

SCIENCE  
TECHNOLOGY  
MEDICINE

DOCUMENTARY  
15 MIN.

#### VERSIONS

English, Spanish  
French: 01-20

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#### ORDER NUMBER

24 4680 | 01-28



## Totally Phenomenal

There is usually something unknown and exciting behind even the most everyday things – one simply has to take a closer look. And that is what **Totally Phenomenal** does. The series answers everyday questions about the realms of physics, chemistry, biology and geography. In each 15-minute programme, a fascinating phenomenon is presented and explained with the help of models or 3D-animations. The programmes also focus on the ways discoveries and inventions are used, thus creating a real-life connection for the viewers.

#### 01 Rays Create Transparency

From the detection of X-rays and the history of its various applications to computer-aided-tomography and X-ray screening at airports, the report highlights the importance of these invisible rays.

#### 02 Satellites Show the Way

This programme explains how a satellite based global positioning and navigation system works and how it is used for supporting air traffic control, navigation systems for cars or for locating ships world-wide.

#### 03 Waves that Warm

Animals and humans alike are able to absorb and make use of the sun's infrared radiation via their skin. In the past, the sun was responsible for a natural greenhouse effect. Now, a human contribution, pollution, may have a snowball effect and lead to dramatic changes.

#### 04 Super Eyes

Being able to see – an important aspect of evolution. But different eyes function and see things differently. We show you fascinating images of what the world looks like from the perspectives of worms, flies or birds of prey.

#### 05 Super Noses

Who has the best nose in the animal kingdom? How can the nose distinguish various scents? What do the odours of perfumes and diapers have in common? This programme addresses all the questions from the world of smells.

#### 06 Super Ears

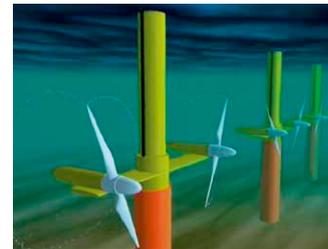
Ears usually make it easy to find the organ with which animals receive sound waves. But there are less obvious ways in which some creatures "hear", or convert those sound waves into signals. Some of these vary greatly from animal to animal. Nature holds a number of surprises.

#### 07 The Trail of DNA

Genetic fingerprints are unique and can be extracted from the smallest skin particles or tiny hairs. DNA determines not only biological development, but also – in criminal investigations, for example – can place someone at the scene of a crime. DNA also provides information on who is related and who is not.

#### 08 Invasion of the Viruses

Experts sound the alarm. A new strain of an influenza virus may cause a pandemic. In a worst case scenario a type of influenza virus, hitherto only fatal for animals, could mutate and become a threat for humans. Do vaccinations offer sufficient protection from a pandemic?



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#### 09 Pretty Windy

Wind can be a very destructive force, but can also be harnessed for good, in yachting or for windmills. This programme explains the basic mechanisms at work, when breezes become blasts and gusts become gales. A closer look at one of the driving forces behind changing weather conditions.

#### 10 Mr Jonas Dives into the Depths

Mister Jonas fears depth. Diving? No thank you. No air to breathe, pressure on the ears, blurred vision and the threat of nitrogen narcosis. How do animals cope with this hostile environment? Mister Jonas takes a diving course and loses his fear of the deep.

#### 11 Currents of Energy

Water and wind power are among the oldest sources of energy, but their importance is set to increase dramatically as the need for environmentally friendly and emissions-free energy grows. This programme introduces several concepts and shows how they work.

#### 12 Biofuels

Say bio energy and most people usually just think of the use of biogases. But the commercially available fuel of the future will be produced from plants, and not faeces. What kinds of bio energy exist, and what contribution can they make to our future?

#### 13 The Versatility of Crude Oil

The world is dependent on oil. But global supplies are running low. This programme shows how the highly sought-after raw material was formed 150 million years ago, how high-tech equipment is tapping into the last reserves, and highlights the production of materials based on a common primary product, oil.

#### 14 From Ore to Steel

Metals are probably the most universal materials in the production of tools, weapons and jewellery. These metals have had a huge impact on the development of humankind. Today, research has switched its focus from copper, iron and steel to primarily light metals.

#### 15 Cloning

The first cloned mammal – Dolly the sheep – was presented to the public in 1997, and caused a sensation. Like no other field of research, the highly controversial issue of cloning represents hope for some, and terrifying scenarios for others.

#### 16 A Glimpse into Space

Satellites and powerful telescopes provide us with an exhilarating window on space – there we see stars explode, new ones being born, and black holes devouring anything that comes too close. It's a spectacle that can teach us something about our origins.

#### 17 The Sense of Touch

Touch is one of the primal senses, important for orientation, the search for food, and social contact. It plays a key role in all of our lives. Intricate computer animations show the different touch sensory nerve cells in action.

#### 18 The Sense of Taste

The tongue is a multifunctional organ – we use it to convey food to the back of the mouth, as well as for speech. But that's not all it can do. Elaborate computer animations and models show how the taste buds on the surface of the tongue function.

#### 19 Glaciers

The fascinating world of glaciers, revealed on a trip around the globe. 3D-animations and time-lapse films explain how glaciers are formed. By studying these highly sensitive indicators of climate change, researchers are trying to assess the future impact of rising global temperatures.

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#### 20 Nerve Network

Without the body's intricate internal wiring system, we wouldn't even manage to bend a little finger. So much about our body is, so to speak, a "test of nerves". A glimpse at the internal workings of the body shows just how this remarkable nervous system functions.

#### 21 Volcanoes

Volcanoes are created when magma rises and breaks through the earth's surface. Experts around the world are always on the lookout for signs of new eruptions so that they can issue warnings. But despite today's technology, totally reliable predictions are impossible.

#### 22 The Tiniest of Clues

It takes more than a police officer's intuition to find out why somebody died a mysterious death. Forensic scientists armed with microscopes are often needed. Insects found on or inside a body can yield vast amounts of information about what happened – information that sometimes even leads to the killer.

#### 23 Greenhouse Earth

Without the greenhouse effect, the earth would be an ice-cold, uninhabitable planet. But since the advent of industrialization, the increase in greenhouse gases has brought with it disastrous consequences for the climate and the environment.

#### 24 Sticky Situation

Geckos and flies can walk on vertical surfaces. Unfortunate insects often meet their fate stuck to a spiderweb or a carnivorous plant. Scientists are looking into how methods of adhesion found in nature can be put to technological use.

#### 25 From Dinner to Dung

Animal and human bodies extract the nutrition they need from food, then expel the rest. That's where nature's recycling service comes into play, thanks to the dung beetle and other tiny helpers.

#### 26 Suction Systems

Suction pads are in use everywhere – from the bathroom shower mat to the mount for a car's navigation system. Nature mastered the principle of using a vacuum to fasten things millions of years ago. The study of suction systems in animals is proving very useful in developing new suction technologies.

#### 27 Nuclear Power

Some say nuclear power will solve the world's energy problems; others say it is far too dangerous. Nuclear fission has been used for half a century now to generate electricity. This film explains how it works and takes a look at the security measures at a new nuclear power plant being built in Finland.

#### 28 Geothermal Energy

The scorching, seething core of our planet is an immense and largely untapped source of energy. Geothermal energy could become an interesting alternative to fossil fuels, which are expensive and contribute to global warming. Iceland already taps the earth's heat. In principle, geothermal energy can be harnessed almost anywhere.