5.3 Air pollution from forest fires

Basic information and collecting ideas	 The creation of farmland by burning forests has increased excessively, with devastating consequences for the entire human race: the toxic gases produced by the fires have no national borders. Impacts of burning forests: Oxygen consumption by the fire Global warming caused by CO2 Pulmonary diseases due to particulate matter and nitrogen oxides Loss of forests as oxygen producers (photosynthesis) Acid rain due to the production of sulphur oxides (leads to forest death) Melting of ice and snow at the poles through the deposition of carbon (soot -> increased heat absorption) and the associated increase in temperature.
Setting up and conducting experiments	 Explain to the students that in the experiment instead of a forest only paper is burnt, which is also made of wood. Work with the students to find a way to make 1 g of paper from a piece of newspaper.
Observing and documenting	When 1 g of paper is burned, about 0.3 g of ash will remain and 0.7 g of pollutants (carbon dioxide and other gases, carbon in the form of soot and water vapour) will be released into the environment.
Analyzing and reflecting	 Help the students understand the results of the experiment and the calculation by means of a model: Take a 10 cm paper strip (weighing about 1 g) and cut off 7 cm. The remaining 3 cm correspond to the ash, while 7 cm are released into the environment as pollutants. If we start with 1 g of paper, we can also calculate the amount of pollutants for 100 g of paper: Example: If 1 g of paper produces 0.7 g of pollutants, 100 g of paper will produce 70 g of pollutants. If the percentage calculation is already known, you can refer to a result of 70% pollutants.
Doing further research	 The students could repeat the experiment and hold a test tube or a ceramic plate over the flame: It forms soot, which is released in a forest fire as dangerous particulate matter. Using a glass container you could also capture the combustion gases and use with lime water to prove that they contain carbon dioxide.

Technical and vocational application	All those who want to act in an environmentally friendly manner should know the consequences of open fires:
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Space for notes