



My Science Journal



This journal belongs to:



DragonflyTV Engineers



I. Baitlin' Bots!

I'm Karl, and I build my own robots that compete in a robot wars contest. I tested two different weapon designs, to see which one would attack most fiercely. How do you think I tested my designs?

- A. used the weapons to cut through wood
- B. used the weapons to push an obstacle out of the way
- C. used the weapon to smash a pumpkin to bits

C: I aimed my robot's spinning weapon at a pumpkin, and measured how far the weapon threw the pumpkin guts. I found that the lighter-weight weapon spun faster, throwing pumpkin guts farther. This is the one I used in competition.

Answer

2. Go Kart Go!

We're Ali and Paige, and we race go-karts. Before each race, we test out our karts to find the best gear selection for that track. We can't shift gears on our karts like you can on a bike, so we have to choose the gears ahead of time. We selected three gear sizes and measured Ali's kart's performance using an onboard computer. Which gear size gave Ali the best performance?

- A. small gear
- B. medium gear
- C. large gear

B. We found that the small gear didn't let the engine run fast enough, but the large gear made the engine run too fast. The medium gear let the engine run fast, and delivered good power to the wheel. Ali won the race!

Answer



Critter Crossword



Each of these animals made an appearance on DragonflyTV. Fill in the crossword puzzle with these animals. The first one is done for you.



cat
cheetah
chicken
cockroach
coral
cow
crocodile

dog
dolphin
dragonfly
gorilla
manatee
octopus
otter

pig
prairie dog
red worm
salmon
sea lion
sea turtle
snake

termite
walleye
weevil
whale



Do It, Get to it!

What?

Demonstrate how soap films affect the surface tension of water.

Materials:

- a dish with water
- dish soap
- pepper

How?

1. Grab the pepper and shake a bunch of it all over the water dish.
2. Then add a drop of soap to the center. Watch what happens to the pepper flakes.

Pepper floats on top of the water because water molecules are attracted to each other and cling together, almost forming a "skin". It's called surface tension. When the soap hits the water, it makes a film that breaks the "skin". The "skin" opens up, taking the pepper with it. What else besides soap can break the surface tension? Try different things! Don't just sit there... Get to it!

Why?



Science Outside... Smelling Insects

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 each one every hour, and write down what kinds of bugs (if any) you see. Do the bugs prefer the same smells you do?

smell	# of bugs	kinds of bugs
1. _____		
2. _____		
3. _____		
4. _____		

**Tell us about your results and send them to DragonflyTV.
Find out how at
<http://pbskids.org/dragonflytv/beon.html>**

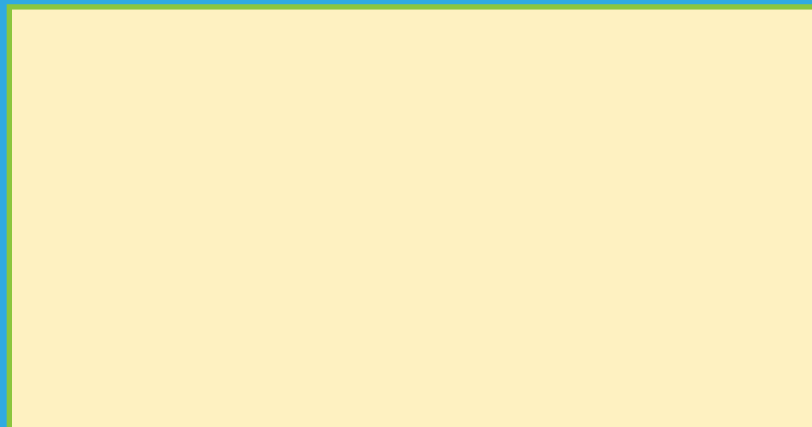




Designer Bugs!



Did you know that there are over 350,000 types of beetles, 400 types of bees, and 150,000 types of butterflies? Here's a chance for you to design your own type of bug. Decide what features your insect will have, and tell the purpose of those features. For example, tell what color(s) your insect has, and how those colors help it (camouflage, attracting a mate, scaring enemies, etc.). Decide where on Earth your bug lives, and why it is especially suited to living there. Make a drawing of your insect below!



My insect is a _____

My insect lives in _____

My insect eats _____



Try this: Match the footprint to the animal!



Here are some footprints from different animals, and pictures of the animals that made them. Draw a line matching each print to the proper animal.

1. cat



A.



2. chimpanzee



B.



3. pig



C.



4. squirrel



D.




Answer
1-C; 2-A; 3-D; 4-B


Have you ever found animal prints outdoors in the mud? You can "capture" the footprints using plaster of Paris. Read how at <http://www.wcsscience.com/casts/oftracks.html>. If you make a cast of a footprint, bring it to your nature center or science museum for help in identifying it.


Log on to <http://pbskids.org/dragonflytv/games/>
and play some more matching games!





How can you accelerate a roller coaster to over 100 miles per hour, without using gravity?


 = A or U


 = R or Z

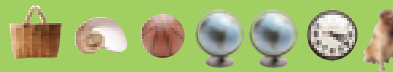
 = C or L

 = H or I

 = E or P

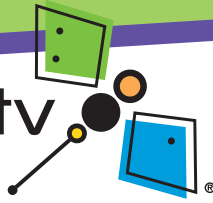
 = D or O

 = S or T



Answer
Use pressurized air to push the roller coaster

Log on to www.dragonflytv.org and click on Riddles & Games to see for yourself!



egg in a bottle



Do It, Get to it!

What?

Demonstrate the power of air pressure.

Materials:

- a peeled hard-boiled egg
- an empty glass bottle, with a neck slightly smaller than the egg
- three matches

How?

1. Grab a parent or adult to light the first match and then light the other two.
2. Drop all three lit matches inside the bottle.
3. Before the matches burn out, place the egg in the mouth of the bottle.
4. The matches go out and the egg starts to slide in!

The flames heat the air inside the bottle. When the matches go out and the air quickly cools, that makes the air pressure decrease inside the bottle. The air outside the bottle starts to push the egg into the bottle. But what does that mean for the egg? Don't just sit there... Get to it!

Why?



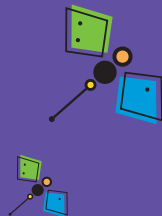
What's That Smell?

Phillip Tong

Did you know that making ice cream is a science? That's Dairy Scientist Phillip Tong's specialty. As a researcher at California Polytechnic State University, it's his job to find ways to improve the process for making ice cream, and to come up with tasty new flavor ideas. He studies other dairy products too, like cheese and milk. What's his favorite ice cream flavor? Espresso! See how Phillip makes ice cream in DFTV shows 204 & 206.

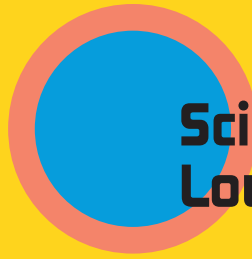
Do your own taste tests! How does your sense of smell affect your ability to recognize flavors? Try this: Gather some food items (jelly, peanut butter, soup, candy, juice, etc.), and have a friend taste one with eyes closed and nose plugged. Have your friend describe the flavor. Then give your friend a second taste of the same thing, this time with nose unplugged, but eyes still closed. What does your friend say now? Then you try it!

Check out what DragonflyTV scientists learned by logging on to <http://pbskids.org/dragonflytv/explore/humanbody5.html>



Learn about other cool scientists at
pbskids.org/dragonflytv





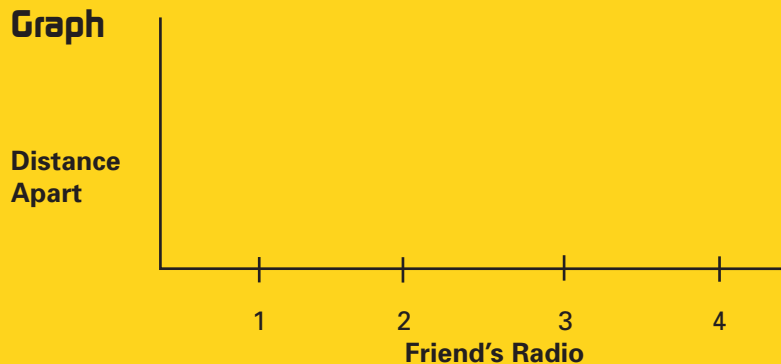
Science In Your Backyard: Loud Sounds



Investigate how sound fades with distance. Go outside and stand back to back with a friend. You'll need two portable radios with speakers, not earphones. Your friend sets her radio to a loudness setting of 2 (on a scale of 1 to 4); you set yours to a setting of 1 (quieter than your friend's radio). You walk away until you think your friend's radio sounds as loud as yours. Measure the distance. Now return to your friend. Keep your radio at 1, but have your friend turn her radio to 3. Walk away again until they sound the same. Repeat with your friend's radio at 4. What do you notice about the distance? Record your findings, and make a graph in the space below.

My radio	Friend's radio	Distance apart when they sound the same
1	2	
1	3	
1	4	

Graph



Tell us about your results and send them to DragonflyTV.

Find out how at

<http://pbskids.org/dragonflytv/beon.html>





DragonflyTV Animal Scientists



1. Righty or Southpaw?

We're Cleo, Brittany, and Molly, and we're crazy about cats. We know that people are either right- or left-handed, but we wondered if that goes for cats, too? Do cats have a paw preference? We gathered up a bunch of Cleo's cats to find out. What do you think we learned?

- A. Cats are all right-pawed
- B. These cats showed no particular preference
- C. Each cat has a definite preference, either left or right

B. One cat would use the right paw to reach for a treat, but then use the left paw to swipe at a toy. The other cats had similar results. We concluded that our cats don't have a specific paw preference.

Answer

2. S-S-Snakes!

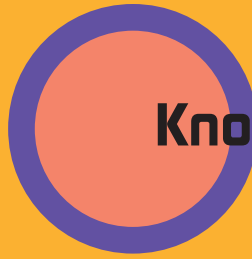
We're LeighAnne and Carmen, and we've been handling snakes our whole lives. We know they use their tongue to smell for food. We wondered if you can tell what a snake likes to eat by how it flicks its tongue. We counted the tongue flicks that a big python made, when we gave it four different scents. Which scent made the python flick its tongue the most?

- A. Frog
- B. Mouse
- C. Minnow

B. The python flicked its tongue most often for the mouse. This is what it usually eats!

Answer

Learn more about these investigations by logging on to <http://pbskids.org/dragonflytv/explore/mammals9.html> or <http://pbskids.org/dragonflytv/explore/creepycrawlies5.html>



Know Your -Ologists!

Tarissa, Kevin, Ari, Kristen, and Akeem are all real kids who did science investigations on DragonflyTV. The subjects they each studied can be described by the following words: a) geologist (studies the earth); b) audiologist (studies sound); c) oligochaetologist (studies worms); d) cetologist (studies marine mammals); e) herpetologist (studies reptiles). Use the clues below to match each person to the job description. You can use the grid to help eliminate choices as you go through the clues (put 'yes' or 'no' into a square, according to what the clue tells you).

Person	audio-	geo-	oligo-	ceto-	herpeto-
Tarissa					
Kevin					
Ari					
Kristen					
Akeem					

Clues:

1. The geologist is a boy.
2. Kevin studies living things, but Ari does not.
3. Kristen does not study reptiles or worms.
4. Akeem does not study mammals, but does study other animals.
5. Tarissa measures things in decibels.
6. The creatures that Akeem studies have scales.

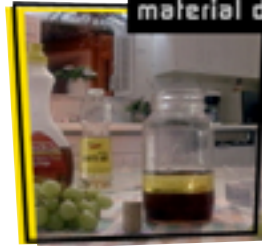
Tarissa - audiologist; Kevin - oligochaetologist; Ari - geologist; Kristen - cetologist; Akeem - herpetologist

Answer





material density



Do It, Get to it!

What?

Demonstrate how materials of different densities float or sink.

Materials:

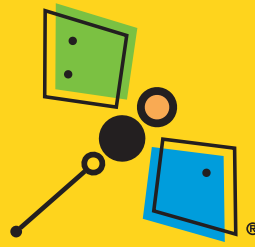
- a tall glass jar
- cooking oil
- a grape
- a cork
- syrup
- a cup of water
- a small piece of plastic

How?

1. Pour two cups of syrup into the jar.
2. Slowly pour two cups of cooking oil into the jar. It should float on the syrup.
3. Pour the cup of water into the jar of syrup and oil. It will sink below the oil, but float on the syrup. It forms a whole new layer!
4. Grab the cork, the grape and plastic and drop them in. Will they sink or float?

Water, oil and syrup all have different densities. The dense syrup sinks while the less dense oil floats on top. The water has a medium density, and goes in between. The items that were dropped in also have different densities. Figure out which items are more or less dense than oil, water, or syrup. Don't just sit there... Get to it!

Why?



DragonflyTV Themes

DragonflyTV is all about real kids, just like you, doing REAL SCIENCE! Check your local PBS listings to tune into episodes on these great topics:

Season 1

Investigate!
Wheels
Animal Behavior
Water
Rocks
Flight
Weather
Technology
Plants
Air
Human Behavior
Space
Human Body

Season 2

Investigate!
Structures
Sports Science
Spinning
Propulsion
Human Body
Sound
Technology
Ecosystems
Underwater
Mammals
Earth Systems
Creepy Crawlies

If you have great investigations, DragonflyTV wants to know about them!
Visit our Web site at pbskids.org/dragonflytv, or write to us at:

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