

# SciGirls Activity 11

## Doggone It!



### Icebreaker:

### Seeing is believing with INVISIBLE INK!

#### SciGirls Skill: Experimenting



#### You'll need:

- a piece of white paper
- an artist's paint brush
- baking soda
- water
- grape juice

#### Guide your girls as they:

- 1) Put two spoons full of baking soda into a cup. Add a cup of water. Stir.
- 2) Use the paint brush to paint a message on the paper, using the baking soda-water mixture as the paint. Let the paper dry completely.
- 3) When you want to reveal the message, brush over the entire paper with grape juice. What happens? Why?



**SciGirls Suggestion:** These simple materials allow each girl in your group to create her own secret message. Encourage them to try liquids other than grape juice. What happens with root beer? Milk? Why?



For more information on this sneaky activity, surf to [http://pbskids.org/dragonflytv/superdoit/invisible\\_ink.html](http://pbskids.org/dragonflytv/superdoit/invisible_ink.html)

## Investigation:

### Colorblind Dogs

Test “doggie vision” with this experiment.

We’re Elizabeth and Caitlin. Our pets Sassie and Chime are agility dogs and they’ve been in training since they were puppies. We noticed that some of the obstacles in the agility course are the same color. We always thought dogs were colorblind. No one could say Sassie and Charm aren’t colorful, but our SciGirls question is: **Can our dogs see colors or are they really colorblind?**



### You’ll need:

- 20 tennis balls
- swatches of colored cloth in shades of gray, green, pink, yellow, blue, and red to cover the tennis balls; 15 gray swatches, then one each of the other colors
- a dog or two!



Visit [pbskids.org/dragonflytv/show/colorblind\\_dogs.html](https://pbskids.org/dragonflytv/show/colorblind_dogs.html) for more doggone information! Then surf to [pbskids.org/dragonflytv/contact/index.html](https://pbskids.org/dragonflytv/contact/index.html) to tell us about your investigation!



Check out this investigation on Tape 2, Segment 11.



## SciGirls Want to Know: What colors, if any, can dogs see?

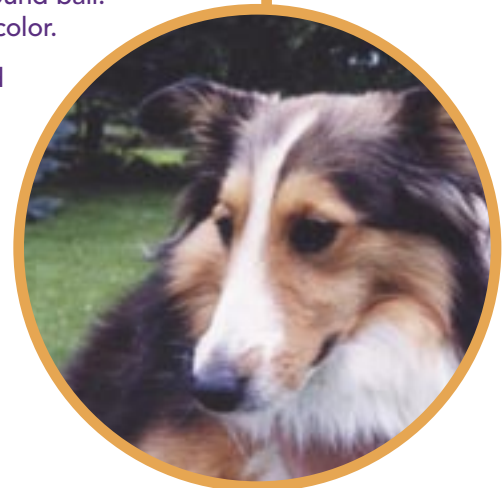
### Guide your girls as they:

- 1) Find a dog or two that is already trained to fetch.
- 2) Cover 15 tennis balls with swatches of gray cloth, some lighter shades, some darker. Toss 14 of them out randomly in a 3 meter x 5 meter area (keep one of the gray-covered balls as the test ball). These serve as "background" balls, out of which the dog must find the tossed ball.
- 3) First run the control test, which involves retrieving a gray ball from among other grays. Stand 15 meters away from the background balls with the test dog. Show the dog the test ball (gray). Give the dog a "wait" command, toss the ball among the others, let it come to rest, then release the dog and give the fetch command. The dog should retrieve a ball and bring it back. Record whether the dog retrieved the tossed ball, or one of the background balls. Repeat for five trials minimum.
- 4) Now run the color test, which involves retrieving a colored ball from among the grays. Select a ball covered with a colored cloth. Again, "wait" the dog, toss the colored ball among the grays, release the dog and have it fetch once the tossed ball is at rest. Record whether the dog retrieves the colored ball, or a background ball. Repeat five times minimum with each color.
- 5) Repeat entire sequence with a second dog, if possible. Remember to record your data in a notebook!

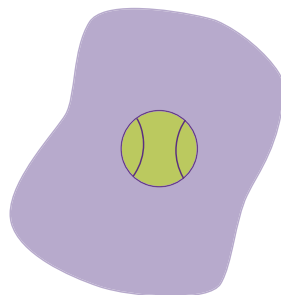


### SciGirls Secret:

Animal behavior inquiries are always favorites, so why not show your girls how they can build a career around their love for animals? Model this career path by exploring biographies, documentaries, or Web resources about animal researchers like Jane Goodall, or have them interview a local veterinarian or Humane Society employee. It could become their pet topic!



Colored Fabric



Tie with string



## SciGirls Synthesize: Data and Analysis

Here are Elizabeth and Caitlin's results. You can use this chart as a model for your own data.

### Number of Balls Correctly Retrieved

	Dog 1	Dog 2	Combined
Control Test	3 out of 5	2 out of 5	5 out of 10
Red	2 out of 5	2 out of 5	4 out of 10
Blue	1 out of 5	3 out of 5	4 out of 10
Green	0 out of 5	1 out of 5	1 out of 10
Yellow	2 out of 5	3 out of 5	5 out of 10
Pink	2 out of 5	2 out of 5	4 out of 10

See Appendix A for a graphing example.

#### Conclusion:

Of course you will draw your own conclusions, but the DFTV girls found that firm conclusions were difficult to reach due to inconsistencies between the two dogs. (One problem was the tendency for one of the dogs to sniff out the tossed ball, apparently trying to find the dog handler's scent!) Still, the girls found that these dogs can distinguish yellow balls from gray ones, but reds, greens, and pinks are more difficult to distinguish from grays. One dog was able to distinguish blue, but the other dog could not. What did you find?

## Keep Exploring!

Test your pooch's sense of smell. Set three cups upside down on the floor with just one of them having a smear of peanut butter inside. Call your dog over and see which cup gets its attention first. Did your dog find the cup that smells like peanut butter on the first try?