

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The title text is centered in the middle of the page.

WEATHER AND CLIMATE

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WEATHER VS. CLIMATE

- WEATHER IS THE CONDITION OF THE ATMOSPHERE IN ONE AREA AT A PARTICULAR TIME.
- CLIMATE IS THE WEATHER CONDITIONS PREVAILING IN AN AREA IN GENERAL OR OVER A LONG PERIOD.

TYPES OF WEATHER

- SUNNY
- CLOUDY
- RAINY
- WINDY
- SNOWY

SUNNY



THE SUN GENERATES ABOUT 400 BILLION MEGAWATTS OF POWER, AND IT HAS DONE SO FOR FIVE BILLION YEARS. WHAT ENERGY SOURCE IS CAPABLE OF THIS SORT OF POWER? REMARKABLY, THE ENGINE OF THE MIGHTIEST STARS IS NOT SOMETHING IMMENSE, BUT RATHER SOMETHING VERY SMALL: TINY BUILDING BLOCKS OF ATOMS SMASHING TOGETHER AT HIGH SPEEDS. WITH EVERY COLLISION, A SPARK OF ENERGY IS RELEASED. NUCLEAR FUSION, THE BLENDING OF ATOMIC NUCLEI TO FORM NEW ELEMENTS, IS WHAT DRIVES ENTIRE GALAXIES OF STARS.

CLOUDY



WHERE DO THE CLOUDS COME IN? AS THE LOWER LAYER STARTS TO HEAT UP, IT RISES LIKE WARM AIR LIKES TO DO. HOWEVER, IT CAN ONLY GO SO FAR BEFORE IT HIT THE “LID” OF WARMER AIR OVER TOP OF IT. CLOUDS FORM RIGHT WHERE THE “LID” IS, AND GET “TRAPPER” THERE, SINCE THE LOWER LAYER ISN’T GETTING MUCH WARMER. AS LONG AS THE INVERSION IS IN PLACE, THE WEATHER REMAINS MOSTLY CLOUDY.

RAINY



RAIN IS LIQUID PRECIPITATION, AS OPPOSED TO NON-LIQUID KINDS (SUCH AS SNOW, HAIL, AND SLEET). IT BEGINS WITH THE VAPORIZATION OF WATER NEAR THE EARTH'S SURFACE, IN THE FORM OF RIVERS, LAKES, OCEANS OR GROUND WATER, PROVIDED THERE ARE ATMOSPHERIC TEMPERATURES ABOUT MELTING POINT OF WATER. THIS IS FOLLOWED BY THE CONDENSATION OF ATMOSPHERIC WATER VAPOR INTO DROPS OF WATER THAT ARE HEAVY ENOUGH TO FALL, OFTEN MAKING IT TO THE SURFACE.

WINDY



WIND IS JUST MOVING AIR, AND AIR IS A COLLECTION OF DIFFERENT GASES. IT'S MOSTLY ONE TYPE OF GAS, CALLED NITROGEN, BUT ALSO LOTS OF OTHERS, INCLUDING OXYGEN—WHICH WE NEED TO LIVE. WHEN AIR IS UNDER PRESSURE, IT STARTS TO MOVE—AND THAT CAUSES WIND.

SNOWY



WHETHER WINTER STORMS PRODUCE SNOW RELIES HEAVILY ON TEMPERATURE, BUT NOT NECESSARILY THE TEMPERATURE WE FEEL HERE ON THE GROUND. SNOW FORMS WHEN THE ATMOSPHERIC TEMPERATURE IS AT OR BELOW FREEZING (0 DEGREE CELSIUS OR 32 DEGREE FAHRENHEIT) AND THERE IS A MINIMUM AMOUNT OF MOISTURE IN THE AIR. IF THE GROUND TEMPERATURE IS AT OR BELOW FREEZING, THE SNOW WILL REACH THE GROUND. HOWEVER, THE SNOW CAN STILL REACH THE GROUND WHEN THE GROUND TEMPERATURE IS ABOVE FREEZING IF THE CONDITIONS ARE JUST RIGHT.

AIR MASS

- AN AIR MASS IS A LARGE VOLUME OF AIR IN THE ATMOSPHERE THAT IS MOSTLY UNIFORM IN TEMPERATURE AND MOISTURE. AIR MASSES CAN EXTEND THOUSANDS OF KILOMETERS ACROSS THE SURFACE OF THE EARTH, AND CAN REACH FROM GROUND LEVEL TO THE STRATOSPHERE—16 KILOMETERS (10 MILES) INTO THE ATMOSPHERE.
- AIR MASSES FORM OVER LARGE SURFACES WITH UNIFORM TEMPERATURES AND HUMIDITY, CALLED SOURCE REGIONS. LOW WIND SPEEDS LET AIR REMAIN STATIONARY LONG ENOUGH TO TAKE ON THE FEATURES OF THE SOURCE REGION, SUCH AS HEAT OR COLD. WHEN WINDS MOVE AIR MASSES, THEY CARRY THEIR WEATHER CONDITIONS (HEAT OR COLD, DRY OR MOIST) FROM THE SOURCE REGION TO A NEW REGION. WHEN THE AIR MASS REACHES A NEW REGION, IT MIGHT CLASH WITH ANOTHER AIR MASS THAT HAS A DIFFERENT TEMPERATURE AND HUMIDITY. THIS CAN CREATE A SEVERE STORM.

MORE ON CLIMATE

- CLIMATE REPRESENTS EARTH'S AVERAGE CONDITIONS OVER TIME.
- WEATHER CAN CHANGE FROM HOUR-TO-HOUR, DAY-TO-DAY, MONTH-TO-MONTH, OR EVEN YEAR-TO-YEAR. A REGION'S WEATHER PATTERNS, USUALLY TRACKED FOR AT LEAST 30 YEARS, ARE CONSIDERED ITS CLIMATE.
- DIFFERENT PARTS OF THE WORLD HAVE DIFFERENT CLIMATES. SOME PARTS OF THE WORLD ARE HOT AND RAINY NEARLY EVERY DAY. THEY HAVE A TROPICAL WET CLIMATE. OTHERS ARE COLD AND SNOW-COVERED MOST OF THE YEAR. THEY HAVE A POLAR CLIMATE. BETWEEN THE ICY POLES AND THE STEAMY TROPICS ARE MANY OTHER CLIMATES THAT CONTRIBUTE TO EARTH'S BIODIVERSITY AND GEOLOGIC HERITAGE.
- CLIMATE IS DETERMINED BY A REGION'S CLIMATE SYSTEM. A CLIMATE SYSTEM HAS FIVE MAJOR COMPONENTS: THE ATMOSPHERE, THE HYDROSPHERE, THE CRYOSPHERE, THE LAND SURFACE, AND THE BIOSPHERE.

SOURCES

- [HTTPS://NSIDC.ORG/CRYOSPHERE/SNOW/SCIENCE/FORMATION.HTML](https://nsidc.org/cryosphere/snow/science/formation.html)
- [HTTPS://ADDINS.WREX.COM/BLOGS/WEATHER/2017/01/WHY-SO-CLOUDY](https://addins.wrex.com/blogs/weather/2017/01/why-so-cloudy)
- [HTTPS://WWW.UNIVERSETODAY.COM/79797/WHY-DOES-IT-RAIN1/](https://www.universetoday.com/79797/why-does-it-rain1/)
- [HTTPS://THECONVERSATION.COM/CURIOUS-KIDS-WHAT-CAUSES-WINDY-WEATHER-92821](https://theconversation.com/curious-kids-what-causes-windy-weather-92821)
- [HTTPS://WWW.COLLINSDICTIONARY.COM/US/Dictionary/ENGLISH/WEATHER](https://www.collinsdictionary.com/us/dictionary/english/weather)
- [HTTPS://EN.OXFORDDICTIONARIES.COM/DEFINITION/CLIMATE](https://en.oxforddictionaries.com/definition/climate)
- [HTTPS://EARTHSKY.ORG/SPACE/WHY-DOES-THE-SUN-SHINE](https://earthsky.org/space/why-does-the-sun-shine)
- [HTTPS://WWW.NATIONALGEOGRAPHIC.ORG/ENCYCLOPEDIA/AIR-MASS/](https://www.nationalgeographic.org/encyclopedia/air-mass/)
- [HTTPS://WWW.NATIONALGEOGRAPHIC.ORG/ENCYCLOPEDIA/CLIMATE/](https://www.nationalgeographic.org/encyclopedia/climate/)