



## HOW TO USE THIS GUIDE

- 1 Duplicate the DFTV student page of your choice (pp. 3–6) and distribute it 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).
- 2 If you have videotapes of the episodes featured in this guide, play the video segment to see how the DFTV kids 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!”
- 3 If your students develop investigations of their own, encourage them to visit the DragonflyTV Web site, [pbskids.org/dragonflytv](http://pbskids.org/dragonflytv), and click on DFTV Boards. Kids can describe their investigations and share their ideas with others.

### 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.



# 409 / At the Zoo: Tigers and Otters

## Student Page

### What's Up?

Hi! Chelsea and Camille here, checking out the fur, feathers, and fun at our local zoo. We love animals, and we like to make them feel as happy as possible. One way to accomplish this is through “zoo enrichment.” Zoo enrichment involves giving animals interesting objects and making their environments seem like home. Good enrichment stimulates the animals to use their natural skills and behaviors and keeps them from getting bored. So when we decided to design an enrichment for tigers and otters, we wondered: **How do you decide if an enrichment works?**

### How Would You Investigate This Question?

To create a comfortable and fun environment for tigers and otters, you'll need to know what animals enjoy in their natural habitat. How do they hunt and play? What are their favorite snacks, and how do they get their paws on them? Where and when do they sleep or rest? What items or activities are not in these animals' native environment, and could actually be harmful to them? When your research is complete, get creative. Match the animals' natural preferences to items, surroundings, or “games” you think they might enjoy. Write your ideas in your notebook and discuss them with your classmates and your teacher. Then watch the video segment, or go to [pbskids.org/dragonflytv](http://pbskids.org/dragonflytv) to learn how Chelsea and Camille “went wild” and built an effective, safe, and fun zoo enrichment.

### Do It, Get To It

Write a letter to your local zoo asking their help in selecting an enrichment toy for an animal at that zoo. Have the zookeeper tell you what kinds of things they would allow you to put into a certain animal's exhibit. For example, you might be permitted to use wood but not plastic. Have several classmates come up with different ideas, then submit them to your zookeeper to be judged. If possible, get permission to actually put the winning project in the animal exhibit.



### Take It Outside!

You've seen clever toys in the store for your dog or cat. Why not develop your own? Think of a toy your pet loves most. Come up with three ways to modify the toy. For example, if your cat loves to chase string, is there a color or texture of string that your cat prefers? Develop a toy, do some tests with your pet, and examine your results. Maybe you'll come up with a toy that will keep your pet occupied for hours!

# About the DFTV Investigations

(for the educator)

## WOLVES

### NATIONAL SCIENCE EDUCATION STANDARD

#### Life Science Grades K–4:

*Organisms and their Environments*

#### Life Science Grades 5–8:

*Regulation and Behavior*

The boys received permission to throw chunks of meat into the wolf pen, then observed how the wolves competed for the meat. The pen contained three females and three males, including a young female and male. The boys threw out several pieces of meat, one at a time, looking for behaviors or gestures such as fighting, growling, chasing, or tail position. They concluded that the leader, or “alpha” in this pack was actually an older female wolf. It’s not always the largest or oldest wolf, nor always a male who is the top wolf.

Discuss with students how animals compete in their social groups for their status. Also point out how pets, especially dogs, live in a kind of pack... with their human owners. A dog’s ear position can tell a lot about its status in the family.

## DOUBLE DUTCH

### NATIONAL SCIENCE EDUCATION STANDARD

#### Life Science Grades K–4:

*The Characteristics of Organisms*

#### History and Nature of Science Grades 5–8:

*Nature of Science*

The girls used a popular technology ‘a personal mp3 player’ to provide a musical distraction for the jumpers. They played a highly rhythmic piece of music in the jumpers headphones, which played at a beat which did not match the rhythm of the jump rope. They conducted a similar test using a strobe light as a visual distraction. They found that for some jumpers, auditory distractions were harder to ignore than visual ones. Still, their results showed that they couldn’t make a general conclusion. They learned that each jumper on their team handles distractions differently.

Discuss with students the difficulties in controlling variables when conducting human performance investigations. In this case, how can you be sure the jumpers are trying equally hard in each circumstance?

## RIVERS

### NATIONAL SCIENCE EDUCATION STANDARD

#### Earth and Space Science Grades K–4:

*Changes in Earth and Sky*

#### Physical Science Grades 5–8:

*Structure of the Earth System*

The girls spent time at the museum exhibit on rivers and found three things there that made them want to learn more. They left the museum and headed for a local river to learn about a) how rivers meander; b) how sediment layers develop in water; c) how humans change river flow with dams. For example, they canoed down a meandering river, noticing how the water deposits rocks and pebbles on the inside of each curve.

On your next field trip to a science museum or nature center, ask your students to consider the exhibits more carefully. Look for some exhibits that encourage them to go into the field and investigate things for themselves.

## TIGERS AND OTTERS

### NATIONAL SCIENCE EDUCATION STANDARD

#### Life Science Grades K–4:

*Organisms and Environments*

#### Life Science Grades 5–8:

*Regulations and Behavior*

The girls received permission from their local zoo to develop play objects for two animals: river otters and tigers. For the otters, they make a six-sided hoop out of bamboo and inserted food into holes drilled in the hexagon. For the tigers, they made a papier-mache warthog and again put meat inside to make it attractive to the animals. The zookeepers put each plaything into the appropriate exhibit, while the girls observed the animals’ responses. Each object seemed to occupy the animal’s attention for several minutes, bringing out natural behaviors and keeping the animals active.

Discuss with students the challenges of keeping zoo animals physically active and mentally challenged.

For more details on these investigations, visit [pbskids.org/dragonflytv](http://pbskids.org/dragonflytv).  
Use the search option to quickly find the specific segment.