Cornelsen Experimenta

Science Kits
for primary school level

Cornelsen

Contact

About us

Cornelsen Experimenta® is producer of teaching material for natural sciences – from Kindergarten to secondary school. We are part of the Franz Cornelsen Educational Group which roots go back to Cornelsen Publishing with more than 75 years of experience in the educational market.

Our company is one of the largest and most important providers for educational material in Germany and more than 60 other countries worldwide. Our trade mark is the 'red case' that includes the teaching material for science. We have more than 40 % market share in German elementary schools, secondary schools and Kindergarten and are proud to say that "Every German school has at least one 'red case' with Cornelsen Experimenta® science material." We inspire since with our material, teachers enable students to understand, internalize and discover the magic of natural science.

Cornelsen Experimenta® is a manufacturing company located in Berlin with approximately 40 employees, partnerships with external authors, cooperation with universities and more than 250 deliverers worldwide. Our product portfolio contains at least 200 cases in which we assemble 6.000 single parts.

Come and join our community and discover a modern, outstanding company with high-end quality products that make you and our common customer – teachers and students – learn enthusiastically natural science accompanied with experiments from Cornelsen Experimenta®.

Quality Assurance

It is the aim of Cornelsen Experimenta® to develop and produce teaching material of high quality for activity-oriented natural science classes. Our products are of high quality and fail-safe.

Cornelsen Experimenta® has established an extensive quality management system which is regulary audited, internally and externally.

Cornelsen Experimenta® has been certified according to ISO 9001:2015. It is ensured that the demands of the customers will be realized and fulfilled with high quality.

Disclaimer

The products shown in this catalogue are continuously adapted to the changing technological and educational developments. Illustrations and descriptions are not binding in their entirety. Errors and omissions are excepted.

TÜVRheinland®
ZERTIFIZIERT

Management System
ISO 9001:2015

www.tuv.com
ID 9105061586

The Cornelsen Experimenta Team

Contents

Integrated Natural Science

Storytelling

Primary Natural Science

Kindergarten kits

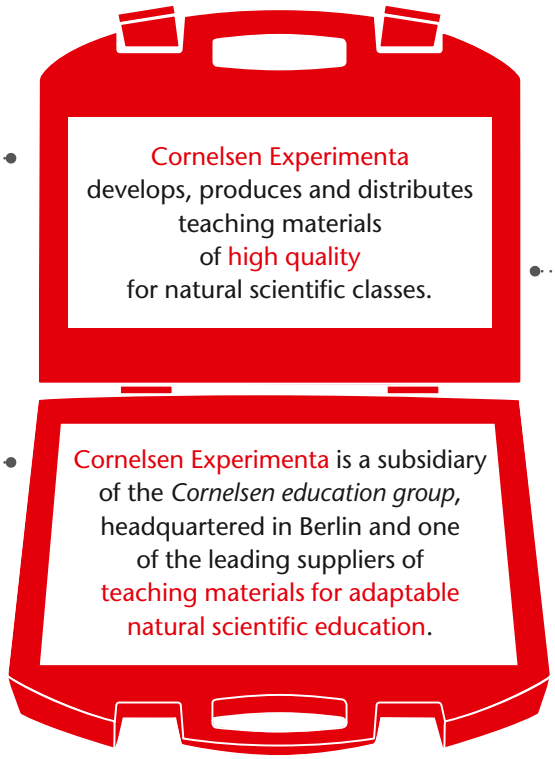
Cornelsen Experimenta® …

… kits allow teachers to gain extra time for other important educational tasks. The kits provide the means teachers and educators need to support them to grant successful classes.

… offers complete solutions, based on an integrated media system. The components of this system – kits and manuals – match each other.

… uses for the production of their teaching aids only quality raw materials. All raw materials are RoHs compliant. All plastic (or other) materials and colours are free of dangerous components and electrical parts used in combination with our educational materials do comply with all CE and other international safety standards.

… has established an extensive quality management system which is regularly audited, internally and externally. Cornelsen Experimenta has been certified after ISO 9001:2008.



… acknowledges the enormous importance to introduce students to experimental learning in their daily school routine. It is our idea that students should work independently to reach sustainable learning success.

… products are subject to the directive 2009/48/EG of 18/06/09, annex 1, no. 13.

… offers a 2 years warranty for all products purchased from us.

… offers a complete service of supplying spare parts. All components of our kits can be reordered separately.

Science kits for the primary school

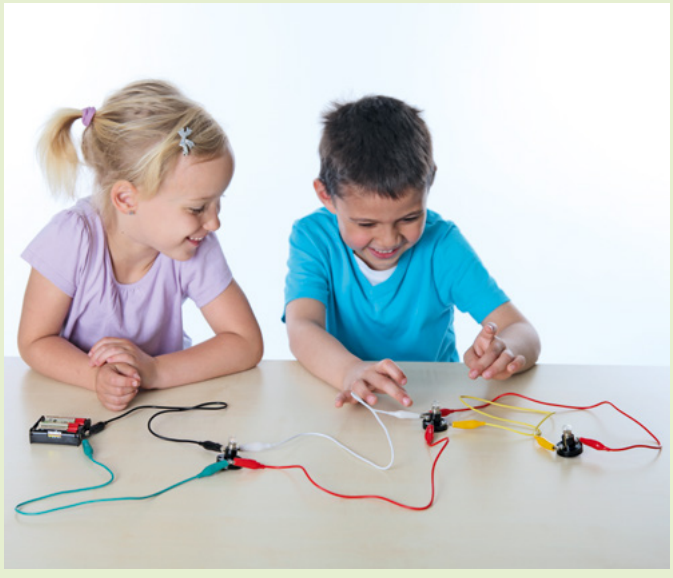
- Modern, action-oriented didactic concept
- Reproducible and sustainable learning effects
- Appropriate for different teaching methods
- All necessary materials included and clearly stored
- Detailed manuals and instructions included
- No laboratory or specialized rooms required

Pages 6 – 75

Pages 24 – 29

Storytelling

- Combining experimentation with exciting stories
- Enables children to experimental learning or investigative discovery learning – from hypothesis to their own conclusion
- includes teacher's manual with methodical approach



Science kits for the Kindergarten

- Fail-safe experiments, easy to reproduce
- Pictorial step-by-step plans
- Robust materials, compactly stowed
- The kits provide fun and thus encourage children's natural spirit of research

Pages 76 – 85

The Experiments

- Support the training of hand-eye coordination,
- Encourage language and cognitive abilities,
- Help to develop and strengthen social competences

Integrated Natural Science

Age 11 – 14

High motivation for experiments with Cory & Nelson

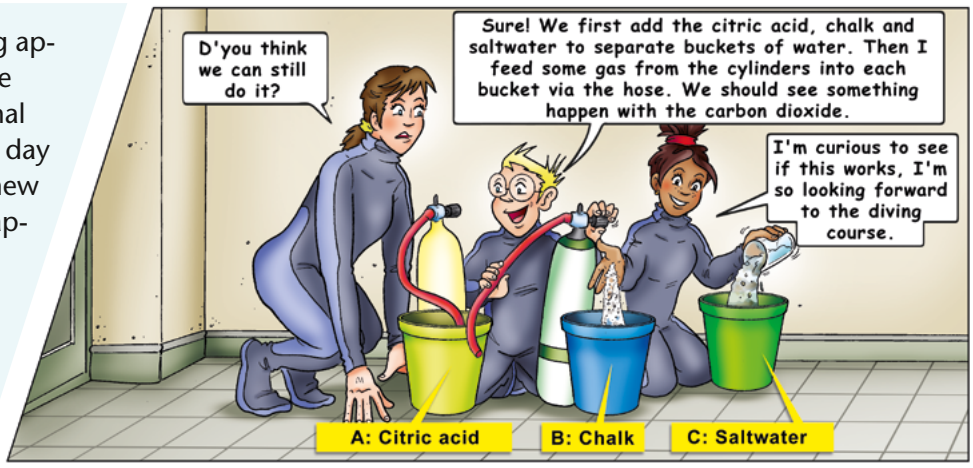
NEW PRODUCT

Air resistance
Heating up air
Air composition
Sound transmission
Air pressure

Air eXperTeenies

The new Natural Science Series that turns school children into experts!

Comics tell stories. The storytelling approach highly excite students since natural science topics get a personal meaning. The experience of every day life phenomena is the aim of our new experiment kit. Each experiment approach is accompanied by a short comic story with the main characters Cory & Nelson. The first kit includes more than 15 experiments linked to the topic "Air".



Experiments at stations do not lead into a defined direction: **there is no right or wrong.**

Each learner receives the support she or he needs. The students are designated as expert for a certain station. This way they are in charge of his or her scientist team.

The "**station expert**" supports his / her **team** while realizing the experiment: either with posed questions, selection of material, the construction of the experiment or **safety precaution**.

The expert alternates at the next station.

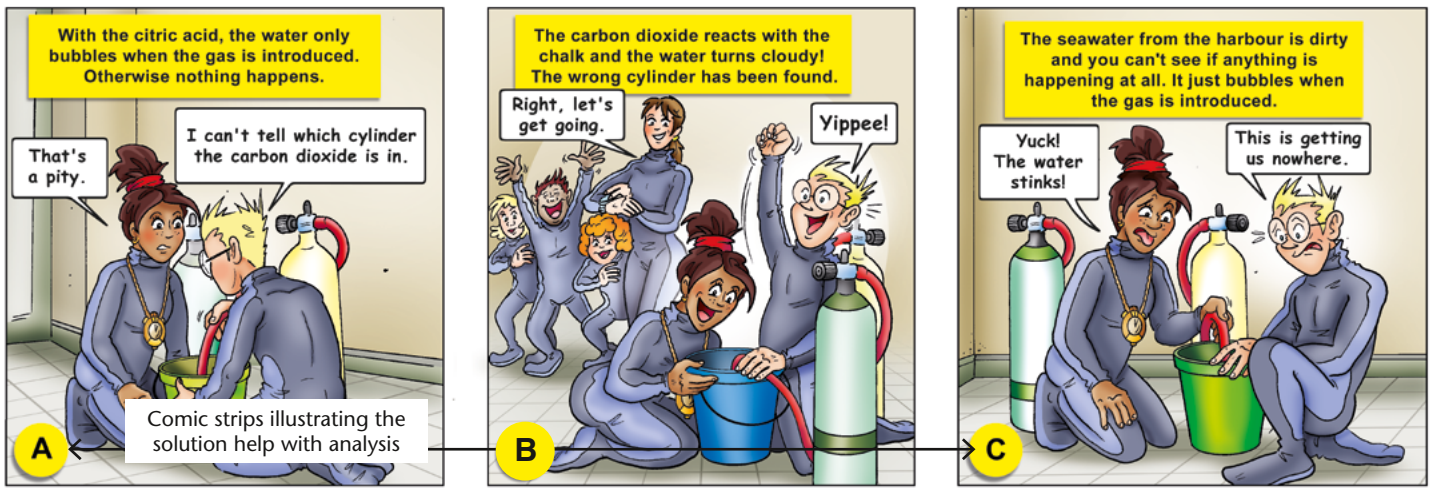
This way everyone can participate in experimenting, find out correlations that lead to the answer of individual questions.

24100	Materials for 5 workstations (for 15 children at least)

While experimenting the teacher is relieved through the expert and each student is individually supported.

The self-confidence and sense of responsibility is strengthenend due to the exchange of the expert function.

While teaching natural science the exchange between the student also enforces teamwork and sense for language.



Comic strips illustrating the solution help with analysis

Age 11 – 14

Students kit Materials in everyday life

This kit contains equipment and resources for scientific experiments covering multiple disciplines to study various substances.

An initial section allows experiments to be carried out on basic material properties.

A second allows experimentation on mixtures of substances and separation of mixtures.

In addition, it is also possible to study changes of state between solid, liquid and gaseous substances and material changes due to chemical reactions.

Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions

22005	Materials for 1 work group or demonstration

Detailed instructions for 38 experiments:

Properties of materials
- Identifying and distinguishing materials
- Hardness and deformability of materials
- Density of materials
- Buoyancy of materials in liquids
- Thermal conductivity of
  – solid materials
  – liquid materials
- Heat resistance and ignition
- Magnetic behaviour
- Solubility
- Acidic and alkaline solutions
- Hard and soft water
- Consequences of water hardness
- Mineral salts in water

Mixtures of materials
- Mixing of solid materials
- Oil and water
- Mixing / Separation
- Separation by deposition (sedimentation)
- Separation by
  – filtration
  – evaporation
  – vaporization/distillation
  – dissociation into constituent parts
- Production of drinking water from salt water
- Desalination of water
- Purification of dirty water by simple filtration
- Purification of dirty water by multi-layer filtration
- Magnetic separation for recycling scrap materials

Changing materials
- Changes in the state of
  – liquids when warmed
  – gases when warmed
  – solid bodies when warmed
- Behaviour of bimetals when warmed
- Boiling of liquids
- States of aggregation of water
- Melting of materials
- Combustion and oxygen
- Release of gases
- Effect of gases
- Formation of rust

Age 11 – 14

Students kit Everyday electricity and magnetism

This kit contains equipment and resources for scientific experiments covering multiple disciplines to study electrical processes and permanent magnetism.

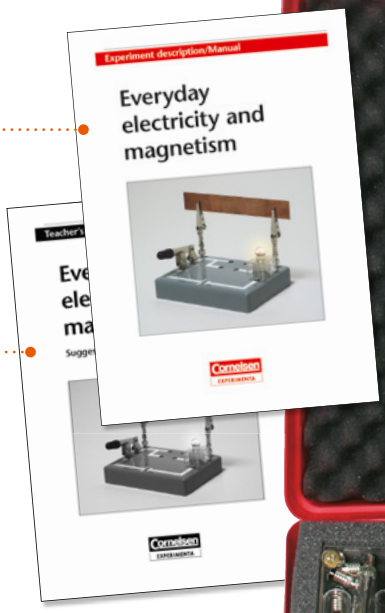
In electrostatics there are experiments for demonstrating electrical charge and investigating how charges behave. In the magnetism section it is possible to study the properties of permanent magnets.

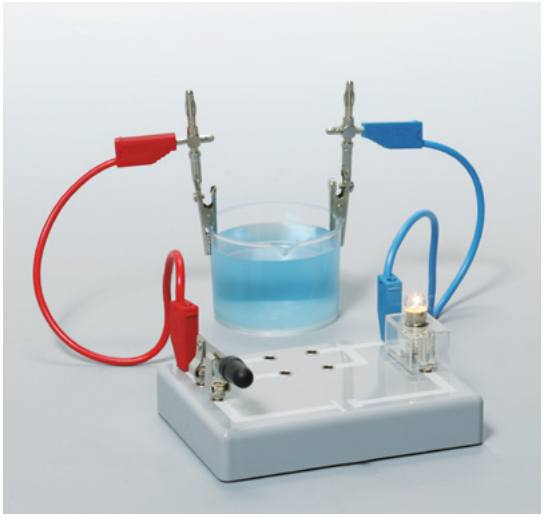
The key focus is on experiments to study the flow of current and on basic electrical circuits. More advanced experiments allow the effects of electrical current to be investigated.

Included in delivery:

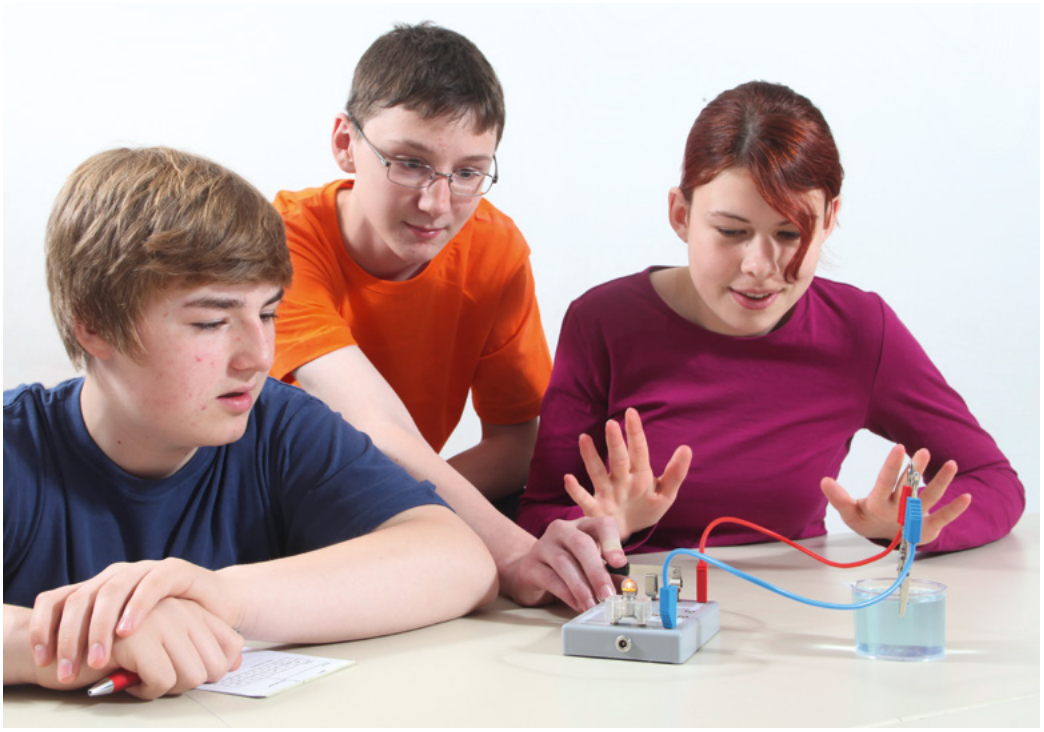
Experiment description
- with student worksheets

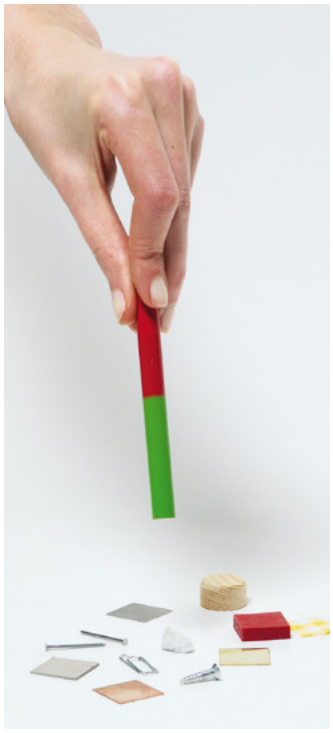
Teacher's booklet
- with suggested solutions





22006 Materials for 1 work group or demonstration





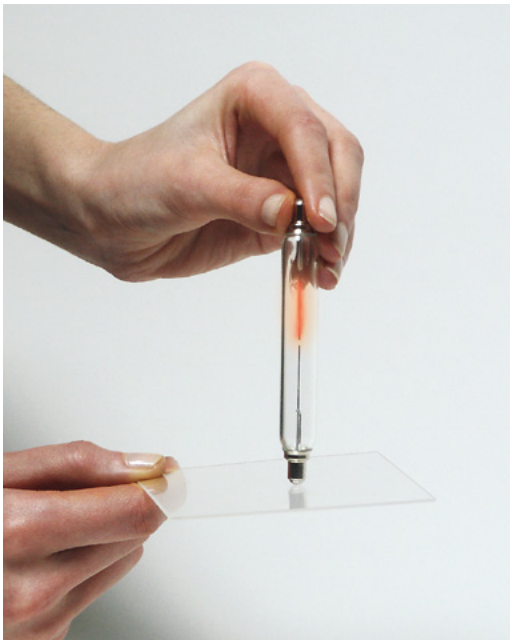
Detailed instructions for 23 experiments:

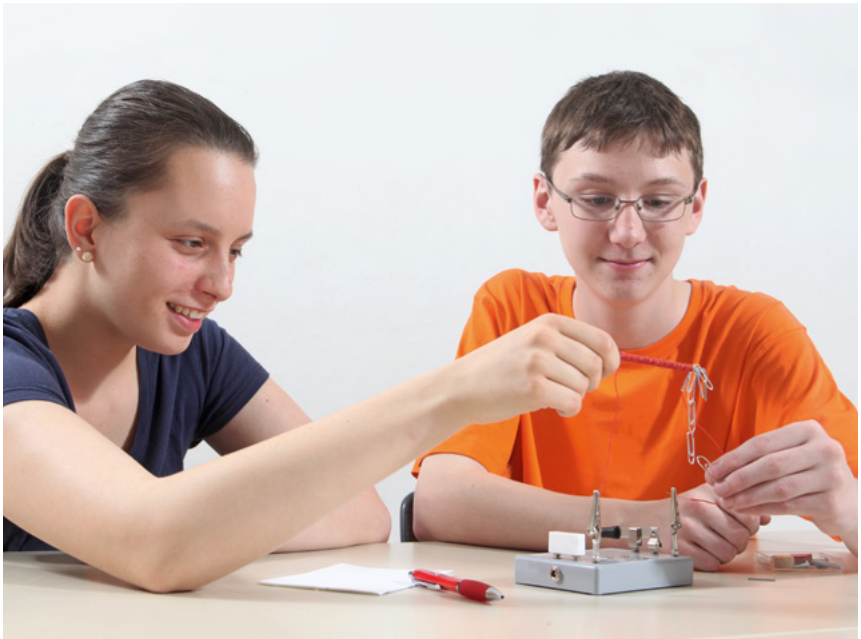
Electricity

- Electric charge
- Effects of electric charge
- Forces between electric charges
- Demonstration of electric charge
- Electric circuits
- Electrical conductivity of
  - solid substances
  - liquid substances
- Wiring of voltage sources
- Lamps connected in parallel
- Lamps connected in series
- Heat / Magnetism arising from electric current
- How an electric door bell works
- How an electric motor works

Magnetism

- Effect of magnetism on substances
- Transfer of magnetic effects
- Forces between magnets
- Floating magnets
- Magnetisation of iron wire
- Splitting a magnet in two
- Demonstration of magnetic fields
- Model compass





Age 11 – 14

Students kit Sun, heat and air

This kit contains equipment and resources for scientific experiments covering multiple disciplines to study the properties of the air around us and the nature of heat.

On the basis of a whole range of experiments, it is possible to learn about basic properties of air and the effects of air pressure.

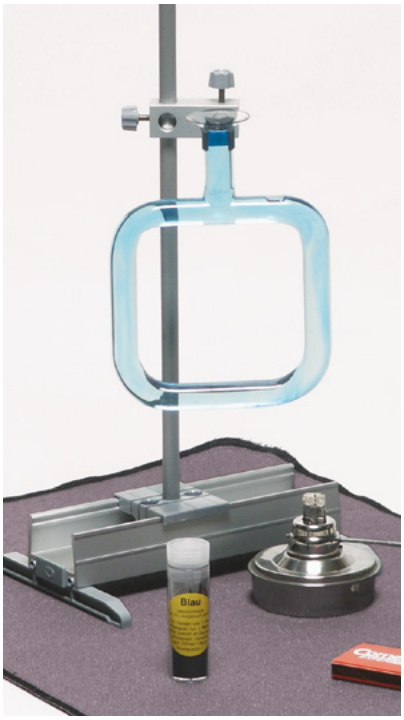
In a further set of topics, experiments are performed to elucidate the concept of heat and how heat from the sun could be utilised.

Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions

22009	Materials for 1 work group or demonstration



Detailed instructions for 29 experiments:

Air

- The invisible air
- What is in the air?
- Air is a body
- Air resistance
- Air versus water
- Air can raise water
- Air can store energy
- Air can transmit force
- Air can expand
- Air pressure – an invisible force
- Effects of air pressure
- Changes in pressure
- Measuring air pressure
- Movement on a cushion of air
- Lift due to hot air
- Lift due to flow of air

Heat / Sun

- Hotter or colder?
- Measurement of heat
- What is temperature?
- Use of bimetallic strips as thermometers
- Heat possesses energy
- Conduction of heat
- How heat can circulate
- Heat can be focussed
- Heat can transform substances
- Heat can be retained
- Heat can be withdrawn
- Heat from the sun
- Conversion of solar energy

Age 11 – 14

Students kit Exploring the world of the small

This kit contains equipment and resources for scientific experiments covering multiple disciplines to learn the methods and procedures for observing very small objects.

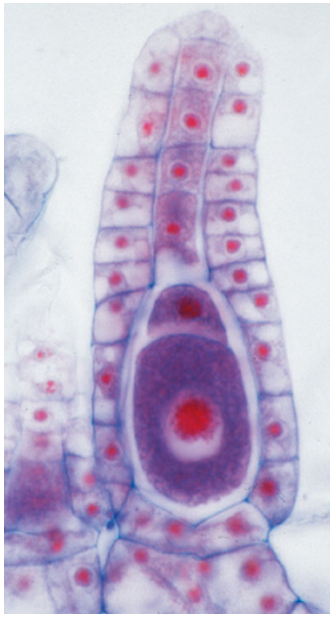
After a range of initial observations of small objects through a magnifying glass, there are numerous experiments allowing students to learn step by step how to prepare tiny objects for investigation with a microscope and how to use a microscope itself.

Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions

22012 Materials for 1 work group or demonstration



Detailed instructions for 20 experiments:

Observations with the microscope

- Examination of a hair
- Examination of feathers
- Examination of a butterfly wing
- Examination of onion epidermis
- Examination of waterweed or rhizomnium moss
- Examination of vacuoles (cell sap cavities)
- Examination of stinging hairs from a stinging nettle
- Examination of pollen
- Examination of the nutrient transport systems of a plant
- Examination of storage cells of a potato tuber
- Examination of the skin on the underside of a plant leaf
- Examination of cells from the lining of the mouth
- Observation of freshwater polyps
- Observation of food ingestion by a freshwater polyp
- Observation of water fleas
- Examination of insects
- Examination of pond water or stream water
- Examination of living creatures in a hay infusion

Observations with the magnifying glass

- Inspection of plant seeds
- Inspection of mosses
- Inspection of fish scales
- Inspection of feathers

Recommended:

Microscope

This microscope is ideally suited for first scientific observations.
Easy handling. Integrated LED-illumination. Lenses made of optical glass.

Magnification: 40x to 400x
Observation tube: monocular eyepiece 45°-inclined
Nosepiece: triple revolving with click stops
Objective: 4x, 10x, 40x
Ocular: 10x
Plain stage: 90 x 90 mm with 2 sample clips and 6 apertures
Power supply: 3 x R6 batteries
Size: 300 x 170 x 120 mm

89905

Age 11 – 14

Students kit My body, my health

This kit contains equipment and resources for scientific experiments covering multiple disciplines to perform simple experiments on the perception of taste and on the ingredients in food.

In addition to experiments on breathing and taste, there are others which allow the demonstration of ingredients in what we eat.

Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions

22014	Materials for 1 work group or demonstration

Detailed instructions for 9 experiments:

Sense and perception, movement, respiration

- Taste cells of the tongue
- Strength of bones
- Determination of respiratory volume
- Determination of the carbon dioxide content of inhaled and exhaled air

Nutrition and digestion

- Detection of starch, fat, glucose and of protein in foodstuffs
- Confirmation of starch digestion in the mouth

Age 11 – 14

Students kit What you feel, what you see what you hear

This kit contains equipment and resources for scientific experiments covering multiple disciplines to perform simple experiments on three of the five senses, touch, hearing and sight. Some simple experiments are used to study the propagation of light, the sense of sight and the function of key optical equipment. Others investigate the creation and propagation of sound waves.

The possibilities of this set are rounded out by experiments on the sense of touch and perception of heat.

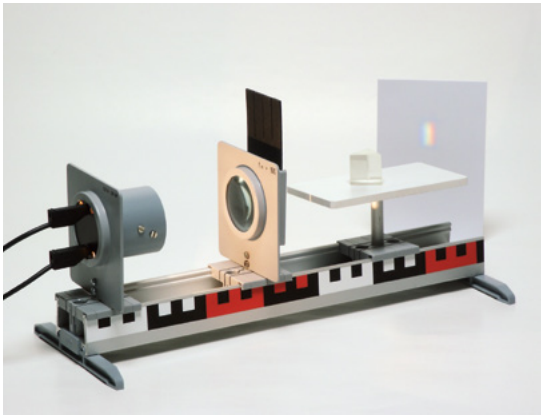
Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions

Additional power supply required, e.g.:

55217 Power supply unit 12 V (see page 71)



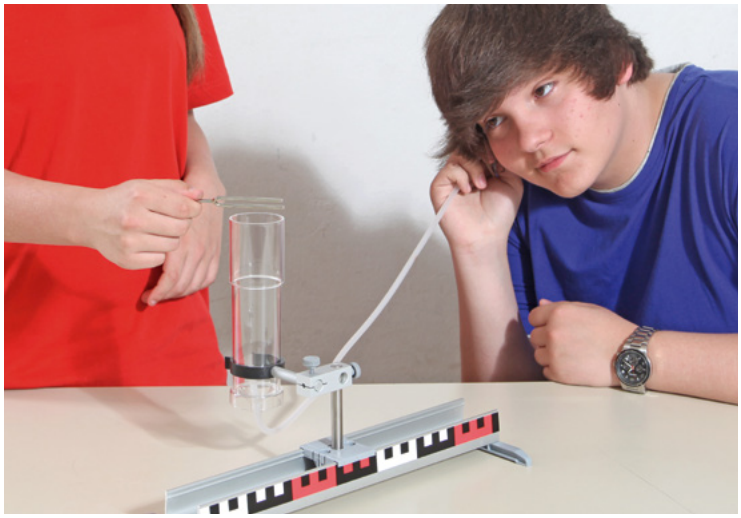
22018 Materials for 1 work group or demonstration

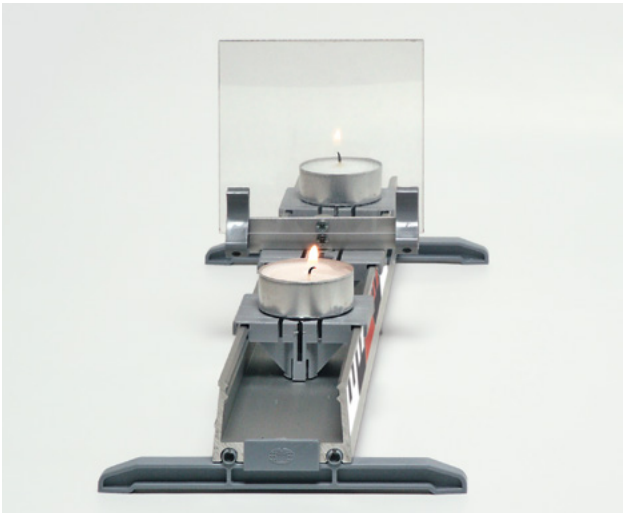
Detailed instructions for 28 experiments:

What you see
- Propagation of light
- How to create beams of light
- Light and dark
- Light and shadow
- Deflection of light
- How reflections happen
- Light can change direction
- Focusing and dispersing light
- How images are created
- How the eye sees
- Why do people need glasses?
- Not all spectacles are the same
- Principle of a camera
- Magnification of images
- Astronomical telescope
- Terrestrial telescope
- Principle of a microscope
- Light and colour

What you hear
- How sounds and sound waves arise
- Demonstration of sound waves
- Propagation of sound waves
- Sound waves cause pressure
- Excitement by sound waves
- Transport of sound

What you feel
- Sensitivity of skin
- Sense of touch
- Sensing heat
- Distinguishing by touch





Age 11 – 14

Students kit Forces and motion in nature and technology

This kit contains equipment and resources for scientific experiments covering multiple disciplines to conduct simple experiments on the effects of mechanical forces.

Various effects of force are investigated in a variety of experiments, which also allow conclusions to be drawn about the technical use of such effects.

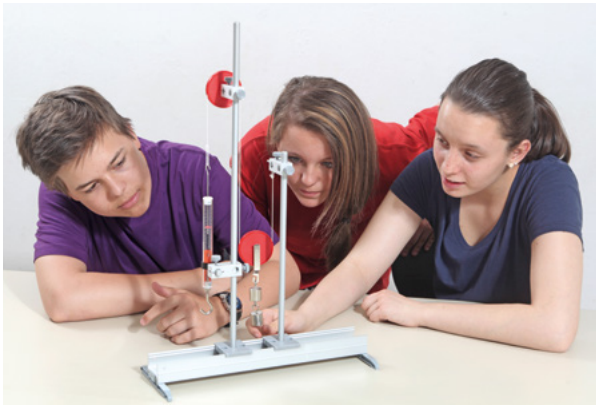
Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions

22021	Materials for 1 work group or demonstration

All
stand equipment
included!



Detailed instructions for 16 experiments:

- Loading by forces
- Deformation by forces
- Acceleration by forces
- Deceleration by forces
- Deflection by forces
- Measurement of forces
- Dragging something up a slope instead of lifting it
- Usefulness of levers
- Single-sided levers
- Redirection of forces
- Saving effort
- Redirection of forces to save effort
- Motion and inertia
- The ubiquitous force of friction
- Uniform or accelerated motion
- Fast or slow motion

Age 11 – 14

Students kit Plants, animals, habitats

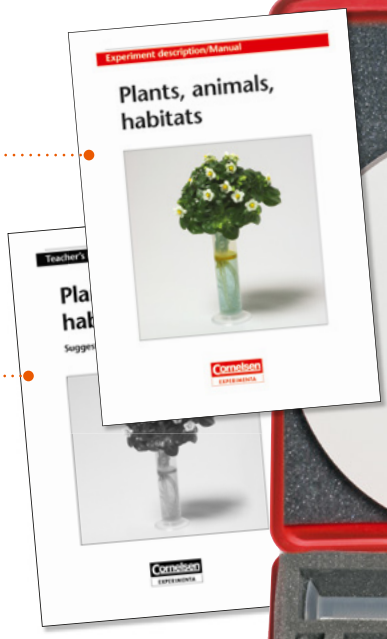
This kit contains equipment and resources for scientific experiments covering multiple disciplines to investigate the living conditions of plants and microscopic creatures.

Multiple experiments and observations can be carried out to investigate the processes and conditions upon which the emergence and prosperity of plant and animal life depend.

Included in delivery:

Experiment description
- with student worksheets

Teacher's booklet
- with suggested solutions



22024 Materials for 1 work group or demonstration

Detailed instructions for 16 experiments:

Structure and life processes of plants

- Examination of a flower
- Investigation of the uptake of water by roots
- Investigation of the water given off by plants
- Investigation of water transport in plants
- Examination of a bean seed
- Detection of starch in seed leaves
- Observing the germination of bean seeds
- Observation of root hairs
- Investigation of the conditions for germination

Water as a habitat

- Determining the quality of water bodies from their turbidity, discoloration and odour
- Measuring temperatures at various depths of water bodies
- Determining the visibility depth of water bodies

Soil as a habitat

- Investigation of soil types
- Identifying different soil constituents
- Determining
  - the humus content of soils
  - the pH value of soil samples
  - the lime content of soils
- Examination of soil samples for living creatures

VINUS explores the world

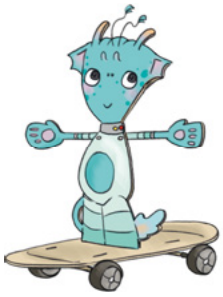
Using a story to get pupils excited about experiments

"Whoa, slow down there," says Ben trying to rein him in. But Vinus is unstoppable.
"What you call air sure can't be very heavy," he simply keeps on talking.
"You can't even see it and you can't lift it like this stone." Lili laughs …

This is a typical excerpt from one of the stories about the little extra-terrestrial creature Vinus, whose space capsule makes a rough landing on Earth. Things on the Earth are perfectly normal for the children Ben and Lili and their dog Jojo, but that doesn't mean they can really explain everything correctly. So they set off together to investigate certain phenomena.

The use of storytelling as a methodology captivates the pupils right from the start. Through stories about Vinus and his friends, topics are transposed from the instruction syllabus to the real world of the children. This gives open questions personal meaning for the children. As a result, they are excited to find the solution to the question for themselves and retain a solid understanding of the responses and interrelationships.

Science instruction through storytelling



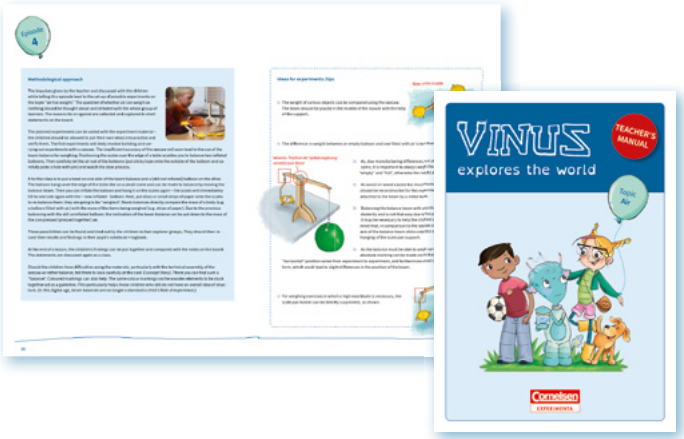
Vinus explores the world is an innovative series based on the storytelling method that combines stories with experimentation.

And here's how it work:

- For each topic, such as 'Air', there are separate stories – for the extra-terrestrial creature, they are **episodes**. The key points arising from an episode always lead to a concrete topic of instruction, e. g. "Air has a weight".
- The episode incites the children to develop their own questions and conjectures. **The concept story** helps them do so.
- This enables each child to reach the intended conclusions individually at their own pace and in their own way. There is no right or wrong here, detours are permitted.
- **The materials** are precisely matched to the content of the episode, thereby maintaining motivation throughout the duration of the experiment.
- This is investigative discovery learning, which furthermore demands social skills because problems are solved together.
- The observations and findings can be recorded in the logbook individually according to the abilities of the child.

Teachers manual

Stories for reading out loud • Methodical approach
Experiment ideas / tips • Pedagogical instructions
Additional information and practical everyday references
Discussion topics and technical answers • Substantive analyses



Concept stories

Visual repetition of the story • Orientation and insights for experiment ideas
Latitude for own thought and possible solutions • Solution approaches

Logbook for pupils

Concept stories as mnemonic device • Room for documenting results • Galactic Researcher Passport
Hidden object game to colour in
Experiments to do at home

Equipment

represents what the story is about – less of a conventional example, but rather "fantastic" (e. g. Vinus hands and antennae), thereby instilling additional motivation.

Science instruction through storytelling

Age 7 – 8

Episodes

Topic Air

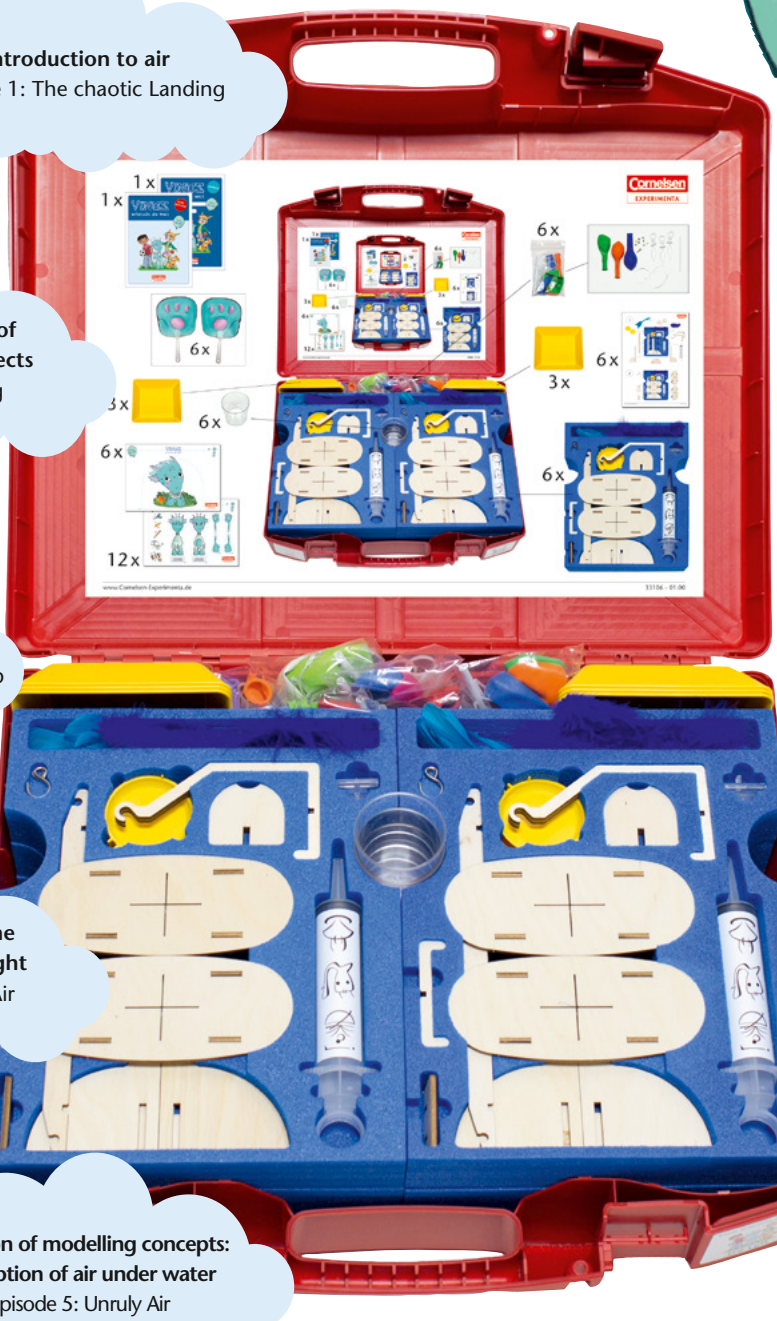
Introduction to air
Episode 1: The chaotic Landing

Introduction to the phenomenon of air pressure and its effects
Episode 2: Struggling with the Unknown

Experimenting with air resistance
Episode 3: The Beginning of a Friendship

Experimenting with the notion that air has weight
Episode 4: Mysterious Air

Initiation of modelling concepts: Perception of air under water
Episode 5: Unruly Air



33106	Vinus explores the world – Topic Air, equipment for 6 groups (with concept stories), including 1 teacher's manual and 1 logbook

Perfectly matched supplies:

Teacher's manual – Air

- Story to read aloud or tell
- Methodical approach
- Possible experiment ideas / tips
- Pedagogical instructions
- Additional information to tell / practical everyday references
- Discussion topics and technical answers
- Substantive analyses
- DIN A4, 48 pages.

3310061

Logbook for pupils – Air

- Concept stories as mnemonic device
- Plenty of room to document findings
- Hidden object game to colour in
- Experiments to do at home
- DIN A4, 24 pages.

3310062 single
3310066 10-pack

Vinus doll

Vinus as a doll can be integrated into the experiments and engenders a high degree of identification among the children.

30 cm high, with zip on the back for emptying and filling the doll.

33050

Demo-Set Ufo

A vacuum pump is used to take the air from the space capsule (Magdeburg hemispheres principle).

The demo set contains:

- UFO as 2 hemispheres (assembled),
- Vacuum pump, 1 valve, small bag of confetti
- Vacuum bag that the Vinus doll fits inside
- Instructions with tips and suggestions

33150

Vinus explores the world – Topic Air, equipment for 1 group (with concept stories)

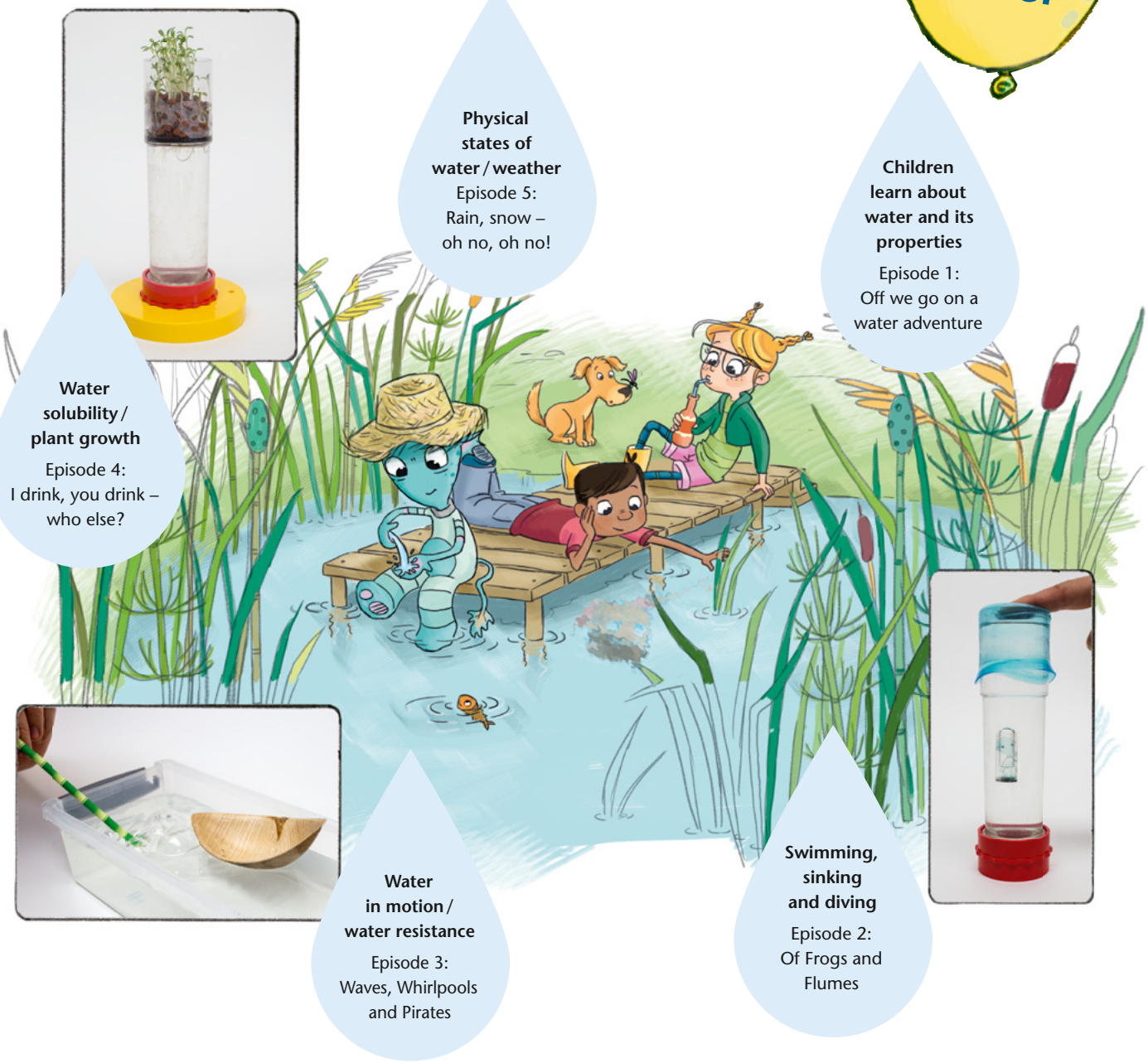
Equipment for 1 group (with concept stories).

33100

Age 7 – 9

Episodes

Topic Water



Physical states of water / weather
Episode 5:
Rain, snow – oh no, oh no!

Children learn about water and its properties
Episode 1:
Off we go on a water adventure

Water solubility / plant growth
Episode 4:
I drink, you drink – who else?

Water in motion / water resistance
Episode 3:
Waves, Whirlpools and Pirates

Swimming, sinking and diving
Episode 2:
Of Frogs and Flumes

33206	Vinus explores the world – Topic Water, equipment for 6 groups (with concept stories), including 1 teacher's manual and 1 logbook for pupils
33200	Vinus explores the world – Topic Water, equipment for 1 group

An excerpt from Episode 1:

“The children splash the water with their feet. All the fish dart away. Vinus plunges his shovel-hands into the water and then straight away his feet too. “That feels …”

He pauses to think about it. “Wet!” shouts Ben.

“Slippery,” says Lili, “and smooth.”

“Cool,” says Vinus, “and supple.”

He scoops up some water with his shovel-hands, but it flows away.

“That’s strange,” says Vinus. “The water runs away, but it also stays on my hands.”

He clasps his wet palms together.

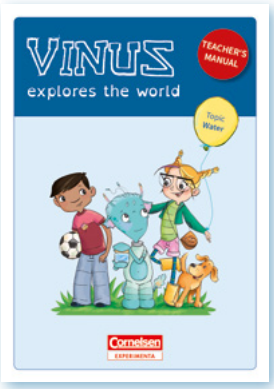
As he pulls them apart again, he stops in his tracks.

“The water glues my hands together.”

Perfectly matched supplies:

Teacher’s manual – Water

- Story to read aloud or tell
- Methodical approach
- Possible experiment ideas / tips
- Pedagogical instructions
- Additional information to tell / practical everyday references
- Discussion topics and technical answers
- Substantive analyses
- DIN A4, 48 pages.



3320061

Logbook for pupils – Water

- Concept stories as mnemonic device
- Plenty of room to document findings
- Hidden object game to colour in
- Experiments to do at home
- DIN A4, 24 pages.

3320062 **single**

3320066 **10-pack**

Vinus doll

Vinus as a doll can be integrated into the experiments and engenders a high degree of identification among the children.

30 cm high, with zip on the back for emptying and filling the doll.

33050

Age 8 – 12

Students kit Sound and tone

This kit can be used in lessons covering physical and technical subjects as well as music and languages.

The kit is especially suitable for learning in groups at specific workstations but can be used for any other type of lesson too.

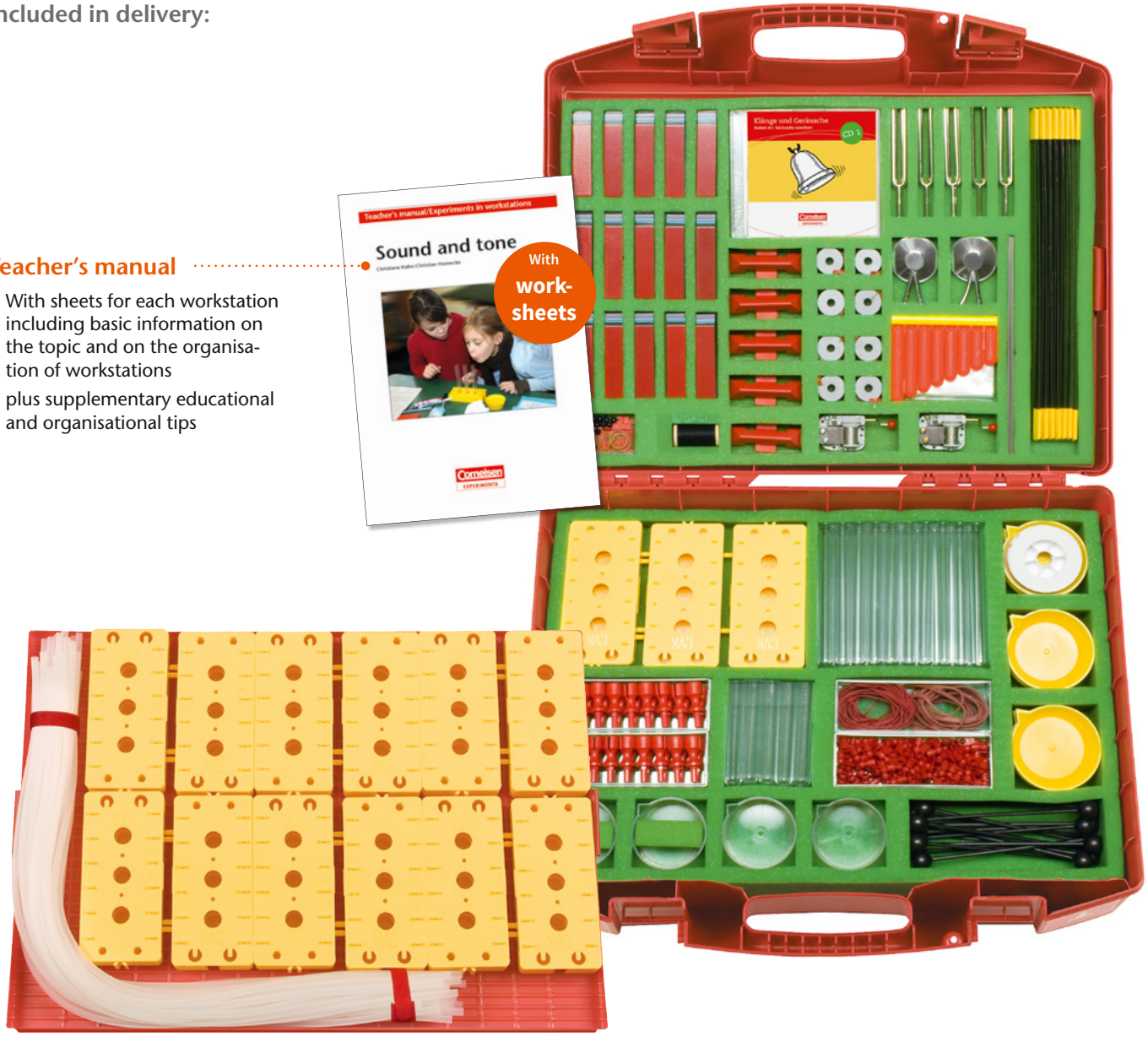
With the help of four CDs the children learn to classify sounds and noises and to identify and name them. They also learn to distinguish similar noises.

Needed in addition: One or two CD-players.

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips



31720	Materials for up to 25 workstations (for 25 children at least)

▶ Teacher's manual 'Experiments in workstations: Sound and tone'

With copy templates covering 25 workstations. The equipment can be used in these experiments:

Hearing, recognising and naming sounds

- Assigning pictures to noises
- Recognising and naming sounds
- Pairs of sounds
- Miming a sound story

Hearing, seeing and feeling vibrations

- Secret tickling
- A tuning fork in water
- Tuning fork ball games
- Singing needles and steel strips

Making high and low tones

- The rubber band zither
- Building a xylophone
- A panpipe
- A mbira (thumb piano)

Amplifying and damping sound

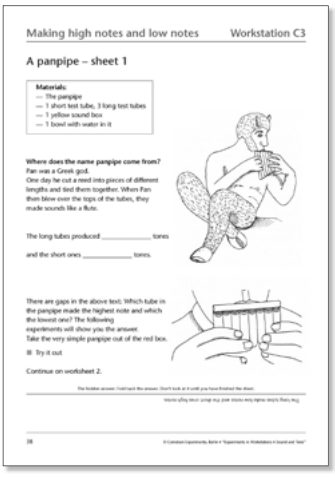
- Loud or quiet?
- The mysterious body
- A sound beaker
- A 'cackle box'

Transmitting sound

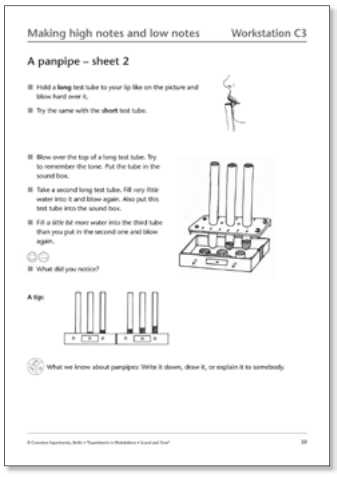
- Why do we have two ears?
- Along the string and into your ear
- A string telephone
- Sound travels
- The magic finger
- A stethoscope
- Hearing through plastic tubes

Conclusion

- Accompanying a story with suitable noises


Making high notes and low notes Workstation C3

A panpipe – sheet 1


Making high notes and low notes Workstation C3

A panpipe – sheet 2

Copy templates from the 'Teacher's manual'

Age 9 – 10

Students kit Floating and sinking

This kit allows children to observe the essential phenomena of floating and sinking.

The key experiments are based on "boats" that the children can make from two sorts of plasticine: One sort is lighter than water and therefore floats whereas the other one is heavier than water and usually sinks unless it is moulded into a shape that can float.

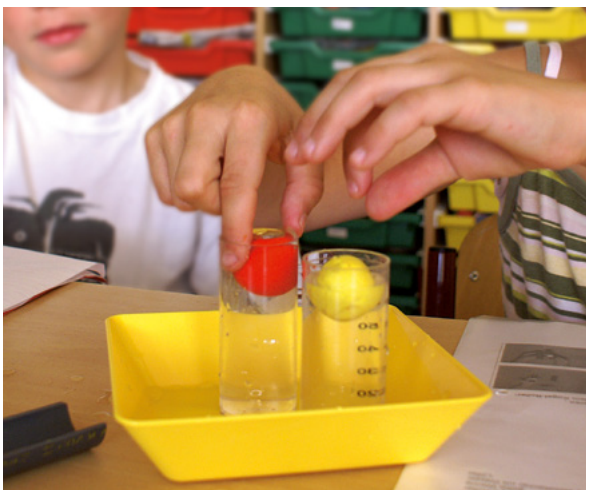
The box also contains balls and a cube made of materials used in the building of ships and boats: wood, steel, aluminium and plastic.

Scales can be used to determine the apparent reduction in weight experienced by a body when it is immersed in water.

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips



31900 Materials for up to 14 work groups / 28 children

All phenomena are examined separately in comprehensible experiments:

The carrying capacity of ships, the displacement of a body suspended in water, the buoyancy and the surface tension of water.

▶ Teacher's manual
'Experiments in workstations:
Floating and sinking'

With copy templates covering 14 workstations.
The equipment can be used in these experiments:

- How to use plasticine for experiments
- The materials for the experiments
- Why does light plasticine float?
- What makes some balls of plasticine float?
- What are ships and boats made of?
- What does a ball do to the water it is in?
- How to make heavy plasticine float
- Comparing two ships
- Launching a ship and loading it
- When do ships sink?
- Does water have secret powers?
- What keeps ships afloat?
- The pond skater's trick
- Whose ship can carry the biggest load?
- Make your own container ship
- From dugout to container ship
- Our workshop
- Our teacher does an experiment for us
- A competition: Will these ships float or sink?

Age 8 – 12

Students kit **Measurement** of temperature, weight and length

This kit contains an easy-to-use collection of measuring instruments, which can be used in primary schools whenever quantities such as temperature, weight and length need to be learned about and measured. They are well proven in technology lessons involving physical and biological investigations and also in maths lessons.

Pupils can gain contemporary knowledge suitable for their basic schooling about the conventions involving units as well as the function and use of measuring instruments. A 'Measuring triathlon' can be held in which they can demonstrate the ability to select the appropriate measuring instrument, to use it properly and to record the results.

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

31790	Materials for up to 18 work groups (for18 – 36 children)

▶ Teacher's manual
'Experiments in workstations: Measurement'

With copy templates covering 28 workstations, where the equipment in the kit can be used in experiments:

Measuring temperature
- Celsius and Fahrenheit invent thermometer scales
- Make your own thermometer
- Making scales for our thermometers
- Make a scale for practising reading thermometers
- Make temperature reading tasks for your partner
- Ideas for where to measure temperatures
- Set up a workstation box for mixing temperatures
- Measuring temperature at home
- Solving tasks for master measurers

Measuring weight
- Using balance scales
- Practising adding up weights
- Things to weigh with the balance scales
- Make your own 'balance scale'
- Set up a workstation box for weighing with balance scales
- Using spring scales correctly and understanding them
- Finding out how heavy satchels are
- Set up a workstation box for weighing with kitchen scales
- Solving tasks for master measurers

Measuring length
- How do we know how long a metre is?
- Making a pocket measuring tape
- Let's measure each other
- Things to measure with a measuring tape
- Set up a workstation box for measuring with a measuring tape
- Measuring, using the callipers out of the kit
- Making your own callipers
- Measuring coins with callipers
- Set up a workstation box for measuring with callipers
- Solving tasks for master measurers

Age 6 – 10

Students kit Magnet and compass

Lessons about magnets

Children learn about the properties of magnets.

Half of the bar magnets in the kit do not have pole marks so that the children learn to determine north and south poles for themselves.

Lessons about the magnetic compass

Experiments with suspended or floating magnets lead to an understanding of how compasses work.

Children also learn to assemble their own compasses and to use them properly.

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

31756	Materials for up to 24 workstations (for 24 children at least)

▶ Teacher's manual
'Experiments in workstations:
Magnet and compass'

With copy templates covering 24 workstations.
The equipment can be used in these experiments:

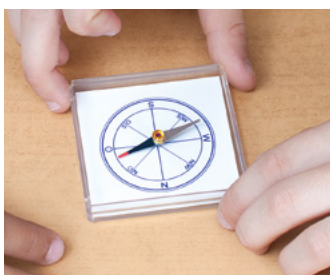
Magnet – Iron
- The big material test
- A 'metal exhibition'
- Uncle Scrooge's fishing game
- The big iron test
- Rusty bike?
- Using paper clips to find magnets

Magnetic force
- The swinging paper clip
- The walking scarecrow
- The dancing snake
- The floating paper clip

Pro and Contra
- The bewitched second magnet
- Magnets in a tube
- The bewitched garage
- The submarine trip

Mixed information about magnets
- How people discovered magnets
- The biggest magnet we know
- The teacher's magnet exhibition
- Make your own magnets
- Magnets without marked north poles

Hanging, floating and turning magnets
- Floating magnets
- Hanging magnets
- Making compasses, using hanging and floating magnets
- Floating compass needles
- 'Real' compass



Age 6 – 10

Students kit Air – Gases around us

We constantly breathe air in and out. Air pressure weighs down on all of us. But as it is mostly invisible children often think that air is “nothing”.

The experiments allow the children to learn about the properties of air and to understand that air is concrete and tangible.

The kit also provides demonstration material for spectacular experiments for the teacher.

Included in delivery:

Teacher’s manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

31710	Materials for up to 31 workstations (for 31 children at least)

Teacher's manual
'Experiments in workstations: Experimenting with air'

With copy templates covering 31 workstations. The equipment can be used in these experiments:

- Is air nothing at all?
- Air is something!
- Valves, valves, valves
- We need air to live
- A coat of air
- Fire in a water tank
- A poem about air
- The funnel trick
- The paper tissue trick
- Building underwater
- Experiments with bottles in a tank

Air exerts pressure
- Test of bravery
- Suction cups
- The balloon and beaker trick
- How Benny empties his aquarium
- The secret of the floating spheres

Air exerts force
- Compressed air
- How air pumps work
- The cheeky paper ball
- Lifting sunken ships, a tricky matter

Air in motion
- Reaction carriage
- Instructions for building a rocket cable car
- Hovercraft

Air helps you fly
- Why does a hot-air balloon rise?
- Why does an aeroplane rise?
- Parachutes, parachutes, parachutes
- Parachute workshop
- Building propeller planes
- Building jets
- Testing paper planes

For the air detective
- There's something in the air
- The air interview

Age 9 – 10

Students kit Electric circuits

Children experience electricity everywhere in their everyday life. This kit helps to explain how electricity is used to produce light, heat and motion.

Children will also learn that electricity can flow under certain conditions only.

The topics covered include the following:

- Open and closed circuits
- Series and parallel connections
- Conducting and non-conducting materials
- Dangers of electric current
- How electricity gets to your home

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

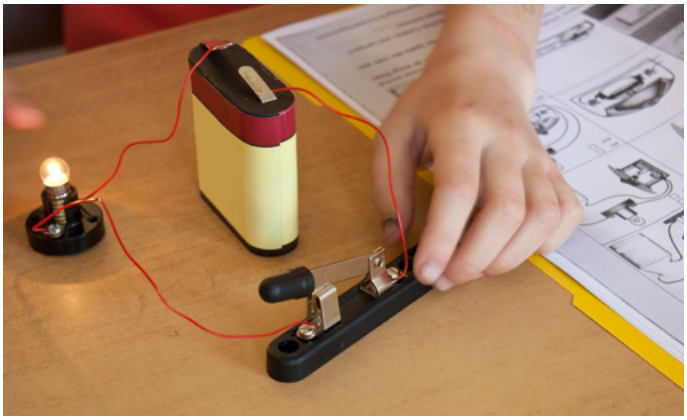
31772	Materials for up to 33 workstations (for 33 children at least)

▶ Teacher's manual 'Experiments in workstations: Electric circuits'

With copy templates covering 33 workstations.
The equipment can be used in these experiments:

Stations include the following:

- Battery test
- Alessandro Volta, inventor of the battery
- Batteries are everywhere
- A battery museum
- 'Batteries have positive and negative sides'
- Batt-Man
- Batteries in cars
- Why does the light come on? – Electric circuits
- Lamps all around us
- Mister Edison invents the light bulb
- Buttonhole lamp
- Spring-loaded torch
- A fire ship
- Car lighting test
- Lights in cars
- Sascha and Derya test each other as electricians
- Switches in our homes
- Save electricity
- Four switches, on and off
- Home-made switches
- Bicycle lights
- Heat from a battery
- Heat from the mains socket
- Seven deadly dangers
- How does one protect oneself against electric shock?
- The trembling roller coaster
- Robot game



Age 10 – 12

Students kit Primary chemistry

Why does the sugar in the tea vanish after stirring? Why do blobs of grease float on the top of the soup while the noodles sink to the bottom? Why does sherbet dropped into water create a lot of fizz? For children water is part of their everyday lives. And they notice and watch these phenomena. Some of them – how substances behave in water – can be explored with this box.

By mixing water with various substances and conducting experiments under varying conditions, the students can investigate how the substances behave and identify any similarities or differences. This develops a systematic, networked and sustainable way of thinking that also gets students making the right connections and coming to the right conclusions.

The experiments follow a common theme, becoming increasingly difficult as they go on.

The following topics are covered:

- Solubility in water in general
- Conditions governing solubility in water
- Water-soluble and water-insoluble substances
- Reversing the dissolving process through crystallization
- Thermal changes caused by dissolving substances in water
- Changes in viscosity caused by dissolving substances in water
- Formation of gas caused by dissolving substances in water

Developed in cooperation with the **University of Dortmund** and **LANXESS**

+

90350 Materials for 6 work groups (for 12–18 children)

What happens when we mix water with ...
... salt ? ... sand ? ... vinegar ? ... oil ? ... sugar ? ... soil ?

Teacher's manual
'What happens when we mix water with ...?'

With copy templates covering 10 workstations.
The equipment can be used in these experiments:

- Tea and sugar
- Water and sugar
- Water and sugar
  - with and without stirring
  - warm and cold
  - in large quantities
- Water and various substances
- Water and salt
- Water and urea
- Water and gelling agents
- Water and sherbet

Included in delivery:

Teacher's manual
„What happens when we mix water with ...?"

- The manual includes basic information on the topic and the organization of workstations for the teacher.
  It also contains information about the scientific background, didactic notes on each experiment and student worksheets.
- Including a list of materials and rules for experiments.

... with sherbet ?

... with gelling agents?

... with urea ?

... with sugar ?

Age 9 – 10

Students kit Water purification

Water is vital to our lives and those of animals and plants. The kits *Water purification* and *Water supply* help children to understand the cycles of water.

They will learn where the water comes from, how it is distributed, utilized and finally rinsed away to be treated and put back into the cycle. They will recognize the importance of water for life and learn how to save water as a resource.

Examples of experiments:

- Which forms of soil allow water to pass through and which don't
- Discovering that sand and gravel filter beds trap solids in the water, while dissolved substances (like oil, salt or detergent) cannot be removed from water by filtering
- The effect of polluted water on germinating plants
- The stages of mechanical cleansing of water
- Discovering the principle of linked water vessels and determining applications for it

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

31802	Materials for up to 24 workstations (for 24 children at least)

Teacher's manual *'Experiments in workstations: Water purification'*

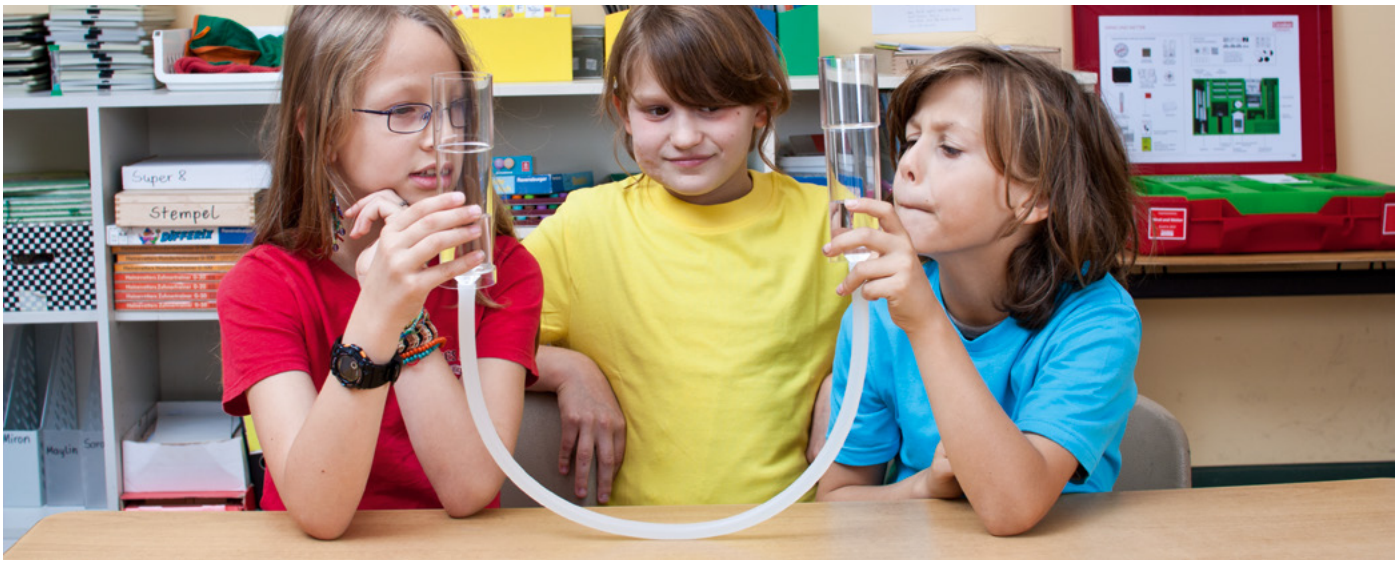
With copy templates covering 24 workstations.
The equipment can be used in these experiments:

Ground water
- What happens to rain water?
- The great soil test
- Drilling deep into the earth
- Ground water is clean, if it isn't …
- A small water cycle
- How water gets in and out of the ground:
  a. Building a fountain /
  b. Making a moving picture

- Too much / too little water

Drinking water
- Drinking water memory game
- Do water plants manufacture water?
- How does drinking water get to the tap?
- What creates the water pressure?
- Where are the pipes?
- What is in sewer water?
- Trying to clean waste water with a grate
- Trying to clean water with a filter bed
- Tiny microbes help to clean water
- The sewage plant
- What shall we do with the dirty water?

Games with water
- Floating paper clips
- Ice lolly
- Coins in a glass
- Magnifying glass made of water



Kit Water supply

This kit contains an easy to set up demonstration apparatus which allows to demonstrate the following:

- Usage and function of a rotary pump for pumping water around a system of pressure pipes
- Usage and function of a main supply
- Function of an elevated tank and the principle of linked water vessels
- Function of a water tower and its usage as a reservoir

Included in delivery:

Teacher's manual

8231	Materials for demonstration

Included in delivery:
Cross-sectional model of a water tap

Age 9 – 12

Students kit Wind and weather

Children learn how to recognise, distinguish and measure different weather phenomena such as

- temperatures
- cloud cover
- wind direction and force
- precipitation

They also learn reading and using the various weather symbols used on official weather forecast charts.

At the same time basic scientific skills like observation, documentation and evaluation as well as the use of instruments are practised and encouraged.

Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

8959 Materials for up to 33 workstations (for 33 children at least)

▶ Teacher's manual 'Experiments in work-stations: Wind and weather'

With copy templates covering 33 workstations.
The equipment can be used in these experiments:

Temperature, etc.:
- How to read temperature
- Measuring temperatures in the classroom
- Observation table: Air temperature
- Maximum-minimum thermometers

Rainfall, etc.:
- What is precipitation?
- Learning to measure how much it has rained
- Reading off precipitation
- Observation table: Precipitation

Cloud cover
- How clouds come into being
- Home-made water cycle
- Various types of cloud
- How heavy is the cloud cover?
- Photographing clouds
- Observation table: Cloud cover

Wind, etc.:
- Wind meter
- How to read a wind meter
- Wind speed
- Compass
- Wind direction
- Home-made wind direction meter
- Observation table: Daily readings of wind speed and direction

Daily weather forecast
- Weather symbols
- Daily weather forecast
- Television forecast
- Observation table: Observations of the weather

Age 6 – 9

Students kit Primary optics

Can light go around the corner? Are there coloured shadows? Why is it dark at night?

Light and shadow, colour and reflection are optical phenomenons, that fascinate children. Experiments will help them to understand the natural scientific facts behind the phenomenon.

The field of vision, the structure of the human eye and other secrets become comprehensible.

All experiments tie in with the experiences of the children. In a playful way they will find out the laws of reflection, the composition of light and optical illusions. Playing with shadows will lead to surprising discoveries.

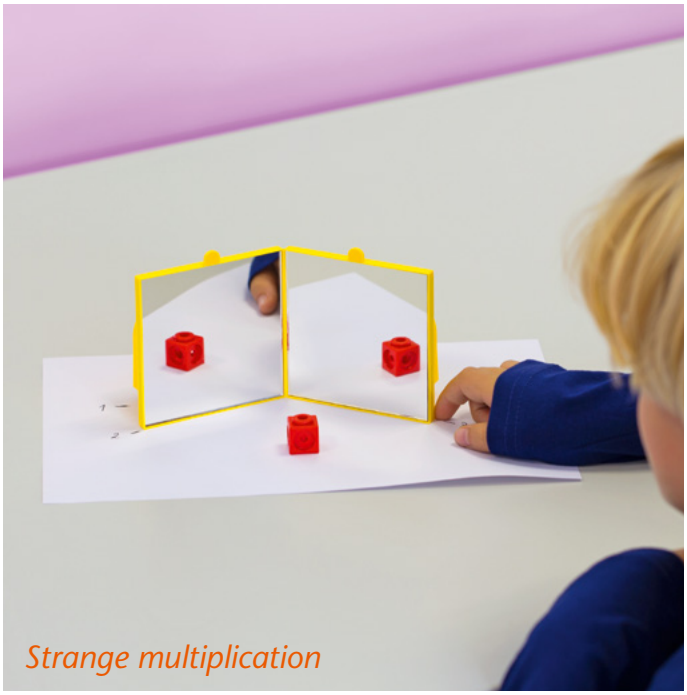
Included in delivery:

Teacher's manual

- With sheets for each workstation including basic information on the topic and on the organisation of workstations
- plus supplementary educational and organisational tips

- Optical illusions

31749 Materials for up to 22 workstations (for 22 children at least)



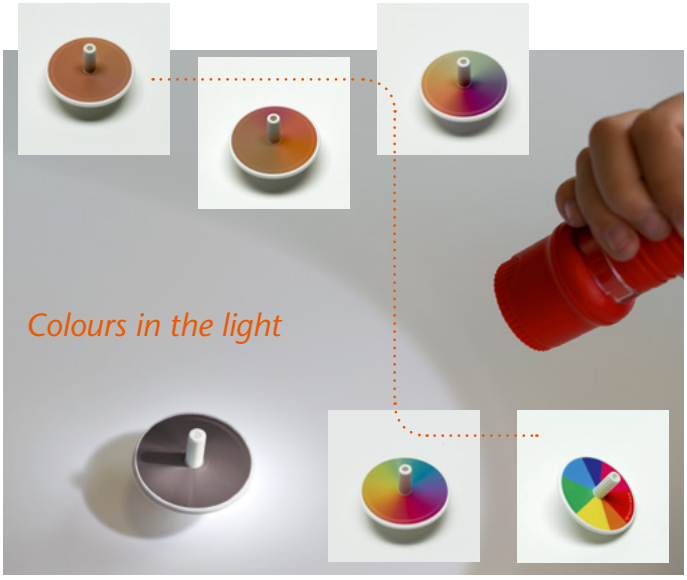
With copy templates covering 22 workstations:

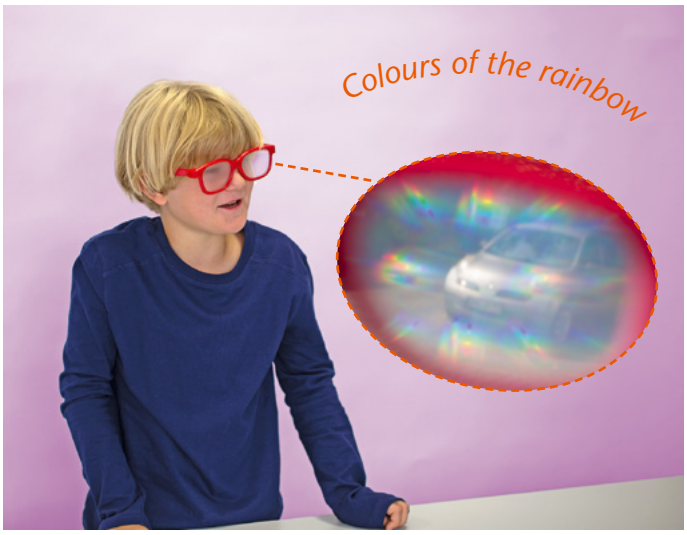
Light and vision
- Human eye
- Field of vision
- Seeing in the dark
- Optical illusions

Shadow
- Shadow
- Shadow play
- Coloured shadows
- Day and night

Reflections
- Strange multiplication
- Flame in water
- Curved mirrors
- Flexible mirrors

Colours
- Colours of the rainbow
- Colours in the light





Age 7 – 9

Students kit Balances and equilibrium

The kit provides simple seesaws, beam balances, spring balances, dial balances and balance beam (lever) calculating machines.

Children learn some historical and physical aspects of scales and weighing. They also learn

- to understand the principle of a seesaw
- to assemble and use a beam balance
- to calculate with a system of measures
- a common system of measures
- to appreciate the advantages of a common system of measures

Some examples of experiments:

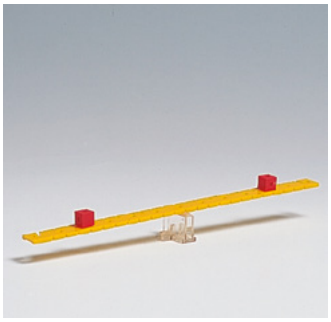
- from seesaw to balance
- beam balance
- Egyptian balance
- Roman balance
- Spring scale with calibration
- Calculator balance (equal-arm lever)
- Calculator balance (unequal-arm lever)

Included in delivery:

Teacher's manual

- With tips on planning lessons and student experiments.

31780 Materials for 15 work groups (for 30 children)



Age 8 – 14

Students kit Vehicles to build and drive

This kit contains 6 *learning sets (68544)* plus additional materials for 6 groups and a teacher's manual.

Using Fischer Technik components, it is easy to build vehicles, apparatus and machines as an introduction to technology.

The precision of the individual parts allows to create fully operable models.

The vehicles can be set in motion using interesting alternative drive systems such as spring rods, rubber bands, sails or balloons.

Included in delivery:

Teacher's manual

- With more than 40 suggested models.

64433	Materials for 6 work groups (for 12 children)
68544	Learning set with materials for 1 work group (for 2 children)

Age 7 – 9

Students kit **Heat**

Thermometers teaching unit

Children learn how to make a thermometer by themselves, how to use it and how to determine freezing and boiling points of water on a thermometer without scale.

This way they learn the basic terminology and theories of heat and thermal expansion.

Evaporation and condensation teaching unit

Children learn to understand the water cycle by finding out what happens when a liquid is converted into a gas and that a gas can be converted back into a liquid.

Additionally recommended:

Insulated wide neck vessel

For the supply of warm and cold water as well as ice cubes for the thermometer and temperature compound experiments.

Content of vessel: 1 litre

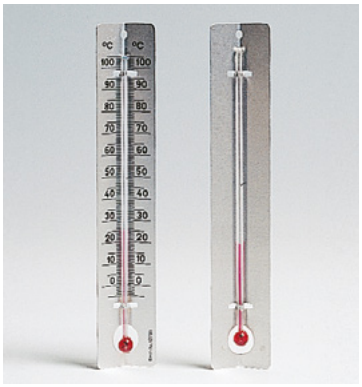
48880

Included in delivery:

Teacher's manual

- With tips on planning lessons and student experiments.

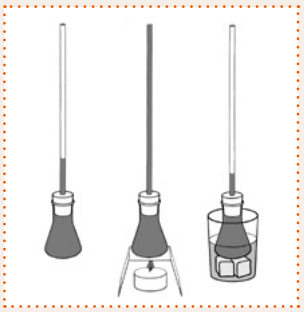
31799 Materials for 15 work groups (for 30 children)



▶ Survey of experiments:

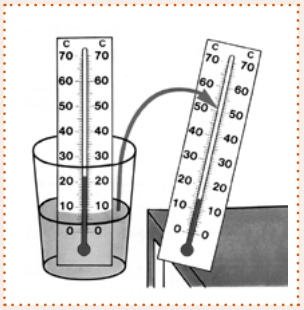
Thermometers teaching unit

- Heating and cooling water
- Heating and cooling methylated spirits
- How does a thermometer function?
- What is a thermometer for?
- The Celsius scale
- Taking temperature measurements and reading exercises



Evaporation and condensation teaching unit

- Converting a liquid into a gas
- Water evaporates, vaporizes too
- Vaporizing liquids are cooling
- Can a gas be re-converted into a liquid?
- What happens when steam cools down?
- The water cycle
- How water particles unite



Age 8 – 14

Demonstration kit **Primary science**

This kit allows two or three groups of children to carry out simple experiments. Teachers can also use it for demonstration.

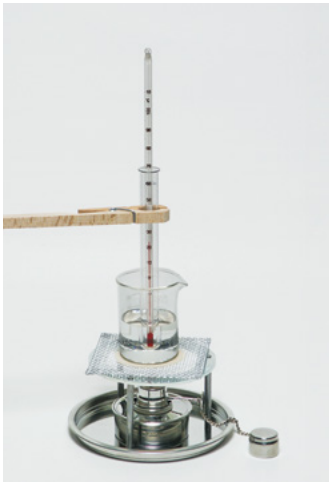
The manual describes 101 experiments on the following topics:

- Force/Energy
- Water
- Electric current
- Magnets
- Air and sound
- Light
- Heat
- Plants

Included in delivery:

Experiment description

16300	Materials for demonstration or 1 work group of 2 – 3 children



Survey of experiments:

Force
- What is a force?
- Force and counterforce
- Forces change motions
- Forces at the tug-of-war

... and 10 further experiments

Heat
- A water thermometer
- How steam ...
  – is made from water
  – will become water again
- How seawater can be made drinkable

... and 9 further experiments

Electricity
- A simple electric circuit
- Lamps side by side in parallel
- Lamps one behind the other in series
- Good and bad conductors

... and 4 further experiments

Water
- Is water a body?
- Can water displace air?
- Can water stand inclined?
- Where does the water go?

... and 8 further experiments

Energy
- What is a force?
- Force and counterforce
- Forces change motions
- Forces at the tug-of-war

... and 2 further experiments

Light
- Which way does the light take?
- How the light can be controlled
- An object in the light beam
- Can light be swallowed?

... and 10 further experiments

Air and sound
- Is air also a body?
- Air is an elastic body
- How sound waves can be seen
- Can the sound go round the corner?

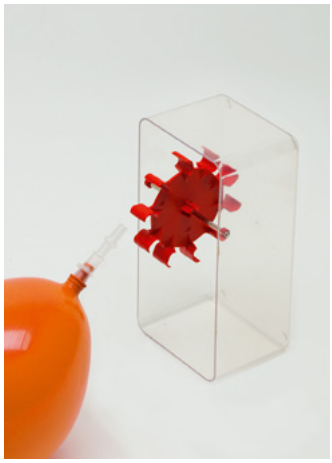
... and 12 further experiments

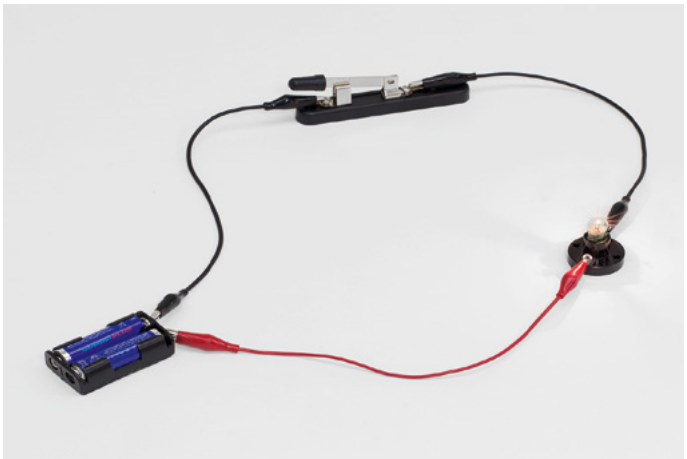
Plants
- Plants need light
- When plants sweat in the sun
- Plants improve the air
- Plants produce oxygen

... and 4 further experiments

Magnets
- Magnets have a force
- Do all materials react on a magnet?
- When magnets encounter
- Penetrating forces

... and 5 further experiments



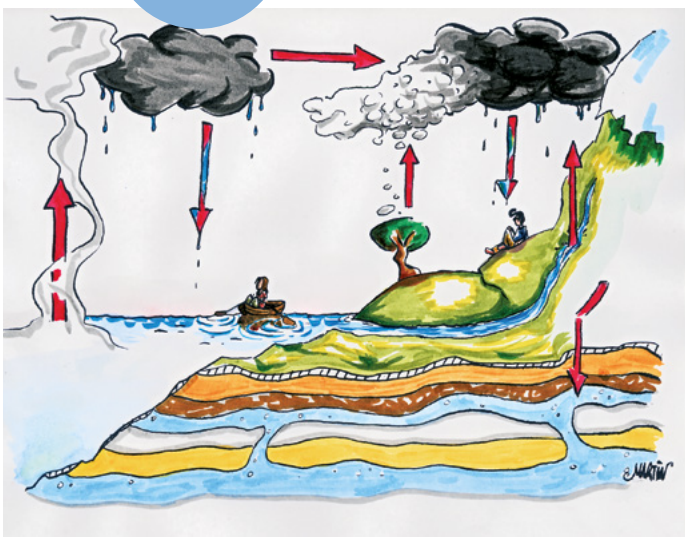


Students kit EcoLabBox

Age 8 – 16

The *EcoLabBox* allows children to carry out 45 experiments and to make water and ground analysis directly on local sites.

The kit helps to detect and measure the most important substances that influence our environment.



▶ In a case with foam insert for transport and storage (390 x 300 x 105 mm):

- German manual
- Reagent set for 59 experiments
- Extracting liquids for ground analysis for at least 20 pH, nitrate, phosphate and ammonium experiments
- Colour comparison card for relaying measured values
- Filtering tripod for filtering without spilling that can be directly mounted in the case
- Pocket magnifying glass with a magnification of 2 and 4
- Sample glasses, filter paper, laboratory bottles with a wide neck and measuring beakers
- DIN A2-sized posters for entering measuring results and further explanatory illustrations

Included in delivery:

Manual
German manual with 80 pages, including coloured illustrations, tables and detailed explanations

537557 Materials for 1 work group (2 – 3 children)

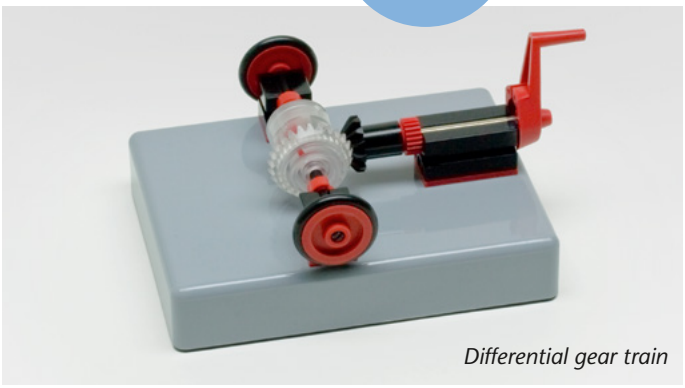
Students kit Gear and drive models

Age 8 – 16

The models of the most important gears and drive systems are put together in a design ideal for educational purposes. They not only clearly demonstrate the design and function of the gears in the model but also allow students to derive basic knowledge from the models.

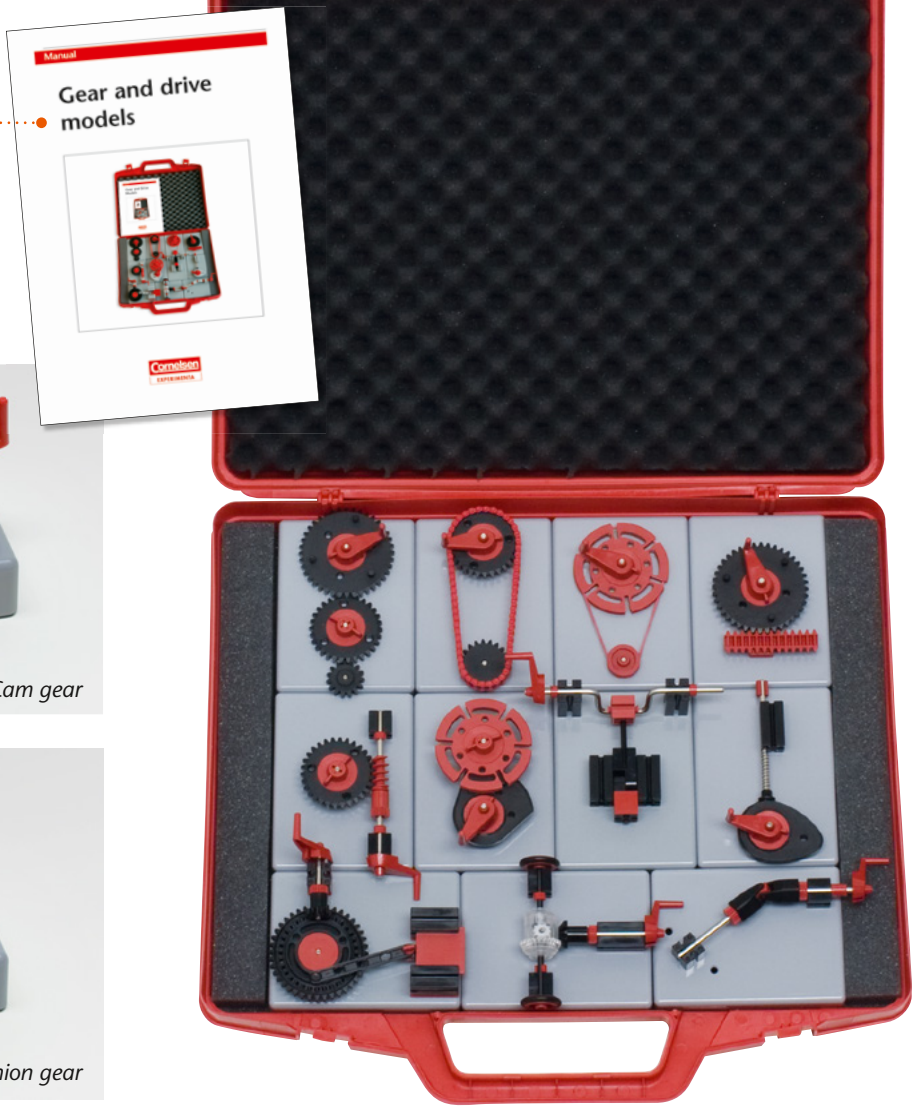
The models are assembled in ready to operate form on individual plastic bases and can be used immediately without any additional accessories.

The kit contains 11 models.



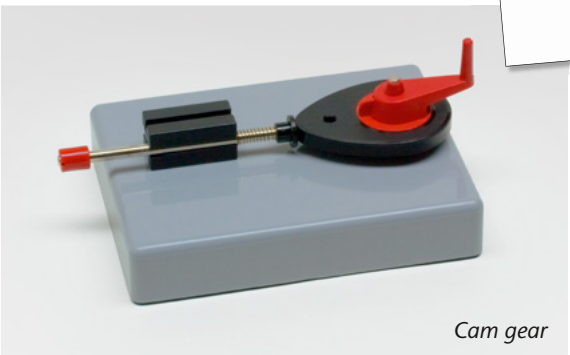
Differential gear train

Included in delivery:

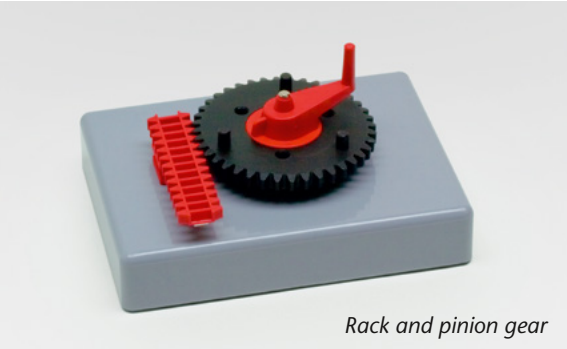


Description of function

- With information on the principle by which each of the models function and on typical technical applications for them.



Cam gear



Rack and pinion gear

65500	Materials for demonstration or 1 work group of 2 children

Age 8–14

Demonstration kit General science

The kit was developed for schools which require a small but complete collection of teaching materials for experiments in science. The kit can accompany basic courses in elementary schools.

The special value of the 'General science' kit lies in the ease of use and reliability of the equipment for the suggested experiments.

Teaching aims can be easily realized.

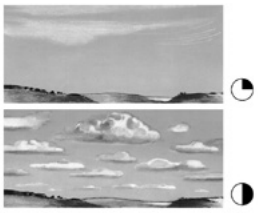
Included in delivery:

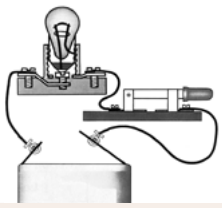
Experiment description

31500	Materials for demonstration or 1 work group of 2–3 children

▶ Survey of experiments:

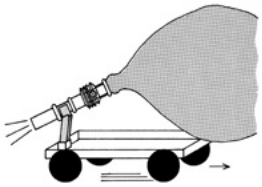
Weather
- What makes the weather?
- Recording the temperature
- Measuring the temperature day by day
- Clouds/Wind direction
- Recording the rainfall





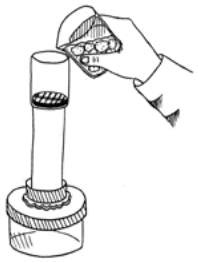
Electrical circuits
- Battery and bulb
- The glass of the bulb
- Simple circuit
- The switch in the circuit
- Series and parallel circuit
- Electric current generates heat
- The electromagnet

Air
- Air occupies space
- Air can displace water, water can displace air
- Air can be contained within other substances
- Air exerts a force
- Compression and expansion
- The force of compressed air can be used to lift an object
- The force of an air current can be used to propel an object
- Rearward discharge as a propulsive force (thrust)
- Interaction between over- and depressure
- Air acts as resistant force against bodies which are moving



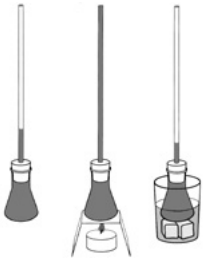
Chemistry
- Dissolving table salt
- Igniting a splinter of wood
- Heating sugar lumps
- Coating a nail with copper
- What role does air play for combustion?

Water Purification
- Which type of soil lets water pass through most rapidly?
- How does ground water get clean?
- What does/what does not get filtered out by the soil?
- How sewers help to keep our water supply clean
- Why are water towers often located on a hill?
- How does polluted water affect seeds and plants?

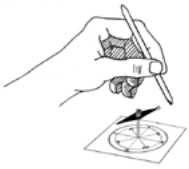


Balances and Equilibrium
- Seesaw
- From seesaw to balance
- Beam balance
- Egyptian balance
- Roman express scale
- Spring scale with calibration
- Calculator Balance (equal-arm lever)

Heat
- Heating and cooling – water
  – methylated spirits
- How does a thermometer function?
- What is a thermometer for?
- The Celsius scale
- Temperature measurements and reading exercises
- Converting a liquid into a gas
- Evaporation/Vaporization
- Can a gas be re-converted into a liquid?
- What happens when steam cools down?
- The water cycle
- How water particles unite



Magnet and compass
- The magnetic force
- Some items are attracted by a magnet, some are not
- Magnetic force exerts itself through many materials
- The poles of a magnet
- Magnets can attract and repel each other
- Constructing a compass
- A compass needle orients itself in a north-south direction
- A freely movable magnet
- always orients itself in a north-south direction
- Also the compass needle is a magnet
- A compass needle can be pulled from the north-south seeking position by a magnet
- Magnetization of a knitting needle
- Knitting needle as compass needle
- How to use a hiking compass with a map



Light and shadow
- We cannot see anything without light
- How are shadows formed?
- Why does the shadow change position?
- Reflection in a mirror and from various materials

Sound and tone
- No sound without vibration
- Vibrations of a tuning fork can be made visible
- High and low tones
- Glockenspiel
- Air produces sounds and tones
- Sound amplification
  – by conducting surfaces
  – by direct conduction
- Sound absorption
- String telephone

Biology: Students receive practice in observing with the aid of a magnifying glass, dissecting and preparing plants and animals.

Zoology: The multi-purpose container with transparent air-permeable lid is well-suited for use as small aquarium/terrarium for a short-term captivity and observation of small animals (e.g. small fishes, beetles and worms).

Botany: Swelling force of seeds; Growth of plant roots, stems and leaves;

Botany (*cont.*): Reaction of plants to light and contact-stimuli; Winding and climbing of plants; Importance of growth factors for plants such as light, warmth, air, water.

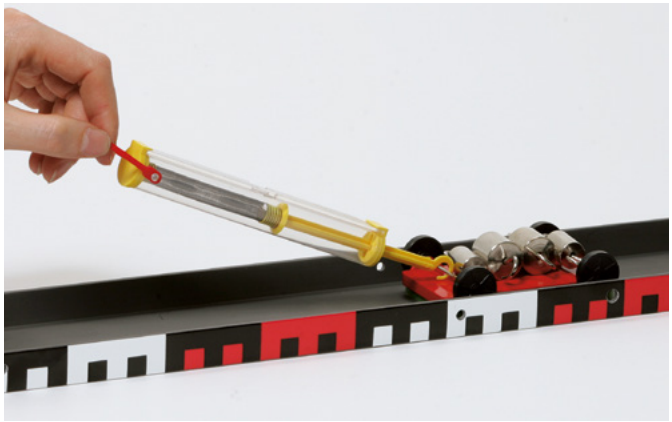
Human biology/Teeth: Comparative examinations of incisor and molar and explanation of caries as a result of inadequate tooth care.

Mini-Kit *'Mechanics'*

Age 8–14

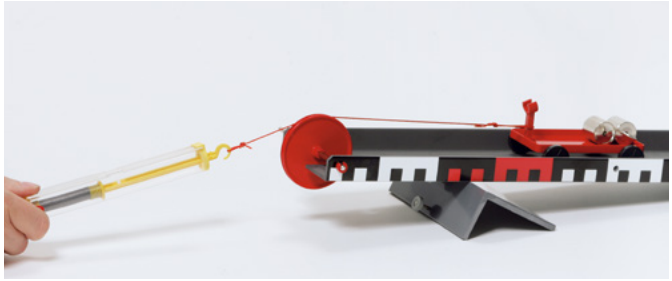
The kit contains a comprehensive manual and 17 different items for multiple use e.g. a rail profile, a stand base, a car, a dynamometer, pulleys, masses with hooks and scale pans.

Size of kit: 270 x 210 x 50 mm



Experiment description with 15 experiments:

- Effect of force
- Measuring force
- Dynamometer
- Friction forces
- Stability
- Center of gravity
- Double beam balance
- Double beam lever
- Single beam lever
- Steelyard
- Fixed pulley
- Movable pulley
- Block and tackle
- Inclined plane



16100

Mini-Kit *'Air and water'*

Age 8–14

The kit contains a comprehensive manual and more than 20 different items for multiple use e.g. a stand base, a car, a paddle wheel, test tubes, U-tubes, rubber stoppers, air cushion and floating discs.

Size of kit: 270 x 210 x 50 mm

Experiment description with 27 experiments:

- Is water a body?
- Water can displace air
- Water against air
- Fluid surface
- Communicating vessels
- Water can climb
- Propagation of pressure in liquids
- Principle of the hydraulic jack
- A simple water level
- Principle of the suction tube
- Principle of a pipette
- Floating metal
- Streaming water has a force
- Is air a body?
- Air can displace water
- Compression and expansion of gases
- Principle of the U-tube manometer
- Heating and cooling of gases
- Pressure in liquids
- Floating water
- Air against water
- A water column
- Effect of the low pressure (suction cup)
- Power transmission with air
- Flowing energy
- Principle of repulse
- Principle of an air cushion

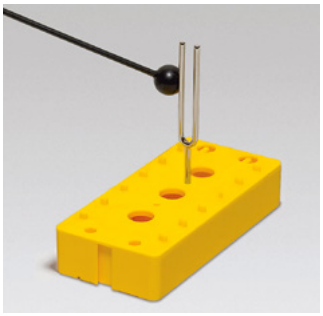
16102

Mini-Kit *'Sound'*

Age 8 – 14

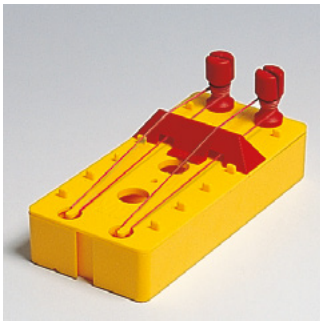
The kit contains a comprehensive manual and easy to set up equipment e.g. a sound box, a tuning fork, test tubes, sound plates, chord stretchers, rubber rings, springsteel strip and ear hoses, with which 8 basic experiments in the field of acoustics can be carried out.

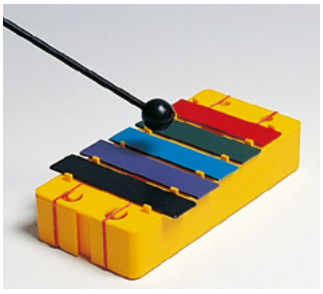
Size of kit: 270 x 210 x 50 mm



Experiment description with 8 experiments:

- What is sound?
- Can sound waves be seen?
- Sound waves exert pressure
- How sound waves are amplified
- How sound waves are transmitted
- High and low tones
- Sounding air
- Sounding metal plates – the xylophone





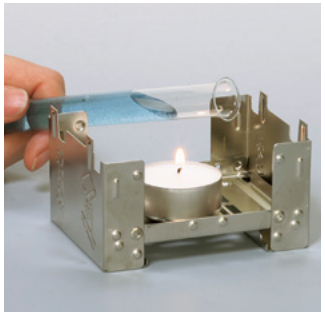
16104

Mini-Kit *'Heat'*

Age 8 – 14

The kit contains a comprehensive manual and 22 different items e.g. a support rod, a burner, candles, a thermometer, a bimetallic strip, dye, capillary tubes, glass tubes, rubber stoppers and Erlenmeyer flasks.

Size of kit: 270 x 210 x 50 mm



Experiment description with 10 experiments:

- Model of a thermometer
- What is a thermometer for?
- Evaporation and condensation
- Heat radiation
- Absorption of heat radiation
- Heat conduction
- Heat conduction in water
- Deformation of metals by heat
- Variation of the volume of gases
- Generation of steam by heat

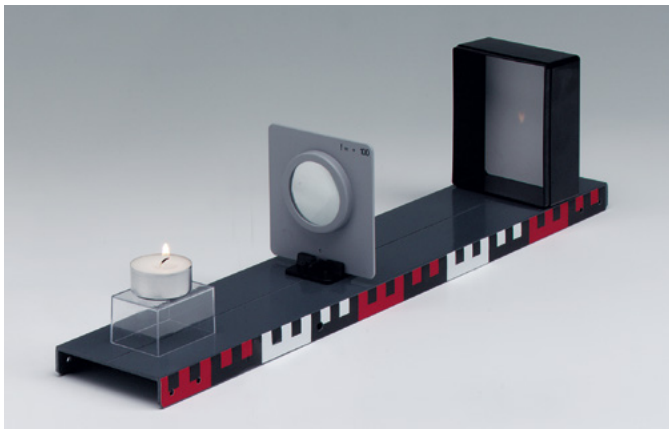
16106

Mini-Kit *'Optics'*

Age 8 – 14

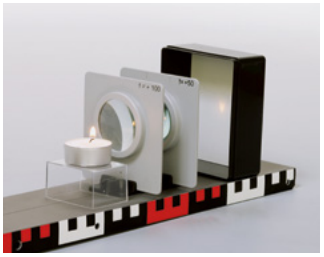
The kit contains a comprehensive manual and 19 different items e.g. an optical bench, a lamp with support, batteries, a slit diaphragm, biconvex lenses, screens and a shadow rod.

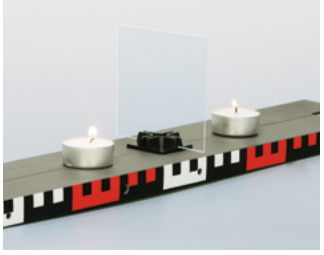
Size of kit: 270 x 210 x 50 mm



Experiment description with 15 experiments:

- Expansion of light
- Creation of shadow
- Reflection of light
- Refraction of light
- Reflection on a plane mirror
- Images on a plane mirror
- Focus of a converging lens (biconvex)
- Images of converging lenses
- Function of the eye
- Function of eye glasses
- Model of a camera
- Model of a slide projector
- Model of an astronomic telescope
- Model of a microscope
- Decomposition of the light





16110

Mini-Kit *'Magnetism/Electrostatics'*

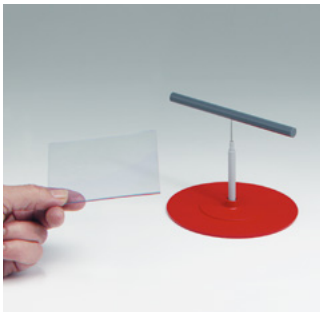
Age 8 – 14

The kit contains a detailed manual and 24 different items e.g. a compass card, a magnetic needle with support, magnet rods, iron filings, small cars, a set of probes, rubbing cloth, a pith ball pendulum and a friction rod.

Size of kit: 270 x 210 x 50 mm

Experiment description with 17 experiments:

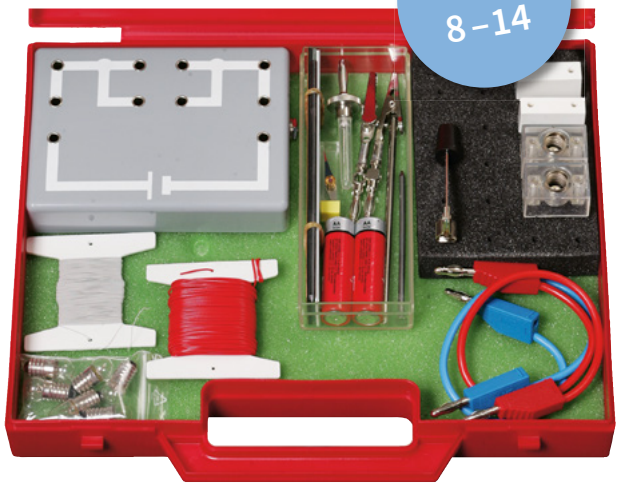
- Magnetic materials
- Magnets have a force
- Penetrating forces
- Magnetic field lines
- When two magnets encounter
- Can a magnet float?
- How a magnet can be produced
- The terrestrial magnetic field
- A magnet motor
- How magnetism can be used
- Electricity by friction
- Forces between two charged bodies
- Polarisation and influence
- The charged balloon
- Model of an electroscope
- Influence at the electroscope
- Electrostatic dance



16115

Mini-Kit *'Electricity'*

Age 8 – 14



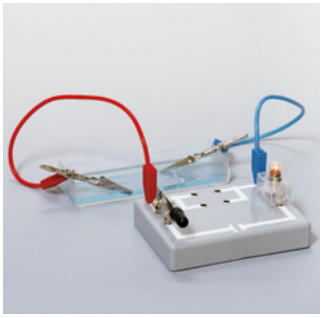
A special plug-base and plug-in elements are the most essential parts in the Mini-Kit 'Electricity'.

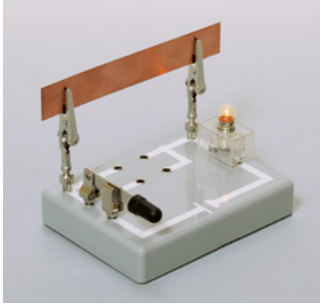
Further items e.g. batteries, lamps and Bulbholders, wire, plug leads, crocodile clips, magnetic needle and holder are also contained.

Size of kit: 270 x 210 x 50 mm

Experiment description with 11 experiments:

- The set-up of an electrical circuit
- Electrical circuit with switch
- Conductor and non-conductor
- Conduction in liquids
- Electric resistance
- Heating effect of the electric current
- Magnetic effect of the electric current
- Electromagnet
- Serial connection in a circuit
- Parallel connection in a circuit
- Chemical effect of the electric current





16120

Mini-Kit *'Biology'*

Age 8 – 14

Students can carry out a number of tasks using the equipment in this Mini-Kit.

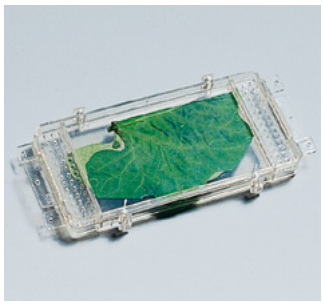
A very important basis for a profound and successful biological lesson is the carrying out of experiments with materials useful for this purpose.

Even if a school is not equipped with a special science lab it needs not refrain from this advantage.

Important learning aims:

- Observing with the aid of a magnifying glass
- Observing, dissecting and preparing plant parts and animals
- Preparing microscopic slides

Size of kit: 270 x 210 x 50 mm



Activity suggestions for the flower and leaf press:

- Create a herbarium
- Pressing flowers and other plant parts with one and two cotyledons (seed leaves) for comparison
- Identifying differences in the shapes of leaves (e.g. wild flowers)
- Comparison of flower petals of peas and beans
- Classifying the petals of a plant according to their size (e.g. comparison of a fading garden rose and wild rose)
- Comparison of the leaves of one type of plant taken from different locations (dandelion, plantain, lady's smock)
- Pressing different kinds of grass, ears of grains (differentiation of species) and roots
- Demonstrating the process of progressive leaf colouring in pressed leaves
- Demonstrating different stages of growth of germinating plants (e.g. bean, wheat) by pressing every day or every second day a germinating plant

With the help of the hand-held microtome it is possible to make very thin slices when dissecting plants or cutting tissue.

16180

Age 8 – 18

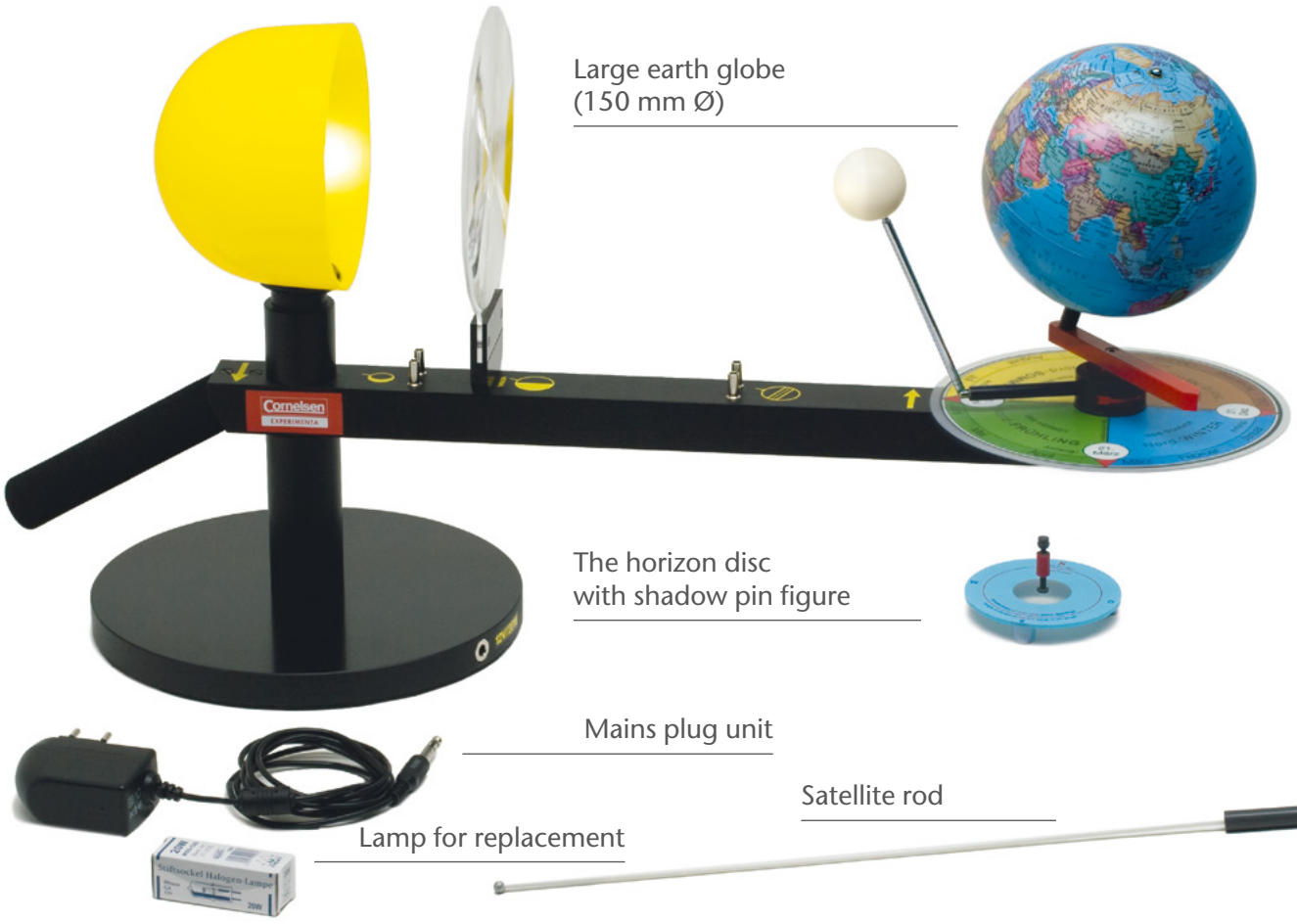
Tellurium N

The particular innovations are the use of a Fresnel lens to produce an extra bright and parallel light beam which illuminates the earth globe completely.

Further the focussing of a light point on the globe to demonstrate the apparent movement of the sun between the tropics and the use of a horizon disc with shadow-pin figure to show the position of the sun by the shadow fall.

The Tellurium N was designed by Prof. Dr. J. Newig, Kiel in cooperation with Cornelsen Experimenta.

Included in delivery:



Also included:
Dust cover, water-soluble felt pen, cleaning-cloth

31121

The Fresnel lens:

A short focal length provides a directed, parallel light with the result that a full half of the globe is illuminated and the shadow line (day and night) corresponds with the nature.
Formerly designed Telluriums are not able to show it like this.

The *three positions* of the Fresnel lens:

- *Day and night, seasons:* The globe is fully illuminated and the shadow line is clearly visible.
- *Tropics (sun-point):* The lens focuses a small light point with a 'hale' on the centre of the globe. When the earth is turned around the sun the light point moves across the equator between the northern and southern tropic.
- *Lunar phases:* The moon will especially be illuminated. When the moon is turned around the earth by hand the lunar phases and the eclipses can clearly be demonstrated.

Horizon disc with shadow pin figure

- To explain the changing situations of illumination on earth easily comprehensible.
- Can be put on the globe at any place.

Tellurium N

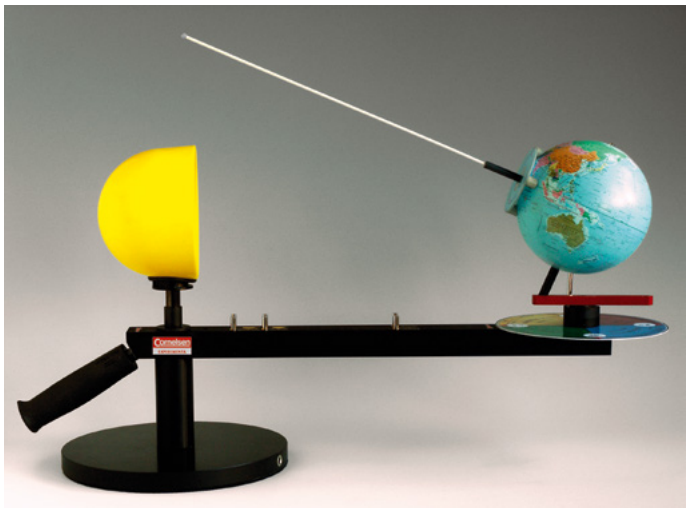
Included in delivery:

Teacher's manual

With lesson elements in detail for the following 13 topics:

- The earth as a gyroscope in space
- Day and night
- Hours
- Polar day and polar night
- Tropics

- Seasons
- Day- and night lengths at various latitudes
- Daytimes
- Lunar phases
- Eclipses
- Tides
- Eratosthenes earth circumference experiment
- Geostationary satellite

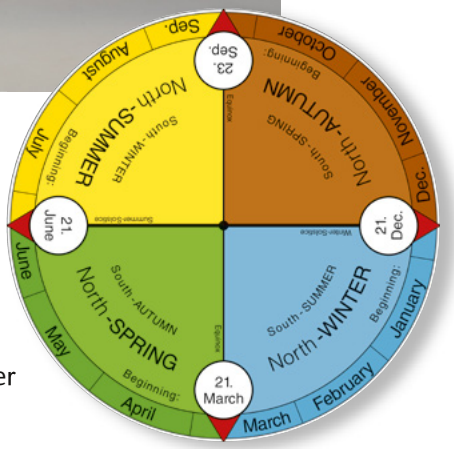


The satellite rod

To demonstrate the position and movement of a geostationary satellite a rod with a 'satellite' on the top can be set on the shadow pin figure of the horizon disc.

The moon on a telescopic support rod

The moon can be moved around the earth by hand and adjusted in height to demonstrate lunar phases and eclipses.



The date disc and the date pointer

The earth globe is mounted on a large date pointer which moves around the date disc when the Tellurium arm is turned around the sun. Corresponding to the date pointer position the earth axis is inclined towards or away from the sun (seasons). The dates of the summer- and winter solstice as well as the equinoxes are especially marked on the date disc.

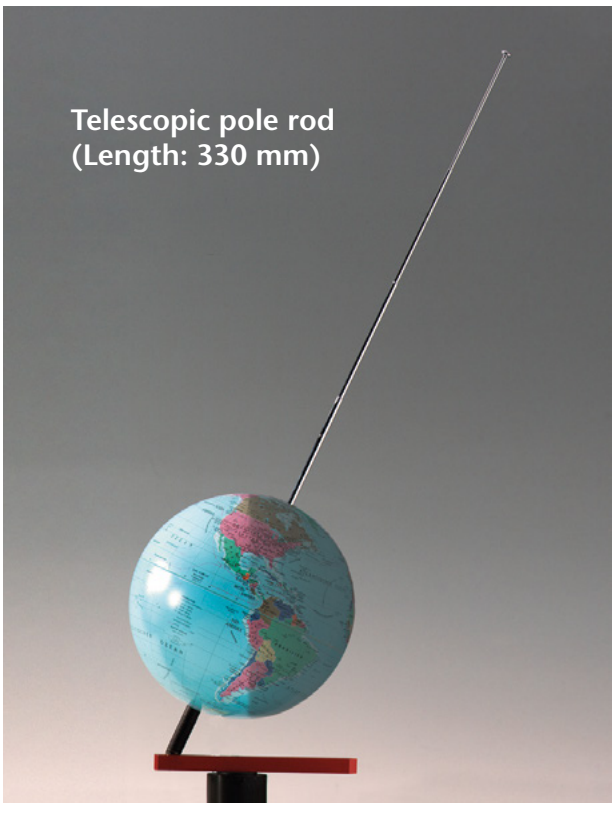
The date disc is available in different languages.

The large earth globe...

Shadow line and other details are clearly visible on the globe even from a long distance.

... with telescopic rod

To demonstrate the position of the earth with its direction of the earth axis to a fixed point in space (the North Star).



Age 13 – 18

Students kit Biology

A very important basis for a profound and successful biological lesson is the carrying out of real experiments with materials specially designed for this purpose.

Important learning aims:

- Observing with a magnifying glass
- Collecting and observing small animals and plants or leaves
- Observing, dissecting and preparing plant parts and animals
- Preparing microscopic slides

The microtome ...

- is a very safe and easy to handle instrument to section biological material.
- cuts thin sections of botanical material or dead animals.
- The section can be taken by the tweezers and be prepared for further investigations.

Included in delivery:

Teacher's manual

18080 Materials for 15 work groups of 2 children

With the pooter, small insects, spiders and seeds can be collected by carefully sucking them into the it. To take the specimen out of the pooter, the bottom of the flask can be removed easily.

Age 8 – 16

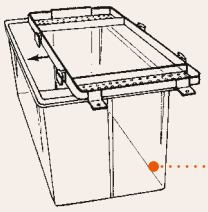
Students kit Germination-Units

Topic **Botany**

- Germination of seeds
- Growth of plant roots stems and leaves.
- Reaction of plants to light and contact stimuli
- Winding and climbing of plants
- Development of plants from the flower to the fruit
- Importance of growth factors for plants such as soil, light, warmth, air, water, water pollution
- Phototropism of leaves and stems
- Geotropism of sprouts and roots
- Swelling force of seeds
- Transpiration of plants
- Assimilation of plants

Topic **Zoology**

With the transparent air permeable lid the multi-purpose container is well suited for use as small aquarium or terrarium for a short term captivity and observation of small animals (small fishes, beetles, worms).



Multi purpose container
150 x 75 x 75 mm

By observing small animals students become acquainted with their habits (movements, breathing, eating and behaviour).

Included in delivery:

Teacher's manual

Multi-purpose container

The multi-purpose container is suitable for making comparisons between germination methods of various plants, for observing the development of plant shoots with roots, stalks, leaves and flowers.
The way the plants twist and coil and seek out light can all be impressively demonstrated as well as the way they react to being touched.
The multi-purpose container is also suitable for keeping small animals and insects inside and observing over long periods when the germination trays are removed.

18085 Materials for 12 work groups of 2 children

Set Berlese-Apparatus including Stereoscope

The Berlese apparatus (also known as the Berlese-Tullgren funnel) was developed for the biological investigation of soil samples. It is primarily used to sort out microorganisms (microarthropods) from mulch, leaf litter and pine needle litter for experimental purposes.

The Berlese apparatus demo set is intended for both qualitative and quantitative investigation of illustrative soil habitats, and it can be employed in general science lessons as well as for more specialised teaching.

The set 'Berlese-Apparatus' with the stereoscope *89930* enables observing microorganisms.

712009	Set Berlese-Apparatus including Stereoscope *89930*
71200	Berlese-Apparatus

Age 4–7

Anna and Leon experiment *with water and air*

Water and air – really strong stuff!

Children make keen and observant researchers. They observe their environment very accurately, make assumptions and wish to check those assumptions on their own.

Here they are given a set of materials with which they can learn all about the phenomena surrounding water and air.

More than 30 exciting experiments allow the children to discover that air and water have many characteristics and are much stronger than one thinks! They will find out for example that air can lift a body or water can power wheels.

The knowledge they have gained will awaken and encourage their interest in natural sciences.

Included in delivery:

Manual

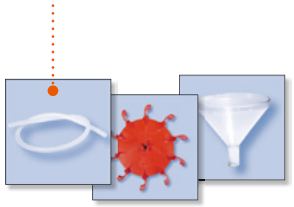
- All the experiments are carefully explained along with the scientific background.
- Short stories from everyday life involving Anna and Leon provide an introduction to the topics.

Instruction cards

- Allow children to learn from pictures how to do the experiments themselves.

Material cards

- With the help of the cards, children can learn about the resources in the boxes and what they are called.



85021

▶ Experiments from the manual 'Anna and Leon experiment with water and air':

- Water can climb
- Water creates force
- Water can transmit power
- Water knows the level
- Water can squirt far
- Water can drive wheels
- You can see and feel air
- Air can open doors
- Air can carry people
- Air can stick things together
- Air can drive cars
- Air can lift up bodies
- Wind can generate power

Age 4–7

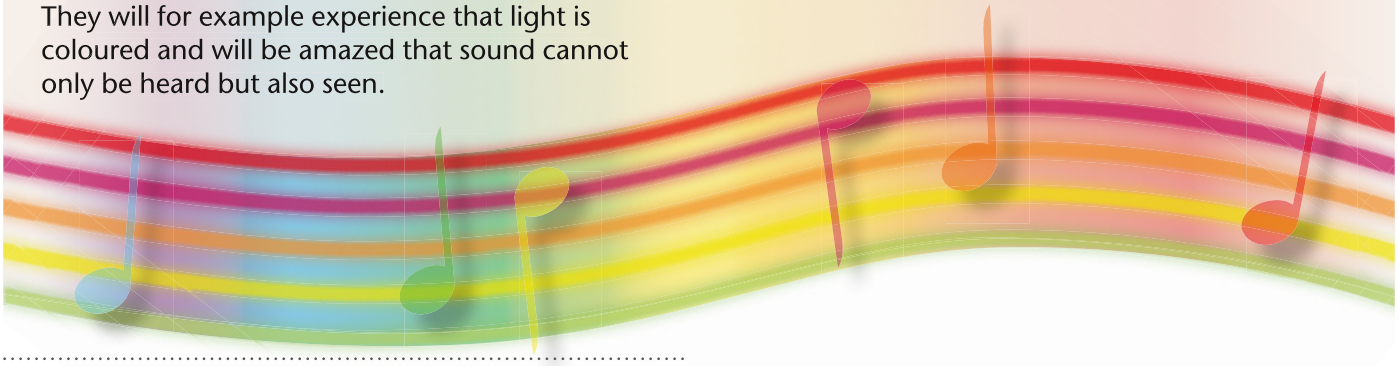
Anna and Leon experiment *with light and sound*

Light and sound – that's interesting!

This is a set of materials with which children can learn all about the phenomena surrounding light and sound.

They will for example experience that light is coloured and will be amazed that sound cannot only be heard but also seen.

The children will be interested to explore the phenomena. The easily to understand, robust materials in the box will help and encourage them.



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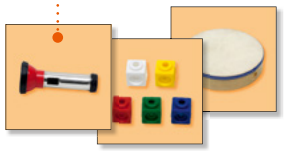

85022

Mirrors and magical pictures

▶ Experiments from the manual ‘Anna and Leon experiment with light and sound’:

- Light beams travel straight
- Light makes shade
- Diverting light
- Mirrors and magical pictures
- Behind the mirror
- Refraction of light
- Make small things look big
- Light is colourful
- Colours of the sky
- Blending colours
- High and low tones
- Sounds all around
- Vibrations create sounds
- Sounds can be heard and seen
- Transporting sound

High and low tones

Refraction of light

Colours of the sky

Age 4–7

Anna and Leon experiment *in nature and environment*

On the trail of nature

The topics of nature and environment are among the most important in pre-school life. The 'Nature and environment' box contains over 30 exciting experiments to enthuse children into thinking about their environment.

They illustrate the interaction between plants, animals, people and non-living aspects of nature. Children experience that it is important to protect the environment and that they too have the opportunity to do so.

Trips can be taken to observe nature and children can simultaneously be given research tasks such as collecting plants, stones or animals for subsequent investigation. They can keep the results of this research in their own files, take pictures of what they find or make a collection. All the results can be exhibited in the kindergarten.

Included in delivery:

Manual

- All experiments are carefully explained along with the scientific background.
- Short stories from everyday life involving Anna and Leon provide an introduction to the topics.

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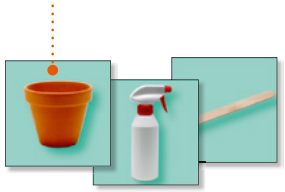

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Plants grow from seeds

▶ Experiments from the manual 'Anna and Leon experiment in nature and environment':

- Plants grow from seeds
- Plants grow towards the light
- Plants need a clean environment
- Different plants grow differently
- Plants have different body parts
- Life under our feet
- Animals live everywhere
- The ground stores our water
- The many things beneath our feet
- Wind and weather are important
- Nature is a cycle
- Different habitats for different creatures
- How the ground is made
- How's the weather?
- How can we promote plants?

Plants grow in different ways

Plants grow towards the light

The many things beneath our feet!

Age 4–7

Anna and Leon experiment *with lever, pulley and magnet*

Lever, pulley and magnet – there is something moving!

This kit revolves around the forces which children come across in their daily lives. They will be surprised to discover where a lever is hidden and where a pulley turns round forces. Especially attractive for children are the effects of magnetic force.

With the materials they can detect the forces of lever, pulley and magnet.

Exciting, curricula-based experiments will enable the children to explore phenomena in environment and technics. Their interest in natural sciences will be wakened and encouraged.

The experiments are fail-safe and easy to reproduce. The robust materials are compactly stowed in a plastic tray with lid.

Included in delivery:

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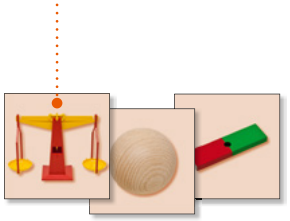


85025

▶ Experiments from the manual 'Anna and Leon experiment with lever, pulley and magnet':

- Everything has its weight
- At equilibrium
- What is heavier?
- A lever can help
- Up and down on the seesaw
- Make it easier with a pulley
- Everything is spinning around
- Who is pulling the brake?
- I want to stay this way!
- It's your turn!
- Who is pulling me?
- Quite elastic!
- Magnetic force
- Quite strong such a magnet!
- Come here, go away!

Age 4–7

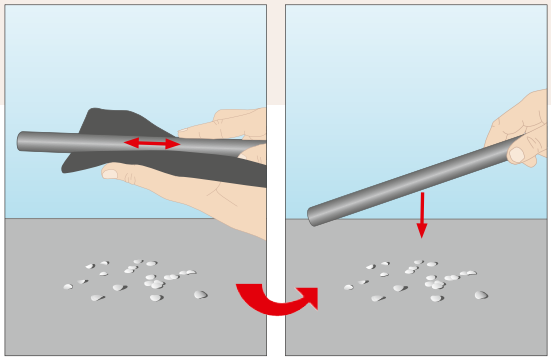
Anna and Leon experiment *with electricity*

Electricity – really fascinating!
Electricity is very important and children come up electricity in nearly all areas of life.

Playfully the children will experience how electrostatic charging develops and which effects it can have. The children learn how an electrical circuit is assembled and which different connections exist.

They can try which materials conduct electricity and which materials can be used as insulators.

The children can find out how a Morse telegraph or a simple alarm system is working.



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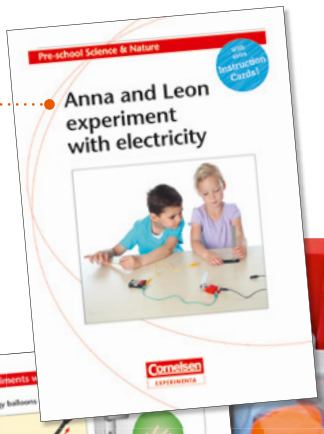

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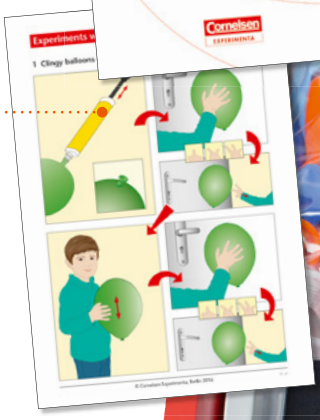

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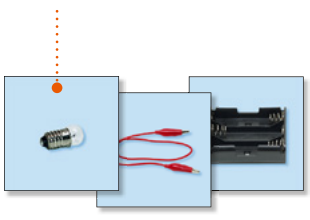

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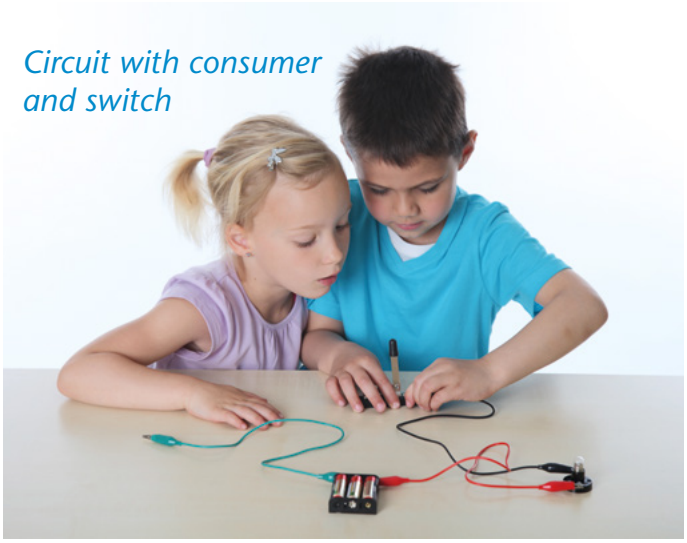
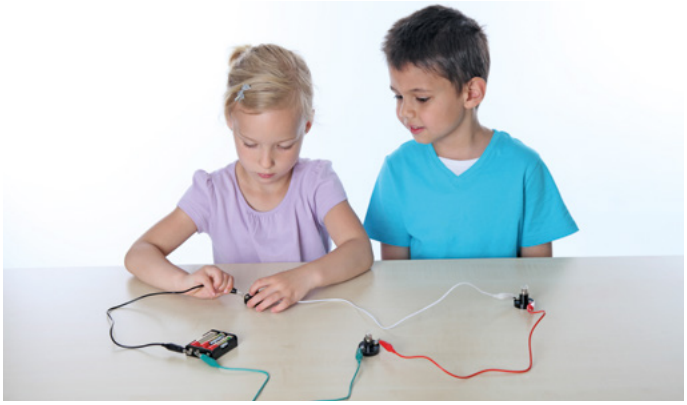
Electrostatic charging

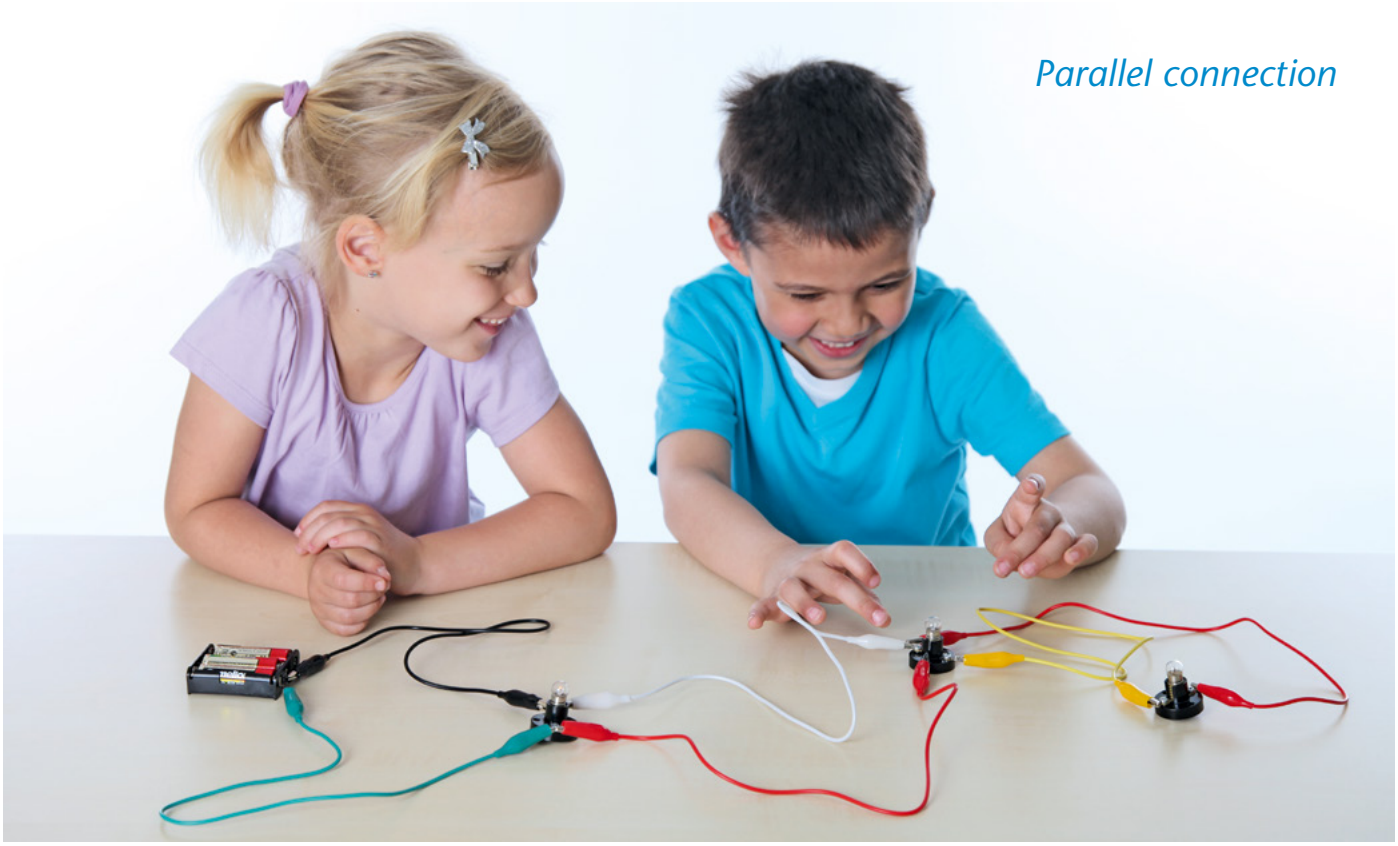


Circuit with consumer and switch

▶ Experiments from the manual 'Anna and Leon experiment with electricity':

- Clingy balloons – electrostatic charging
- Really attracting – electrostatic charging
- Electrostatic charging
- Always in a circle – circuit with consumer
- Conductors and insulators
- Circuit with consumer and switch
- All in a series – series connection
- Parallel connection
- Sending messages in Morse with light and bell





Parallel connection

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Cornelsen Experimenta GmbH
Holzhauser Straße 76
D-13509 Berlin
Germany

Fon: +49 (0)30 435 902-0
Fax: +49 (0)30 435 902-22

E-Mail:
international@cornelsen-experimenta.com

Cornelsen Experimenta online
cornelsen-experimenta.com

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