

# Additional resources

ORANSSI LUMI

**An exploratory journey  
through atmospheric events**

For grades 1-9



# Make your own notebook

## GET INSPIRED

### [5 Simple Book Binding Methods](#)

Video about simple bookbinding techniques  
*Babble Dabble Do*

### [Easy Beginner Bookbinding Ideas for Teaching Groups of Kids](#)

Blog about easy beginner bookbinding ideas for groups of kids of different ages  
*papercraftpanda.com*

# Introduction

## EXPAND YOUR KNOWLEDGE

### [What's in the air?](#)

Educational content about air composition  
*UCAR Center for Science Education*

### [Aerosols: Tiny Particulates in the Air](#)

Educational content about aerosols  
*UCAR Center for Science Education*

### [Particulate Matter](#)

Air quality teaching box. Includes content and activities. Original and external resources  
*UCAR Center for Science Education*

### [Aerosols Protocol](#)

Teaching resources  
*The GLOBE Program, NASA*

### [Sizes of Aerosols, Raindrop and Cloud Droplets](#)

Graphical educational resource about particle sizes  
*UCAR Center for Science Education*

## EXPERIMENT MORE

### [I Breathe WHAT??](#)

Activity for making your own pollution collector  
*Teach Engineering, University of Colorado Boulder*

### [Sky Conditions](#)

Activity on sky conditions and visibility  
*NASA*

### [Observing Visibility and Sky Color](#)

Activity on sky colour and visibility  
*The GLOBE Program, NASA*

### [Sky Scarf](#)

Pattern for documenting sky conditions through knitting  
*Lea Redmond and Knit The Sky*

## GET INSPIRED

### [Weather Misconceptions and Introduction Activity](#)

Game for exploring misconceptions about weather and climate  
*UCAR Center for Science Education*

# Dust

## Dusty

### EXPAND YOUR KNOWLEDGE

#### [The Dirt on Atmospheric Dust](#)

Outreach article about dust and satellite-based dust detection  
*NOAA*

#### [Sand dunes are important desert dust sources](#)

Outreach article about sources of sand and dust  
*MadGeogNews, University of Wisconsin*

### EXPERIMENT MORE

#### [Exploring Atmospheric Dust and Climate](#)

Collection of educational activities about atmospheric dust  
*UCAR Center for Science Education*

#### [Dust on the Move](#)

Activity on dust transport and grain size  
*UCAR Center for Science Education*

### GET INSPIRED

#### [Dust Tales: The Story of Atmospheric Dust](#)

Educational slide deck about atmospheric dust  
*UCAR Center for Science Education*

## In a handful of sand (Part I)

### EXPAND YOUR KNOWLEDGE

#### [Sand and Dust Storms](#)

Outreach article about impacts of sand and dust storms  
*World Meteorological Organization*

#### [Sedimentary Rocks](#)

Video about sedimentary rocks  
*The Good and the Beautiful Homeschool Science*

#### [The dustiest place on Earth](#)

Outreach article about dust formation and diatoms  
*nature.com*

#### [African dust keeps Amazon blooming](#)

Outreach article about the fertilising effect of dust  
*nature.com*

#### [Dust in the Wind](#)

Outreach article about the relationship between the Sahara and the Amazon  
*EarthDate, Bureau of Economic Geology, University of Texas at Austin*

### EXPERIMENT MORE

#### [Dust on the Move](#)

Activity on dust transport and grain size  
*UCAR Center for Science Education*

#### [Miineralit](#)

Online mineral collection  
*geologia.fi*

#### [Sand Types](#)

Online sand catalogue  
*sandatlas.org*

#### [Desert Sand](#)

Online desert sand catalogue  
*sandatlas.org*

### GET INSPIRED

#### [Sand, Singing Dunes and other Types of Sand Dunes](#)

Facts and details about sand and dunes  
*factanddetails.com*

## Inside a sandstorm

### EXPAND YOUR KNOWLEDGE

#### [What Is a Dust Storm?](#)

Educational content about dust storms  
*SciJinks, NOAA*

#### [Haboob, Sandstorm or Dust Storm?](#)

Outreach article about sand and dust storms  
*MetMatters, Royal Meteorological Society*

#### [Sand and Dust Storms](#)

Outreach article about impacts of sand and dust storms  
*World Meteorological Organization*

#### [Sand and Dust Storms](#)

Outreach video about impacts of sand and dust storms  
*World Meteorological Organization*

#### [The Physics of Sandstorms](#)

Outreach article about the physical mechanisms of a sandstorm  
*science.org*

#### [The impact of sand and dust storms](#)

3D pop-up educational book about the impacts of sand and dust storms  
*InDust COST Action*

#### [The impact of sand and dust storms](#)

Educational video about the impacts of sand and dust storms  
*InDust COST Action*

## ADDITIONAL RESOURCES

### [Microbursts](#)

Outreach article about microbursts  
[weather.gov](#)

### [Zooming In: Visualizing the Relative Size of Particles](#)

Particle size infographics  
[visualcapitalist.com](#)

## EXPERIMENT MORE

### [Storyblocks](#)

Audio and video resources  
[storyblocks.com](#)

### [Wind Effect Instrument](#)

Video demonstration about the thunderdrum  
*Heart-Beats* by Mijaelle Dewart

### [The Thunderdrum!](#)

Video tutorial for building a DIY thunderdrum  
[kipkay.com](#)

## GET INSPIRED

### [How to Survive a Dust Storm or Sandstorm](#)

Practical guidelines about how to survive a dust storm  
[wihow.com](#)

### [Watch a Man Play ‘Sandstorm’ on a Potato](#)

Article and video  
[atlasobscura.com](#)

## Not-so-quick sand

## EXPAND YOUR KNOWLEDGE

### [Desert](#)

Educational content about deserts  
[education.nationalgeographic.org](#)

### [Desertification, explained](#)

Outreach article about desertification  
[nationalgeographic.org](#)

### [Climate change: Land degradation and desertification](#)

Outreach article about land degradation and effects on health  
[World Health Organization](#)

### [Special Report on Climate Change and Land - Desertification](#)

Mirzabaev et al., 2019: Desertification. In: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.*

### [IPCC: Deserts, Semiarid Areas and Desertification](#)

Mirzabaev et al., 2022: Cross-Chapter Paper 3: Deserts, Semiarid Areas and Desertification. In: *Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change.* Cambridge University Press, Cambridge, UK and New York, NY, USA

### [What Is Antarctica?](#)

Educational content about Antarctica  
[NASA](#)

EXPERIMENT MORE

**World Atlas of Desertification**

Online and printable resources about land degradation in the context of human action, sustainability and solutions. Printed version Cherlet, M., Hutchinson, C., Reynolds, J., Hill, J., Sommer, S., von Maltitz, G. (Eds.), *World Atlas of Desertification*, Publication Office of the European Union, Luxembourg, 2018.  
*European Union - Joint Research Centre*

**Shrinking Aral Sea**

Outreach article about the desertification of the Aral Sea  
*Earth Observatory, NASA*

GET INSPIRED

**The Great Green Wall**

Educational content about the Great Green Wall  
*education.nationalgeographic.org*

# Wind

## Ready, set, fly!

EXPAND YOUR KNOWLEDGE

**Wind**

Educational content about wind  
*UCAR Center for Science Education*

**Wind**

Educational content about wind  
*education.nationalgeographic.org*

**Why the Wind Blows**

Educational video content about wind  
*UCAR Center for Science Education*

**The Highs and Lows of Air Pressure**

Educational content about high and low pressure systems  
*UCAR Center for Science Education*

**Föhn-tuuli Suomessa**

Outreach article about Föhn wind in Finland  
*Finnish Meteorological Institute*

**Wind Power**

Outreach article about wind power  
*nationalgeographic.org*

EXPERIMENT MORE

**Modeling Wind Dynamics and Forests**

Activity on modelling wind dynamics in forests  
*UCAR Center for Science Education*

GET INSPIRED

**How Do Birds Fly?**

Outreach video on the physics of bird flight  
*The Pendulum Swing*

**How Airplanes Are Made**

Outreach video about airplanes  
*Minute Physics*

## Black T-shirt / white T-shirt

EXPAND YOUR KNOWLEDGE

**The Energy Budget**

Educational content about the energy budget in the Earth system  
*UCAR Center for Science Education*

**The Causes of Climate Change**

Outreach article about the causes of climate change  
*NASA*

**The Problem with Dust**

Outreach article about the role of dust in climate  
*Physical Sciences - UCLA*

**How Sunshine Warms the Earth**

Educational content about albedo and radiation  
*SkySci - UCAR Center for Science Education*

EXPERIMENT MORE

**Radiation and Albedo Experiment**

Activity on radiation and albedo  
*UCAR Center for Science Education*

**The Greenhouse Effect Teaching Box**

Greenhouse effect teaching box. Includes content and activities. Original and external resources  
*UCAR - Center for Science Education.*



GET INSPIRED

**Dust and the Earth System**

Educational video content about the role of dust in the Earth system  
*InDust COST Action*

Let the dust settle

EXPAND YOUR KNOWLEDGE

**Giant Dust Is Spreading Across The World, Defying The Laws of Physics**

Outreach article about transport of giant dust particles  
*sciencealert.com*

**What Are Trade Winds?**

Educational content about trade winds  
*SciJinks, NOAA*

**Atmospheric Dust Transport**

Outreach article about dust transport  
*World Meteorological Organization*

**Atmospheric Dust**

Course on atmospheric dust  
*UCAR - COMET Program*

EXPERIMENT MORE

**Dust: a True World Traveller**

Educational content and activities about dust transport  
*Earth Observatory for Kids, NASA*

**Dust on the Move**

Activity on dust transport and grain size  
*UCAR Center for Science Education*

GET INSPIRED

**COMET MetEd**

Teaching and Training Resources for the Geoscience Community  
*UCAR*

All the way here

EXPAND YOUR KNOWLEDGE

**The Dirt on Atmospheric Dust**

Outreach article about dust and satellite-based dust detection  
*NOAA*

**Satellites Track Unusual Saharan Dust Plume**

Article and video animation using Sentinel-5P data  
*European Space Agency*

**Earth Observation**

Outreach article about Earth observation satellites  
*Finnish Meteorological Institute*

**Circulation of Dust in the Atmosphere**

Video animation of circulation of dust in the atmosphere, generated from model data  
*UCAR Center for Science Education*

**What Is Desert Dust and How Does It Change Atmosphere and the Air We Breathe?**

Outreach article about dust in the atmosphere  
*EU - The Copernicus Programme*



## ADDITIONAL RESOURCES

### EXPERIMENT MORE

#### [Want to learn more about satellite imagery?](#)

Tutorials, user guides and examples of how you can use satellite imagery  
*Sentinel Hub*

### GET INSPIRED

#### [How to Make the Perfect Time-Lapse of the Earth](#)

A detailed guide covering various examples on making animations from satellite imagery  
*Matic Lubej, Sentinel Hub Blog*

## Cloud in a jar

### EXPAND YOUR KNOWLEDGE

#### [Clouds and How They Form](#)

Educational content about the formation of clouds  
*UCAR Center for Science Education*

#### [Making Clouds](#)

Educational video content about cloud formation  
*SkySci - UCAR Center for Science Education*

#### [Your Cloud Questions Answered](#)

Educational content about clouds with FAQs  
*SkySci - UCAR Center for Science Education*

#### [Making Raindrops With Mindy](#)

Educational content about cloud condensation nuclei  
*SkySci - UCAR Center for Science Education*

#### [In the Clouds with Mindy](#)

Educational game about cloud condensation nuclei  
*SkySci - UCAR Center for Science Education*

#### [The Shape of Raindrops](#)

Educational video about the shape of raindrops  
*SkySci - UCAR Center for Science Education*

### EXPERIMENT MORE

#### [Clouds Teaching Box](#)

Clouds teaching box. Includes content and activities. Original and external resources  
*UCAR - Center for Science Education*

#### [Water Cycle Experiment](#)

Activity about the water cycle  
*The Good and the Beautiful Homeschool Science*

#### [Make a Cloud Form in a Jar Science Experiment](#)

Activity on cloud making  
*Cool Science Experiments HQ*

#### [How to Make a Cloud in a Bottle - 3 Easy Methods](#)

Activity on cloud making  
*sciencenotes.org*

#### [Make a Cloud in a Bottle](#)

Activity on cloud making  
*Jet Propulsion Laboratory - NASA*

#### [Cloud in the Bottle](#)

Activity on cloud making  
*The Spangler Effect*

#### [How to make a cloud in a bottle](#)

Activity on cloud making  
*MetOffice - UK Weather*

### GET INSPIRED

#### [Elementary GLOBE: Do You Know That Clouds Have Names?](#)

Digital book about cloud classification for children  
*SkySci - UCAR Center for Science Education*

#### [This artist makes clouds appear in unexpected places](#)

Article about an artist that makes clouds indoors  
*nationalgeographic.com*



## ADDITIONAL RESOURCES

# Snow \* \* \*



## Snow...y

### EXPAND YOUR KNOWLEDGE

#### [Snow](#)

Outreach article about snow  
*National Snow and Ice Data Center, CIRES*

#### [17 surprising facts about snow](#)

Outreach article with facts about snow  
*BBC Earth*

#### [What Are Snowflakes?](#)

Educational content about snowflakes  
*SkySci - UCAR Center for Science Education*

#### [What Makes Snowflakes Take Shape?](#)

Educational video about snowflake formation  
*SkySci - UCAR Center for Science Education*

#### [Why are Snowflakes Like This?](#)

Science outreach video about snowflakes with an interview with Dr. Ken Libbrecht  
*Veritasium*

#### [How to Make a Snow Day!](#)

Educational content about weather conditions for snowfall  
*SkySci - UCAR Center for Science Education*

#### [Is it Going to Snow?](#)

Educational video about predicting snowfall  
*UCAR Center for Science Education*

#### [Atmospheric Deposition](#)

Outreach article about atmospheric deposition  
*World Meteorological Organization*

#### [Albedo and Climate](#)

Educational content on albedo  
*UCAR Center for Science Education*

### EXPERIMENT MORE

#### [A Century of Glacier Change](#)

Activity on glacier melting  
*UCAR Center for Science Education*

### GET INSPIRED

#### [SnowCrystals.com](#)

Online guide to snowflakes, snow crystals and other ice phenomena  
*Kenneth G. Libbrecht*

#### [Growing Snowflakes](#)

Video resources of growing snowflakes  
*snowcrystals.com*

## Orange snow cake

### EXPAND YOUR KNOWLEDGE

#### [Not All Snow Can Make Snowballs](#)

Educational content about wet and dry snow  
*SkySci - UCAR Center for Science Education*

#### [Difference Between Wet and Dry Snow](#)

Outreach video about wet and dry snow  
*The Weather Channel*

#### [Why the Snow in Parts of Europe Was Orange](#)

Article on Saharan dust affecting Eastern Europe  
*The New York Times*

#### [Why Snow in Eastern Europe Is Turning Orange](#)

Article and video about Saharan dust affecting Eastern Europe  
*nationalgeographic.org*

#### [Dust dampens albedo effect, spurs snowmelt in the heights of the Himalayas](#)

Outreach article about the effect of dust on albedo and snowpack melting  
*sciencedaily.com*

### EXPERIMENT MORE

#### [Is Snow White? Maybe, or Maybe Not](#)

Activity on the colour of snow portrayed in paintings  
*UCAR Center for Science Education*

### GET INSPIRED

#### [The Surprising Colors of Snow](#)

Outreach article on the colours of snow  
*JSTOR Daily*

#### [The secrets of the Alps' strange red snow](#)

Outreach article about the coloured snow in the Alps  
*BBC*



## In a handful of sand (Part II)

### EXPAND YOUR KNOWLEDGE

#### [Exploring Atmospheric Dust and Climate with Augmented Reality](#)

Visualisations of dust transport and ocean fertilisation by dust  
*UCAR Center for Science Education*

#### [NASA Satellite Reveals How Much Saharan Dust Feeds Amazon's Plants](#)

Outreach video and article about Saharan dust transported to the Amazon  
*NASA*

#### [Pumping Iron: How Dust Can Change the Climate](#)

Educational game about ocean fertilisation by dust  
*UCAR Center for Science Education*

#### [The dustiest place on Earth](#)

Outreach article about dust formation and diatoms  
*nature.com*

#### [African dust keeps Amazon blooming](#)

Outreach article about the fertilising effect of dust  
*nature.com*

#### [How can adding iron to the oceans slow global warming?](#)

Outreach article about the fertilising effect of dust and role in global warming  
*howstuffworks.com*

#### [What are Diatoms?](#)

Specialised site about diatoms  
*diatoms.org*

#### [These Kaleidoscopic Masterpieces Are Invisible to the Naked Eye](#)

Outreach short video about diatomist Klaus Kemp  
*National Geographic*

#### [Diatom makes Human and All Living things Alive!](#)

Outreach short video about the importance of diatoms  
*National Geographic*

#### [Bio-char](#)

Outreach article about biochar and permaculture  
*UK Permaculture Association*

### EXPERIMENT MORE

#### [Experiment-driven sustainability education](#)

Activities and educational resources on soil remineralisation  
*lets.remineralize.org*

### GET INSPIRED

#### [Kiss the Ground](#)

Documentary about regenerative agriculture and its impact on the Earth system  
*Joshua Tickell and Rebecca Harrell Tickell*

#### [Dirt Rich](#)

Documentary about regenerative agriculture  
*Marcelina Cravat*

#### [WaterBear](#)

Streaming site for documentaries, films and series with an environmental focus

## Practice makes perfect

### EXPAND YOUR KNOWLEDGE

#### [How to Measure Snowfall Accurately](#)

Outreach article about how to measure snowfall  
*weather.gov*

#### [What is Citizen Science](#)

European Citizen Science Association website

### EXPERIMENT MORE

#### [Measuring Snow](#)

Practical guidelines about how to measure snowfall  
*weather.gov*

#### [How is Snow Measured?](#)

Practical guidelines about how to measure snowfall  
*weatherworksinc.com*

#### [How to Build Your Own Snow Gauge](#)

Video tutorial to build your own snow gauge  
*The Cape Elizabeth Land Trust*

#### [7 Ways to Observe Snow and Ice With Your Students](#)

Teaching box about observing and measuring snow  
*The Robertson Program for Inquiry-based Teaching in Mathematics and Science, University of Toronto*

## ADDITIONAL RESOURCES

### GET INSPIRED

#### **Talviseuranta**

Citizen Science Snow Monitoring in Finland  
*Luontoliitto-SYKE*

#### **Citizen science in Finland - Get involved**

Citizen science initiatives in Finland  
*Tampere University*

#### **Finnish Environment Institute (SYKE)**

Projects seeking solutions to environmental problems through citizen science  
*SYKE*

#### **Citizen Science University of Oulu**

Citizen science initiatives  
*University of Oulu*

#### **Snow sampling Citizen science experiment during Easter 2022**

Citizen science experiment in Norway  
*University of Bergen*

#### **SciStarter**

Online citizen science hub with projects from all around the world  
*SciStarter*

#### **eu-citizen.science**

Platform for sharing citizen science projects, resources, tools, and training

## The story of a particle

### EXPAND YOUR KNOWLEDGE

#### **A Guide to Climate Change for Kids**

Educational content about climate change for children  
*ClimateKids - NASA*

#### **A Kid's Guide to Climate Change (Plus a Printable Comic)**

Educational resource about climate change  
*Life Kit - NPR*

#### **Climate change 2021: a Summary for All**

Official IPCC report for broader audiences about the state of our climate  
*The Intergovernmental Panel on Climate Change - World Meteorological Organization*

#### **International Teachers' Climate Change Forum**

Teacher forum on climate science, climate education and the connection between these two domains  
*University of Helsinki Science Education and Institute for Atmospheric and Earth System Research Finland*

### EXPERIMENT MORE

#### **Climate Time Machine**

Educational content with visualisations of Earth's key climate indicators changing over time  
*ClimateKids - NASA*

### GET INSPIRED

#### **Climate University**

Free online courses for universities and everyone who wants to make the sustainability transition in society real  
*climateuniversity.fi*

#### **'If you win the popular imagination, you change the game': why we need new stories on climate**

An essay by Rebecca Solnit  
*The Guardian*

