

# 3-2-1 Classroom Contact

Science

CTW 1991

30 15-minute programs for grades 3-6

For Science and Social Studies S.O.L. Correlations visit the ITV/SOL

Database at <http://www.brptv.com/html/edserv/index.html>



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Funded by the National Science Foundation, this series draws on the extensive library of footage from the original *3-2-1 Contact*, specifically tailoring it for classroom use by covering a single topic in each 15-minute program. The series presents a balance among the physical, biological, and earth sciences, along with ideas for cross-curricular work in language arts, math, and social studies. A new comprehensive 3-ring binder teacher's guide links each show to hands-on science lessons. The guide contains two lesson plans for each program, step-by-step hands-on science activities, reproducible student handouts, experiment pages for students to record their observations, conclusions, and future research ideas, and much more.

## EARTH SCIENCE

**101. Antarctica: Getting to the South Pole**—The geographic South Pole is located on Antarctica, a huge continent covered with a thick layer of ice—at the South Pole, it's 9,000 feet thick! Follow the route across this icy desert taken by early explorers who risked their lives in search of the South Pole.

**102. Crystals: They're Habit Forming**—Salts, sugars, and snowflakes are crystals. Every kind of crystal has its own specific shape, or habit. But how do crystals form? Grow some to find out!

**103. Erosion: Earth is Change**—Earth's surface is constantly changing. Floods, landslides, hurricanes, erupting volcanos, and soil-shifting earthquakes make quick changes. But constant action by wind and water over millions of years can wear down Earth's surface and shape landscapes like the Grand Canyon!

**104. Fossils: Remains to be Seen**—How do we know what dinosaurs looked like when they lived millions of years ago? The answer is fossils—traces of past life preserved in Earth's crust. Fossils help scientists figure out how the dinosaurs lived, and possibly how they died.

**105. Ocean Environments: The 3-D Sea**—Oceans may look the same on top, but underneath they're all different, filled with spectacular sea-dwelling creatures. There are different environments under water—animal life in each environment depends on things like the depth, temperature, salinity,

and oxygen/carbon dioxide content of the water there.

**106. Volcanoes: Too Hot to Handle**—What comes out of volcanoes? A lot of stuff! Materials from deep within volcanoes raise Earth's surface, make mountains, and create new land masses. Come along for a look at Mauna Loa during an eruption and Mount St. Helens after it blew its top.

**107. The Water Cycle: Go with the Flow**—Water on Earth is cleaned in a never-ending cycle of evaporation, condensation, and precipitation. But there's a limit to the amount of pollution the water cycle can handle. Sometimes water gets polluted even before it hits the ground—rain falling through polluted air can form acid rain that may kill plants and animals.

## LIFE SCIENCE

**108. Animal Vision: Eye of the Beholder**—Ever wondered how the world looks through a frog's eyes or a chameleon's eyes? Here's your chance to look at things in a whole new light! Animals' eyes help them survive in their specific environments. Some animals don't see colors at all; some see only a few; and some see colors we don't—those in infrared or ultraviolet light.

**109. Antarctic Animals: Living on the Edge**—Only a few animal species live in Antarctica. On the ice-covered land mass, air temperatures dip to below -100 degrees F. So most animals live in the just-freezing ocean water surrounding the continent.

**110. Australian Mammals: Life Down Under**—Australia is home to many unique animals including some unusual mammals like the kangaroo, the koala, and the platypus. But why do all these strange, unusual creatures live in just one place? It all started a long, long time ago in a place called Gondwanaland.

**111. Bioelectricity: The Body Electric**—All living things—people, animals, and plants—produce electricity. Each cell in the human body works like a tiny battery. We use the electricity to send messages to and from our brains. And their own electric impulses even help amputees move myoelectric limbs!

**112. Classification: The Order of Things**—Living things can be grouped, or classified, according to common traits. Doing so helps us find out how species are related—the more traits in common, the closer the relationship. Knowing about common traits even helped a scientist solve the mystery of a plane crash!

**113. Digestion: The Inside Story**—Some animals eat plants; some eat meat; and some eat plants and meat. Whatever an animal eats, its teeth get the digestive process underway. But where does food go from there?

**114. Flying Animals: Winging It**—How is a clam like a polar bear? Neither has wings, so neither can fly! But lots of other animals do have standard flying equipment—wings. Some are flying birds, some are flying mammals (bats), and some were flying reptiles (pterosaurs) that became extinct more

than 60 million years ago. Even though these creatures may look different, their virtues have a lot in common.

**115. Food Chains: Eat and Be Eaten**—All animals-including humans-depend on plants because there's a plant at the beginning of every food chain. For example, sea urchins thrive on kelp, a water plant, and in turn, sea urchins are food for sea otters. Find out how scientists keep this delicate balance.

**116. Innate and Learned Behavior: How Do They Know That?**—Why does a spider always weave the same kind of web instead of getting creative from time to time? Because the web-spinning behavior is innate-the animal knew how to spin webs when it was hatched. Humans have innate behaviors too, such as crying and swallowing. But there are lots of things animals-including humans-learn to do.

**117. Social Behavior: Living in Groups**—Although most animals are solitary creatures, some live in groups: herds of bison and schools of fish live in loose assemblies of hundreds; prides of lions and troops of baboons live in small but organized groups; colonies of ants and bees live in highly organized groups of thousands.

**118. Training Animals: Learning New Tricks**—What do pigs, dolphins, and monkeys have in common? They're animals that can be trained to do things-sometimes just for fun; sometimes to help humans. And they're mammals-the animals best able to learn. When working with animals, trainers break down tasks into steps that are taught one at a time.

#### PHYSICAL SCIENCE

**119. Air is Matter: Air is There**—Air is matter that really matters. It's everywhere, throwing its weight around by holding things up or knocking them down. But wherever it is and whatever it does, air has volume and mass that make it matter!

**120. Friction: Getting a Grip**—What do bobsleds, roller coasters, motorcycles, skis, cars, planes, snakes, and people all have in common? They all need friction to get 'em going and to slow 'em down! Friction is the resistance encountered when one thing moves over the surface of another. Treads on tires and shoes create friction so people can "get a grip!"  
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**121. Generating Electricity: More Power to You!**—How is electricity generated? Simply put, if you move a magnet past a wire-or a wire past a magnet-

you get an electric current. Huge power plants use falling water, wind, or steam to rotate coils of wire inside giant magnets to create enough electricity for all of us.

**122. Gravity and Weightlessness: Measuring G's**—Gravity constantly grabs things and pulls them toward Earth's center. In fact, that's why things have weight. But how do you get into a weightless situation? Try riding a rollercoaster...or even an elevator!

**123. Light and Color: Living Color**—Why can't we see the colors of objects in the dark? Because light has to hit the object and reflect its color back to our eyes. Hard to visualize? Not really, when simple animations and colorful experiments take us out of the dark and into the light!

**124. Motion and Forces: Play Ball!**—An object can't move unless acted upon by some force that sets it in motion. We apply force to hit a baseball or shoot a basketball through a hoop, but there's another force that's working all the time-gravity. Knowing that forces, including gravity, work in predictable ways helps softball pitchers trick batters!

**125. Refraction: Facts of Light**—A ray of light travels in a straight line, but it can be refracted, or bent, when it travels at an angle from one material into another. It's important to be able to bend light, especially for lighthouses. They bend light from one bulb and send it far out to sea to warn sailors of rocks ahead.

**126. Surface Tension: BUBBLES!**—Can anyone blow a soap bubble that's non-spherical? No way! Because of surface tension, soap film sticks together and always forms a sphere. Experiments with soap bubbles help kids learn more about what's holding them all together-surface tension.

#### SCIENTIFIC INVESTIGATION

**127. How Do You Know? Collect the Data**—You can get a lot of information from books, data banks, and even from TV. But sometimes you just have to get up, go out into the field, and observe people and things in order to collect data. Meet some scientists collecting data deep in the woods and deep underwater.

**128. How Do You Know? Dig It Up!**—How do archaeologists find out what prehistoric humans ate? The scientists become detectives, excavating ancient trash heaps and hunting for animal bones, shells, and plant pollen that give clues to what people ate. But for direct evidence, scientists analyze fossil feces. Seeds and

plant pollen trapped and preserved in thousand-year-old dung reveal what was eaten!

**129. How Do You Know? Experiment**—Is every sound a language? Do parrots speak English? And who left that message on the answering machine? You can try to guess the answers, or you can set up controlled experiments designed to let you know when you've found the right answers!

**130. How Do You Know? Make a Model**—Lots of people put together model planes or ships for fun. But models aren't just toys, they're scientific tools! Models can help us test theories, learn about things that are very small, very big, very far away, or that lived very long ago. We can even calculate a dinosaur's weight by using a model of the creature!