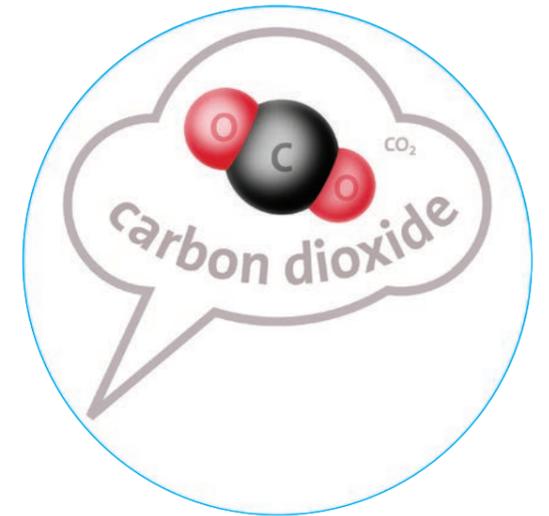
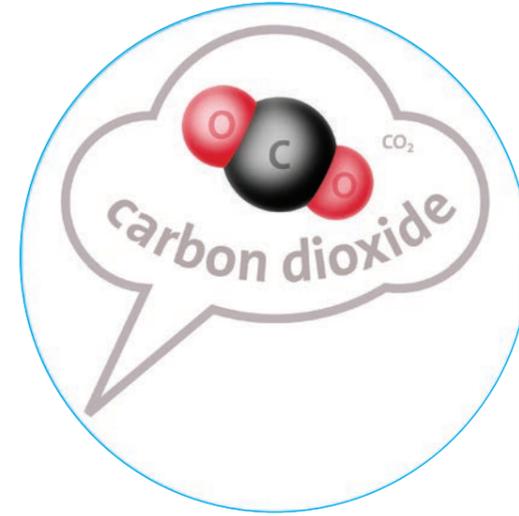
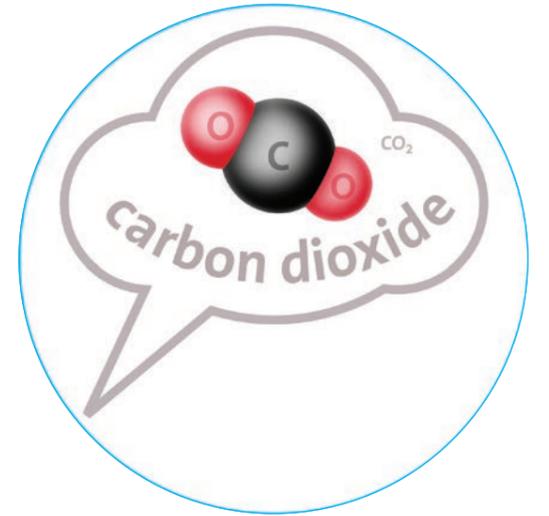
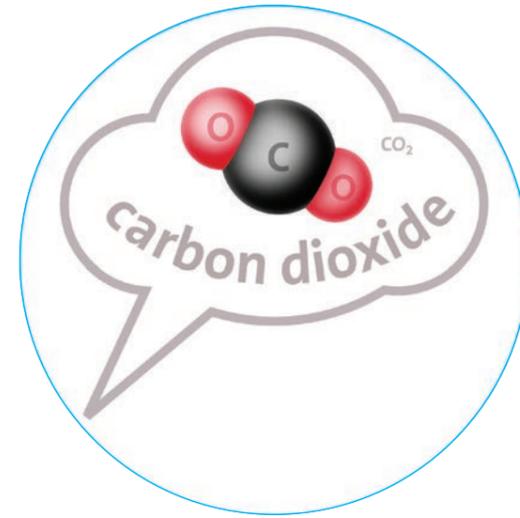
What will change if renewable energy and e-mobility are increasingly used? (pages 21 to 22)

What are the options for adapting to climate change? What are the implications of these adjustments? (pages 19 to 20)

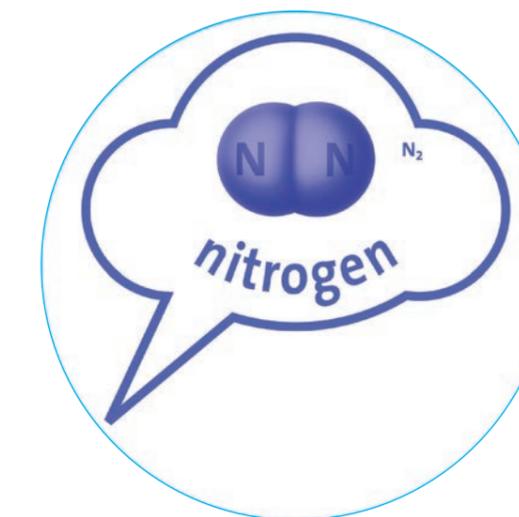
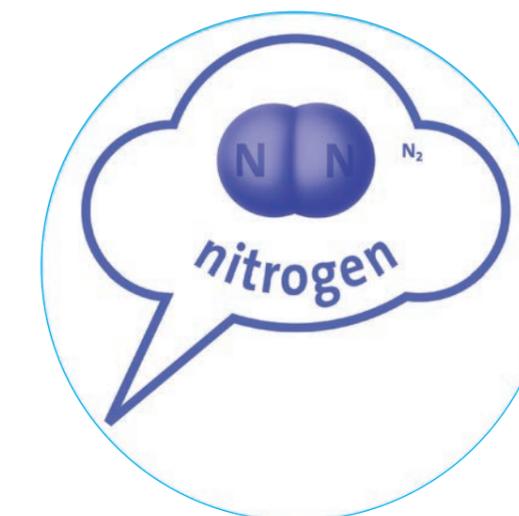
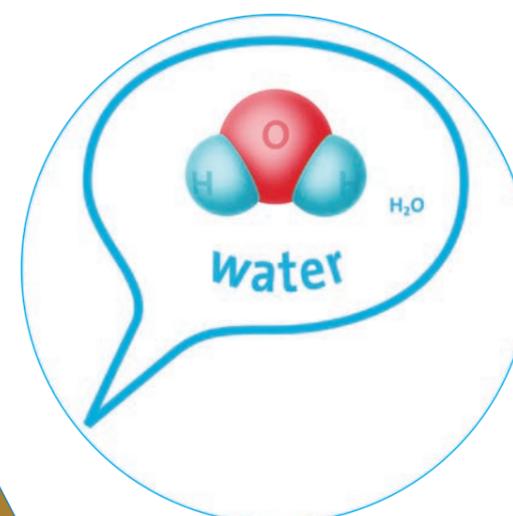
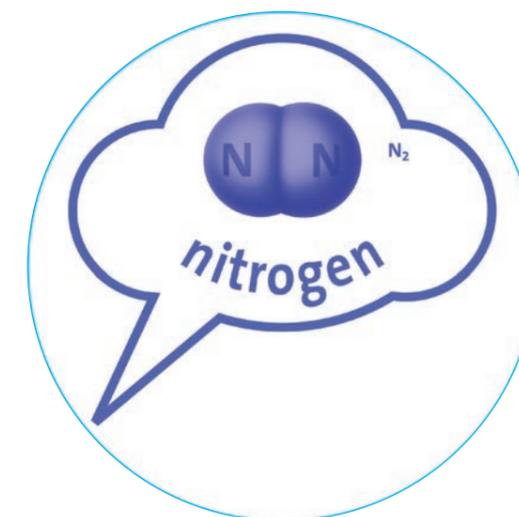
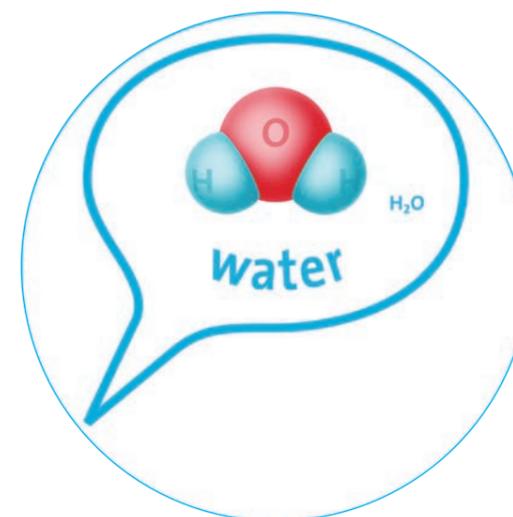
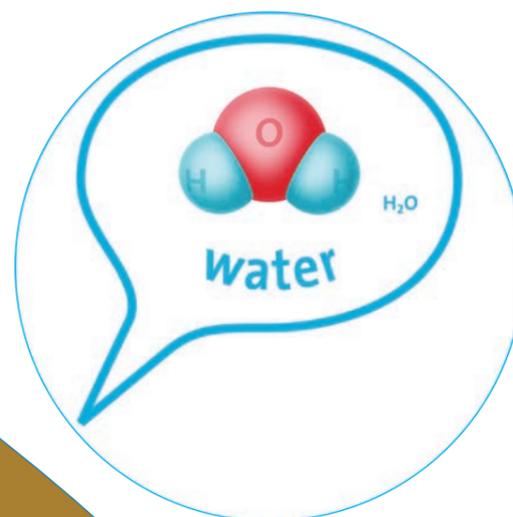
How can young people and children make a contribution? Reflect in the group, note down possibilities and place them in the middle of the globe.

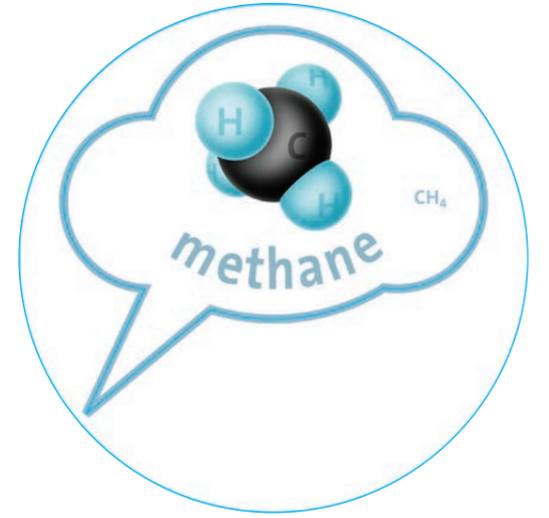
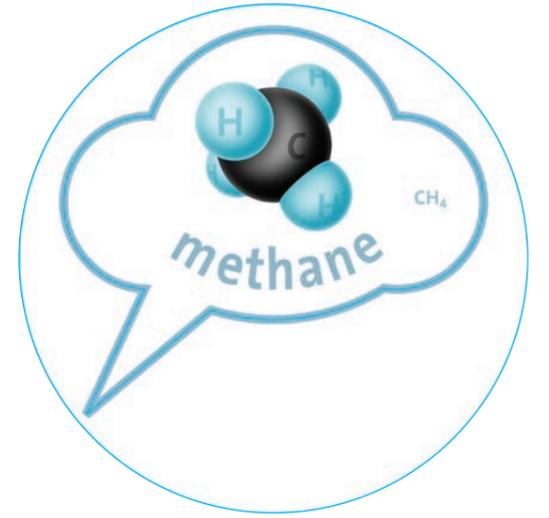
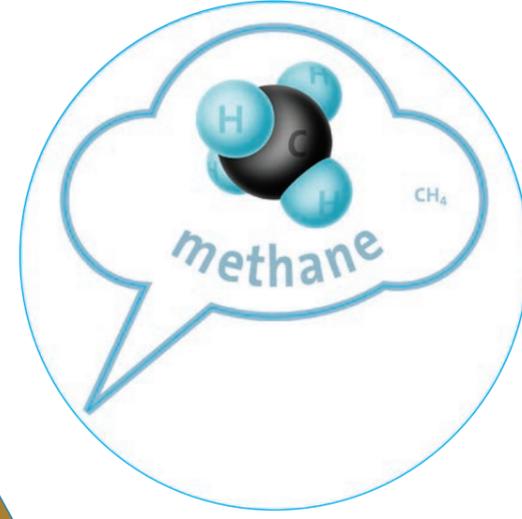
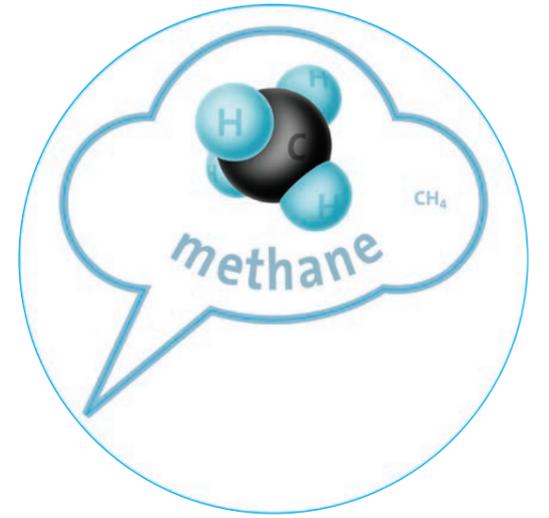
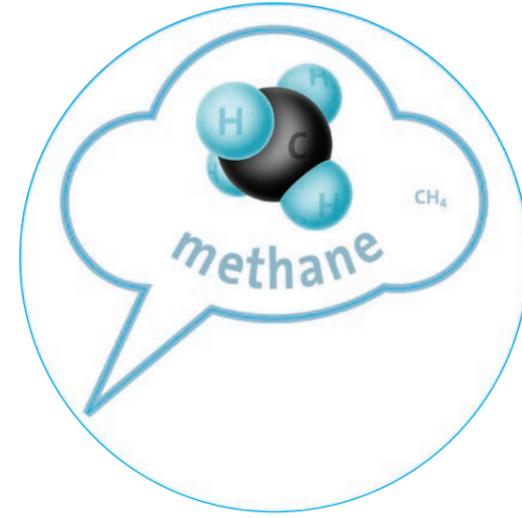
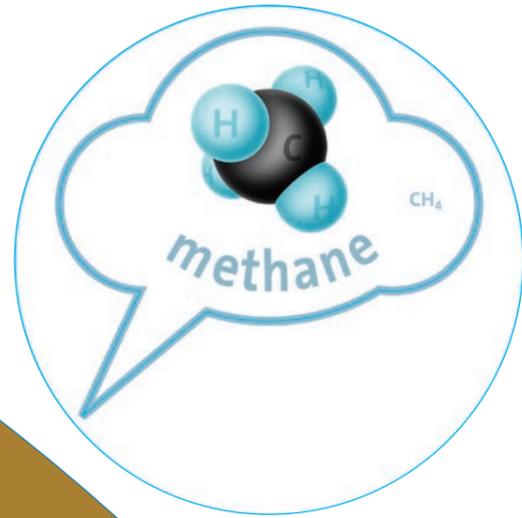


1/4 earth
carbon dioxide

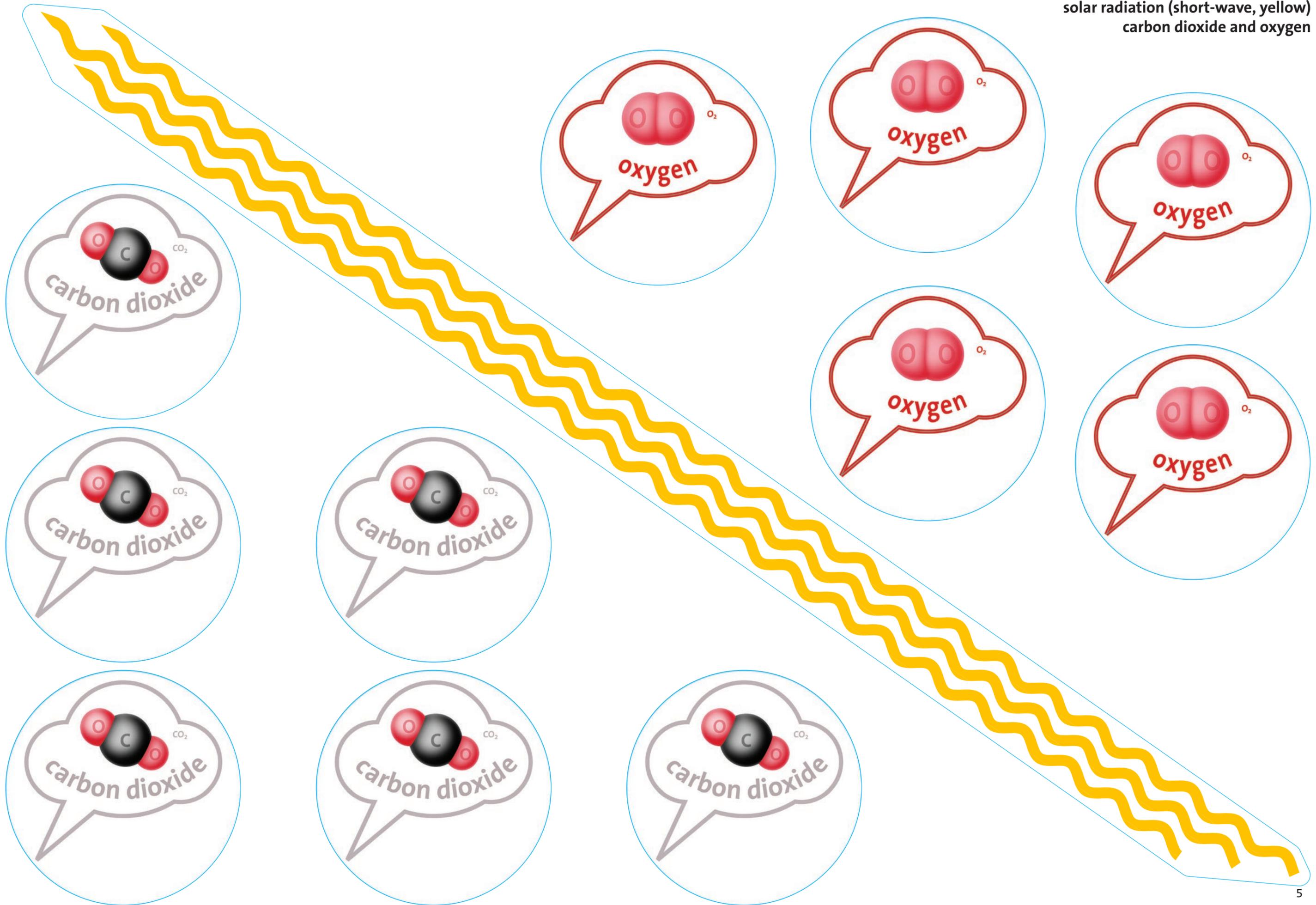


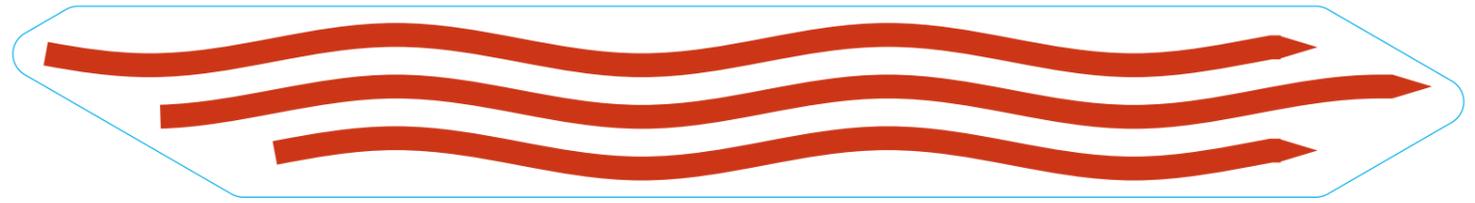
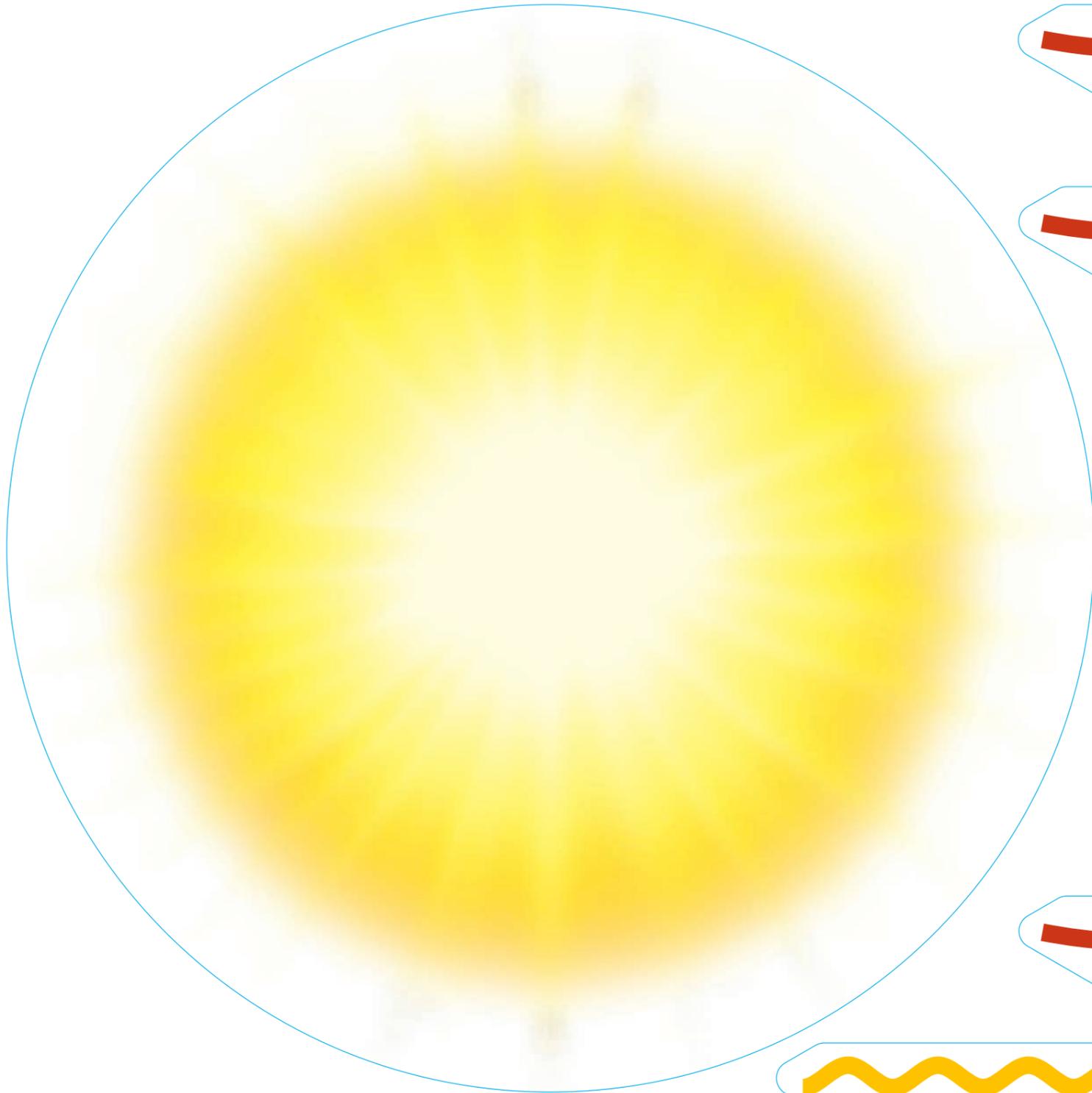
1/4 earth
nitrogen and water





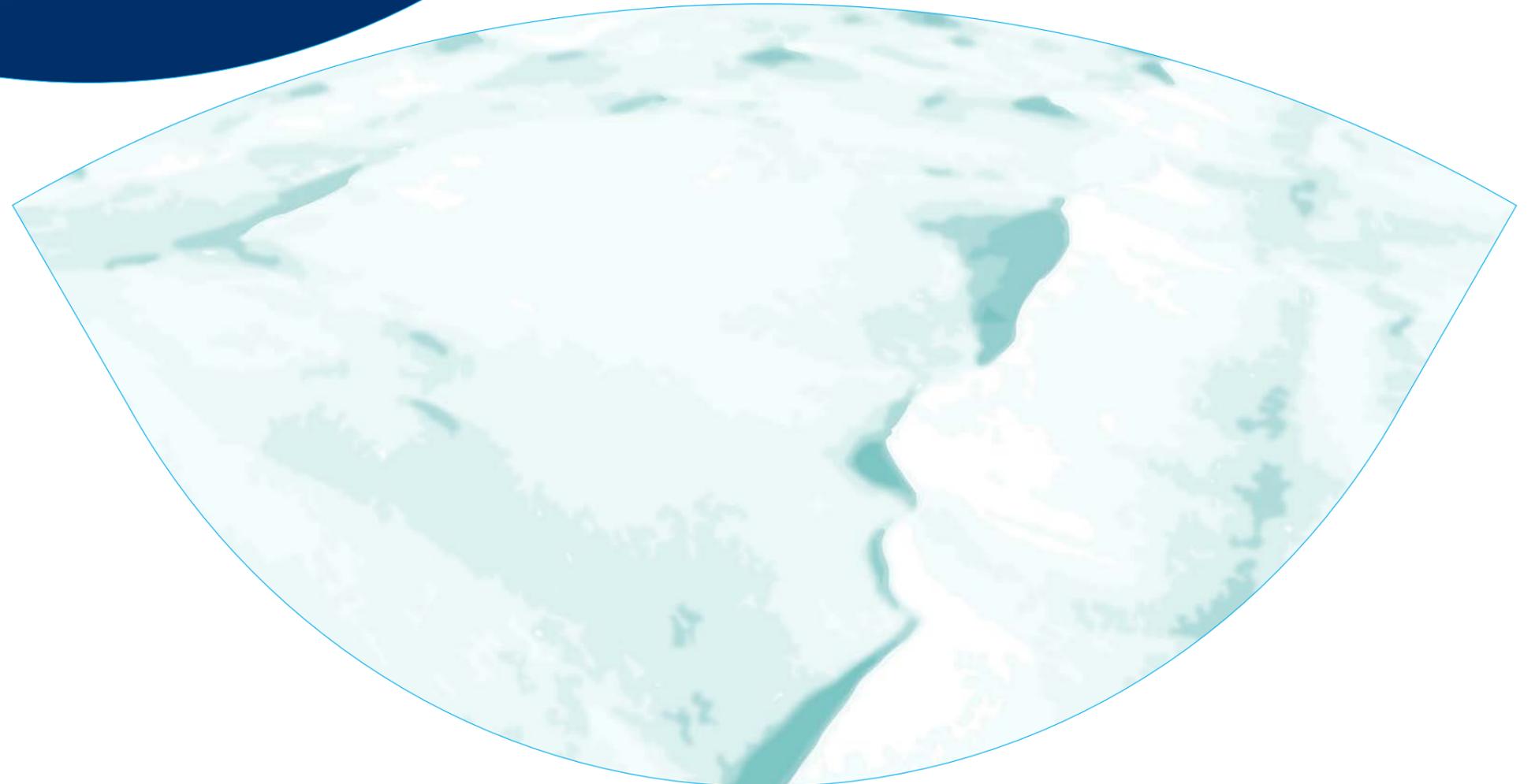
solar radiation (short-wave, yellow)
carbon dioxide and oxygen



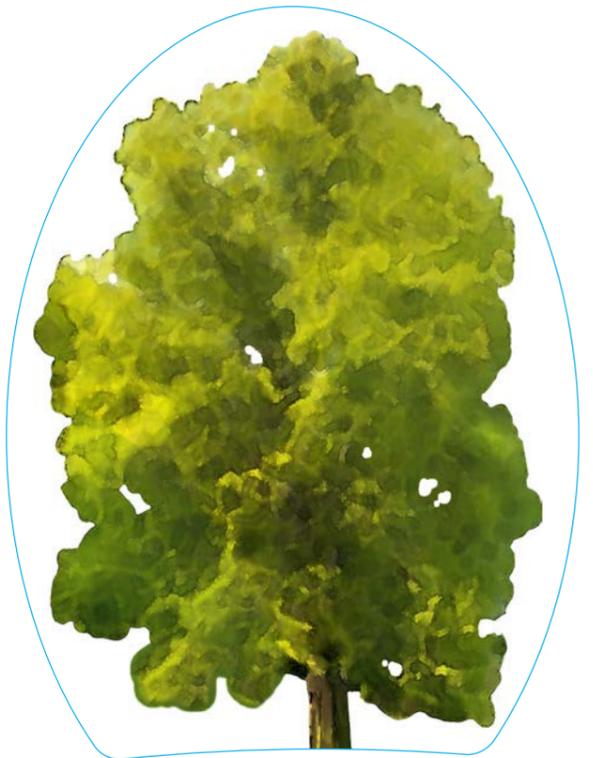
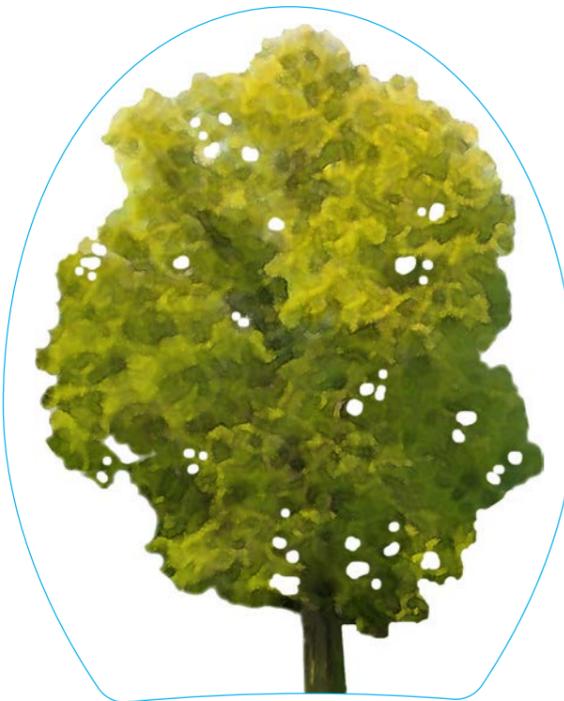
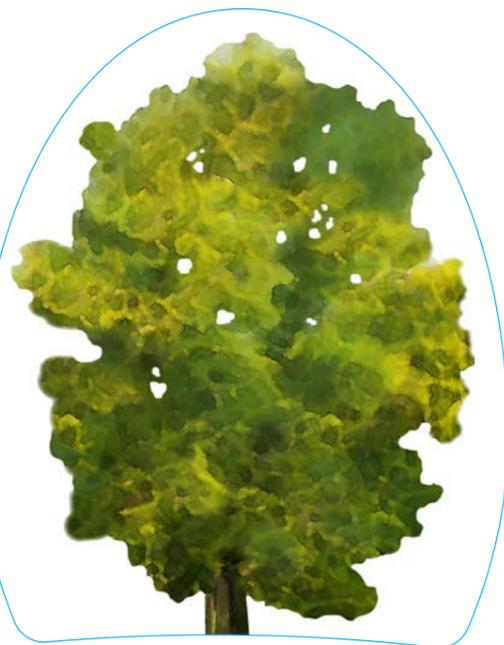
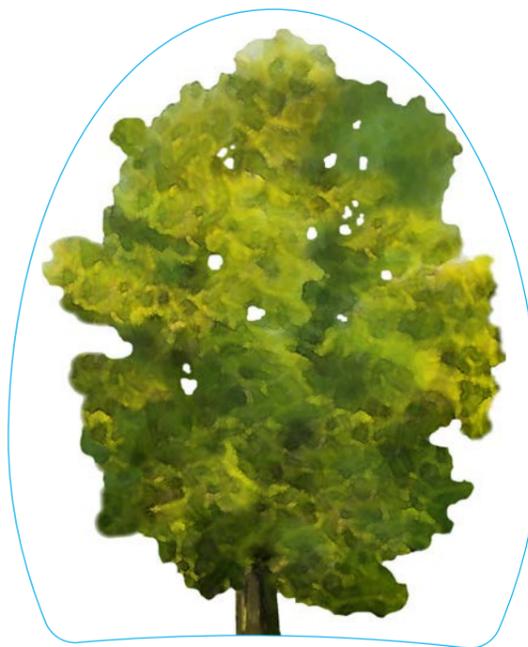
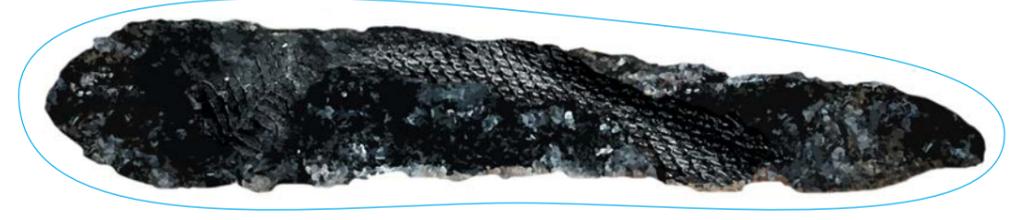
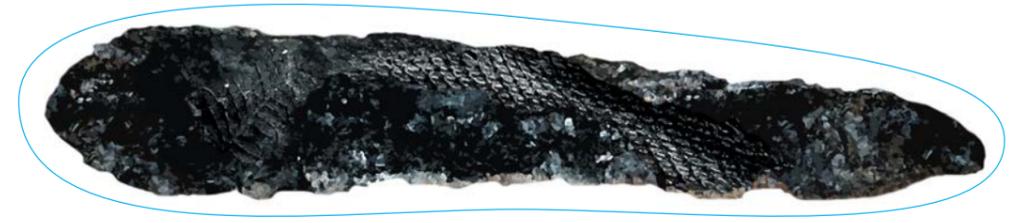
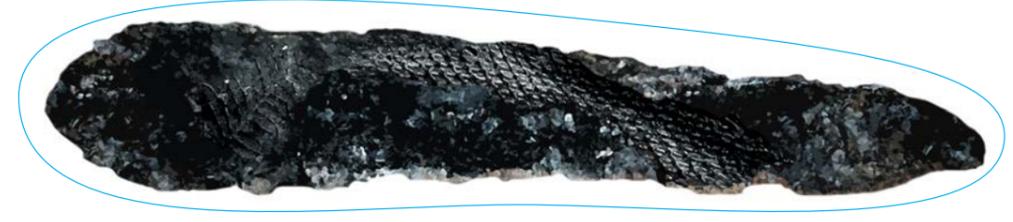


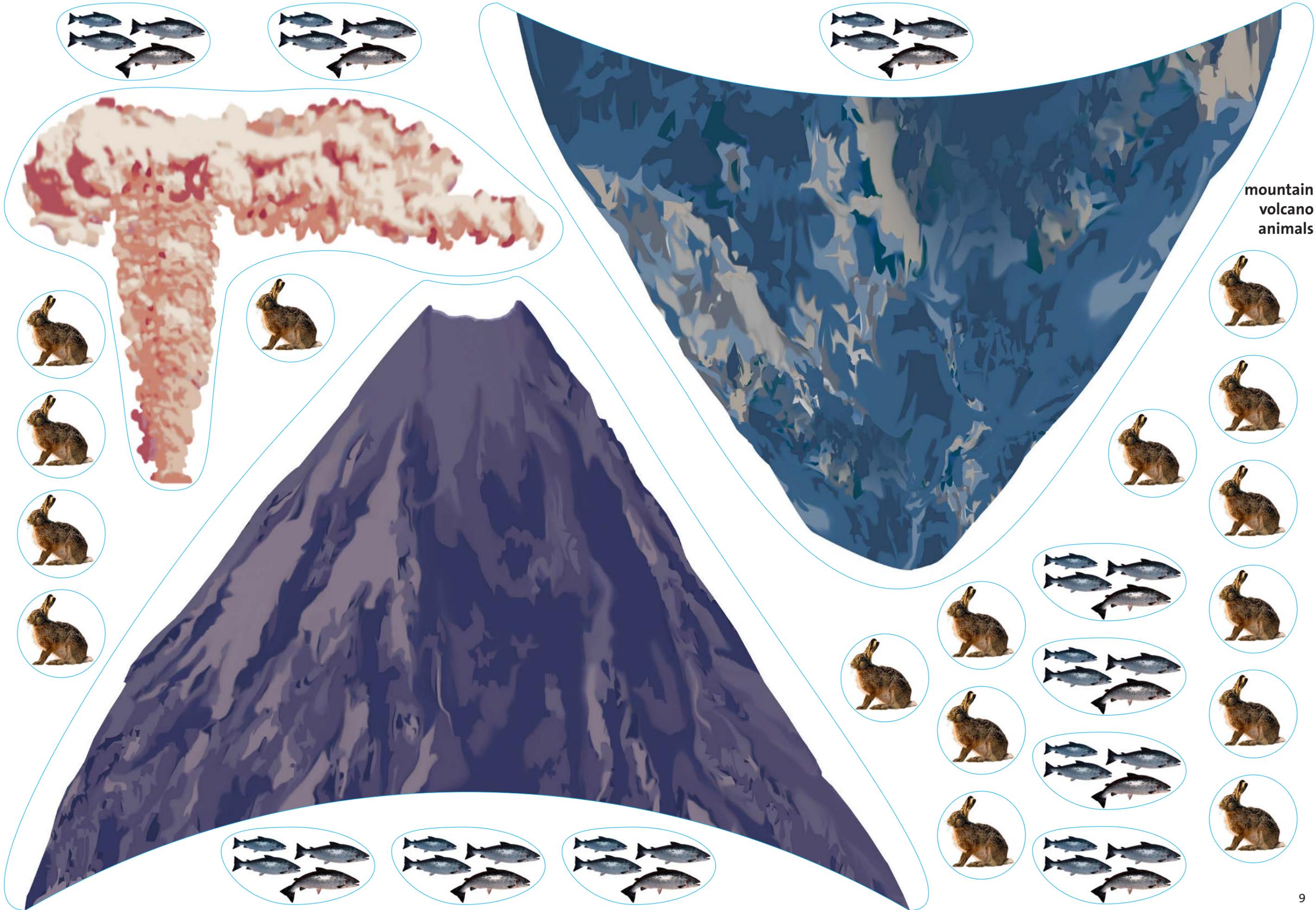
sun
solar radiation (short-wave, yellow)
thermal radiation (long-wave, red)



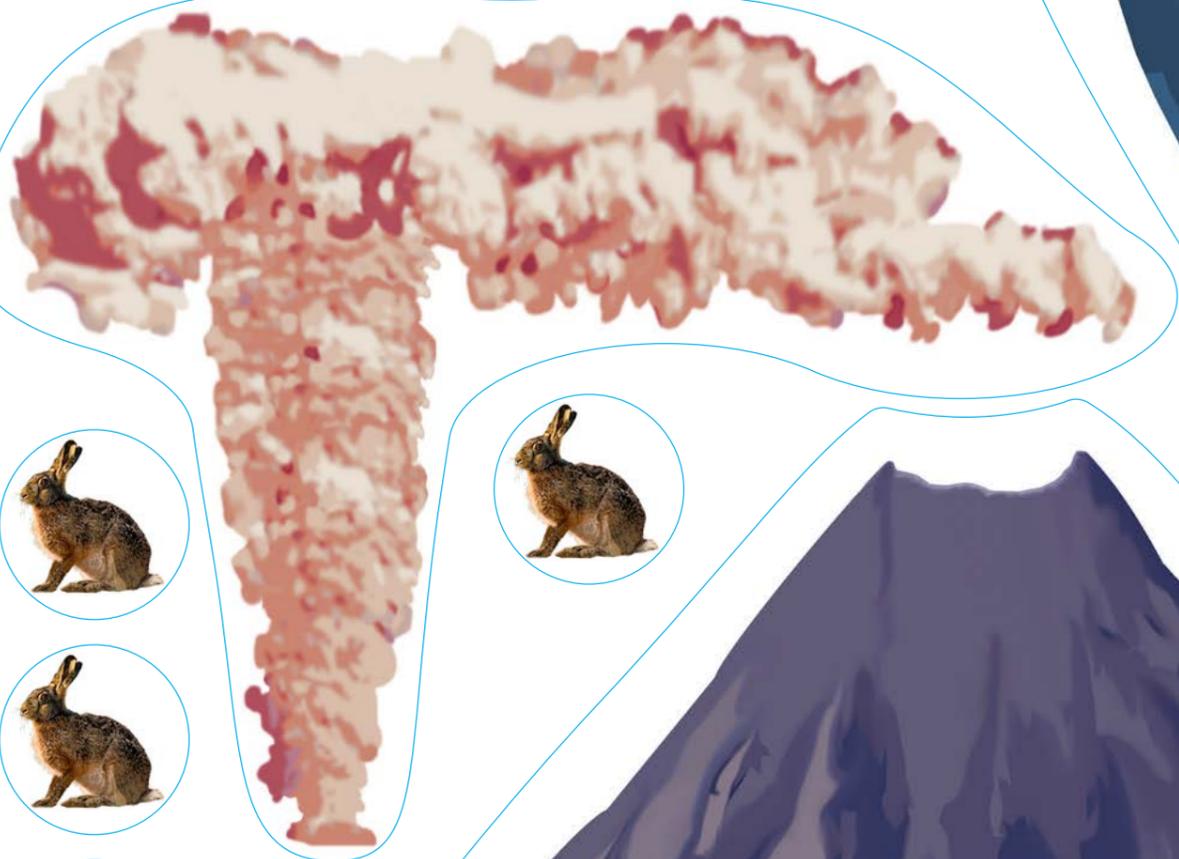
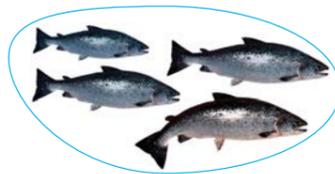


trees
coal/petroleum/natural gas
iceberg

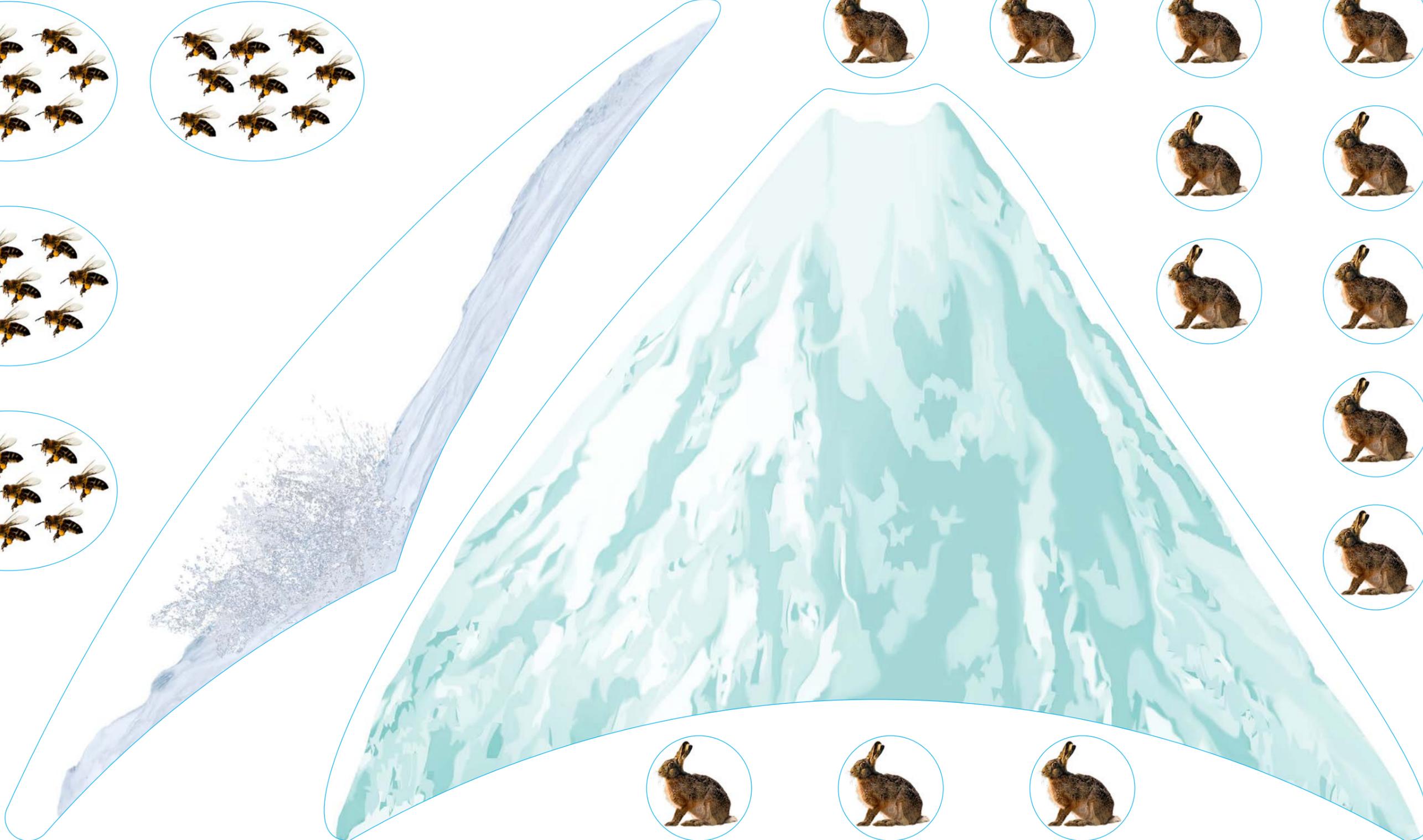
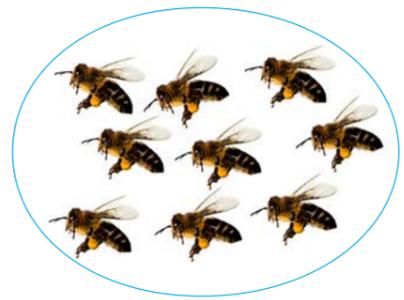
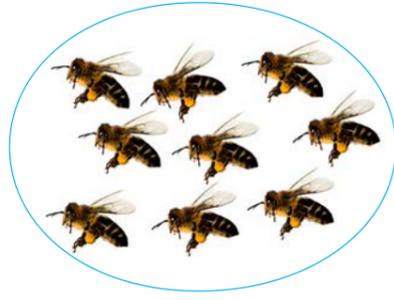
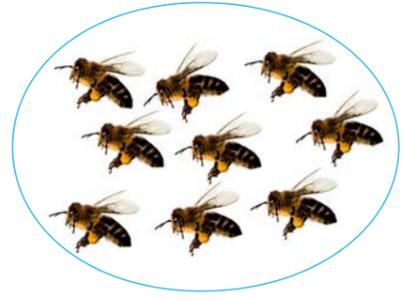
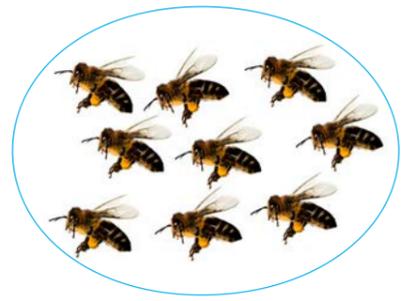


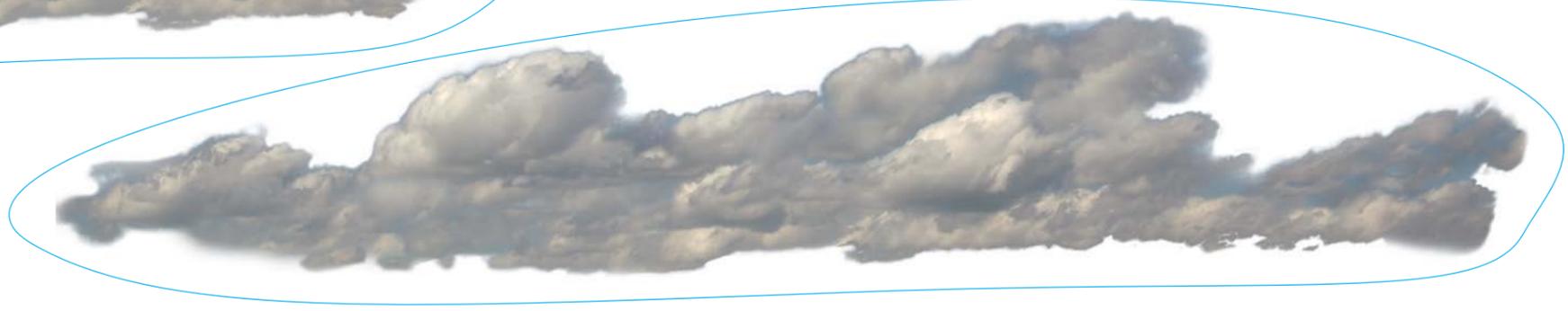
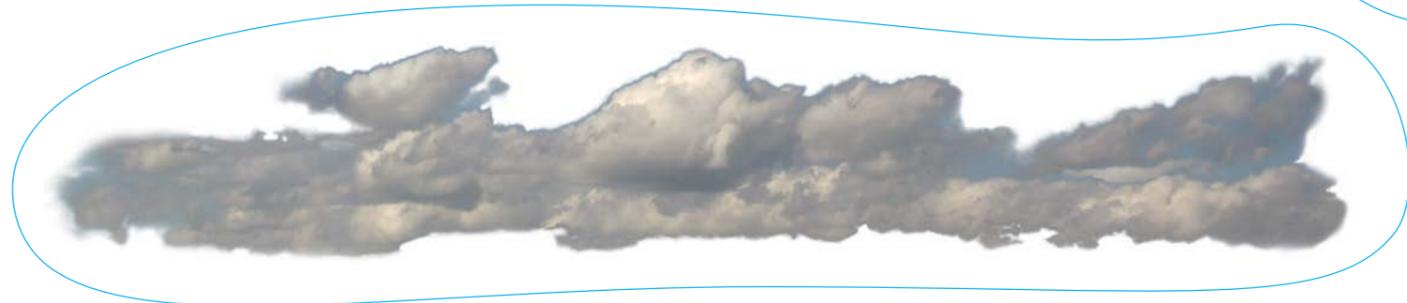
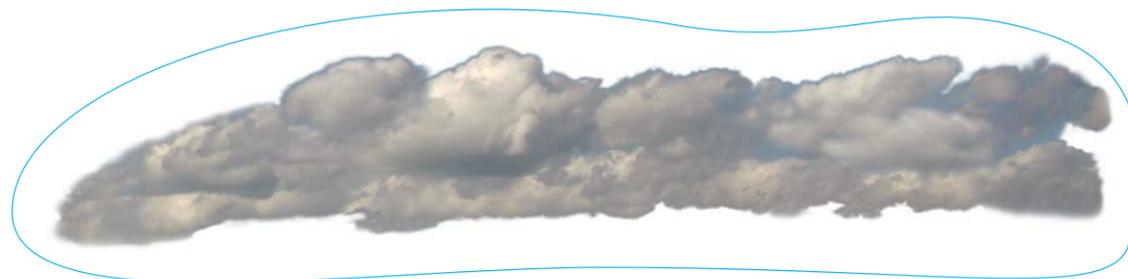


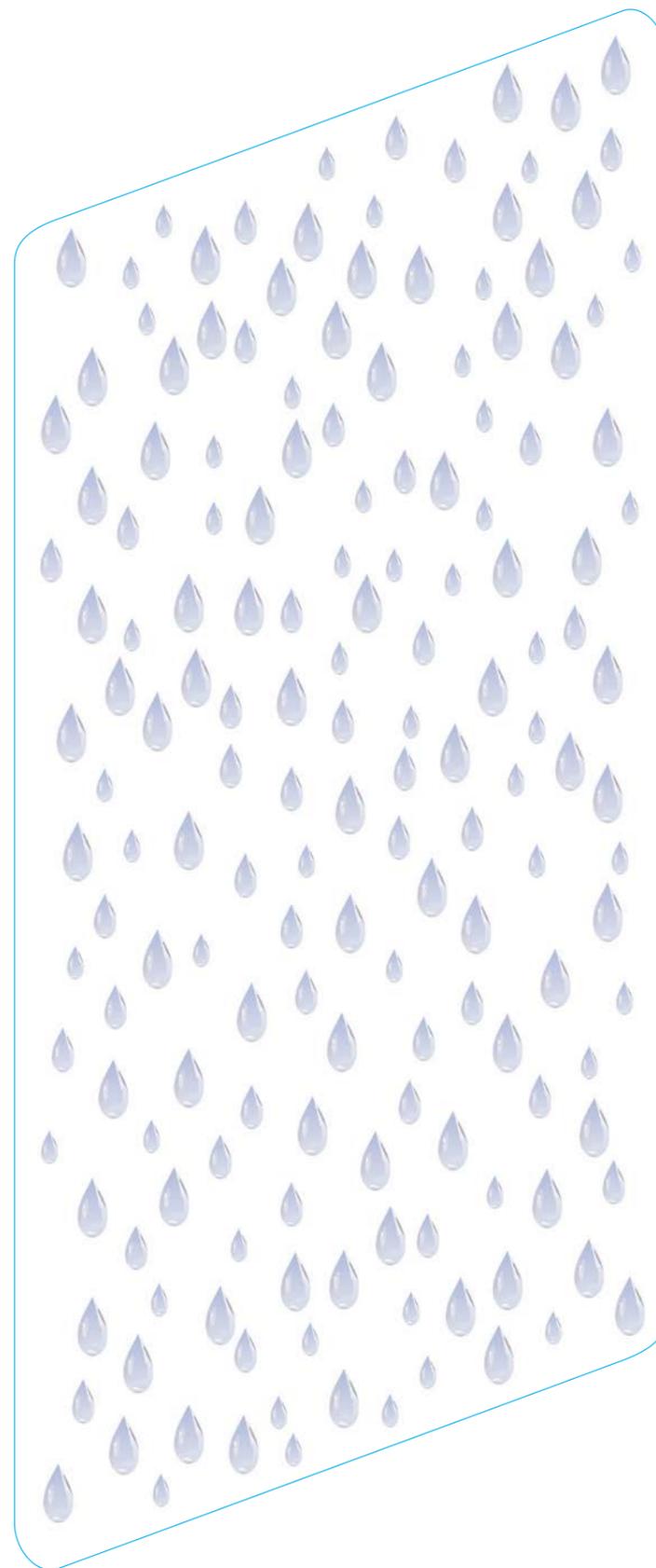
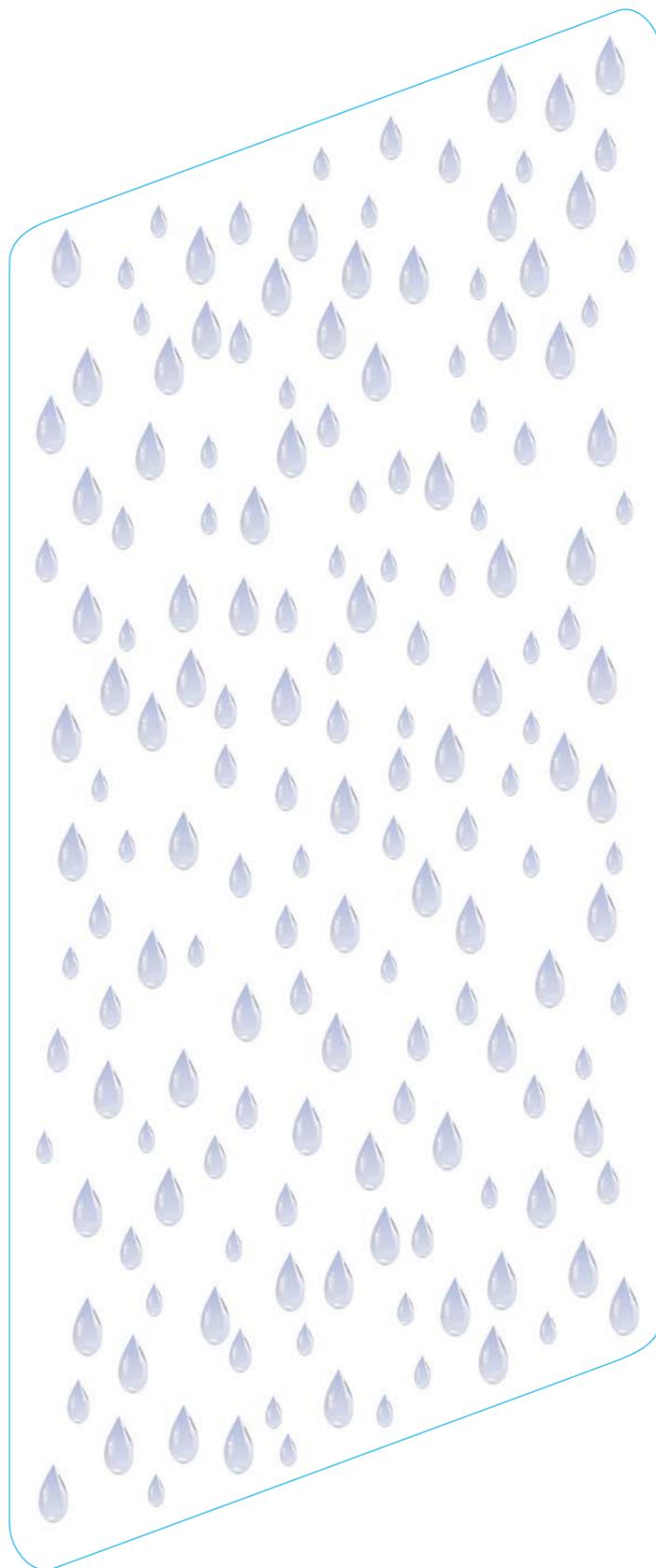
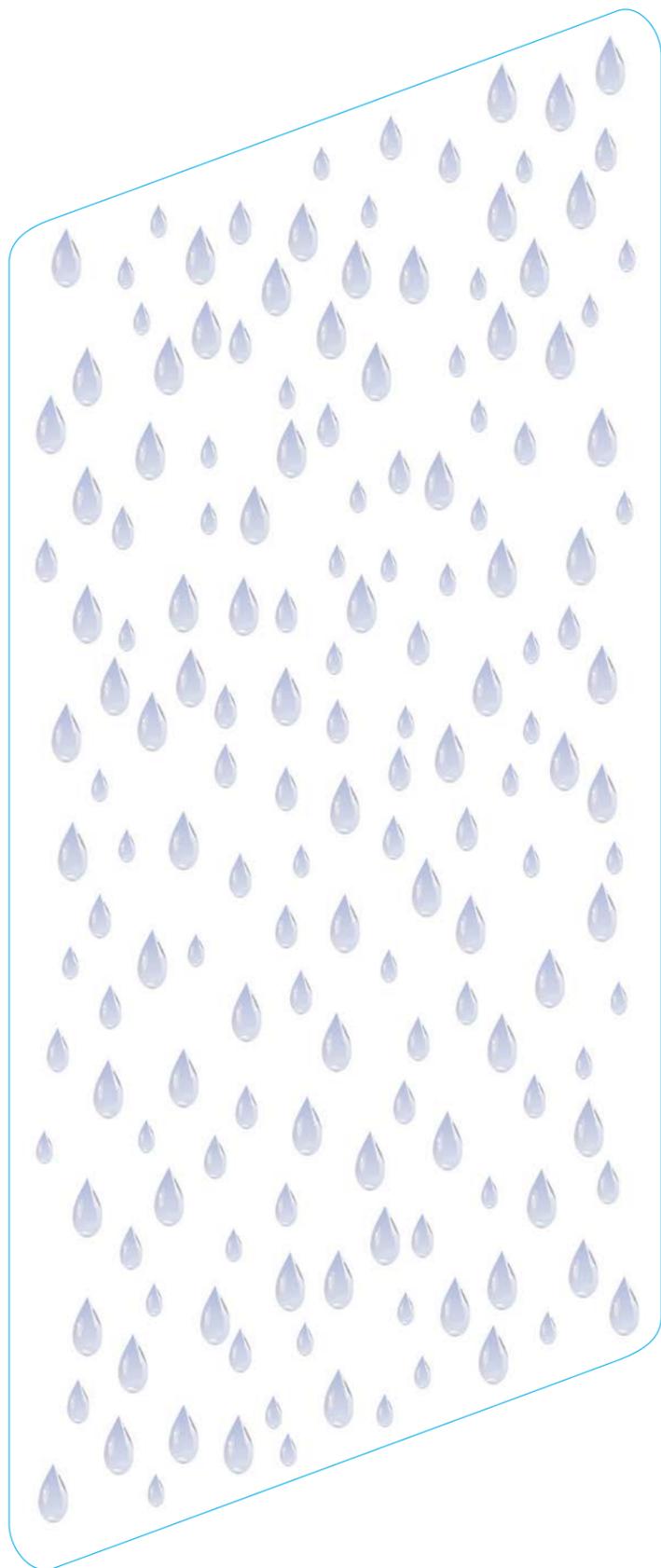
mountain
volcano
animals

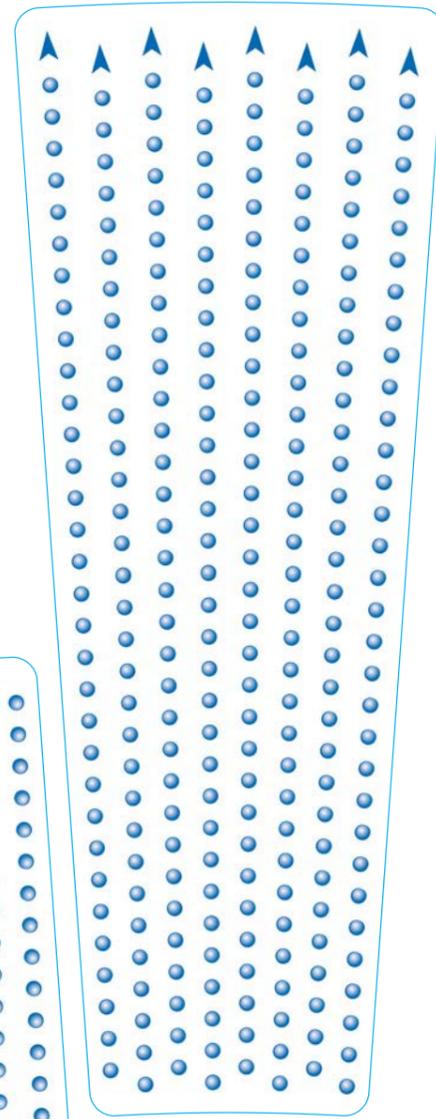
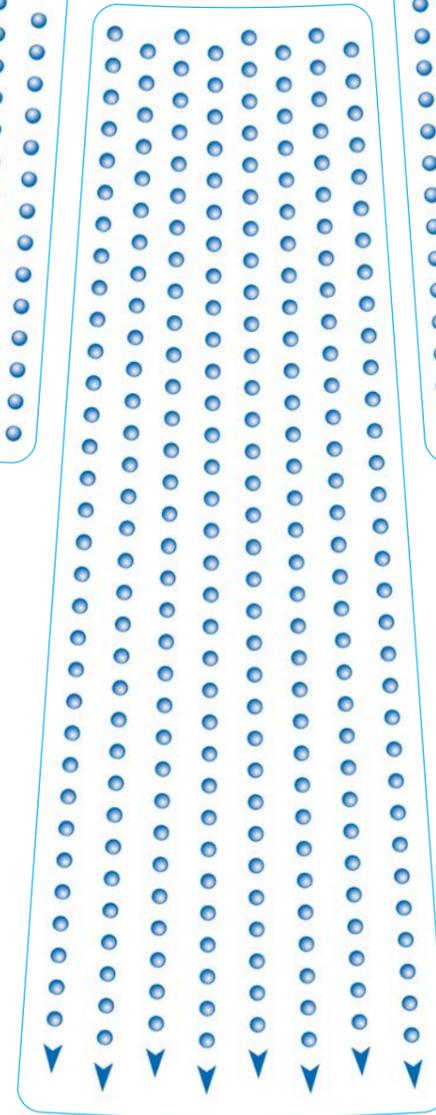
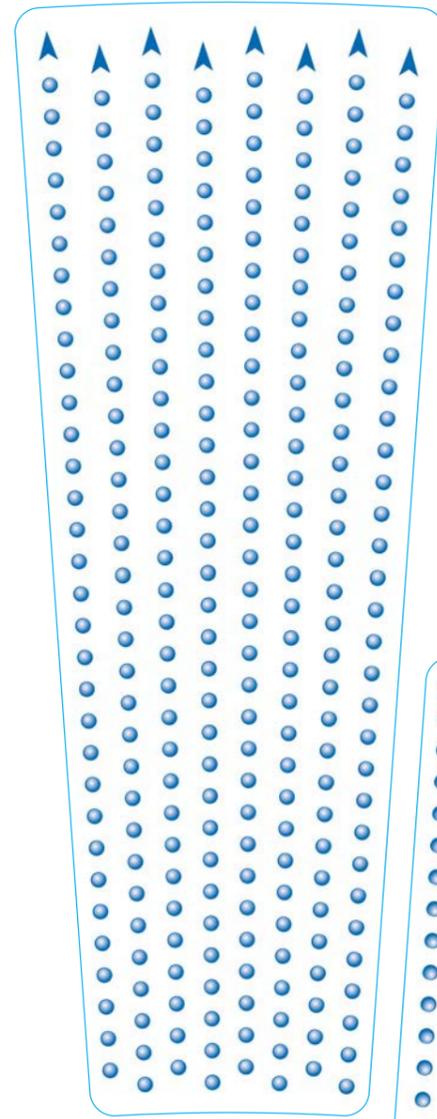
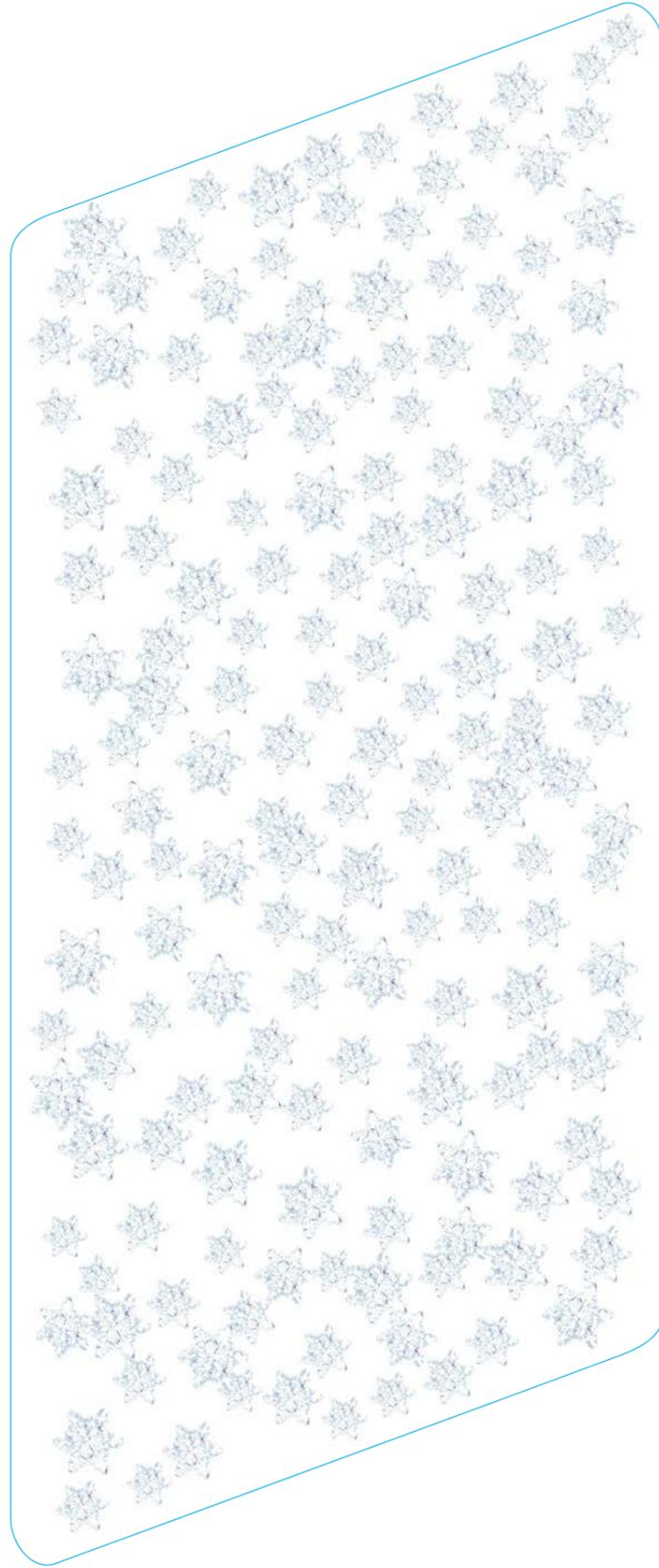
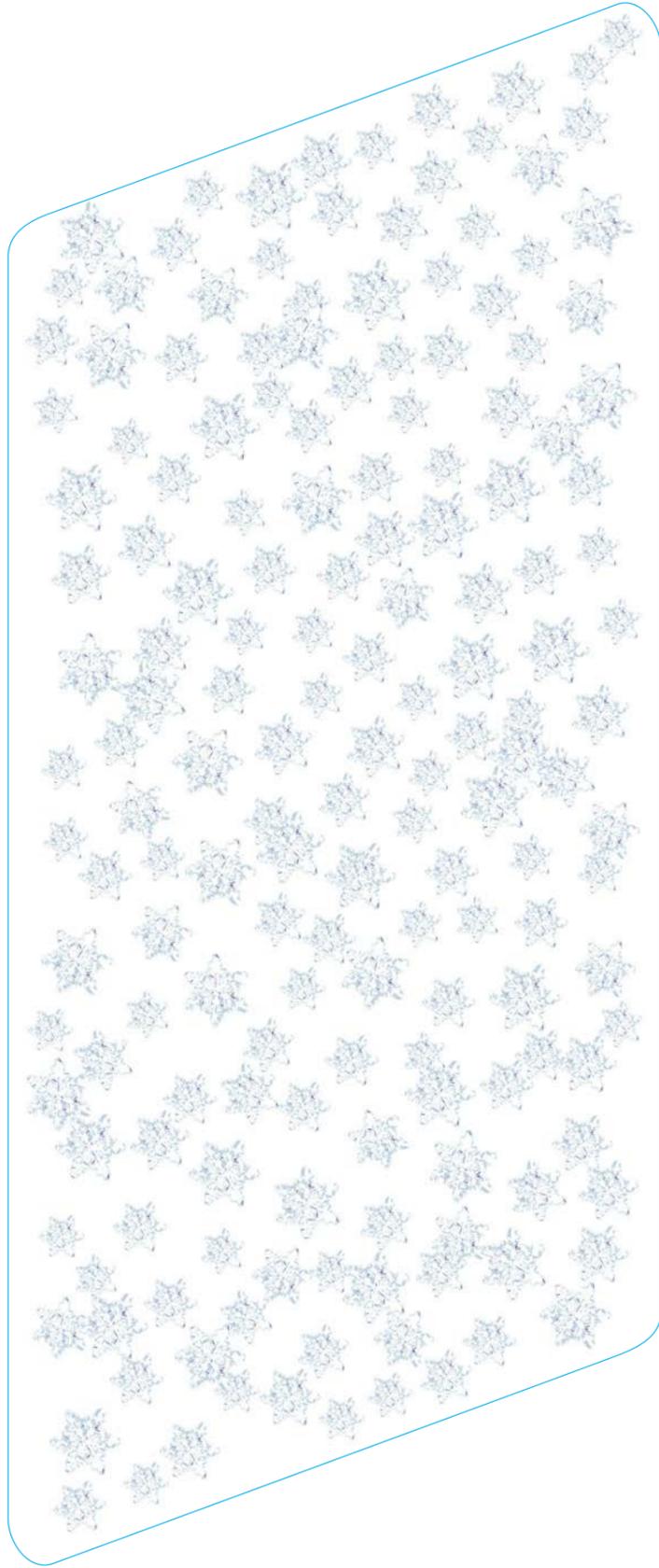


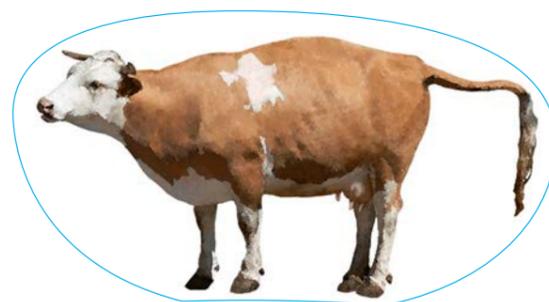
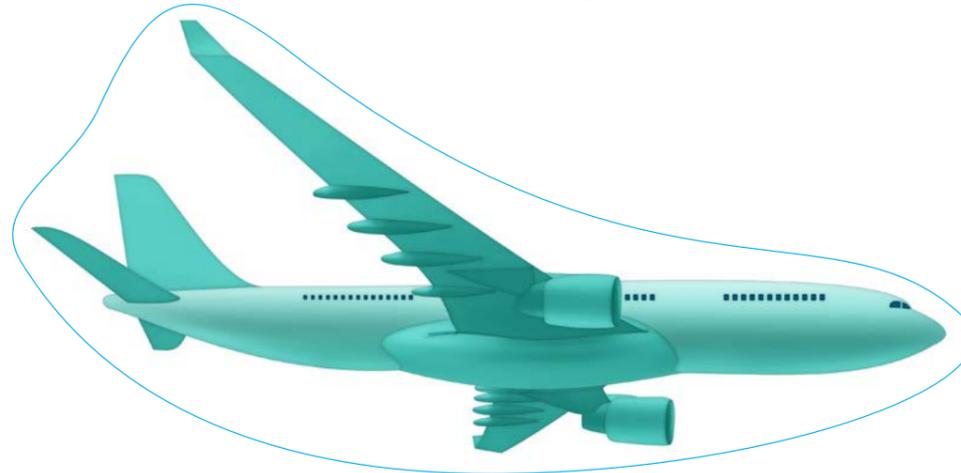
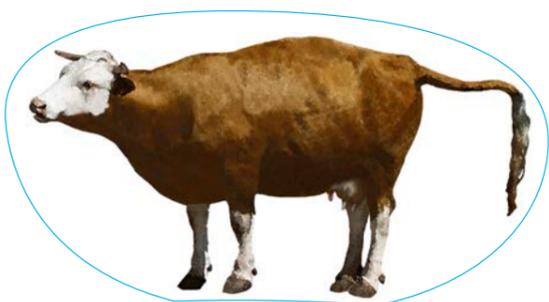
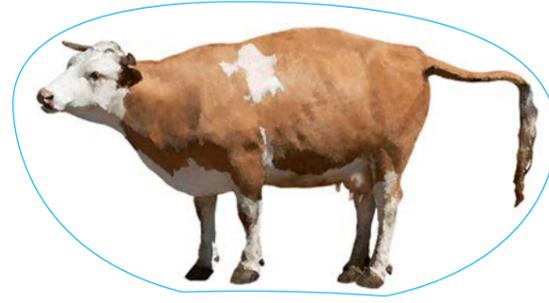
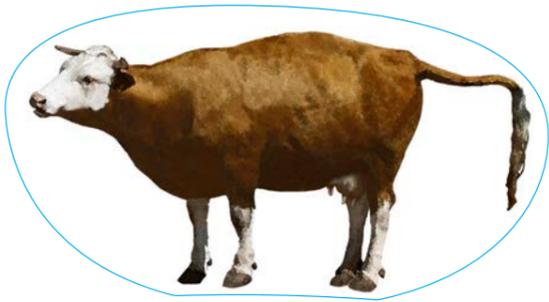
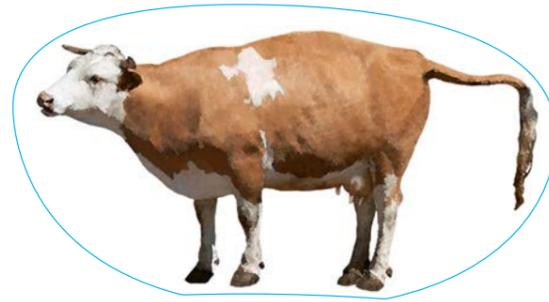
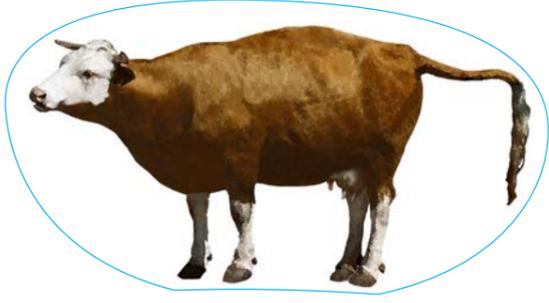
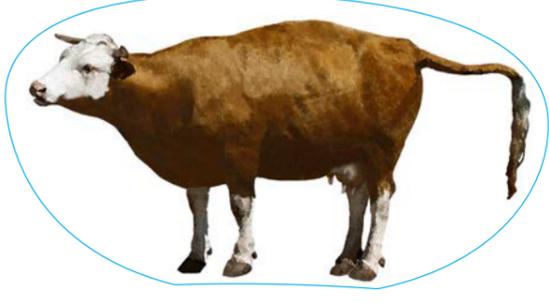
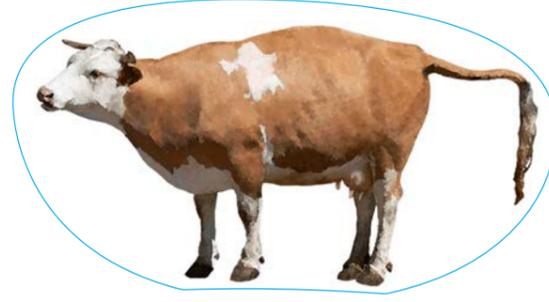
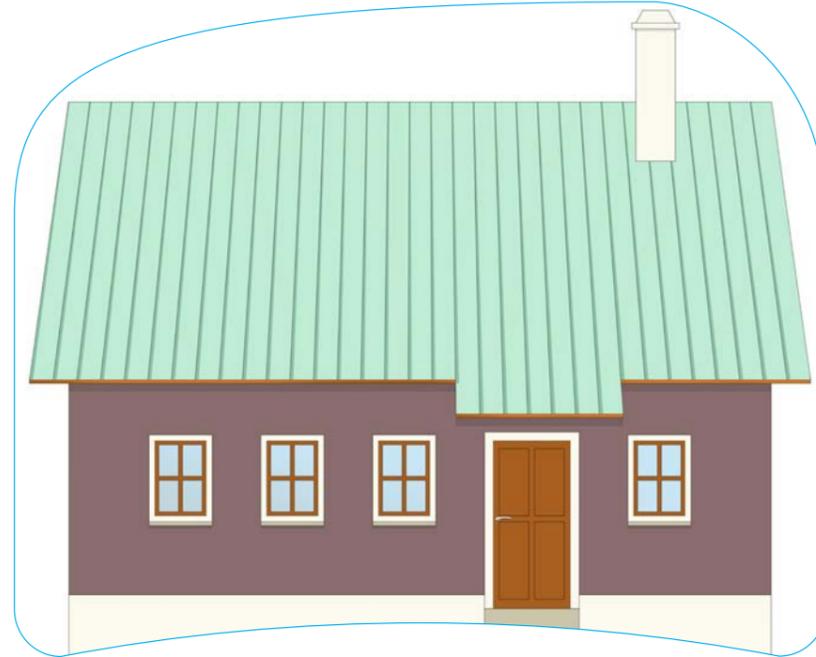
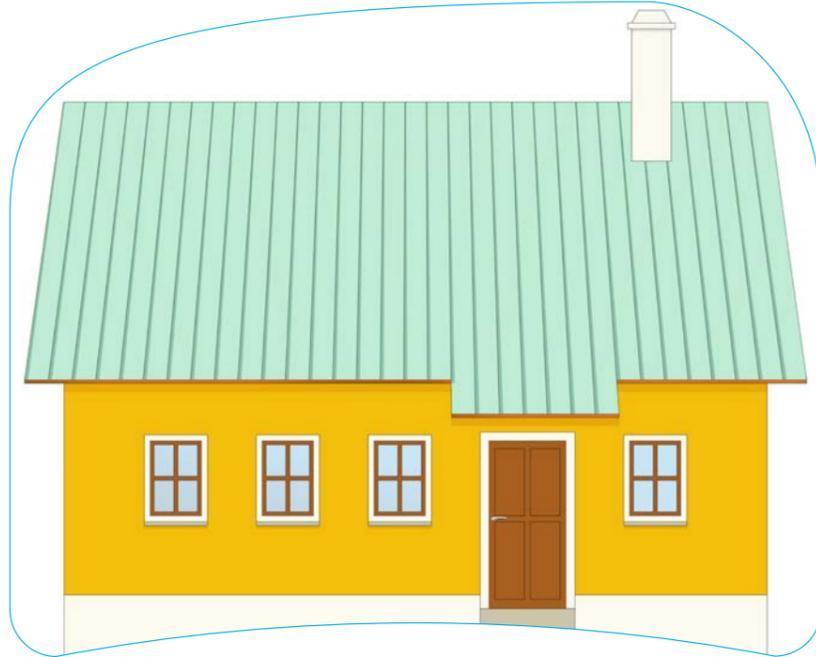
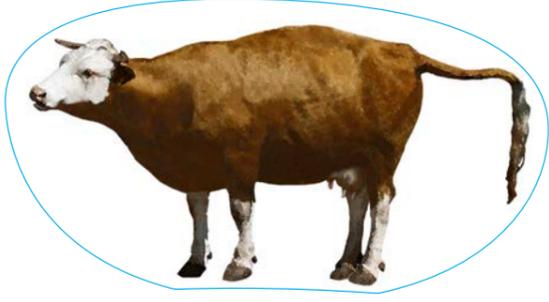
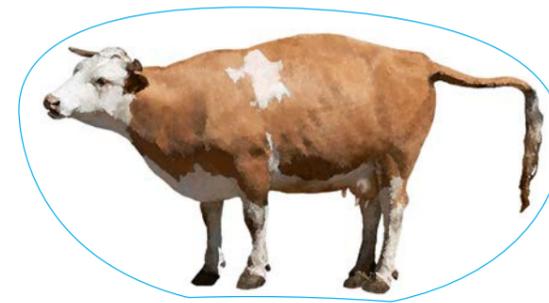
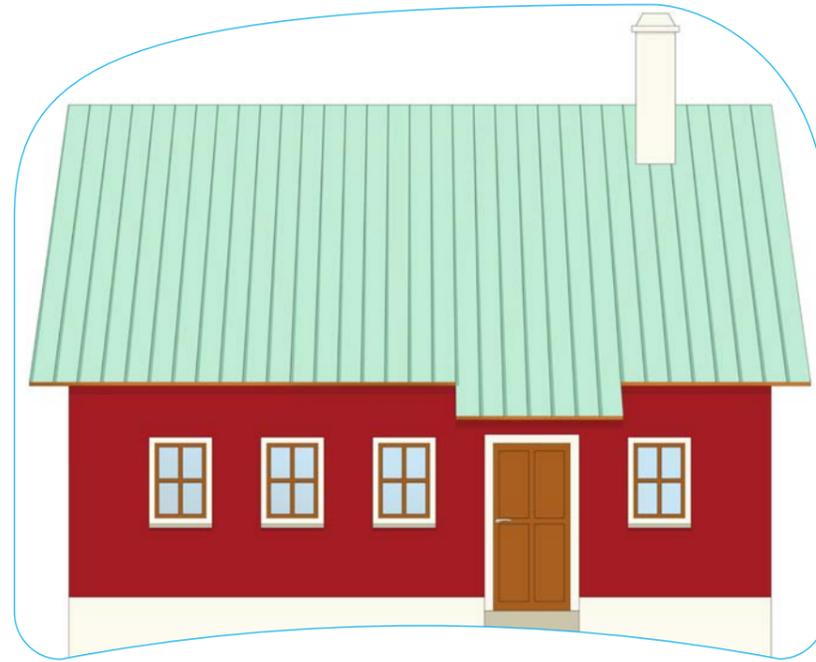
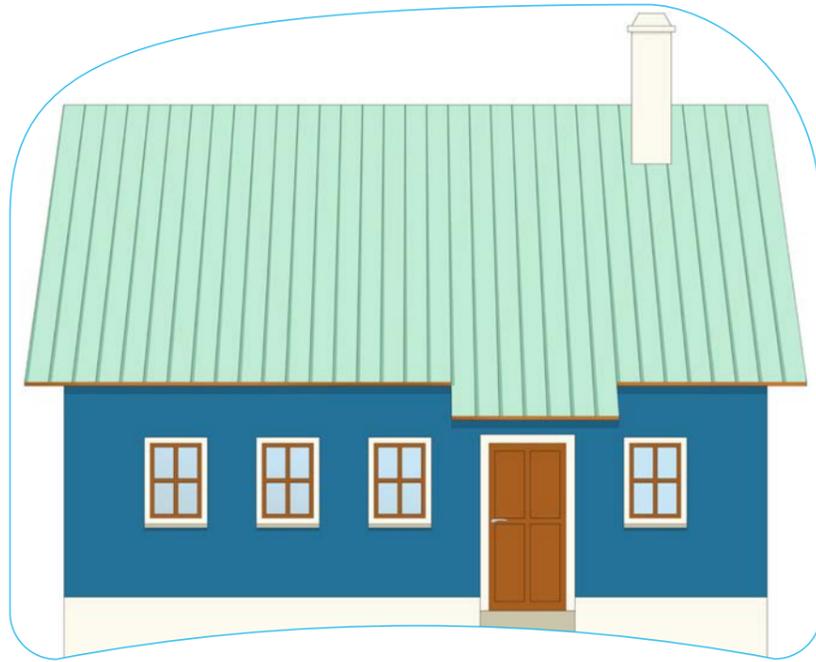
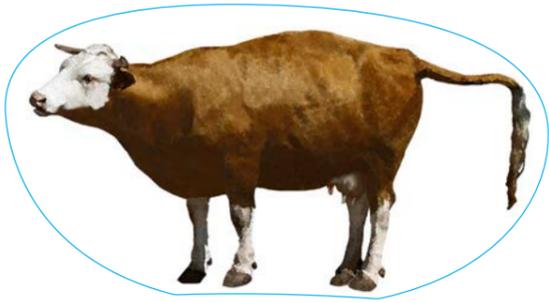
snow cover for mountain/volcano
stream
animals
plankton



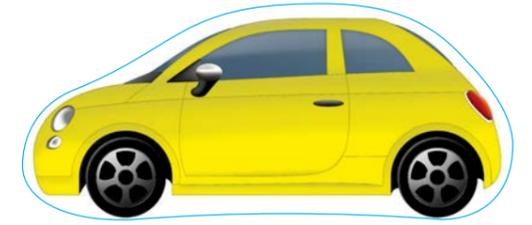
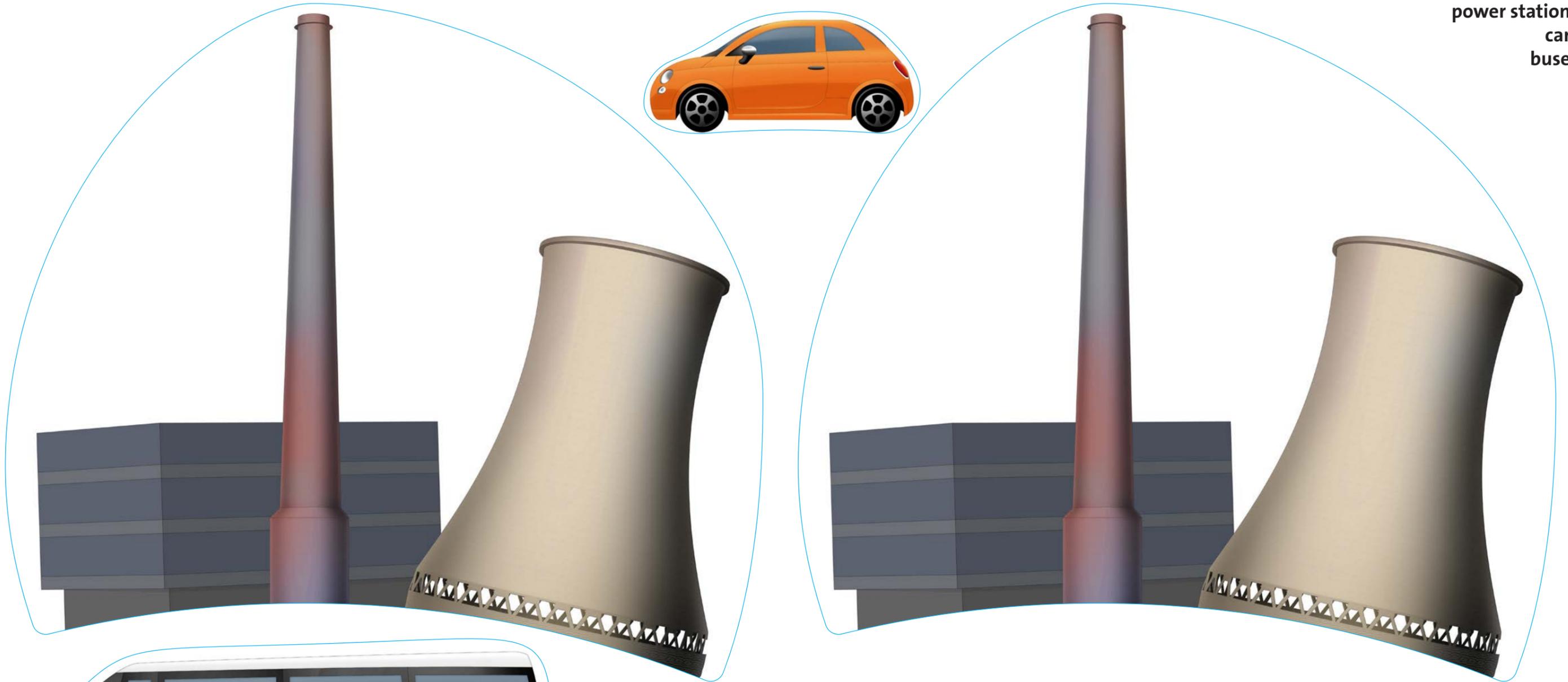




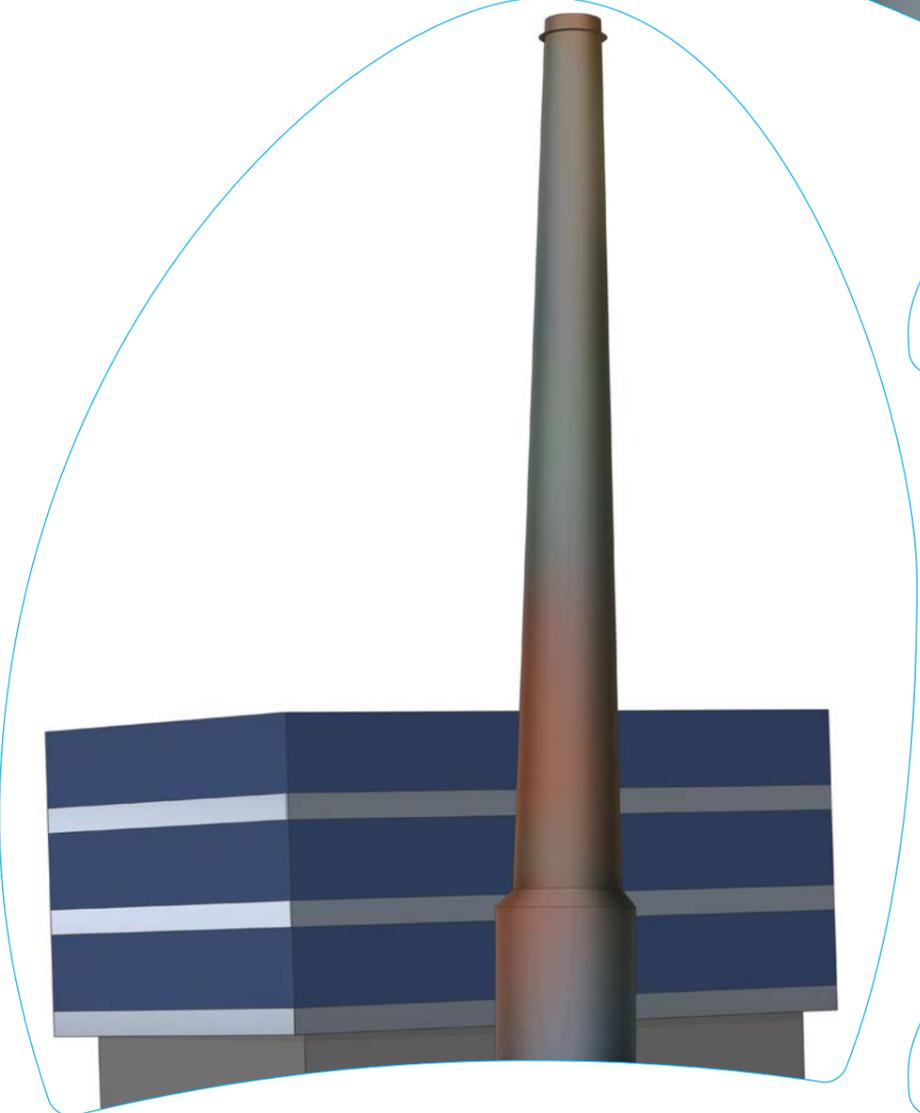
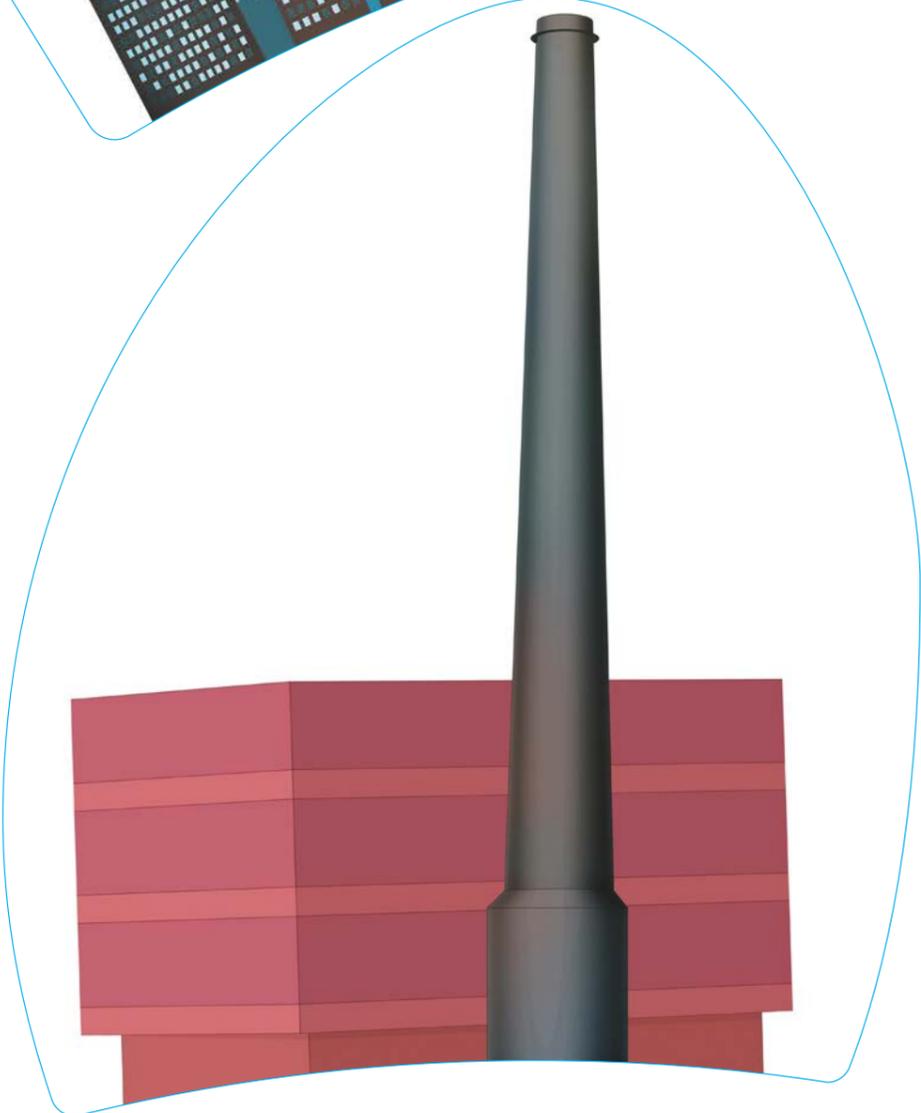
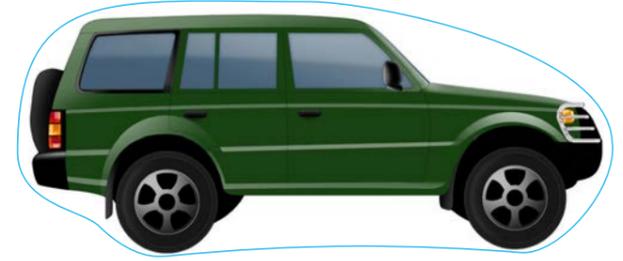


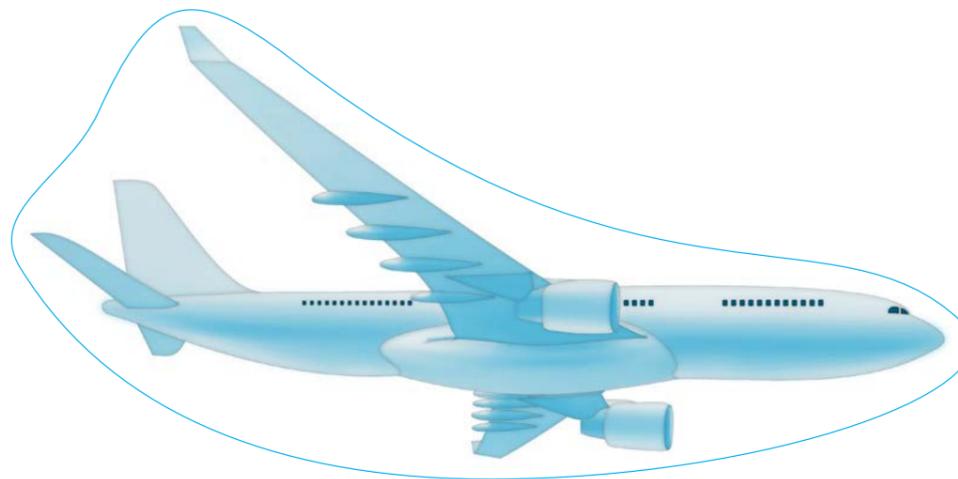
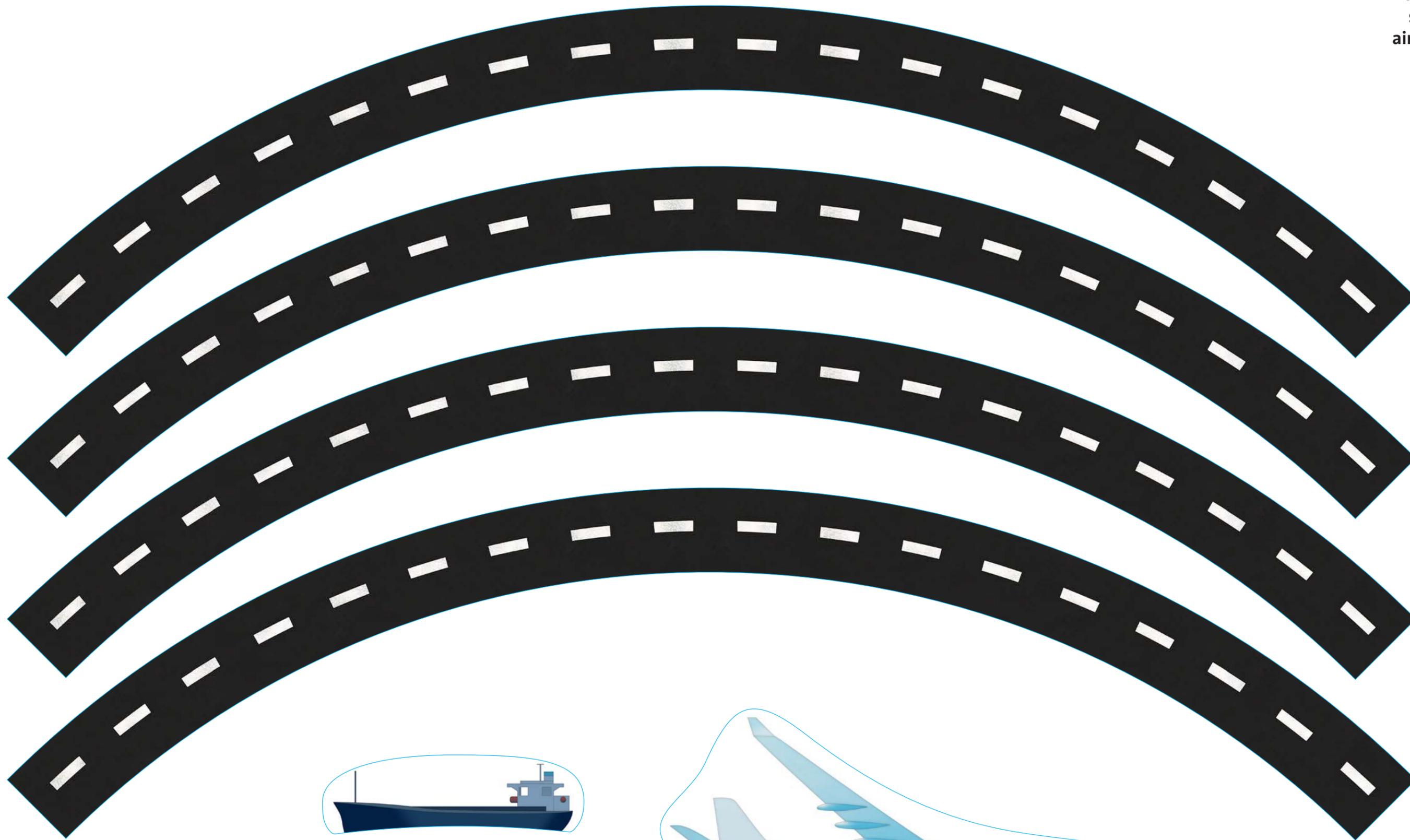


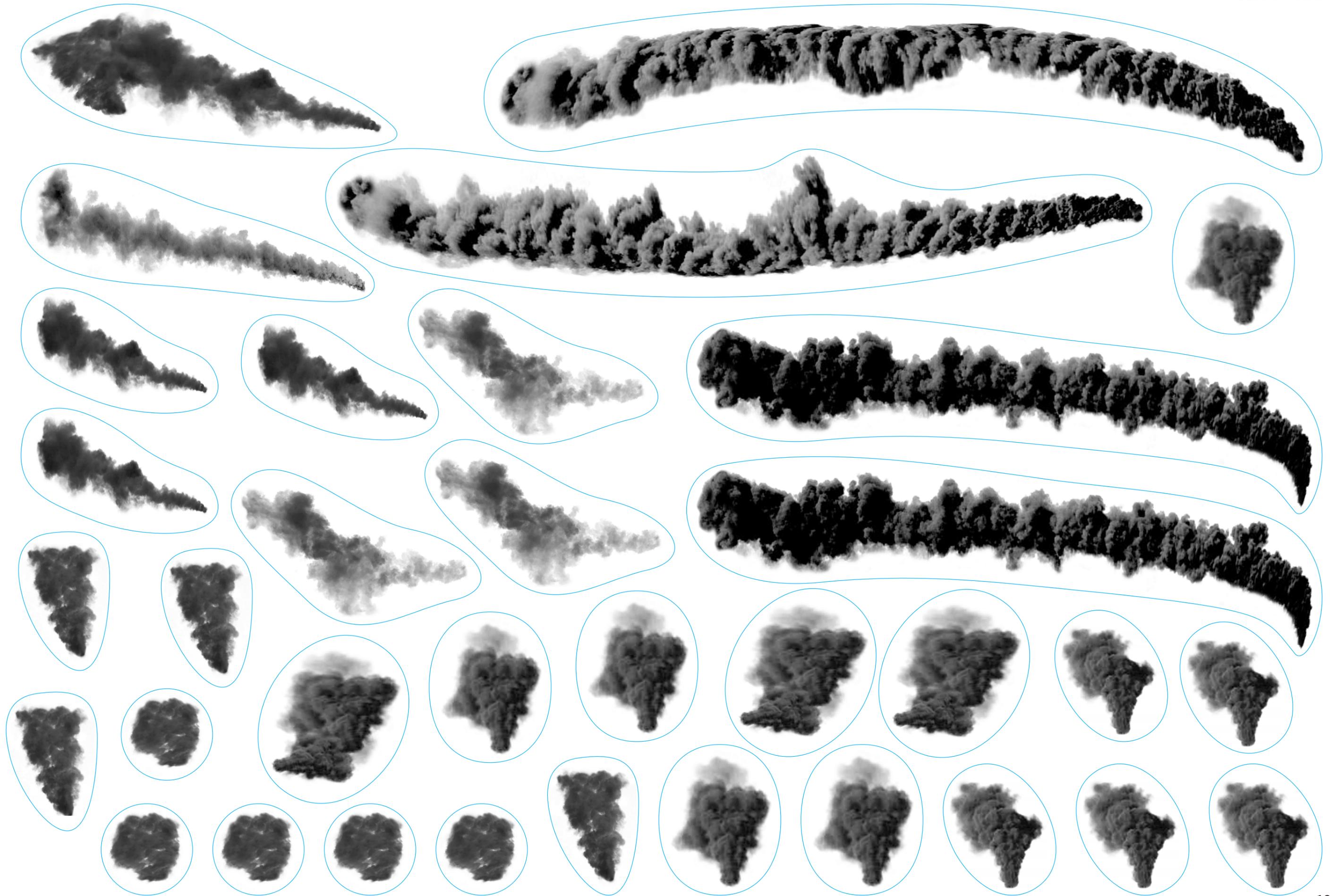
power stations
cars
buses



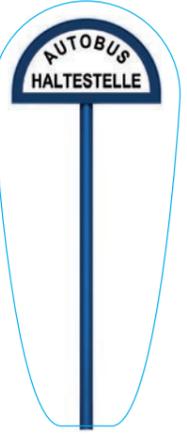
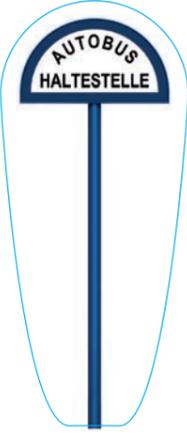
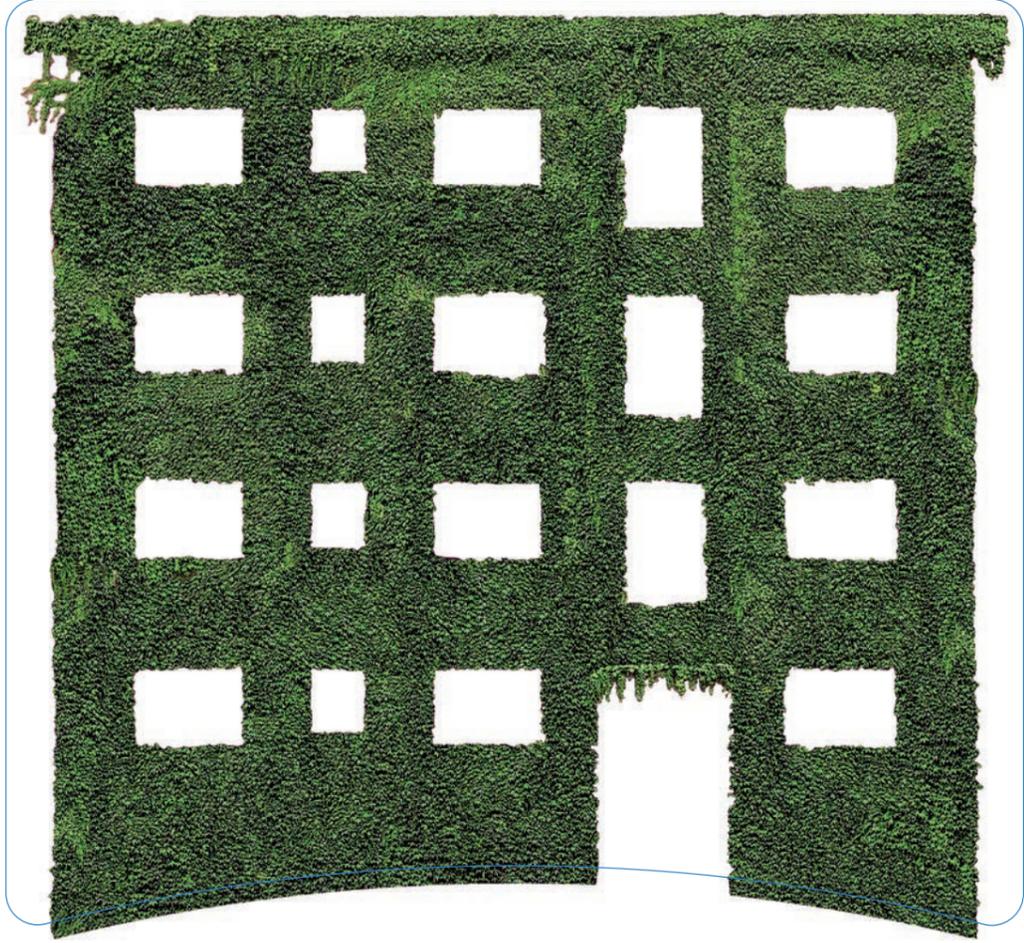
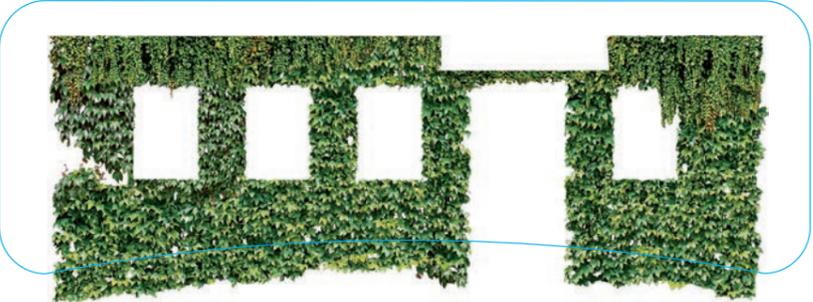
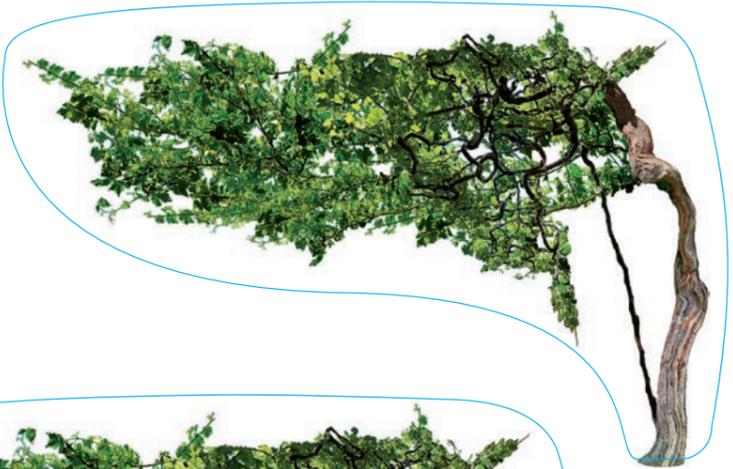
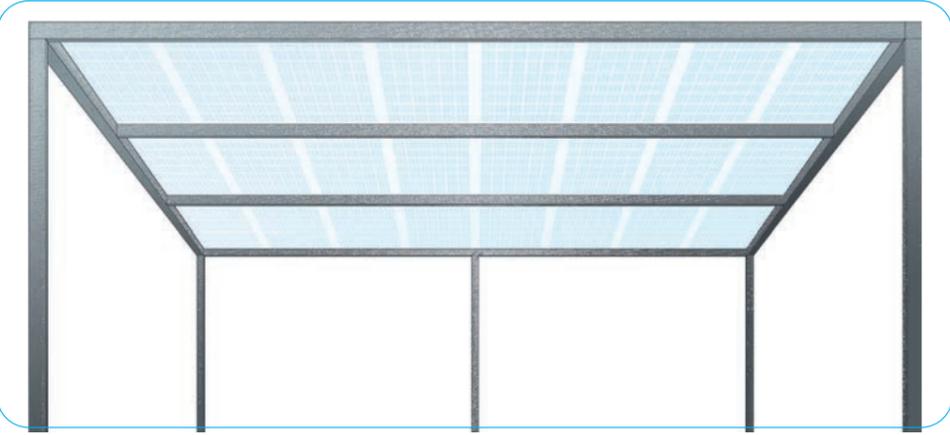
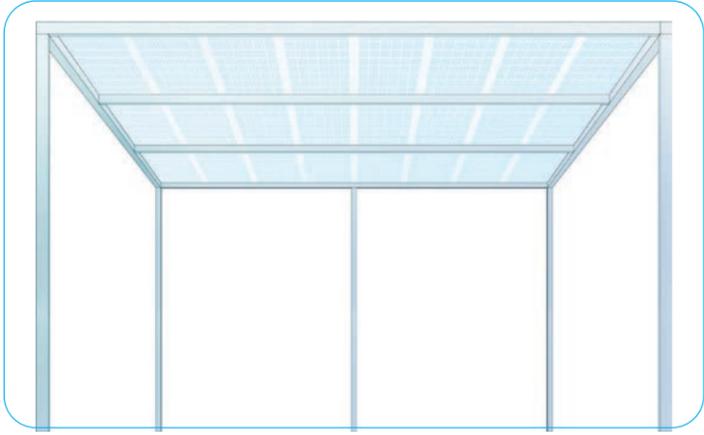
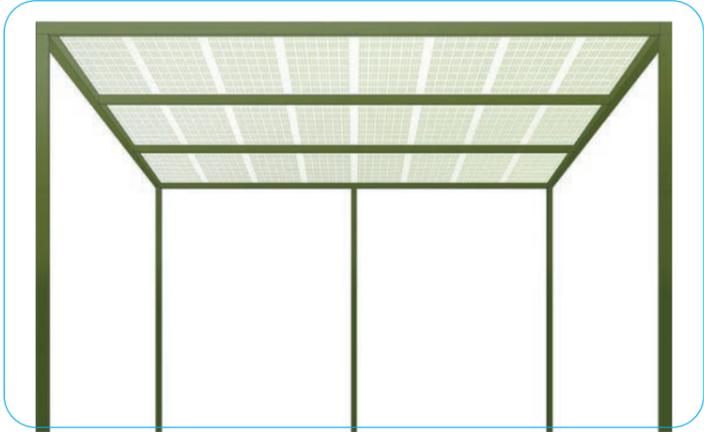
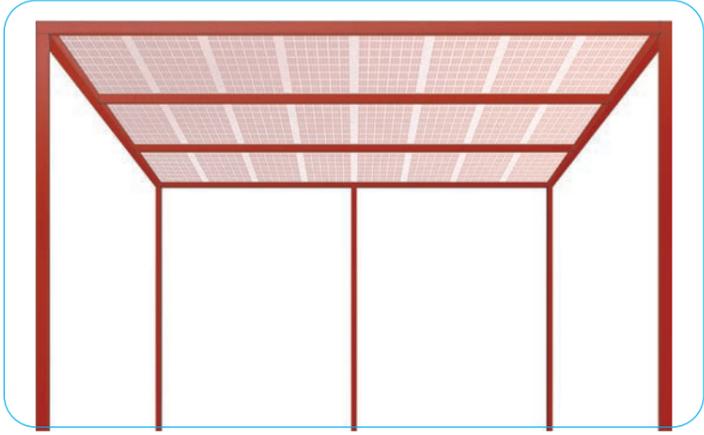
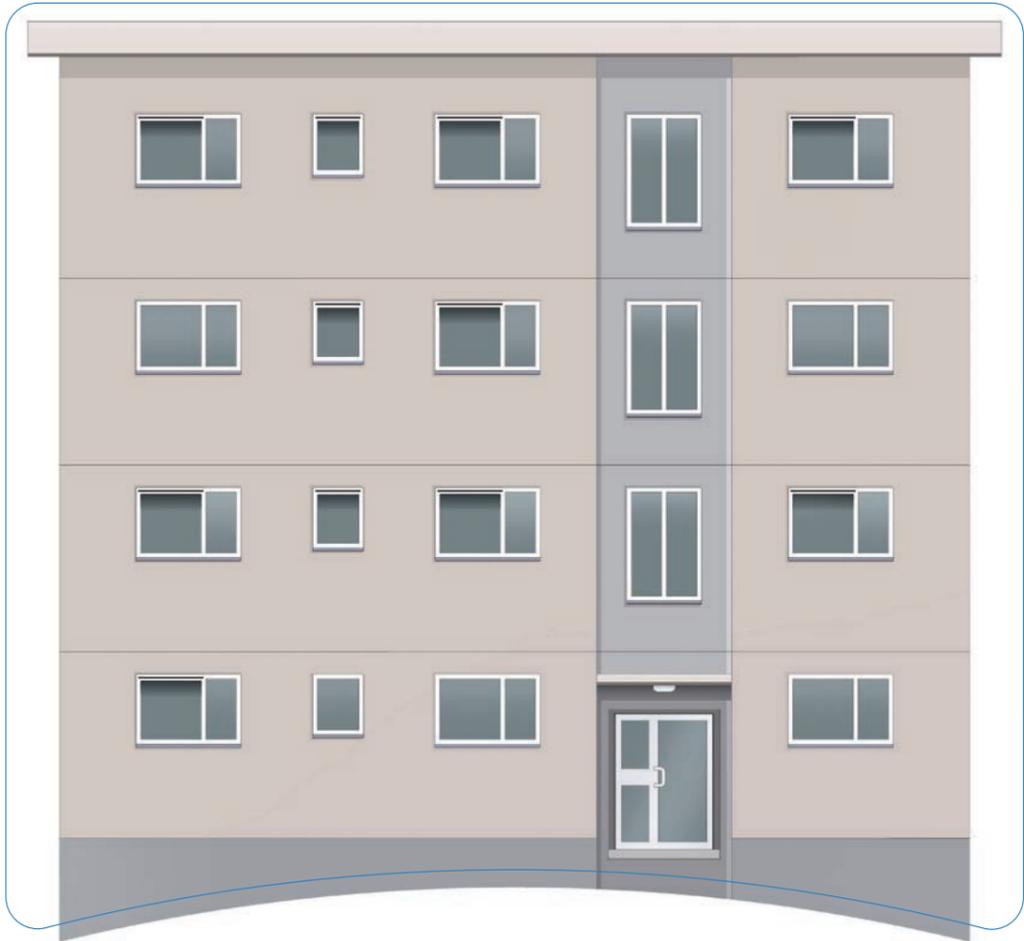
city
off-road vehicles
factories
waste (organic, plastic, ...)







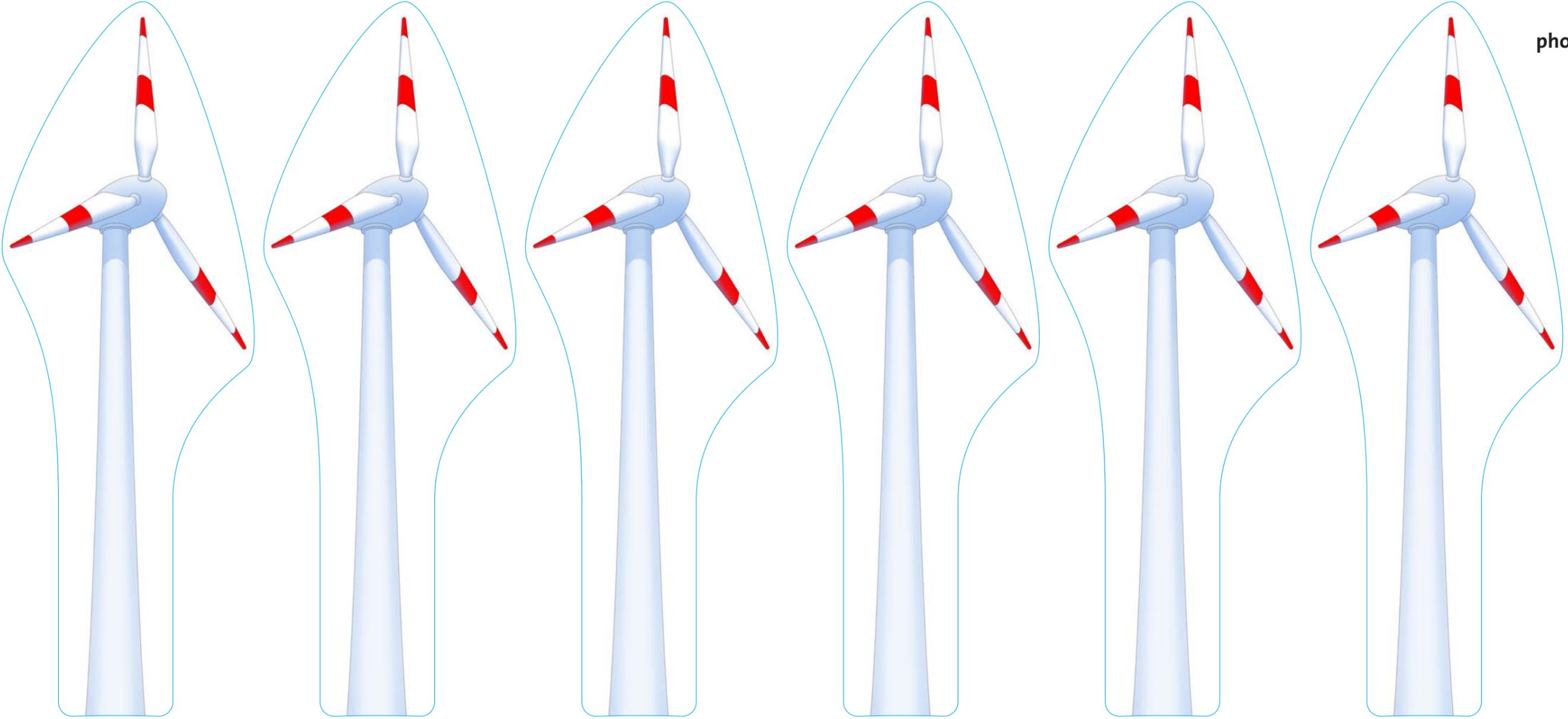
greening
townhouse
bus stop
climbing plants



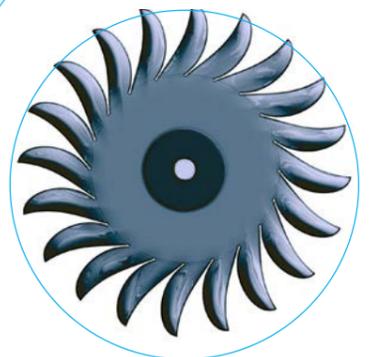
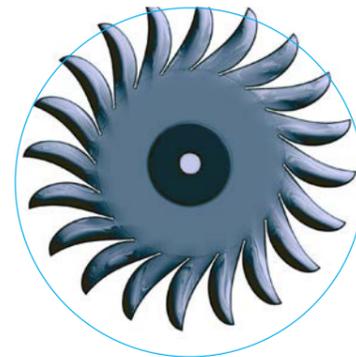
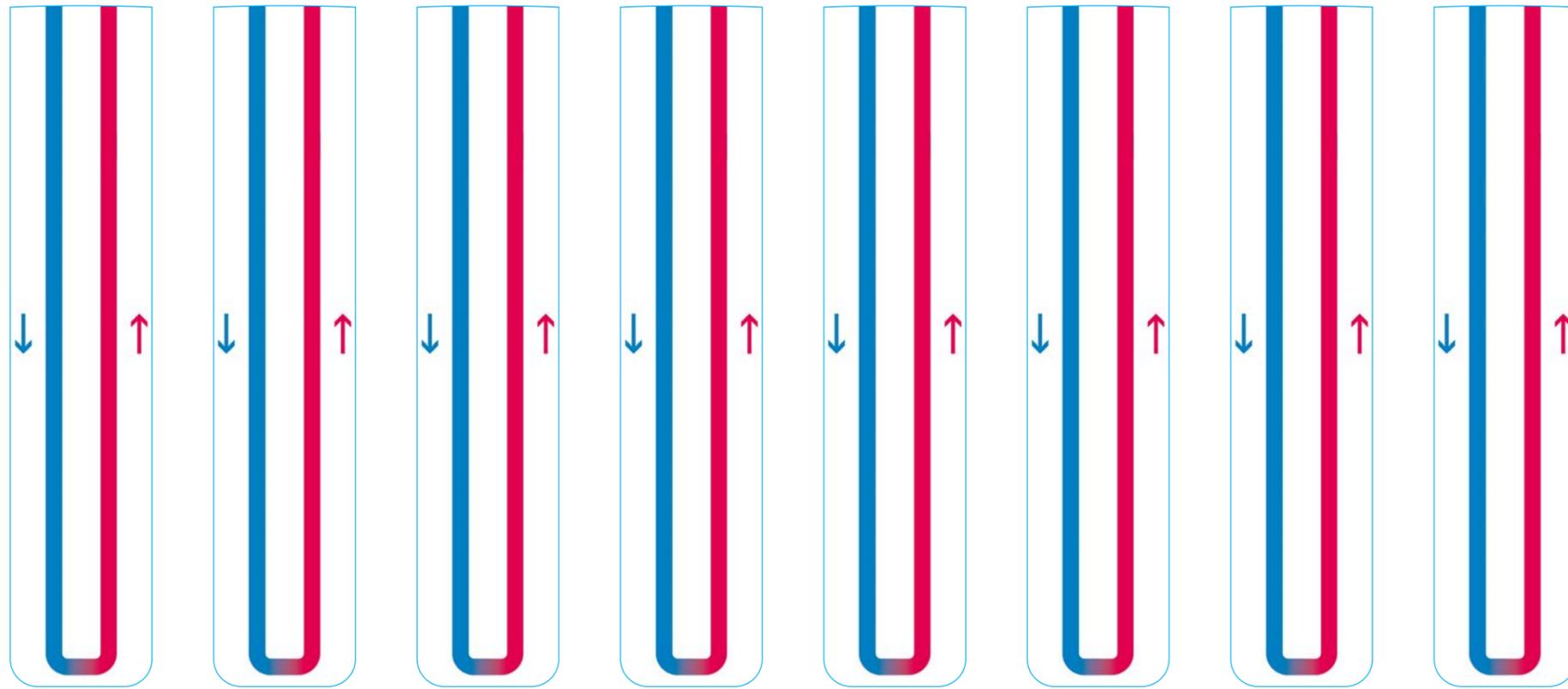
greening
asphalt
trees
potted plants



Renewable energy:
windmills
photovoltaics



Renewable energy:
water wheels
geothermal energy
“electric power” symbol
“hydrogen operated” symbol



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