

3B Scientific

EARTH SCIENCE

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- Plate tectonics and volcanic activity
- Minerals and rocks
- Rock slides
- Fossils
- The human genealogical tree
- Earth as a planet
- The Earth's magnetic field
- Crystallography and mineralogy
- Measuring and testing equipment
- Microscopes and cameras

EARTH SCIENCE

Dear customer,

The earth is the only planet known so far on which higher forms of life exist. Many factors, including the inner structure and the outer form, contribute to this. To better understand our environment, we need to know about the conditions in which higher life forms came into being, and in particular which external influences were necessary for them to appear. These factors will help us to protect our planet now and in the future. Societally-relevant environmental and geological challenges are constantly growing, the main ones being climate change and scarce resources. This is precisely why the geological sciences have taken on ever greater significance in modern teaching in recent years.

So, we have developed interesting new products, working with renowned experts, and have summarized them on the following pages:

Your attention is particularly drawn to our new model of the Mid-Atlantic Ridge (page 3) that you have already an image of on the cover. Did you recognize it? The processes of this and other volcanically active areas can be viewed using products specifically designed for this, such as the volcano cross-section (page 3), the set of three volcanic rocks (page 3), and a collection of volcanic rocks and minerals (page 3). The rock cycle is impressively explained using our new collection of rocks (page 4). Signs of former life forms, such as ammonites, the archaeopteryx lithographica (page 6) and index fossil collections (page 7) help us to understand how higher life forms adapted to external environmental conditions over time. In addition to these and other exciting products, you will find our well-established products, such as our anthropological skull (page 8) and microscopes (page 16).

Take a look and be inspired.

Kind regards,

Tobias Hecht
Product Manager

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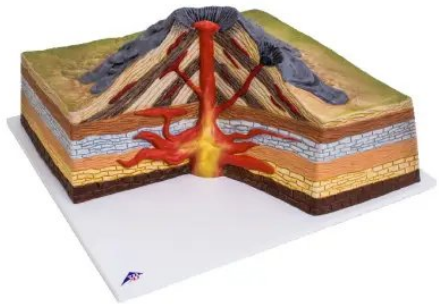
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Mid-Atlantic Spine
This model shows the S-shaped course in 3D of the volcanic mountain range produced by tectonic shifts in the Atlantic Ocean.

Size at the equator: 1:320.000.000
Material: PVC
Dimensions: 64 x 48 x 8 cm³
Weight: 6.5 kg
9952-1017594



Stratovolcano
This hand-painted model shows the inside of a stratovolcano with the path of liquid magma to earth's surface.

Material: PVC
Dimensions: 47 x 35 x 19 cm³
Weight: 2.4 kg
9952-1017595



Set of three volcanic rocks
Set of three vulcanite rocks consisting of three little bags, each containing ten pieces of either lava rock, obsidian or pumice stone.
9952-1018462



9952-1018443 - Collection of 24 rocks

Minerals and rocks collections

The collections contain 24 frequently occurring examples of various stone and mineral groups. The examples are approx. 3 x 3 x 3 cm³ to 5 x 5 x 5 cm³ in size, and come in a robust box that includes numbering, labels and an information booklet.

Use the cameras on **page 18** to view the rocks and minerals.



Collection of 24 volcanic rocks and minerals
The collection contains volcanic rocks and minerals.

The collection contains:
1. Volcanic rocks: basalt, phonolite, pitchstone, rhyolite
2. Lava: Lava from Vesuvius, basaltic lava and rhyolitic lava
3. Pyroclasts: lapilli, volcanic ash, pumice stone
4. Minerals: anorthite, anorthoclase, augite, cristobalite, hauyne, leucite, natrolite, nepheline, pickeringite, sanidine, sulphur, thaumasite, tridymite, obsidian.

9952-1018442



Collection of 24 rocks
The collection contains frequently occurring examples of metamorphic, sedimentary and magmatic rocks as well as important examples of industrial rocks.

The collection contains:
1. Magmatic rocks, plutonites: foyaite, gabbro, granite, granodiorite, larvikite and monzonite
2. Magmatic rocks, vulcanites: basalt, pumice stone, phonolite, rhyolite
3. Sedimentary rocks: breccia, dolomite, gypsum, limestone, chalk, quartzite and sandstone
4. Metamorphic rocks: amphibolite, eclogite, mica schist, gneiss, marble, phyllite and serpentinite.

9952-1018443



Collection of 24 minerals
The collection contains examples of ten classes of minerals: elements, sulphides, halogenides, oxides, carbonates, borates, sulphates, silicates, phosphates and organic compounds.

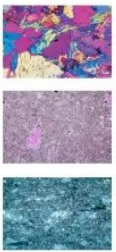
The collection contains:
1. Elements: graphite and sulphur
2. Sulphides: bournonite, galenite and pyrite
3. Halogenides: fluorite and halite
4. Oxides: hematite, quartz and rutile
5. Carbonates: calcite and dolomite
6. Borates: ludwigite
7. Sulphates: barite, coelestine and gypsum
8. Phosphates, arsenates and vanadates: apatite and vanadite
9. Silicates and germanates: actinolite, amazonite, muscovite, sodalite and talk
10. Organic compound: copal

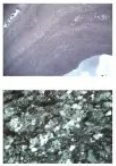
9952-1018444

Thin slides of rock prepared for viewing under a microscope

Selected rocks and minerals are ground and polished to a thickness of 20 – 30 µm. The preparations are mounted with Canada balsam on slides of the size 45 x 30 mm² (32 x 24 cover glass). For the identification of forms, colours, refractions and fossil inclusions the slides can be viewed under any normal microscope in transmitting light. Additional information is given by using microscopes with polarized-light equipment.







Rocks and Minerals, Thin Section, Basic Set no. I
10 Microscope Slides size 30 x 45 mm², without box.

Contents: granite, syenite, gabbro, basalt, gneiss, micaschist, quartzite, marble, sandstone, limestone fossilized
9952-1012495

Rocks and Minerals, Thin Section, Basic Set no. II
10 Microscope Slides size 30 x 45 mm², without box.

Contents: andesite, trachyte, rhyolite, diorite, microgranite, chalk, limestone oolithic, millstone, coal, schist
9952-1012498

Rocks and Minerals, Thin Section, Fossils and Meteorites
4 Microscope Slides size 30 x 45 mm², without box.

Contents: chondrite (meteorite), suévite (impactite breccia), petrified wood, stromatolite
9952-1018505

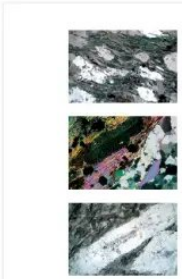
Your favorite polarization microscopes are on **page 17.**





Rocks and Minerals, Thin Section, Sedimentary Rocks
22 Microscope Slides size 30 x 45 mm², without box.

Contents: arkose, chalk, coal, gypsum, limestone with alveolina, limestone with asphalt, fossilized limestone, limestone with crinoid stem, glauconitic limestone, limestone with globotruncana (maestrichtien), limestone with globigerinina (paleocene), limestone with miliolidae, limestone with nummulitidae, limestone with ooids, limestone with polyp, limestone with iron ooids, limestone with intraclasts, oil shale, sandstone, calcareous sandstone, slate, travertine
9952-1018500



Rocks and Minerals, Thin Section, Igneous Rocks
31 Microscope Slides size 30 x 45 mm², without box.

Contents: altered granite, andesite, basalt, basalt with olivin, basalt with phenocryst and white feldspat, picrit basalt, tholeiitic basalt, granodiorite, pillow lava, dacite, diorite, diorite quartzique, dolerite, doreite, gabbro, granite, two-micas granite, porphyry granite, kimberlite, laurvikite, microdiorite, microgranite, peridotite, phonolite, rhyolite, red rhyolite, syenite, tephrite, trachyandesite, trachyte, volcanic breccia
9952-1018490



Rocks and Minerals, Thin Section, Metamorphic
29 Microscope Slides size 30 x 45 mm², without box.

Contents: amphibolite, anatexis granite,eclogite with garnets, eclogite with coronitisation haloes, glaucophanite, gneiss, augen gneiss, gneiss with sillimanite, gamettite, granulite, hornstone, green hornstone, marble, metagabbro with hornblende, metagabbro with glaucophane, micaschist, micaschist with cordierite, micaschist with two-micas, micaschist with kyanite, micaschist with garnets, micaschist with glaucophane, micaschist with chloritoid, migmatite, quartzite, schist, schist with andalusite, serpentinsed peridotite, green schist,serpentinite
9952-1018495



Archaeopteryx lithographica
Liquid wood mold of the well-known archaeopteryx lithographica fossil from Bavaria. The clear avian characteristics, flight feathers and furcula, as well as reptilian characteristics, the bony tail and front claws, are recognisable. It is therefore considered a transitional form of both species. The fossil is considered one of the few complete findings of the archaeopteryx lithographica, which lived around 150-200 million years ago.

Weight: 1.8 kg
Height: 47.5 cm
Width: 40 cm
Length: 1.5 cm
9952-1018509





Ammonite, model
An exact and scientifically-based reproduction of what an ammonite may have looked like. The model shows all the important organs on the head such as the eyes, the tentacles, the funnel and the jaw that resembles the beak of a parrot.

Length: 15 cm
Width: 9 cm
Height: 8 cm
Weight: 121 g
9952-1018515



Ammonite, polished
Polished shell of a fossilised ammonite from Madagascar.

Size: 5 - 9 cm
Period: Cretaceous (~ 90 Mya)
9952-1018511



Ammonite, 2 polished halves
Polished shell divided into two halves of a fossilised ammonite from Madagascar.

Size: 8 - 12 cm
Period: Cretaceous (~ 90 Mya)
9952-1018510



Stratigraphic collections
These collections contain carefully selected animal and plant fossils from all the important groups that are representative of certain geological time periods. These examples, placed in chronological order, give an overview of the development of life from the Precambrian to the Triassic period. Each item is stored individually in boxes placed in chronological order, with a label, the date and details of where the item was found. The fossils come in a wooden box with a detailed accompanying booklet in English, German and French. The collections were created especially to give an introduction to palaeontology. The items delivered may vary depending on availability. We will ensure that we provide at least one example from each period.

Stratigraphic collection 20 fossils **9952-1018512**
Stratigraphic collection 40 fossils **9952-1018513**

Examples from the Collection

Name: Hexacorallia: Pattalophyllia sinuosa
Age: Tertiary, Eocene: 56-38 Mya
Place found: Pyrenees, Spain



Name: Trilobite: Diacalymene ouzregui
Age: Ordovician: Middle Ordovician
485.4 – 443.4 Mya
Place found: Alnif, Morocco



Name: Ammonite: Divisosphinctes (Perisphinctes) besairiei
Age: Jurassic, Late Jurassic, Oxfordium: 163.5 - 157.3 Mya
Place found: Sakaraha, Madagascar





Anthropological Skull – KNM-ER 406, Omo L. 7a-125
This model is a high-quality casting of a reconstruction of the Kalvarium skull (KMN-ER 406) with a partial mandible (Omo L. 7a-125). The Kalvarium skull is approximately 1.7 million years old and was discovered at Lake Rudolph (now called Lake Turkana) in 1970. The partial mandible comes from a different dig but is clearly from the same species. The classification of the species has not yet been indisputably clarified. Discussions continue as to whether the specimen is an Australopithecus boisei or a Paranthropus boisei. Example of a pre-human hominid.

Discovered at: Lake Turkana, formerly Lake Rudolph
Discovery: 1970
Age: about 1.7 million years
18 x 18 x 22.5 cm³; 0.8 kg
9952-1001298



Anthropological Skull – Steinheim
This Steinheim model is a detailed casting from Berkhemer's reconstruction (1936, skull with no jawbone). The original of this skull from a predecessor of Neanderthal man was a Homo (sapiens) steinheimensis aged between about 25 and 35 and was discovered in a gravel in Steinheim, southern Germany, in 1933.

Discovered at: a gravel pit near Steinheim an der Mur, Germany
Discovery: 1933
Age: approximately 250,000 years
19 x 12.5 x 21.5 cm³; 0.7 kg
9952-1001296



Anthropological Skull – Sinanthropus
This skull is an accurate casting of a Sinanthropus skull reconstructed by Weinert and modelled from drawings by Black and Weidenreich after all the original bone specimens had been lost. Sinanthropus belongs to the genus Homo erectus pekinensis (Sinanthropus pekinensis) and can be seen as a typical example of early man.

Discovered at: Zhoukoudian
40 km south west of Peking
Discovery: 1929-1936
Age: 400,000 years
21 x 14.5 x 21.5 cm³; 0.9 kg
9952-1001293

Biface
Accurate reproduction of a biface made from quartzite. The original finding was probably used by an ancestor of the Neanderthals as a multi-purpose tool.

Material: Liquid wood
Age: 0,3 - 0,4 Mya
Place found: Neandertal
Height: 19 cm
Width: 9 cm
Depth: 5 cm
9952-1018514





Anthropological Skull - La Chapelle-aux-Saints
Cast from a reconstruction of the La Chapelle-aux-Saints skull, the model skull is an accurate copy of one belonging to a 50-55 year old male Neanderthal from ancient Europe of the species Homo (sapiens) neanderthalensis. Early man.

Discovered at: southern France
Discovery: 1908
Age: Approximately 35,000 to 45,000 years
22 x 16 x 22.5 cm³; 0.9 kg
9952-1001294



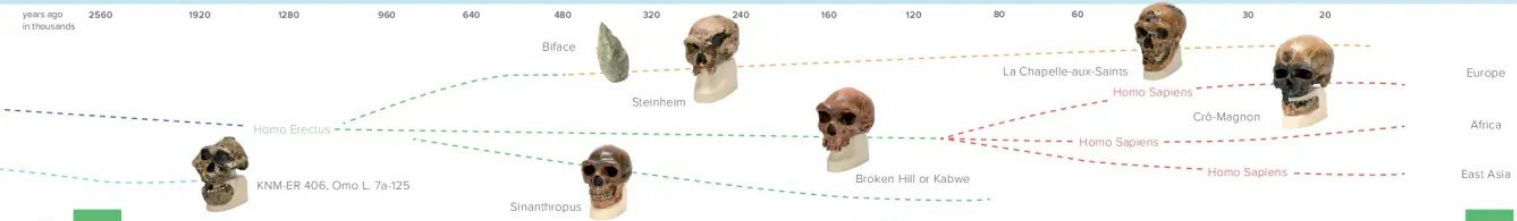
Anthropological Skull – Crô-Magnon
This wonderful casting is a reconstruction of an early hominid called Crô-Magnon man. The age of the original is dated to be 20,000 to 30,000 years old. The skull itself belonged to an early modern man of the species Homo sapiens from the ice age of the neo-Palaeolithic era. Early man (neo-Palaeolithic).

Discovered at: a cave in Vézéretal/southern France
Discovery: 1868
Age: 20,000 to 30,000 years
21.5 x 15 x 24.5 cm³; 0.9 kg
9952-1001295



Anthropological Skull –Broken Hill or Kabwe
An accurate casting of a skull reconstructed from an original that was discovered in an iron ore working at Broken Hill, in northwest Rhodesia (modern-day Kabwe in Zambia). It is an example of the early man, Homo sapiens rhodesiensis or a Homo erectus rhodesiensis, and indications exist to point to both these classifications. For this reason, there is also a wide range in the estimates of the specimen's age based on differing scientific assumptions. An early example of an ancient Homo sapiens (as classified by Henke and Rothe 1994) or a Homo erectus rhodesiensis.

Discovered at: a cave in an ore working at Broken Hill, modern-day Kabwe in Zambia
Discovery: 1921
Age: probably 150,000 to 300,000 years old. Previous estimates were of 40,000 to 60,000 years
21 x 15.5 x 23.5 cm³; 0.8 kg
9952-1001297





Orbit™ Tellurium
Accurate and easy-to-operate three-dimensional model of the sun, moon and earth, for comprehensive demonstration of their motions. Earth and moon in two different sizes in order to demonstrate day and night, motion of the sun across the sky, annual seasons, the changing amounts of daylight, phases of the moon, as well as solar and lunar eclipses and the cycles they exhibit. Shadows have clear edges since the sun is represented by a bright lamp with a Sunbeam™ reflector. As an alternative to turning the whole system together, the rotation of the earth on its axis and the position of the moon in its orbit can be adjusted individually by hand.

Experiment Topics:
- Day and night
- Motion of the sun across the sky
- Seasons
- Changing periods of daylight
- Sundial and the shadow of a gnomon
- Phases of the moon
- Crescent moons of various different widths
- Solar and lunar eclipses and their cycles
- Lunar months and festivals based on lunar periods

Includes:
- Tellurium with earth and moon in two sizes
- Display cards showing dates, solar eclipses, lunar eclipses and phases of the moon
- Small figure
- Sundial
- Detailed instructions in English
- Mains transformer, 100–240 V/6V

Dimensions: 650 x 250 x 300 mm³
9952-1008661

Geological Compass
Surface areas and linear measurements in space can be measured in one step. The angle is measured laterally on a vertical circle, and the direction is measured with an integrated Pendel clinometer. Thanks to its robust construction, this structural compass is ideally suited to working in the field. The delivery includes a leather bag with a belt clip, and a special tool to adjust the compass rose and the lid hinge. The circular level, the mirror and the pelorus are also integrated. Oscillation time of the magnetic needle: 30 . 60 seconds.

Pendel clinometer:
Calibration: 90°-0°-90°
Scale value: 1°

Horizontal circle:
Calibration: 0-360°
Scale value: 1°

Vertical circle:
Calibration: 90°-0°-90°
Scale value: 5°

Dimensions: 80 x 65 x 20 mm³
Weight: approx. 240 g including leather bag.
9952-1018441





Globe with Bar Magnet
Globe of the world with bar magnet along the axis of the poles on acrylic base, for demonstrating the shape of the Earth's magnetic field. A compass (1003093) or a magnetic field indicator (1003555) can be seen to align at the surface of the globe in accordance with a magnetic field parallel to the lines of longitude. The inclination can also be determined using the magnetic field sensor.

Dimensions: 220 x 160 x 200 mm³
Diameter (globe): approx. 120 mm
Weight: approx. 340 g
9952-1013123



Relief Globe
Tabletop globe with lighting on a metal-reinforced plastic stand with double-image map and tactile 3D relief of mountain ranges. When the globe is not lit up, it shows a physical map of the earth. When it is lit up, the current political position is shown with a contrasting delimitation of the countries and their borders. Labels in English.

Technical information:
Diameter: 30 cm
Total height: 43 cm
Meridian: plastic, transparent
Power supply: 230 V, max. 25 W
Lamp socket: E14
9952-1018440



Work out the world's magnetic field with our experiment: **UE3030700.**
Other interesting experiments can be found in our **Experiment Catalogue.**
Go to **3bscientific.com/physics-experiments,pe.html** to see all Experiment PDFs online.



Inclination Instrument E
Instrument for measuring the inclination of the Earth's magnetic field and also for mapping the magnetic field of a current-carrying conductor. The bearings are of agate upon which the magnetic needle is mounted in a frame with reference circle. The frame is equipped with an additional reference circle. There are two 4 mm sockets included for power supply.

Length of magnet needle: approx. 100 mm
Dimensions: approx. 180 x 100 x 220 mm³
Weight: approx. 620 g
9952-1006799



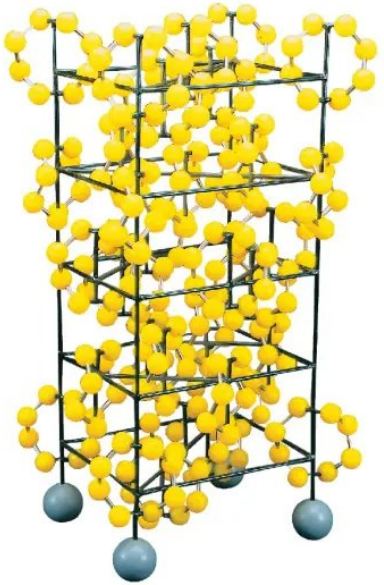
Compass Magnet with Plastic Bowl
Very powerful neodymium magnet covered with a plastic case, can float on the surface of water and faces North South when it comes to rest. Complete with translucent plastic bowl marked with compass points.

Dimensions:
Magnet: 80 x 30 mm² max dia.
Bowl: approx. 40 x 115 mm² dia.
9952-1003096



Magnetic Field Indicator
Bar magnet, with poles identified by colour and free to turn in space, for three-dimensional mapping of magnetic fields. On agate gimbal bearings pivot allowing free rotation in space, small bar magnet with colour pole coding. Handle and cardanic suspension made of plastic to alleviate any adverse effects on magnetic field.

Magnet: approx. 25 x 3 x 3 mm³
Handle length: approx. 95 mm
9952-1003555



Sulphur (Rhombic form)
This model depicts the crystal structure of rhombic sulphur where the basic structure is a ring of 8 atoms. The elemental structure of the crystal contains sulphur molecules consisting of 16 atoms. The bonds of the elemental structure are marked in white.

Dimensions: approx. 27 x 48 x 20 cm³
Weight: approx. 3.6 kg
9952-1002527



Calcium Carbonate
This model demonstrates the elementary structure of calcium carbonate (calcite) as well as other crystal structures of similar construction.

Dimensions: approx. 31 x 31 x 28 cm³
Weight: approx. 2.8 kg
9952-1002530



Sodium Chloride
This versatile model demonstrates the ion lattice crystal of the sodium chloride type such as NaCl, KCl; NaBr, AgCl, MgO and CaO.

Dimensions: approx. 13,5 x 13,5 x 12,5 cm³
Weight: approx. 0.6 kg
9952-1002521



Silicon Dioxide
Show the structure of silicon dioxide and other covalent compounds by demonstrating the tetrahedral-shaped arrangement of their particles.

Dimensions: approx. 19 x 19 x 19 cm³
Weight: approx. 0.8 kg
9952-1002528



Diamond
Diamond is the world's hardest natural substance. Your students will be able to understand why when they view the arrangement of carbon atoms represented in this model.

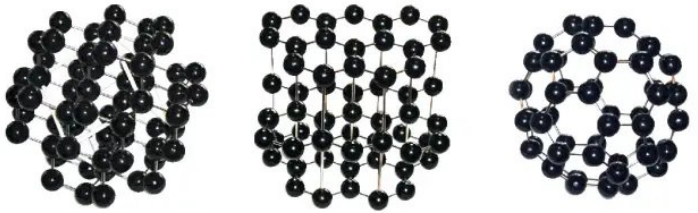
Dimensions: approx. 26 x 24 x 23 cm³
Weight: approx. 1.5 kg
9952-1002523



Mohs' hardness scale
Ordinal Mohs' hardness scale with minerals in boxes with a hardness of 1-10. The mineral in level 10, diamond, is included as a diamond tool.

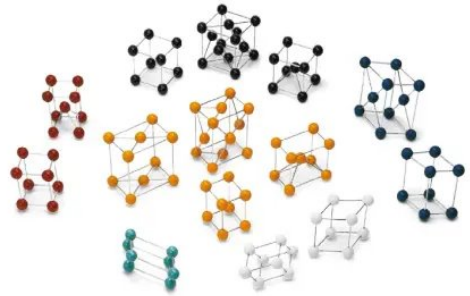
The set includes:
1. Talk
2. Gypsum
3. Calcite
4. Fluorite
5. Apatite
6. Orthoclase
7. Quartz
8. Topaz
9. Corundum
10. Diamond tool

9952-1018488



Set of 3 Carbon Configurations
Set of 3 easy-to-use models of various carbon crystal structures: diamond, graphite and fullerene, for demonstrating the fundamental differences between the structures.

Ball diameter: 25 mm approx.
Lengths of sides: 150 mm approx.
9952-1012836



Set 14 Bravais Lattices
Set of easy to handle models of the 14 fundamental lattice types (Bravais lattices), from which Auguste Bravais postulated that practically all naturally occurring crystal lattices can be derived by shifting along the axes.

Made of wooden balls in six different colours connected via metal rods. The six colours distinguish the six different systems into which the lattice types are categorised.

Diameter of balls: 25 mm approx.
Length of sides: 150 mm approx.
9952-1012837

Soil analysis case
The analysis case can be used to quickly, easily and reliably identify important soil parameters without prior knowledge of chemistry. The case contains all the necessary reagents, equipment and accessories. It can be used to identify the concentrations of the following substances in the soil: nitrate, nitrite, ammonium, phosphate and potassium. It is also possible to determine soil structure, acidity (pH value), density and humidity. Identification cards can be used to make colour comparisons to a high level of accuracy and can be used in the classroom. It is essential to be able to interpret the results to implement and manage measures to improve the soil e.g. fertilisation, reducing soil compaction, liming etc. The case contains a thorough introduction in English, French, Spanish and German.

Value range of the chemical parameters:
pH: 2.0-9.0
Ammonium: 10-400 mg/L NH_4^+
Nitrate: 10-500 mg/L NO_3^-
Nitrite: 1-80 mg/L NO_2^-
Phosphate 1-20 mg/L P/100g
Potassium: 2-15 mg/L K+
9952-1018516





Ecological Test for Water Lab
A really compact box – laboratory for a fast analysis of different types of water (e.g. drinking water, surface water, water of aquaria). All the applied chemicals are neutral in reaction to the environment, which means, none of the test solutions endanger water. The used test solutions can be disposed of via the home waste water system.

Sufficient for 50 to 60 tests:
- Ammonium 0.05-10 mg/l
- Nitrate 10-80 mg/l
- Nitrite 0.02-1.0 mg/l
- Phosphate 0.5-6.0 mg/l
- ph-Value 5.0 – 9.0
- 1 Drop = 1° German hardness (dh).

Description in English and German.
33 x 22 x 4 cm³, 1.2 kg
9952-1003785



Device kit for water, soil and air experiments – ECOLABBOX
The EcoLabBox is a mobile laboratory for water, soil and air tests in the working environment. You can use this laboratory to find and measure the most important substances that have an effect on our environment. A total of 21 basic environmental experiments are described that are particularly suited to groups of school pupils aged 12 and upwards. All reagents are in water hazard class 0 and can therefore be disposed of without any problems. It is comfortable for use on the move, thanks to an adjustable carry strap on the case.

The following parameters can be tested:

Water and soil parameters:
- pH value: 3.0-9.0
- Nitrate concentration: 10-80 mg/l
- Phosphate concentration: 0.5 - 6 mg/l
- Ammonia concentration: 0.05 - 10 mg/l

Water parameters:
- Nitrite concentration 0.02 - 1.0 mg/l
- Water hardness: 1 drop = 1° dGH

Box contents:
- Colour chart for measuring
- Filter stand for safe filtering
- Can magnifier for better identification of tiny organisms
- Filter papers for making soil extractions
- Special tweezers for watching tiny organisms without harming them
- Funnel
- Graduated beaker
- Plastic pipettes

German	**9952-1003787**
English	**9952-1003792**



Geiger Counter
Versatile, easy to use and compact precision instrument for measuring α-, β- and γ-radiation. With filter selection switch at the front of the Geiger-Müller counter tube for filtering out types of radiation (γ/β, γ/α/β or γ only), large display and integrated USB interface. Including USB cable, Windows software, and operating instructions.

The following functions and operating modes are available for measurement:
- Standard mode for displaying the current radiation level. Display of the equivalent dose as a numerical value and as bar chart and display of the time until a selected cumulative dose limit is reached (default: 5 µSv/h). Also equipped with variable acoustic and optical warning threshold signal and display of average radiation from previous day.
- Pulse counting either permanent or with variable gate time. Gate time adjustable in seconds, minute or hours Additional optional acoustic count indication.
- Count rate measurement. The pulses registered are measured successively and converted into a count rate (number of pulses per second).
- Integrated display of date and time for correct recording of measured radiation.
- The number of pulses registered is stored in the internal memory. This facilitates recording e.g. of weekly values for up to 10 years.
- Computer docking station. The software enables the measured data to be evaluated and processed on an MS-Windows PC.

Radiation types: α from 4 MeV, β from 0.2 MeV, γ from 0.02 MeV.
Measured variables: equivalent dose in Sv/h, mSv/h, µSv/h pulses/s, pulses/variable time interval.
Display: LCD, 4 digit, numerical with display of measured variable, quasi analogue bar chart, operating mode indicators.
Radiation detector: End window Geiger-Müller counter tube, stainless steel housing with neon-halogen filling
Measuring length: 38.1 mm.
Measuring diameter: 9.1 mm.
Mica window: 1.5 – 2 mg/cm².
Gamma sensitivity: 114 pulses/min for ^{60}Co radiation = 1 µSv/h in background radiation energy band.
Background rate: 10 pulses per minute approx.
Internal memory: 2 kilobytes.
Battery life: 3 years approx.
Dimensions: 163 x 72 x 30 mm³ approx.
Weight: 155 g approx.
9952-1002722



Oil-Test Paper and pH Test Paper
To test for oil in water or in soil and to find hydrocarbons, especially fuel (Diesel) and motor oil. Even if the water is self-coloured, a deep blue colouring of the test tape indicates even a small oil content. Package with 100 tapes 20x70mm. Description in English and German.
8x5x2.5 cm; 0.07 kg.
9952-1003783



Water tester
This digital water tester measures the physico-chemical concentrations of hydrogen ions (pH), dissolved salts (electrical conductivity / EC) and dissolved ions (evaporation residue, TDS) in a measuring solution. An integrated temperature sensor also serves to measure the temperature in °C or °F and the automatically compensate the values. The electrodes supplied can be simply switched if necessary. A compact and robust case made from sturdy plastic protects the device from splashes. The device has a battery charge indicator and an automatic off function that activates if no measurements are taken for 8 minutes.

Measurement ranges and precision:
pH: 0 - 14 ± 0.01
EC: 0 - 3.999 µS ± 2%
TDS: 0 - 2.000 mg/l ± 2%
Temperature: 0 - 60 °C ± 0.5 °C

Technical information:
Protection class: IP 64
Dimensions: 163 x 40 x 26 mm³
Weight: 100 g
Power supply: 4 x 1.5 V for approx. 100 hours of operation
9952-1017859



Dosimeter Radex RD1706
Used for determining dose rates in µSv/h for β-, γ- and X-rays, this radiation meter can be operated by nonprofessionals while nonetheless offering the features of a professional dosimeter. Including two built-in Geiger-Müller counter tubes and a large, illuminated LCD display. The device measures the activity of β and γ particles and uses the results to calculate the dose rate. Depending on dose rate, the measurement and calculation times vary from 26 s to 1 s at high dose rates. Detection of each particle is indicated by an audio signal to facilitate searching for radioactive sources. The difference between the mean dose rate and background radiation level, as well as the background radiation level itself are displayed in the "background" mode. This facilitates, for example, inspections of enclosed spaces and building materials. Overshoot of an adjustable alarm threshold can be indicated either by an audio signal or a vibration signal. Measured values remain saved after the device has been turned off.

Specifications:
Counters: Two GM counter tubes SBM20-1
Measurement variable: Ambient equivalent dose rate H*(10)
Measuring range: 0.05 ... 999.0 µSv/h
Alarm threshold: Adjustable from 0.10 to 99.0 µSv/h
Alarm: Audio or vibration signal
Measurement and calculation times: 26 s
1 s (at H*(10) > 3.5 µSv/h)
Value display duration: Continuous
Energy detection range
X-radiation and γ-radiation: 0.03 to 3.0 MeV
β-radiation: 0.25 to 3.5 MeV
Batteries: 1.5 V, AAA (1 x or 2 x)
Operating time: 500 h, with 2 batteries (1350 mAh) under normal conditions
Dimensions: 105 x 60 x 26 mm³
Weight (without batteries): 90 g
9952-1012894

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Stereo-zoom Microscope, 45x

The rugged 45x stereo-zoom microscope models are characterised by their ease of operation and their fine optical and mechanical qualities. They are equipped with a 0.7x to 4.5x zoom objective allowing magnifications from 7 to 45 times the original size. The ocular features a "high eye point", making them highly suitable for those who wear spectacles. Two halogen lights for reflected and transmitted illumination which can be activated independently ensure that the object is evenly lit with uniformly bright light. Thanks to the fine optical equipment the stereo-zoom microscopes provide a very bright, distortion free image with excellent resolution.

115V 9952-1013373
230V 9952-1013376

	9952-1013373	9952-1013376
Description	Stereo-Zoom Microscope, 45x, (115 V, 50/60 Hz)	Stereo-Zoom Microscope, 45x, (230 V, 50/60 Hz)
Stand	Metal stand, column firmly connected with base, pinion knobs attached on both sides for coarse and fine focusing	
Tubus	Binocular inclined 45°, interocular distance adjustable between 54 and 75 mm, head rotatable by 360°	
Eyepieces	Pair of wide field eyepieces WF 10x 20 mm with eyepiece lock and rubber eyepiece cups	
Objectives	Zoom objective, 0.7x to 4.5x	
Enlargement	7x bis 45x	
Diameter of Image Field	4.4 mm to 28.6 mm	
Distance from Specimen	100 mm	
Maximum Height of Object	80 mm	
Object Plate	Base with detachable object plates (plastic, black/white and glass) 95 mm dia. and 2 specimen clips	
Illumination	Top-, transmitted- and mixed-light illumination, adjustable 12 V, 15 W halogen lamp, power supply 115 V resp. 230 V 50/60 Hz	
Supplied	Complete with dust cover	



Stereo Microscope, 40x, Transmitted-Light Illumination LED

Stereo microscopes model 40x are robust microscopes that are distinguished by their ease of operation and excellent mechanical and optical quality. They can be used in numerous applications within the fields of biology and geology. Simply by rotating the objective from the 2x setting to 4x, the overall magnification can be set to 20x or 40x. With the aid of accessories, a magnification of up to 80x can be achieved.
Low-temperature LED illumination Allows samples to be viewed for longer without heat affecting the prepared specimen. It also has the advantage of being brighter, as well as being longer lasting and eliminating the need to change bulbs. Power is supplied to the LED illumination via rechargeable batteries, for wireless use.

115V 9952-1013369
230V 9952-1013128

	9952-1013369	9952-1013128
Description	Stereo Microscope, 40x, Transmitted-Light Illumination LED (115 V, 50/60 Hz)	Stereo Microscope, 40x, Transmitted-Light Illumination LED (230 V, 50/60 Hz)
Stand	Metal stand, column firmly connected with base, pinion knobs attached on both sides of the stand for coarse and fine focusing	
Tube	Binocular inclined 45°, interocular distance adjustable between 55 and 75 m	
Eyepieces	Pair of wide field eyepieces WF 10x 20 mm with eyepiece lock and rubber eyepiece cups, diopter compensation ±5 on the left eyepiece, one eyepiece with pointer	
Objectives	Revolving nosepiece with objective 2x / 4x	
Enlargement	20x/40x	
Object Plate	Base with detachable object plates (plastic, black/white and glass)	
Illumination	LED, top, transmitted and mixed-light illumination, power supplied by rechargeable battery, 115 V resp. 230 V, 50/60 Hz charger	
Dimensions	190 mm x 300 mm x 115 mm	
Weight	2.9 kg	
Supplied	Complete with dust cover	





Polarisation Microscopes

High quality mechanics and optics along with ease of operation are the outstanding features of the polarisation microscopes 1012403 and 1012404. Their compact and ergonomic design makes it easier to work with them. The main application for these microscopes is in mineralogy where they are used to study rock specimens, identify minerals and investigate crystals. They may also be used in biology, though, for instance when studying the structure of starch grains, the texture of cellulose fibres in cell walls or the position of rod-like viruses in cells (e.g. tobacco mosaic virus).

Monocular 9952-1012403
Binocular 9952-1012404

	9952-1012403	9952-1012404
Description	Monocular Polarisation Microscope	Binocular Polarisation Microscope
Stand	Robust, all metal stand with arm permanently connected to the base. Focussing by means of separate knobs for coarse and fine adjustment located on either side of the stand and operated by rack and pinion drive with ball bearings and retaining lever, adjustable stopper for protecting the object slides and objective	
Tube	Monocular inclined 30°, head rotation 360°	Binocular head, 30° viewing angle, 360° rotatable head, viewing distance adjustable between 54 and 75 mm, ±5 dioptric compensation for both eyepieces
Polarisation Equipment	Polariser with scale and analyser, which can be inserted into the tube	
Eyepieces	Wide field eyepiece WF 10x 18 mm	Pair of wide field eyepieces WF 10x 18 mm
Objectives	Inverted objective revolver with 3 achromatic objectives 4x / 0.10, 10x / 0.25, 40x / 0.65	
Enlargement	40x, 100x, 400x	
Object Stage	Circular object stage 120 mm in diameter, which can be rotated 360°, scale with Vernier and 2 specimen clips	
Illumination	Adjustable 6 V, 20 W halogen lamp integrated in base, universal 85 to 265 V, 50/60 Hz power supply	
Condenser	Abbe condenser N.A.1.25 with iris diaphragm, focussed via rack and pinion drive	
Dimensions	240 mm x 190 mm x 385 mm	240 mm x 190 mm x 425 mm
Weight	5.5 kg	6 kg
Supplied	Complete with dust cover	



Digital Camera for Microscope, 8 Mpixel
One advantage of the camera is that when the viewing field of the microscope is too dark to see with the naked eye, the camera can still provide a bright, highly detailed image. It is thus highly suited to dark-field microscopy and for microscopes equipped with fluorescent illumination.

- Camera sensor: 1/2.5" CMOS, colour image
- Pixel size: 1.75 µm X 1.75 µm
- Sensitivity (V/Lux·sec): 1.3
- Resolution : 3264 X 2448 , 8 Mpixel
- Dynamic range: 75 dB
- Wave Length: 400 - 650 nm
- Exposure: ERS (Electronic Rolling Snap)
- White Balance: automatic / manual
- Output: USB 2.0
- Programmable Control: image size, brightness, gain, exposure time
- Power supply : via USB interface 2.0, USB cable 2.5 m in length
- Camera housing: oxidised metal housing
- Dimensions : 110x50x50 mm³ approx.
- Weight: 260 g approx.
- Microscope adapter: 2 adapters 30 mm dia. and 30.5 mm dia.
- System requirements: Windows 2000/XP(SP2)/2003/ Vista/2008 (32 and 64 bit)/WIN7

9952-1013379



A. Auto Focus Vision Viewer™
High-resolution, easy-to-use, desk-top colour video camera with a host of uses. Particularly suitable for presenting printed text, images and other objects or even dynamic processes. Includes auto focus camera lens and wide field of vision (43 x 36 cm²), flexible goose-neck support and integrated USB cable. Compatible with interactive whiteboards. Includes Applied Vision™ software.
9952-1012834

B. FlexCam® 2
This modern document camera with high definition (HD) resolution can do the job of multiple presentation devices, e.g. overhead projectors, opaque projectors or slide projectors. Documents, pictures, objects etc. can be laid directly onto the flat base under the camera. The two bright white LEDs integrated into the head of the camera provide excellent illumination of the field of view. A built-in microphone allows sound recordings to be made. Includes microscope adapter and Applied Vision™ software.
9952-1012835

Notes

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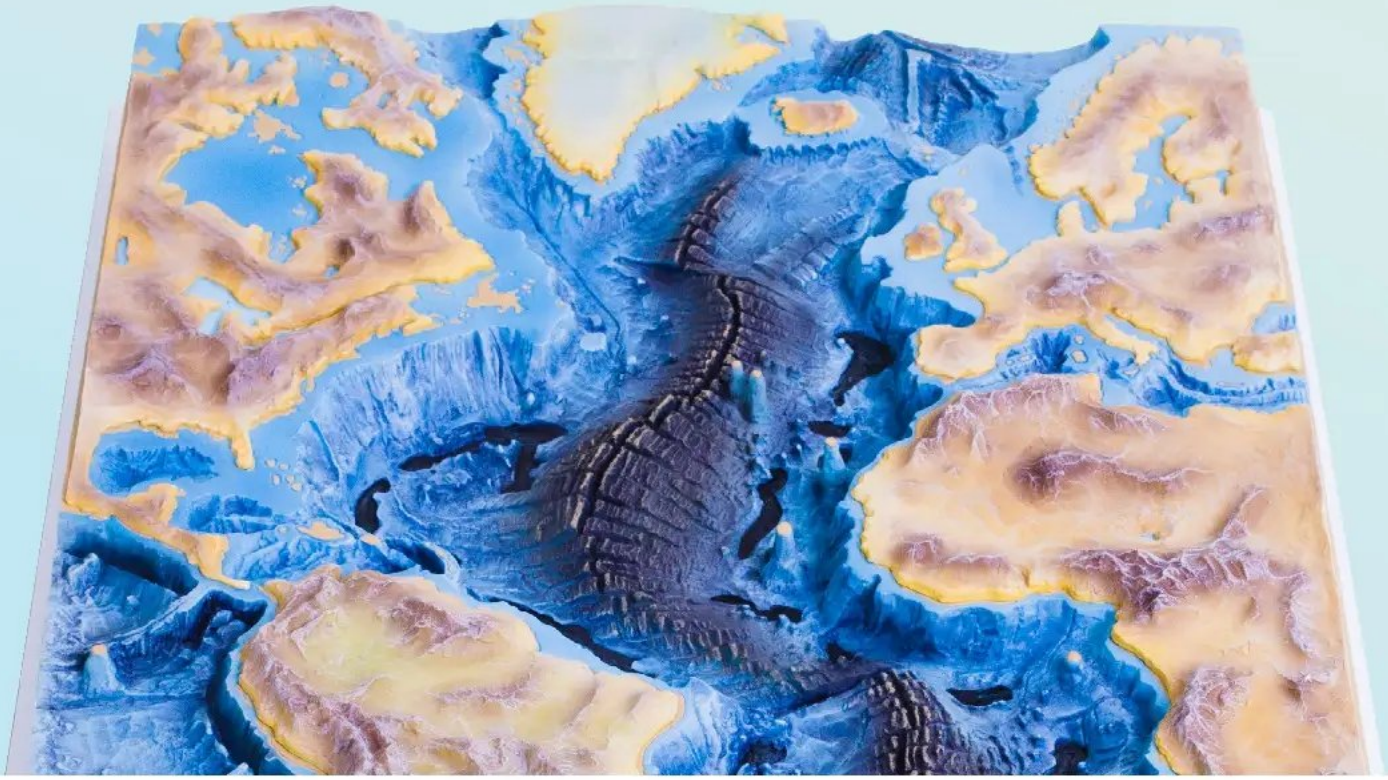
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(9952-1017594)

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