

## Age Guideline

### Secondary School (12 – 16)

<b>Title:</b>	Bug Technology
<b>Category:</b>	Natural Science, Life Science & Technology
<b>Director:</b>	Kenichi Sugawara
<b>Produced by:</b>	NHK in association with NHK ENTERPRISES
<b>Running Time:</b>	48:00 min.
<b>Country:</b>	Japan
<b>Year:</b>	2016

The amazing abilities of insects inspire researchers to ever new developments. For example, the idea of "pain-free needles" is based on the principle of a mosquito spike. And the structure of dragonfly wings was the basis for an effective wind power generator. Their special abilities helped insects to survive on Earth for 400 million years. Modern science decodes these animal technologies using 4K shots, macro pictures, and high-speed cameras to take advantage of them for new human development.

#### Experiments

- Cloth Water Race
- In-and-Out Egg
- Insect Engineer
- Popsicle Stick Water Race

<b>Title:</b>	Bugs – Nature's Little Superheroes
<b>Original Title:</b>	Insekten – Superhelden auf sechs Beinen
<b>Category:</b>	Ecology & Environment
<b>Directors:</b>	Björn Platz
<b>Produced by:</b>	a & o buero filmproduktion
<b>Running Time:</b>	52:00 min.
<b>Country:</b>	Germany
<b>Year:</b>	2016

They are small and are not exactly loved by everyone: insects. Yet, insects are much more than just annoying creepy crawlers: they are true mini-geniuses. The documentary shows how the animal superheroes on six legs help solve some of the greatest problems of mankind. For example, by assisting in the development of new biomaterials, scientists can use animal behavior to solve traffic problems. Insects also play an important role in the investigation of more effective antibiotics.

#### Experiment

- In-and-Out Egg
- Insect Engineer

#### Game

- Popsicle Stick Water Race

**Title:** Connected Seeds  
**Category:** Natural Science, Life Science & Technology  
**Director:** Donna Lipowitz  
**Produced by:** Donna Lipowitz  
**Running Time:** 26:35 min.  
**Country:** United Kingdom  
**Year:** 2017  
**Age Guideline:** University and General Public

A group of computer scientists from the Queen Mary University in London is responsible for a research project that collects information about seeds: seeds, plants, their properties, growth and susceptibility are observed and recorded by the participants. The idea of the project is to use the new technique to collect experiences and data to create a seed library that helps gardeners to protect and save their seeds.

#### Experiment

- Garden of Curiosity
- Hydroponic Garden

**Title:** Drone in Greenland  
**Category:** Non-Verbal & Science Shorts  
**Director:** Guillaume Jouvét  
**Produced by:** ETHZ  
**Running Time:** 5:10 min.  
**Country:** Switzerland  
**Year:** 2017

The film shows how glaciologists use drones to monitor the calving – the breaking of large ice masses at the front of the tidal glacier. With aerial images created by drone flights, the scientists follow the movements of the ice masses and the formation of glacial clefts. This data is important to develop models that help to understand the process of ice breaking. The so-called calving is responsible for about half the mass loss of the Greenland ice sheet.

#### Experiment

- Chain Reaction Stick Spring
- Hot Ice

**Title:** Migrating Birds – Scouts of Distant Worlds  
**Original Title:** Zugvögel – Kundschafter in fremden Welten  
**Category:** Natural Science, Life Science & Technology  
**Directors:** Petra Hofer and Freddie Rockenhaus  
**Produced by:** colourFIELD  
**Running Time:** 89:00 min.  
**Country:** Germany  
**Year:** 2016

Every year billions of birds die on their migration routes. They starve, die of thirst, are killed by exhaustion or environmental poisons, by enemies, by winds or by power lines. Nevertheless, their migration has been anchored for generations; Year after year, the animals take the hardships and dangers of a long flight. The film shows the voyages of migratory birds with breathtaking aerial photography: from the Arctic to Africa, from Siberia to Serengeti. It explains how the animals orientate themselves and how, for example, a young stork finds the way to Africa even though he has never been there.

#### Experiment

- In-and-Out Egg

#### Game

- Parachute Race

**Title:** Treasures of the Earth – Metal  
**Category:** Ecology & Environment  
**Director:** Doug Hamilton; Terri Randall; Kate Dart - Series Director  
**Produced by:** A NOVA Production co-produced by Pioneer Film and Television Productions Limited with China International TV Corporation with CCTV-10 and PAAN Media Holdings Co., Limited, with KBS Korea in association with PBSd, for WGBH and KBS; A NOVA Production by Hamilton Land and Cattle, Inc. for WGBH Boston; A NOVA Production by Terri Randall Productions for WGBH Boston.  
**Running Time:** 58:16 min.  
**Country:** United States of America  
**Year:** 2016

The enduring luster of gold, the conductivity of copper, the strength of steel—the special properties of metals have reshaped societies and defined eras; they have such an important role in human history that entire ages have been named after them. But what gives metals their astounding characteristics? And how have metals enabled our modern hi-tech world? Explore the science of metals with chemists and engineers as they literally test the mettle of metals and investigate how these remarkable materials have ushered humanity from the Stone Age to the stars.

#### Experiment

- Heat Race
- Light Me Up

**Title:** Zapata's Science  
**Original Title:** Ciencia Zapata  
**Category:** Natural Science, Life Science & Technology  
**Director:** Pablo Accame  
**Produced by:** Pakapaka  
**Running Time:** 14:53 min.  
**Country:** Argentina  
**Year:** 2016

The young scientist Sofía and her little brother Zapata, a fan of the supernatural who is always waiting to prove that there is extraterrestrial life, are at the center of this Argentinian animation series. The two siblings solve problems together and face challenges that have arisen through their archrival Dr. No, a scientist who only uses science to his own advantage.

#### Experiment

- Hot Ice

**Title:** Zero Gravity – Mission in Space  
**Category:** Natural Science, Life Science & Technology  
**Directors:** Jürgen Hansen  
**Produced by:** La Vingt-Cinquième Heure, Prospect TV  
**Running Time:** 55:00 min.  
**Country:** Germany  
**Year:** 2016

The film accompanies two young astronauts on their first space mission: the Germans Alexander Gerst from the European Space Agency (ESA) and the American Reid Wiseman from NASA. For the first time in history, the audience has the opportunity to experience this whole journey. After five years of training, Gerst and Wiseman started their six-month mission to the International Space Station in May 2014. "Zero Gravity – Mission in Space" is a unique close-up of life in space and presents the viewers stunning images of the Earth.

#### Experiment

- Garden of Curiosity
- Hydroponic Garden
- Recycled Bottle Garden
- Solar Car

#### Game

- Parachute Race

## Age Guideline

### Primary School (9 – 11)

<b>Title:</b>	Checker Can – The Transportation Check
<b>Original Title:</b>	Checker Can – Der Transport-Check
<b>Category:</b>	Family Edutainment
<b>Directors:</b>	Johannes Honsell
<b>Produced by:</b>	Megahertz GmbH, Bayerischer Rundfunk
<b>Running Time:</b>	24:45 min.
<b>Country:</b>	Germany
<b>Year:</b>	2013

Every day millions of tons of goods are moved around the globe: by ship, plane, truck or train. In order to cope with this volume huge transporters are used from time to time. Checker Can is able to watch as one of the largest transport aircraft in the world is loaded in Hamburg: even the wings of the aircraft "Beluga" have storage space. However, not every product reaches its destination by air: Checker Can also accompanies transports with a steam locomotive and a truck. What's being carried via means of technology nowadays used to be carried by animals like donkeys. And they can carry a great many things as Checker Can learns in the Eselgarten in Augsburg.

#### Experiment

- Friction and Wheels
- Motor Go

#### Game

- Make it Jump

<b>Title:</b>	Checker Tobi – The Climate Check
<b>Original Title:</b>	Checker Tobi – Der Klima-Check
<b>Category:</b>	Family Edutainment
<b>Directors:</b>	Antonia Simm
<b>Produced by:</b>	Megahertz GmbH, Bayerischer Rundfunk
<b>Running Time:</b>	25:00 min.
<b>Country:</b>	Germany
<b>Year:</b>	2016

Everyone knows rain, cold and storms as "weather". And this is directly related to the climate. Checker Tobi explains vividly what the climate is, how it works and why people need to protect it. He even flies into a thundercloud with a propeller engine from the German Aerospace Center. He explains what the greenhouse effect, climate change and the personal ecological footprint is all about in simple terms – and what every individual can do to protect the climate and thus the earth.

#### Experiment

- Hot Ice



**Title:** Checker Tobi – The Robot Check  
**Original Title:** Checker Tobi – Der Roboter-Check  
**Category:** Family Edutainment  
**Directors:** Antonia Simm  
**Produced by:** Megaherz GmbH, Bayerischer Rundfunk  
**Running Time:** 25:00 min.  
**Country:** Germany  
**Year:** 2015

In the German Research Center for Artificial Intelligence in Bremen, Checker Tobi meets robot woman "Aila". The machine moves almost like a real human and can do many actions thanks to ingenious programming. Robots support people not only in everyday life, but also carry out dangerous tasks: In Bremen, for example, the researchers are testing spider-shaped space robots on a reconstructed moon landscape, which also manage in extremely hilly terrain. In this episode of Checker Tobi, the audience learns a lot about robot technology – and also whether a machine can develop and show feelings.

#### Experiment

- Motor Go

**Title:** Earth to Future – The City in the Year 2121  
**Original Title:** Erde an Zukunft – Die Stadt im Jahr 2121  
**Category:** Family Edutainment  
**Directors:** Katja Engelhardt  
**Produced by:** tvision  
**Running Time:** 24:51 min.  
**Country:** Germany  
**Year:** 2016

Felix the host takes a trip through time and lives in the environmentally friendly "City in the Year 2121", where garbage drones recycle the waste on site and where flying spacegliders are on the road instead of cars. However, the fact that future-oriented ideas can already be found in 2016 is also shown by Felix: the Swedish city of Hammarby has developed an underground waste disposal system. And at the Berlin-Südkreuz train station, there are environmentally-friendly means of transport such as rail, electric buses, electric cars and e-bikes, driven by wind and solar energy that is generated there. In addition, modern methods of vegetable or fish farming are presented for large cities.

#### Experiment

- Create a Flow
- Garden of Curiosity
- Home-Made Fertilizer
- Hydroponic Garden
- Motor Go
- Popsicle Stick Water Race
- Recycled Bottle Garden
- Solar Car

**Title:** Full Proof – Salt  
**Category:** Family Edutainment  
**Director:** Uif Putters  
**Produced by:** NTR  
**Running Time:** 12:43 min.  
**Country:** The Netherlands  
**Year:** 2016

In this series of the children's science fiction show "Full Proof" the twelve-year-old Masai girl Joy presents the phenomenon of Lake Magadi in her homeland in Kenya. The salt lake regularly dries out, the salt settles on the ground and can be scraped off there. The program explains the properties of salt by means of small experiments. For example, Joy builds a chain of salt crystals, uses osmosis to preserve vegetables, uses salt to make coconut ice, and explains why you should never drink the salt water.

#### Experiment

- Grow Salt Crystals

**Title:** I Got It! - Global Warming  
**Category:** Family Edutainment  
**Director:** Khin Nita Htun  
**Produced by:** MRTV-4 Ever Group and Goethe-Institut  
**Running Time:** 10:11 min.  
**Country:** Myanmar  
**Year:** 2015

In this episode of "I Got It!", Oaksoe Ka from Myanmar is dealing with global warming – in a very practical way. That's because he is interested in plants and is taking part in a planting competition at his school. To this end, the children are looking for the seeds themselves. Oaksoe Ka does so as well and decides to use a certain kind of plant. The film explains how important plants are for the climate and how they can influence global warming.

#### Experiment

- Hot Ice

**Title:** nine-and-a-half: Ew, Insects? – Siham Tries the Food of the Future  
**Original Title:** neuneinhalb: Igitt, Insekten!? – Siham probiert das Essen der Zukunft  
**Category:** Family Edutainment  
**Directors:** Nasibah Sfar  
**Produced by:** tvision GmbH im Auftrag des WDR  
**Running Time:** 09:30 min.  
**Country:** Germany  
**Year:** 2016

Open your mouth and put an insect inside? Siham is tasting the food of the future. Together with Chef René she conjures an exotic menu: worms on tomato sauce, salad of brown algae and as dessert grasshopper snacks! These special ingredients should be healthy and in many countries around the world they are regularly consumed. And she learns why it is good to eat insects. Let's see if Siham likes it? And which ingredient makes her sick? All this you will see in this nine-and-a-half episode.

#### Experiment

- Less Now, More Tomorrow

#### Game

- Cow or Bug?
- Favorite Freaky Food

**Title:** nine-and-a-half: Green Wonder – Can Algae Save the Climate?  
**Original Title:** neuneinhalb: Grünes Wunder – Können Algen das Klima retten?  
**Category:** Family Edutainment  
**Directors:** Nasibah Sfar  
**Produced by:** tvision GmbH im Auftrag des WDR  
**Running Time:** 09:30 min.  
**Country:** Germany  
**Year:** 2016

Algae are green, slippery and they smell funny – at least that's what reporter Johannes thought until now. At a research center in Jülich he now learns that these tiny creatures have a giant force and are real saviors of the climate. They consume a lot of carbon dioxide, that is, exactly the gas that hurts the climate. Researchers have bred billions of microalgae in Jülich in giant plastic tubes. The plants are not just saviors of the climate, but also store the very precious algae oil – which you can even use to fuel an airplane.

#### Experiment

- Garden of Curiosity
- Hot Ice



**Title:** nine-and-a-half: Nothing Goes without Codes – Why Programming is the Language of the Future  
**Original Title:** neuneinhalb: Ohne Codes nix los – Warum Programmieren die Sprache der Zukunft ist  
**Category:** Family Edutainment  
**Directors:** Nasibah Sfar  
**Produced by:** tvision GmbH im Auftrag des WDR  
**Running Time:** 09:30 min.  
**Country:** Germany  
**Year:** 2016

Cars that drive autonomously, robots that help elderly people in the household, or computers that help doctors with risky operations: machines will play an increasingly important role in the future. That is why more and more people are needed who can speak with machines – for example Harald Bergemann. He has programmed robots that are now speeding through a huge warehouse, helping human workers pack packages. The audience learns how important it is to be able to speak with machines and how to learn a programming language.

#### Game

- Binary Code Necklace

**Title:** nine-and-a-half: The Super Tree – Johannes Discovers the Wood of the Future  
**Original Title:** neuneinhalb: Der Superbaum – Johannes erforscht das Holz der Zukunft  
**Category:** Family Edutainment  
**Directors:** Christine Roskopf  
**Produced by:** tvision GmbH im Auftrag des WDR  
**Running Time:** 09:30 min.  
**Country:** Germany  
**Year:** 2016

The Asian Kirib tree is the fastest growing tree in the world. Within a year it grows up to five meters. The turbo growth has a secondary effect: The tree produces very much wood within a short time. Since the global demand for wood has been increasing for years, Kiri wood is a coveted raw material for the future. The Kiri tree has recently been planted in Germany. Reporter Johannes visits a tree school for the program. It reveals the secret of the fast-growing super tree and explains how the Kiri tree helps protect local forests.

#### Experiment

- Garden of Curiosity

**Title:** Show with the Mouse – Paper from Elephant Dung  
**Original Title:** Sendung mit der Maus – Papier aus Elefantendung  
**Category:** Family Edutainment  
**Directors:** Monika Hulshoff  
**Produced by:** WDR  
**Running Time:** 07:05 min.  
**Country:** Germany  
**Year:** 2015

The fact that wood is used for the production of paper is known. The fact that elephant droppings can also be used for the production sounds strange. This episode of "The Show with the Mouse" is based on a book that shows how the process works – and whether a book made of elephant droppings smells oddly. A reporter tries it out himself and collects elephant droppings at the zoo to produce his own piece of paper in the paper museum.

#### Game

- Dung Recycling Units