



HOW TO USE THIS GUIDE

Duplicate the DFTV student pages (pp. 3–6), and distribute them to your students. Read the questions posed by the young scientists. Encourage your students to describe how they would investigate the questions. Guide them through the steps of developing an inquiry (see below).

If you have a videotape of the episodes, play it to see how the DFTV scientists investigated the questions, and what their results were. The investigations are also described on page 7 of this guide and on the DragonflyTV Web site. Apply the ideas learned in the DFTV example to the classroom activity "Do It, Get to It", or encourage students to do the investigation described in "Take it Outside!"

If your students develop investigations of their own, encourage them to visit the DragonflyTV Web site, www.dragonflytv.org. On the link titled "Be on DFTV" they can describe their investigation and they'll be considered for the next season of DragonflyTV!

OBSERVATIONAL

1. Write the question: How does A compare to B? Make a hypothesis.
2. Decide what to measure or observe for both A and B, and how to do it.
3. Make multiple observations when possible. Record all results.
4. Organize the data in a table or chart, looking for differences or similarities.
5. Write an answer to the original question. Also write down any new questions that come up during this investigation.

EXPERIMENTAL

1. Write the question: If I change A, what happens to B. Make a hypothesis.
2. Choose the independent variable (the thing you change) and dependent variable (the thing that is affected), and how to measure them.
3. Do multiple trials when possible.
4. Organize the data into a table, and prepare a graph. Look for patterns or trends.
5. Write an answer to the original question. Also write down any new questions that come up during this investigation.



211 / MAMMALS: Is my cat right- or left-pawed?

What's Up?

We're Brittany, Molly, and Cleo, and we're crazy about cats. We all know that people are either right, or left-handed, but we wondered if that goes for cats, too. Do they have their own "paw preference?" To find out, we recruited Cleo's cats Nudge, Cle-Cle, and Brooklyn, and put them through three tests. Did any of these cats turn out to be true "south paws"?

HOW WOULD YOU INVESTIGATE THIS QUESTION?

What types of tests would you create to indicate "handedness?" What do cats use their paws to do? Think about whether the age of the cat is a factor. Also decide how many tests it will take to get a result you are confident in. Should you repeat the tests on different days, to see if you cat is consistent? Describe your investigation in your notebook, and discuss it with your teacher, or go to www.dragonflytv.org to learn what Brittany, Molly and Cleo discovered.

Do It, Get To It

Does your classroom have a pet goldfish? You can do a simple investigation with your own class pet! Here's how. Watch your fish closely, and count the number of times you see its gills beat in one minute (you might watch its mouth open and close instead). Now, encourage the goldfish to "exercise" by gently swirling a clean straw or stick in the water. You don't have to scare the fish, just get it to swim around for a whole minute. Leave the fish alone again, and count the gill beats now. What did you notice? If the gill beats increased, then how many minutes have to go by before they slow down to the resting rate?

Take It Outside!

Test your dog's problem-solving abilities with some simple tests. Record how much time it takes your pet to complete these four tests: 1) crawl out from under a blanket; 2) find a treat under a blanket; 3) find a treat under a cup; 4) find a treat under a low shelf. When you hide the treat, let your dog see you do it. Use a stop watch to measure the time until the dog gets the treat in its mouth. Get your friend's dog involved, too, and do a comparison. Do big dogs perform better than little dogs in some tests? How does the shape of the dog's snout affect its ability to complete the tests? Does it matter what time of day you try the test?



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A PRODUCTION OF
TWIN CITIES PUBLIC TELEVISION **tpt**
St. Paul • Minneapolis



DragonflyTV is a production of Twin Cities Public Television (TPT), St. Paul/Minneapolis, and is made possible by major grants from Best Buy Children's Foundation and the National Science Foundation.
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About the DFTV Investigations (for the educator)



ROVs

NATIONAL SCIENCE EDUCATION STANDARD

Science in Personal and Social Perspectives Grades K-4:

Changes in Environments

Science and Technology Grades 5-8:

Understandings about Science and Technology

The team compared the health of two parts of the reef: White Banks, which sees a lot of boat and human traffic, and Dino's Rock, which is not marked on most maps. At each location, they laid down a 50 foot (15 m) rope, with floating buoys every 5 feet (1.5 m). The rope and buoys provided a visual reference while they navigated the ROV from the boat. When they played back the videotape, they noticed more signs of damage and disease at White Banks compared to Dino's Rock. This could relate to the amount of human traffic at the sites, but other factors could also account for the damage.

Even if your students can't assemble their own ROV, it's a good exercise to get them thinking about what characteristics such a vehicle ought to have. Imagine some remote environments and have your students design "vehicles" to explore them. For more details about this investigation, visit www.dragonflytv.org.

PET HANDEDNESS

NATIONAL SCIENCE EDUCATION STANDARD

Life Science Grades K-4:

Organisms and Environments

Life Science Grades 5-8:

Regulation and Behavior

The girls chose three behaviors that required their cats to use their paws: 1) reaching for a treat in a clear tube; 2) batting at a dangly cat toy; 3) swiping at a dab of peanut butter on its nose. When they got the cats to cooperate, they found that a cat might use its right paw 9 out of 10 times to reach for the treat, but then use its left paw 7 out of 10 times to clean the peanut butter off its nose. They learned that it's difficult to make a strong conclusion about whether their cats were right- or left-pawed, without repeating the tests many times, and considering other factors.

Household and classroom pets make excellent subjects for scientific study. Animal studies also raise many issues about designing science investigations and paying attention to different factors. Caution your students about jumping to conclusions too quickly. For more details about this investigation, visit www.dragonflytv.org.

Learn more about developing DragonflyTV investigations in your classroom, and earn college credit from Miami University of Ohio. Visit www.dragonflyworkshops.org for details.

MOUNTAIN BIKES

NATIONAL SCIENCE EDUCATION STANDARD

Earth and Space Science Grades K-4:

Changes in Earth and Sky

Earth and Space Science Grades K-4:

Earth's History

The DFTV investigators rode their bikes along a one-mile (1.6 km) stretch of the Slick Rock Trail, and the Porcupine Rim Trail. They carried clip-on voice recorders and narrated their journeys, noting when they caught air, encountered debris, changed gears, and had to get off their bikes. When they played back their recordings, they found there were more dropoffs and rough trail debris on the Porcupine Rim trail, while Slick Rock was more hilly, with only some sand debris in the trail and fewer dropoffs. They concluded that Slick Rock's sandstone came from wind-borne sands, and Porcupine Rim's sandstone came from water-borne rocks, sand, and debris.

Encourage your students to think about how long it takes some geologic processes to occur. Also point out how a process like erosion can both build up new formations, and wear them down. For more details about this investigation, visit www.dragonflytv.org

SNAKES

NATIONAL SCIENCE EDUCATION STANDARD

Earth Science Grades K-4:

Organisms and Environments

Physical Science Grades 5-8:

Regulation and Behavior

The DFTV Scientists prepared three animal scents by putting minnows, a frog, and a dead mouse in separate jars of water. They also had a control jar of plain water. They dipped a cotton swab into each scent, and placed the swab into the snakes cage, counting the snakes tongue flicks for one minute. They found that the snakes flicked their tongues most often for the scent of their natural prey!

Discuss the difficulties in doing animal behavior investigations. Many factors must be considered in the snake study: time of day; date of last feeding. For more details about this investigation, visit www.dragonflytv.org.

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