

# CLIMATE CHANGE

<https://identitiesproject.eu/climate-change/>

Modular blocks	Goals of the block	Activities	IDENTITIES approach to interdisciplinarity	Role of participants	Mode of interaction	Suggested digital tools	Workload time	Non-editable format	Editable format	Hints for implementation
ID explorer - Introduction	The goal of the ID explorer block is to allow students to explore the concept of circular causality within climate phenomena, and to allow them to delve into the construction of causal maps.	Exploring feedback in climate systems				Assignment	3 h	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_IDN_IT16_2164.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_IDN_IT16_2164.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_IDN_IT16_2164.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_IDN_IT16_2164.pdf</a>	It is important to provide a clear definition of the concept of feedback and to give various examples to enable students to create a solid idea of what will be discussed next
		Reading a text on the use and production of biofuels				Assignment		<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Text.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Text.docx.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Text.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Text.docx.pdf</a>	Discussion between students on the concepts of circular causality and loops should be encouraged
		Construction of a causal map on bio-fuels				Assignment		<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Worksheet.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Worksheet.docx.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Worksheet.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/02_CC_Biodiesel_Activity_Worksheet.docx.pdf</a>	It is important here to leave space for students to discuss, reason and construct their own map idea. Upon completion of each of the 5 tasks there must be room for discussion. In addition, each of the three final claims needs space to be analyzed and debunked
ID student	The ID student block aims at familiarizing students with certain fundamental concepts of complexity in order to be able to recognize the interdisciplinary nature of complex systems such as climate change.	Introduction to complexity				Assignment	8 h	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Introduction_Complexity.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Introduction_Complexity.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Introduction_Complexity.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Introduction_Complexity.pdf</a>	The emphasis of the presentation should be on simply introducing fundamental concepts and a common vocabulary on certain terms between students and researchers. It is beyond the scope of this activity an in depth analysis of the presented phenomena.
		Exploring the possibility of long - term predictability through the comparison of weather forecasts.				Assignment		<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf</a>	There should be a discussion about students' personal experiences with weather prediction not only about the specific example of Barcelona's weather.
		Exploring the limited predictability of deterministic chaotic systems, the forms of order that non-linear systems present through the chaotic oscillator, and the magnetic pendulum experiments.				Assignment		<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-1-2.docx.pdf</a>	During the implementation of the chaotic oscillator activity, students should be reminded (if needed) that the harmonic oscillation is represented as a circular graph in this specific case. Additionally, it should be highlighted in the video experiment concerning the magnetic pendulum that the metallic ball always starts from the same starting point, which is indicated by a blue line on the video's ruler.
		Exploring the concept of critical states through the Benard cells experiment.				Assignment		<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-3.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-3.docx.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-3.docx.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/Activity-3.docx.pdf</a>	In the video experiment concerning Benard cells the specific geometry (e.g. hexagonal or cylindrical) of the newly formed cells should not be the main focus. The formation itself is the main focus. In the last activity students should be encouraged to pick randomly the initial "rotating cell".
ID analyst	The aim of the ID analyst block is to have students analyze the topic of uncertainty in a disciplinary and interdisciplinary context, starting with the topic of climate change and then going on to generalize.	Complexity as an epistemological activator and boundary object.				Assignment	3 h	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-1.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-1.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-1.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-1.pdf</a>	This activity aims to bring together the activities developed so far and to get students to reason about the concepts they have developed. It is therefore necessary to provide space to allow them to focus on the meaning they have developed
		Reading and discussion on the types of uncertainty in climate modelling.				Assignment		<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-2.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-2.pdf</a>	<a href="https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-2.pdf">https://identitiesproject.eu/wp-content/uploads/2022/12/AnalystActivity-part-2.pdf</a>	Explain well the differences between the uncertainties. Encourage questions about the clarity of the activity and what is being asked specifically

## Legend

<ul style="list-style-type: none"> <li>Identities of the disciplines <ul style="list-style-type: none"> <li>● mathematics</li> <li>▲ physics</li> <li>▲ computer science</li> </ul> </li> <li>Interdisciplinarity zone</li> <li>Boundary objects</li> <li>Boundary-crossing mechanisms</li> <li>Epistemological activators</li> <li>Linguistic activators</li> </ul>	<ul style="list-style-type: none"> <li>Role of explorer</li> <li>Role of student</li> <li>Role of analyst</li> <li>Role of teacher-designer</li> </ul>	<ul style="list-style-type: none"> <li>Individual activity</li> <li>Group activity</li> <li>Interactive activity trainer-trainees</li> </ul>