

# Negative climatic events

Secondary: (ages 11 – 14)

Science

It is hard to underestimate the influence that climate has on our lives. Temperature and precipitation defines people's activity, specialization in agriculture and many other things. Climatic events vary around the world and bring negative effects as well as benefits to economies and people's lives. Students learn about the variety of negative climatic events on Earth and identify methods of protection from dangerous climatic events for the population.

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**Time allocation**      3 lesson periods

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**Subject content**      Analyse negative natural events and their influence on people's lives

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**Creative and critical thinking**      This unit has a **creativity** and **critical thinking** focus:

- Generate and play with unusual ideas
- Pose and propose how to solve a scientific problem in a personally novel way

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**Other skills**      Communication, Collaboration

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**Key words**      climate; environment; disasters; hurricanes; tornados; floods; fires; storms; wind; blizzards; warning; alerts; geography

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## Products and processes to assess

Students identify and explore real and unreal (possible and impossible) climatic events and develop new ways to warn and protect the population from these events. At the highest levels of achievement, in addition to high quality definitions and written work, students generate unusual, imaginative, and logically sound ways of protecting the population from negative events. Their work process demonstrates a willingness to explore a variety of ideas and take and justify and position and there is good awareness of areas of personal novelty and why final choices have been made. They consider several ways of formulating and answering the challenge and a clear understanding of both the strengths and limitations of the chosen and alternative positions as well as an openness to the ideas, critiques, and feedback of others when relevant.

## Teaching and Learning plan

This plan suggests potential steps for implementing the activity. Teachers can introduce as many modifications as they see fit to adapt the activity to their teaching context.

Step	Duration	Teacher and student roles	Subject content	Creativity and critical thinking
1	Lesson period 1	Small groups of 4-5 are formed. Teacher presents the lesson's topic of finding out about negative climatic events and why they happen and coming up with imaginative new ways to warn people about and protect them from these events. Students receive sets of photos, maps and individual worksheets (Annexes).		
2		<p>Every group reads the task and distributes roles and tasks between the group members. Then they start working.</p> <p>Task:</p> <ol style="list-style-type: none"> <li>1. Look attentively at photos of negative climatic events (see appendix). Name them and give definitions of each.</li> <li>2. Choose from them events that could happen in our country or local area. Which of them do not happen in our area and why? Are there any that you think are fake?</li> </ol> <p>Can we prevent and protect the population from these negative climatic events? In what ways? <u>Choose two negative events.</u> What new ways of warning and protection of the population from them can you propose? How to do it? Should we take this into consideration when planning cities? Would the event be different in a city and in the countryside? Explain your point of view. Once you have finished, you will need to present your work using visual props where appropriate and tell the rest of the class about the strengths and limitations of your ideas. Students may have to engage in research in order to help them answer some of the questions</p>	<p>Learning about negative climatic events: what causes them, where do they happen, how can we protect ourselves from them?</p>	<p>Generating, exploring, and playing with unusual and radical ideas</p> <p>Posing and proposing how to solve a scientific problem in a personally novel way</p>
3	Lesson period 2 (this can be extended if needed)	As students continue their work and prepare to present it, the class can break regularly to discuss the results and review their work. Before the final presentation, all maps or other visual props are placed on board or wall.	As above	<p>Posing and proposing how to solve a scientific problem in a personally novel way</p> <p>Reflecting on chosen approach relative to possible alternatives</p>
4	Final lesson period	<p>Groups present their results and answer questions from other groups and the teacher.</p> <p>Once all groups have presented their work, the teacher may choose to close the activity with a reflective discussion. What have we learned about weather, natural disasters, the environment, and negative climatic events? How have we used creative and critical thinking? How could we have improved our work?</p>	Communicating what they have learned about negative climatic events	<p>Considering several perspectives on a problem</p> <p>Reflecting on steps taken and chosen approach relative to possible alternatives</p>

## Resources and examples for inspiration

### Web and print

- Set of maps that evaluate climatic conditions for people's life (Annex 2):
- Set of different photos of natural events (Annex 3).
- Individual worksheet for every group with questions (Annex 1)

### Other

- Projector and presentation with negative events' photos and their definitions.

**Creativity and critical thinking rubric for science**

• Mapping of the different steps of the lesson plan against the OECD rubric to identify the creative and/or critical thinking skills the different parts of the lesson aim to develop

	<b>CREATIVITY</b> Coming up with new ideas and solutions	Steps	<b>CRITICAL THINKING</b> Questioning and evaluating ideas and solutions	Steps
<b>INQUIRING</b>	Make connections to other scientific concepts or conceptual ideas in other disciplines	1	Identify and question assumptions and generally accepted ideas of a scientific explanation or approach to a problem	
<b>IMAGINING</b>	Generate and play with unusual and radical ideas when approaching or solving a scientific problem	2,3	Consider several perspectives on a scientific problem	4
<b>DOING</b>	Pose and propose how to solve a scientific problem in a personally novel way	2,3	Explain both strengths and limitations of a scientific solution based on logical and possibly other criteria (practical, ethical, etc.)	3
<b>REFLECTING</b>	Reflect on steps taken to pose and solve a scientific problem	4	Reflect on the chosen scientific approach or solution relative to possible alternatives	3,4

Annex 1. Worksheet

Topic: **Negative climatic events**

<p><b><u>Group members</u></b></p>	
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1. Look at the photos of negative *climatic* events. Name them and give a definition for each.

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2. Choose events that can happen in our country. Which don't happen so often in our country and why? Are there any you think are fake?

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3. Is it possible to warn and protect the population from negative climatic events? In what ways? Choose two negative events. What new ways of warning and protection can you suggest? Do we need to take them into account in urban planning? Will they be different in cities and the countryside? Give arguments for your viewpoint.

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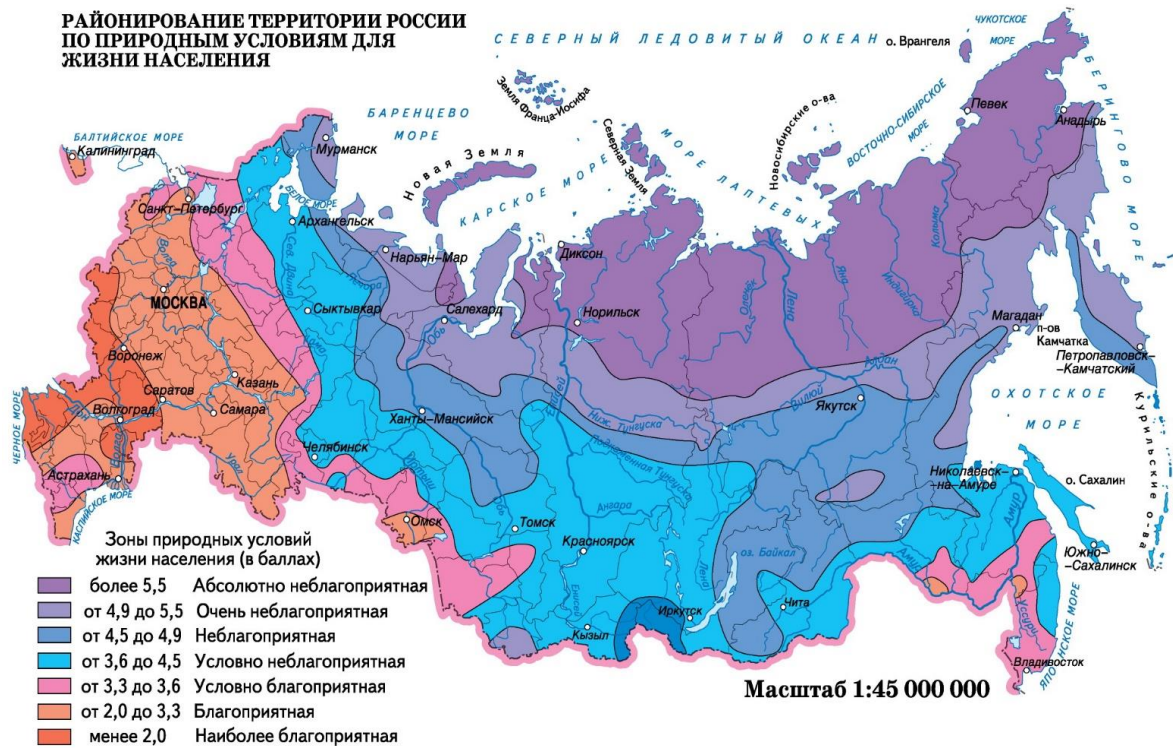
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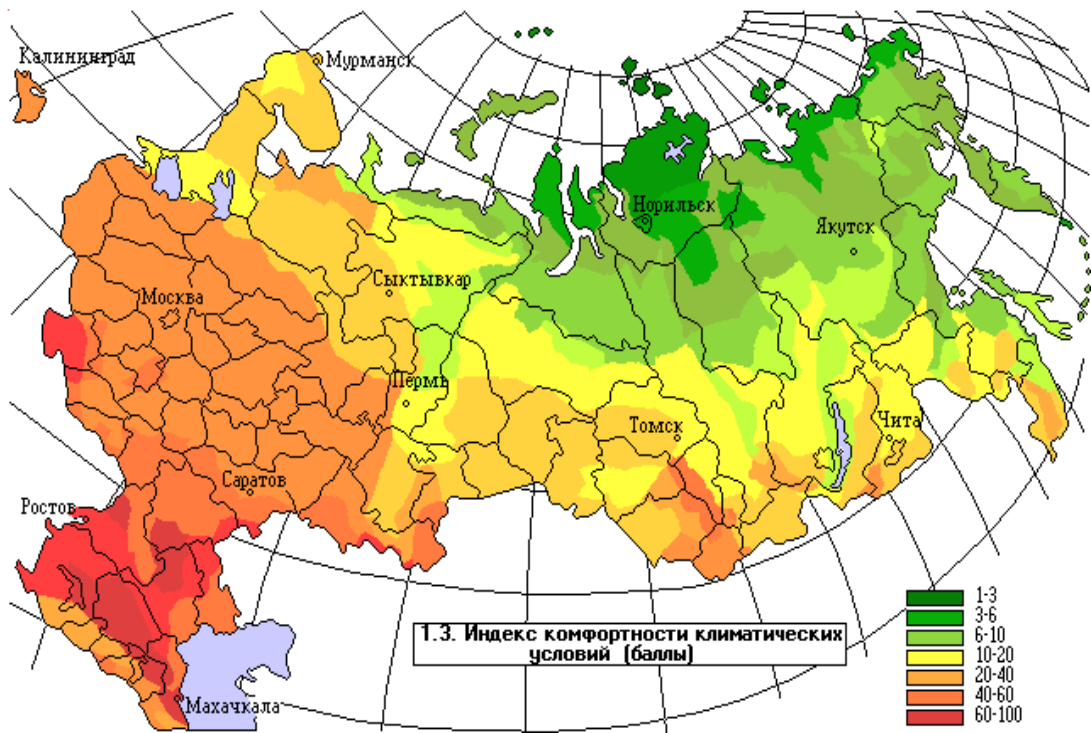
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Annex 2. Maps

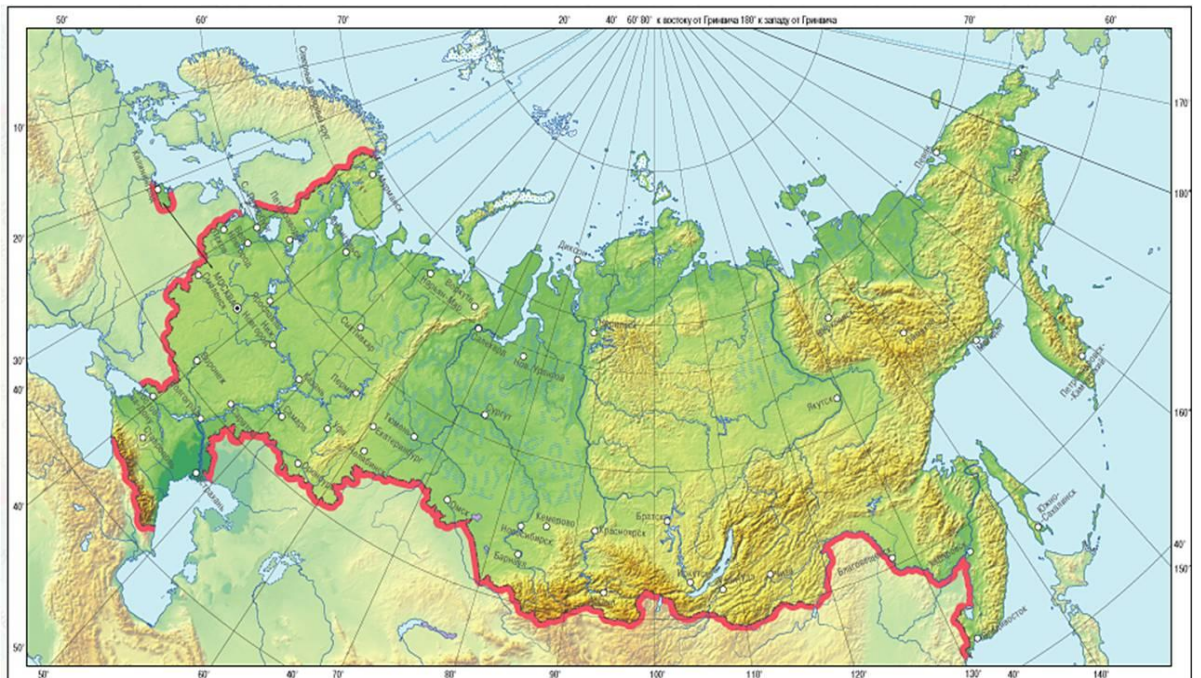
1. Zones of Russia by influence of natural conditions on people's life



2. Index of comfort of climatic conditions



### 3. An outline map of Russia



### Annex 3. Photos of natural events



Picture 1. Hail



Picture 2. Screenshot from the Russian movie "The Crew" by N. Lebedev, 2016



Picture 3. Sandstorm





Picture 4. Mudflow



Picture 5. Icy rain



Picture 6. Rainfall



Picture 7. Animated photo of a thunderstorm



Picture 8. Hot wind



Picture 9. Black ice



Picture 10. Landslip



Picture 11. Volcanic eruption



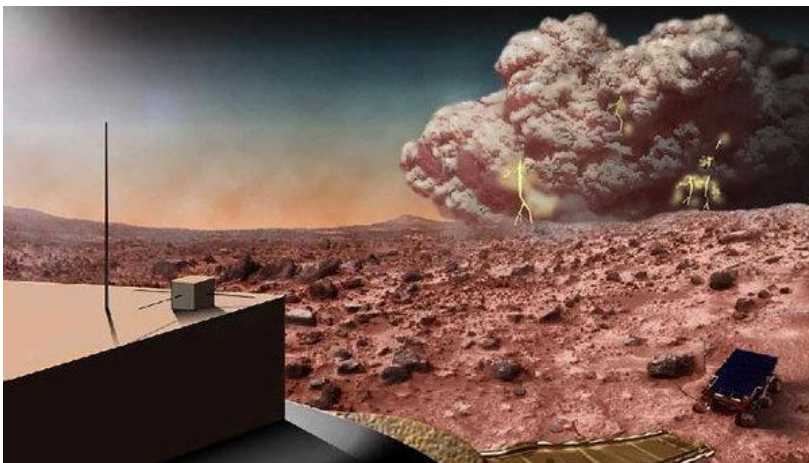
Picture 12. Northern Lights



Picture 13. Screenshot from "The Mist" movie by F. Darabont, 2007



Picture 14. Thunderstorm



Picture 15. Animated picture of moon's surface



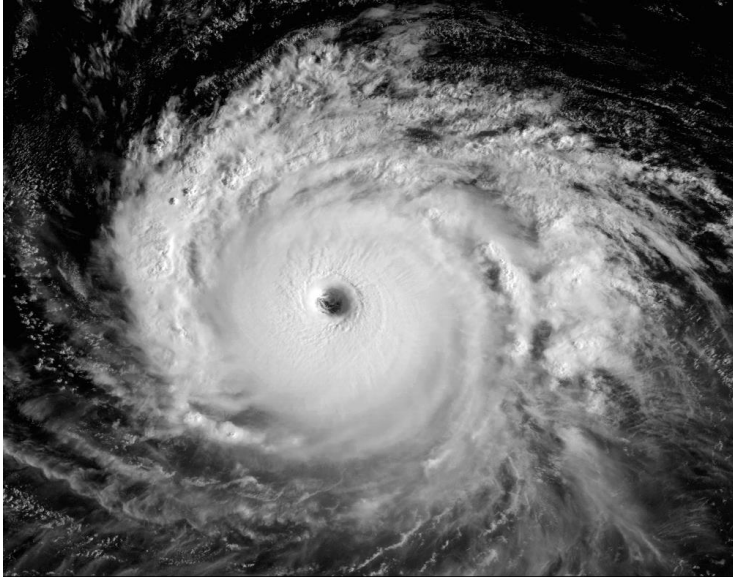
Picture 16. Tsunami



Picture 17. Screenshot from the "Into the Storm" movie by S. Quale, 2014



Picture 18. Drought



Picture 19. Photo from space "Cyclone"