



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.

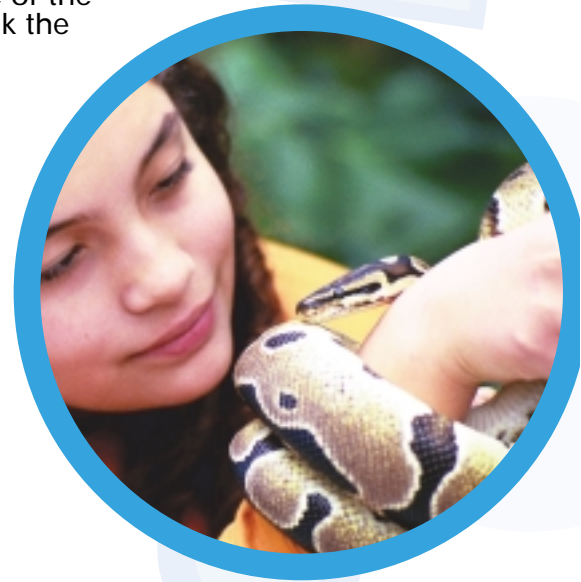
213 / CREEPY CRAWLIES: What do snakes crave?

What's Up?

We're LeighAnne and Carmen, and we think snakes make perfect pets. Snakes have a super-strong sense of smell, and they actually sniff with their tongues. If they smell anything yummy on us, they'll think we're lunch! That's why we wash our hands before and after handling our pets. This got us thinking: can you tell what food a snake craves by the way it flicks its tongue? We tested the sense of smell of some of the snakes at the pet store where LeighAnne works. How do you think the snakes responded?

HOW WOULD YOU INVESTIGATE THIS QUESTION?

Think about the sorts of prey snakes hunt down. How would you make sure the snakes were detecting the smell of prey, instead of just seeing it? Would a snake be interested in human food? What would you look for to decide whether the snake smells something it wants to eat? Describe your investigation in your notebook, and discuss it with your teacher, or go to www.dragonflytv.org to learn what LeighAnne and Carmen discovered.



Do It, Get To It

How quickly do smells travel? Try a little experiment right in your classroom. Have your classmates spread out through the whole room, then have them cover their eyes and ears while you keep your eyes open. Have your teacher pour some perfume onto a piece of paper towel in one corner of the room. Begin timing with a stopwatch or clock, and have your friends raise their hands when they first smell the perfume. Make a kind of map that shows how the perfume scent spread across the room. What does the map tell you about how smells travel? Do the windows, doors, and vents in the room have anything to do with it?

Take It Outside!

Many insects are guided by their sense of smell. Set up an experiment to see what types of smells attract insects. Choose four things that have a strong smell, such as almond flavoring, vinegar, maple syrup, and pear juice. Pour a small amount of each onto its own paper towel. Set each towel outside on the grass (put a rock on it so it won't blow away!), and wait. Check on each towel every 15 minutes for an hour, or longer if you can. Write down what you see: type of bug, number of bugs, etc. Do the bugs prefer the same smells you do? Why are insects attracted to certain flowers?

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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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