OVERVIEW: The Canine Cognition badge is designed to increase the human and canine bond. The exercises show us different dimensions to how our dog's brains work and how we can use that knowledge to teach new skills.

COGNITION & FAST-MAPPING:

Cognition is the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses.

Fast-mapping is a way of learning; it's the hypothesized mental process whereby a new concept is learned based only on minimal exposure to a given unit of information. Fast-mapping is often used as a method to teach a very young child new words. It's also a way to aid in memory recovery in adult patients who have experienced some type of brain injury. In much the same way we can use the concept to teach dogs new skills. Fast-mapping does not negate or replace the need for multiple repetitions in training and 80% response accuracy before moving on to the next training step. It means drawing conclusions based on immediate context, and then confirming or revising the conclusion as additional knowledge is acquired.

Using fast-mapping to teach new information to our dogs does not involve any "tricks", for example, where a dog appears to be reading a cue card but is really responding to a different, subtle cue. Instead, it's a way to use contrast and context to teach our dogs the ability to follow cues in ways not previously imagined.

INDICATION BEHAVIOR:

In order to communicate with your dog using fast-mapping, your dog needs to have a solid indication behavior, a paw or nose touch. As this is an advanced badge, it is assumed that the dog already knows this and uses it in varying ways. The information below can be used for dogs needing a tune up.

From the Art of Shaping Badge -

Elicit a paw behavior using games to get the paw moving. This can be achieved in a number of different ways, including those below.

1. Slot machine – dog paws at hand hiding a treat and hand opens to deliver the treat
2. Target stick slap – don't reward for a nose touch; instead wait for the dog to paw it
3. Shell game – treat is covered by a hand on the floor; hand lifts when dog paws at it
4. Leaning tower – dog targets to one side until weight comes off the opposing foot
5. Yucky paw – do something strange to the paw like putting double stick tape on the bottom in order to get him to lift it

From the All Dog Band Badge -

1. The object you want your dog to touch with his nose needs to be interesting to the dog in some way
2. Use a touch stick to have the dog target the object with his nose
3. Place a small dry treat in the place the dog should touch with his nose
4. Click and treat when the dog's nose comes in contact with the object
5. Use the technique on different objects to proof the behavior

In order to proceed with this badge, the dog's indication behavior must be solid and consistent. if the dog knows both a paw and a nose touch indication behavior, they may both be used for the cognition exercises. However, the cue given to the dog - paw or nose touch - must result in the proper response.

NON-AGGRESSIVE "NO" BEHAVIOR:

Teaching your dog a non-aggressive way to say no has many applications and is helpful in getting a dog to cooperate with you without needing restraint. Usually, the behavior taught for this purpose is a chin rest or bucket indication, but other behaviors are acceptable providing they serve the same purpose. The "no" behavior is useful when grooming with a comb or brush, clipping nails, checking for a strain or other first aid, massaging the dog, putting on booties, etc. It can also be used as a focus behavior to settle the dog.

The non-aggressive no behavior is a contract between you and your dog. You must **always** follow through and honor what the dog is telling you.

The Chin Rest

This concept has been in use for many years, especially with exotic animal husbandry, but the original history is unknown. You can teach a chin rest in the hand but then your hands aren't free to do what you need to do. Teaching a chin rest on a towel, chair, bed, table, etc. allows your hands to remain free to perform care tasks.

1. Shape dog to rest chin on rolled up towel, hand, etc.
2. Increase the duration of the behavior
3. Move your hand towards the dog – stop immediately if she lifts her chin
4. Reinforce chin resting by repeating step 3 and building duration
5. Touch the dog – stop immediately if she lifts chin
6. Reinforce by repeating step 5 and building duration
7. Add additional steps as needed until process is complete

Reward the dog for the chin rest, but avoid treating immediately after the chin rest resumes or the dog will start lifting his chin to check to see if a reward is coming. Delivering treats to the front of the dog's mouth will help to keep the dog's focus forward rather than where you are positioned.

Generalize the behavior by cuing the chin rest on many different objects so she is prepared whenever the technique is needed.

The Bucket Indication

This is a more recent technique developed by Chirag Patel. It serves the same purpose as the chin rest by giving your dog a choice about participating in the activity that needs to be performed.

1. Put treats in a small bucket or cup
2. Reinforce the dog for looking at the "bucket" while it's in your hand
3. Reinforce the dog for looking at the bucket when it is placed on the floor or a small table
4. Increase the duration required
5. Move hand toward dog – stop immediately if she looks away from bucket
6. Reinforce the dog looking at the bucket by repeating steps 2 and 3, building duration and gradually moving hand closer – praise, but do not reward an immediate resumption of looking at the bucket or you will encourage the dog to bob his head in order to receive a reward
7. Touch the dog – stop immediately if she looks away from bucket
8. Reinforce looking at the bucket by repeating steps 4 and 5, building duration and pressure of touch
9. Add additional steps based on what you are choosing to use this process until process is complete

Practice this technique with the bucket in different places and with different objects in your hand, i.e. a brush, comb, nail clippers, cold pack, muzzle, etc. so that the dog is prepared whenever the technique is needed.

VIDEO DEMO

A SOLID "LEAVE IT" CUE:

A solid "leave it" is useful in many different situations as you undoubtedly have already discovered. Practicing the cue as outlined below helps both you and the dog to understand the concept of "I know you know". Though this concept is something that is likely demonstrated in your home many times each day, you may be unaware of it.

Play the "leave it" game with a favorite toy or tempting treat by having your dog leave it under varying conditions, like:

● When you are looking at the dog
● When you are facing dog with eyes covered
● When you have your back turned towards the dog
● When out of sight of the dog, in another room or with a closed door between you

Increase the duration of the exercise to 1 minute, 2 minutes or even 10 minutes.

VIDEO DEMO

"I KNOW YOU KNOW":

The exercise above demonstrates that "I" (the handler) knows that the object is to be left and "you" (the dog) knows the same, and both know that the other has the same understanding of the situation.

How many ways does this occur each day? Think about how a dog communicates that he wants to go outside for example. Does he stand by the door, ring a bell, or bark? However he lets you know, it is clear that you both have the same understanding of his action.

Another example of "I know you know" is choice. The dog is given a choice of actions, where it is clear to both of you that there is a choice and a resulting action of that choice. You likely give your dog choices fairly often. Consider the following circumstances:

Choice: Applications for teaching a Choice Cue

- Walking in town – turn left at corner or cross the street? "You choose!"
- Walking in the woods – take the trail to the left or to the right? "You choose!"
- At the door – go out in the yard or stay inside? "You choose!"
- Do you want to go for a drive? "You choose!"
- Which treat do you want today? "You choose!"
- Go get a toy. "You choose!"
- And/or…

"You Choose" Video

Pointing Cup Game

This game is an easy demonstration of "I know you know". The objective is to get your dog to go to objects when you point to them, starting with a simple opaque cup and using a "get it" cue.

1. Teach your dog to get treats under a cup
   a. Place an opaque plastic cup in front of your dog on the floor
   b. Let the dog see you place a treat under it
   c. Tell your dog to get it and encourage her to knock over the cup to get the treat
2. Pointing Test #1: Do I Know You Know?
   a. Don't let your dog watch (place behind a barrier or have someone cover dog's eyes)
   b. Put an opaque plastic cup off to one side, 6-10 feet from the dog
   c. Return to your starting spot across from the dog and have your partner uncover the dog's eyes. Alternatively, bring the dog out from behind the barrier and have her stay, then return to your starting spot.
   d. Point to the cup and tell the dog to "Get it!" (release her from the stay if necessary). Repeat several times.
   e. Record your results. Does the dog go promptly to the cup and get the treat the first/each time? What does this suggest to you?

3. Pointing Test #2: I Know You Know
    a. Have your dog sit or lie down and stay
    b. Put out two opaque plastic cups one on each side, 6-10 feet from the dog
    c. Let her see you place a treat under one of the cups
    d. Return to your starting spot across from the dog
    e. Point to the cup with the treat under it and tell her to "Get it!" (release her from the stay if necessary). Repeat several times
    f. Record your results. Does she go promptly to the cup and get the treat each time? What does this suggest to you?

The "I know you know" concept can be applied to other objects once the dog has a solid understanding of the game.

VIDEO DEMO

DISCRIMINATION BEHAVIORS:

Discrimination (object, shape, color, written word) is the ability to determine (and indicate) the difference between similar-but-different things using fast-mapping, the mental process where concepts are learned based on limited exposure. Fast-mapping appears to be mediated by general learning and memory mechanisms. In order to learn through fast-mapping, two conditions need to be met: referent selection and referent retention. In referent selection, the dog must associate a word with a particular item; whereas, in referent retention, the dog must be able to store the word in his memory for later use.

All of the discrimination behaviors used for this badge require an indication behavior as described above. In order to prove the dog's understanding through cognitive learning, **the behavior must be repeated multiple times**, changing the circumstances (object, location, etc.) each time. Remember that there can be no extraneous cues given to the dog during demonstration. Though the behaviors appear to be like tricks and can be used in many different situations to impress others, they are not tricks as we tend to think of them. They represent true cognitive learning.

Object Discrimination -

When first teaching object discrimination, start with only one differential. As you increase the difficulty more will be added. Don't rush the process. You need to ensure that the dog has progressed from just a lucky guess to an informed choice before moving to the next step.

1. Teach the name of an object using classical conditioning
    a. Show the dog the object, i.e. "ball"
    b. Pause to let the dog take in the information
    c. Use indication cue, i.e. "touch"
    d. Allow the dog to respond to the indication cue and reward a correct behavior
    e. Remove the object from the dog's sight, i.e. behind your back

f. Bring the object back and repeat the steps above

Note: At this point the dog may automatically go to the object when you say the name of it. You may accept that or you may prefer to have the dog wait for the indication cue before moving. Teaching the dog to wait allows you to later change the cue from "touch" to "find", "fetch", or "bring".

2. Teach the name of the second object
   a. Put the first object away
   b. Repeat the above steps for a second object, i.e. "cup"
   c. Continue as above, randomly switching the sides the object is coming from
2. Discrimination between objects
   a. Hold both objects behind your back
   b. Present the 2 objects together and ask for one, i.e. "ball"
      i. Offset the object you ask for so it is closer to the dog, setting the dog up for success
      ii. If the dog attempts to indicate the unnamed object, you may put it quickly behind your back without saying anything, allowing the dog to "touch" the correct object
      iii. Gradually decrease the offset
   c. Continue the process, randomly switching the sides the objects come from and the object you ask for
   d. Work up to the point where your dog can discriminate objects from a distance of at least 5 feet, requiring him to step forward to identify the correct object
3. Work to add additional objects - 3 are required

Note: The process used for object discrimination is essentially the same process you will use for several of the discrimination exercises. For that reason, we have abbreviated the process for those exercises. There are some variances, and those are noted with each exercise.
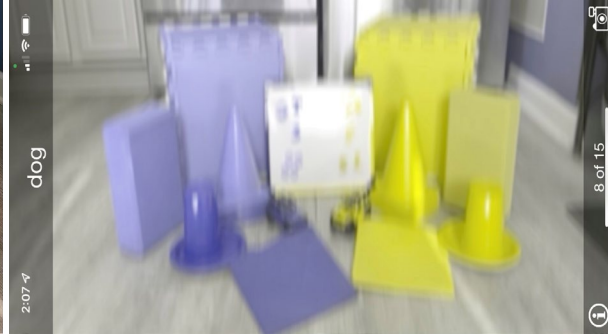
VIDEO DEMO

Color Discrimination

Dogs are said to be red/green colorblind. Though this is not entirely accurate, it is the best description we have for understanding a dog's vision. Dogs see primarily in shades of blue, yellow and gray. Notice the two photos below. The items in the photo are ***absolutely identical*** other than their color. The first photo shows the objects s we see them. The second uses a "dog vision" filter to show us a representation of how our dogs see those items. Dog vision apps, like *Creature Vision*, are available in the Apple App Store and on Google Play.

August 2021

Original Picture   How Dogs see it

Rex Specs gives us another example of [what do dogs see?](#).

For this exercise you will need 3 sets of identical objects, where one is blue and its mate is yellow. To teach your dog to discriminate between blue and yellow you will follow a process similar to the one described above for object discrimination. The process below is abbreviated based on knowledge gained in teaching the previous exercise.

1. Teach the first color, i.e. "blue"
   a. Use the dog's indication cue, i.e. "touch"
   b. If the dog goes automatically to the color when you name it, decide if you will except that or prefer to have him wait for the indication cue
   c. Repeat with the same color, switching sides
2. Teach the second color, i.e. "yellow" as with the first
3. Present both colors together once you are confident that the dog knows the color names
   a. Put both colors behind your back
   b. Show both at the same time, with one offset
      i. If the dog heads toward the wrong color, reset, and when you next present the 2 colors increase the offset and allow the dog to indicate the correct color
      ii. Gradually decrease the offset
   c. Repeat with both colors, randomly switching sides and the color you ask for
   d. Add distance until your dog can identify colors at a distance of 5 feet, when placed on the ground
4. Repeat the process of color discrimination using a different set of identical blue/yellow objects. Three sets of objects are required, and one must require the dog to walk to the object at a distance of at least 5 feet.

VIDEO DEMO

August 2021

Shape Discrimination

As you might guess, the process for teaching shape discrimination is essentially the same as described above for object and color discrimination. For this exercise you may use objects or shapes printed on cardstock and cut out or you can draw the shapes on small whiteboards as pictured. The use of shaped magnets on a magnetic board is also acceptable. The key is to make sure that the objects are large enough to easily identify them. Eventually your dog can learn to discriminate between larger shapes such as a hoola hoop (circle) and a cube (square).

Follow the process as described until the dog can distinguish between at least 3 different shapes when they are presented simultaneously.

With objects, colors and shapes you can add an additional degree of difficulty by combining attributes, i.e. "blue ball", "yellow car", or "blue triangle".

INSERT PHOTO

VIDEO DEMO

Reading Cue Cards

When teaching a dog to read cue cards our process varies a bit from what we use with objects, colors and shapes. Remember that this is not a parlor trick. It is true cognitive learning and requires patience on the part of the handler, and multiple training sessions for the dog.

Dogs do not recognize written language as we do, but they can learn that certain squiggly lines mean one thing and other squiggly lines mean another. To ensure that we are not "polluting" the dog's learning with any intentional or unintentional extraneous cues, it can be helpful to have someone else watch you when working with your dog and give you feedback. Alternatively, you can video your training sessions and watch yourself to make sure you have no extraneous movement.

The words you want to teach your dog should be printed as large as possible on standard size paper or cardstock. At least two of the words you use must be obedience words. The third may be any word of your choice. Make sure the words you start with are dissimilar enough that they will not confuse the dog. For example, the words "paw" and "bow" look very similar to a dog. Likewise, "sit", "spin" and "stand" all begin with an "s".

Again, we are using classical conditioning to pair a new cue with a known cue. The dog must know and respond to the verbal cues for the requested behaviors.

1. Teach your first word, i.e. "down"
    a. Start with the dog in front of you; he may be on a platform or mat if you wish
    b. Show the dog the cue card
    c. After a pause, give the verbal cue, i.e. "down"
    d. Click and treat when the dog responds with the correct action
    e. Repeat the process until you can eliminate the verbal cue

    f.   Continue practice until you have a minimum of 80% success rate with no verbal cue

2.   Introduce the second word, i.e. "sit"
    a.   Start as before and show the dog the new word
        i.   The most likely response is that the dog will repeat the action associated with the previous word, i.e. "down"
        ii.   When this occurs, return the dog to his neutral position and ask him to wait
    b.   Show the cue card again and follow with the verbal cue, i.e. "sit"
    c.   Click and treat when the dog responds with the correct action
    d.   Repeat the process until you can eliminate the verbal cue
    e.   Continue until you have at least an 80% success rate with the second word

3.   Present the first two words randomly to the dog
    a.   Show the dog one of the words
        i.   If he responds correctly, click and treat
        ii.   If he responds incorrectly, return him to his neutral position with a simple word, i.e. "whoops", "try again", or "uh oh", to let him know that he was incorrect
    b.   Randomly present the words, adding in the verbal cue as necessary
    c.   Repeat the process until you can completely eliminate the verbal cue

4.   Once your dog is successful with two words, add the third using the same process
    a.   Make sure you are presenting the words randomly - no pattern training!
    b.   Always hold the cards in the exact same way, i.e. one hand or two, placement of hands, position of cards, etc.

There are several things to keep in mind when teaching cue cards.

- Consistency is important
- You can use any words you like, providing at least two are obedience words - be creative
- Words that require the dog to move away from his position are perfectly acceptable, i.e. "bed" for "go to bed"
- You may need to use different fonts, upper and lower case as needed to distinguish between words
- You can teach as many words as you like. It's quite fun to have a dog that can read!

"My Dog Can Read!" Video Demo

Matching Objects

The object of this exercise is for the dog to be able to indicate an object with a "same" or "match" cue when shown an identical object. The objects can be anything as long as they are ***absolutely identical, including their color***. Finding identical objects around the house shouldn't be difficult. Anything will work, including things like cans of beans, straws, candles, etc. You will need 3 sets of identical objects for the exercise.

Absolutely identical examples:

Not identical examples:

1. Teaching the "match" cue
   a. Sit on the floor with your dog in front of you and a low platform between you
   b. Put one object on the platform and ask your dog to wait - the identical object should be behind your back
   c. Bring the item from behind your back and show it to the dog
   d. Give your dog your cue, i.e. "same" or "match" followed by your indication cue, i.e."touch"
   e. Reward the dog when he indicates the matching item on the platform
   f. Repeat several times before moving to a different pair of items
2. Repeat the process with a second pair of items
3. Matching with more than one item in view
   a. Place two items on the platform and ask your dog to wait
   b. Bring one of the identical items from behind your back and ask the dog to "match"
   c. Reward the dog for responding correctly or use a word like "try again" if he responds incorrectly
   d. Continue presenting the two items randomly
   e. Repeat until your dog is responding correctly the majority of the time
4. Add a third item, repeating the process above

Most dogs pick up on this exercise quickly and can match an unlimited number of things. There are infinite uses for this skill! You can build on it by asking the dog to go and "get" or "find" "same". This comes in handy if you find yourself in one room with a slipper and you need your dog to go get or find the other one. When paired with other skills, like opening the refrigerator, it's possible for your dog to go and get you another cold beverage!

VIDEO DEMO

Counting

To teach your dog to count you will need three simple identical items, such as rubber ducks. You also need several white boards or magnetic dots large enough for the dog to see easily and several magnetic boards.

1. Start with one board showing one dot
   a. Place one of the items in front of you
   b. Display a white board with a large dot on it or magnetic board with a single dot
   c. Say "one" and your indication cue, i.e. "touch"
   d. You may point at the object and then the board
   e. Dog should respond by indicating the dot
   f. If using, gradually fade out the pointing gesture
   g. Repeat the process until the dog indicates on the single dot
2. Add a second board with two dots
   a. Place one of the items in front of you
   b. Display both boards, one with one dot, the second with two
   c. Say "one" and your indication cue, i.e. "touch"
   d. You may point at the item and the correct board if needed
   e. Dog should respond by indicating the dot
   f. If using, gradually fade out the pointing gesture
   g. Repeat the process until the dog can differentiate between the boards with one and two dots
3. Repeat the process now using two items and two boards
4. Once solid, randomly alternate between one and two items
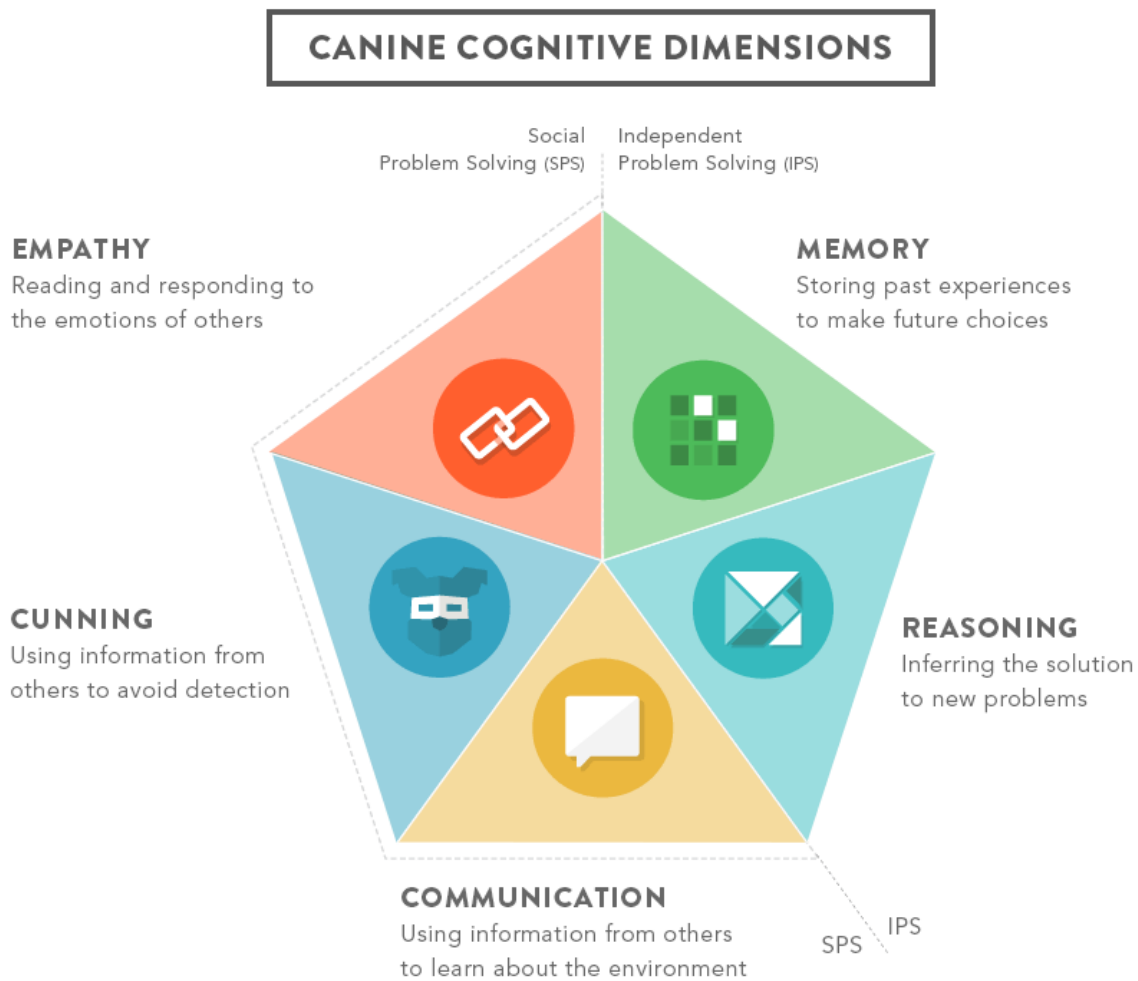5. Add teaching the number three using three dots

With practice, your dog should be able to differentiate between one, two and three of the items you are using and indicate the correct board. When using three boards, you can place them on some sort of stand if that makes the logistics easier for you. Make sure to shuffle the boards often to be sure the dog is not simply hitting left, right or center. As your dog perfects this concept, you can begin to ask him "how many" rather than saying the number.

VIDEO DEMO

August 2021

COGNITION TEST:

The last requirement for this badge is for the handler to set up a cognition test that applies fast-mapping. This type of test requires the dog to use all dimensions of cognition in order for your dog to respond to the test. The graphic below, from dognition.com, shows the different cognitive dimensions that a dog will use to solve a problem. While they appear equal as depicted, each dog is different in their ability to apply these in navigating the world around them.

CANINE COGNITIVE DIMENSIONS

Social
Problem Solving (SPS)

Independent
Problem Solving (IPS)

EMPATHY
Reading and responding to
the emotions of others

MEMORY
Storing past experiences
to make future choices

CUNNING
Using information from
others to avoid detection

REASONING
Inferring the solution
to new problems

COMMUNICATION
Using information from others
to learn about the environment

SPS   IPS

Please note that while the dognition.com website provides some good information, it is a commerce site where they offer testing packages for canine cognition. DSA is not in any way endorsing this site or encouraging the purchase of a testing package

You will notice that there are two different types of skills – social problem-solving skills (external) and independent problem-solving skills (internal). Social skills come from the outside world whereas independent skills come from the dog's own sense of self.

You likely have a pretty good understanding of your dog, even if you've never thought of these concepts quite like this before. Do you have a highly empathetic dog? How about one who seems to have excellent reasoning skills? Just as a dog has strengths in these areas, they have areas that challenge them as well. It's important to understand that these dimensions do not measure IQ in any way. One dog is not smarter than another based on his ability to apply one of these skills. Breed traits often play a role in the skills a dog relies on most. However, skills can be developed. This is why our Dog Scout badges are open to all breeds and activities/badges/titles are not limited to groups that have been selectively bred for specific traits.

Setting up and running a cognition test

The test that you set up must be a unique one, that is, one that you have thought of yourself and not one found on our web site or anywhere else on the internet. It is acceptable to work with a partner to brainstorm, and then set up and run your test with both of your dogs. However, both partners must contribute equally to the process.

You will need to provide any equipment that you will need for your test. Some tests use little at all in terms of supplies and others may take on more complexity. You may simply need 2 rooms, or you might need to use some kind of a blind. Some tests require a second person to hold or release the dog at the appropriate time.

All tests have the same components.

- Idea – What does your test consist of?
- Hypothesis – What do you expect to result from the test?
- Application – Running the test
- Actual Results – What actually resulted?
- Comparative Analysis – Were the results what you expected? Why or why not?

If we take a look at this cognitive test, we can better understand each of these components.

The idea of the test was fairly simple. Two identical bowls were used, and food was placed in only one of the bowls. The bowls were placed so that the bowl that contained the food was placed farther away from where the dog entered the room. The dog could not see what was happening in the room where the bowls were placed. The goal was to see if the dog would learn with repeated testing, that the bowl closest to her was always going to be empty. In order for the test to be true, each time the test was conducted the food was in the same bowl and food never touched the empty bowl.

The handler hypothesized that the dog would quickly learn to bypass the empty bowl. However, this dog is very food motivated so she would retain some interest in the empty bowl just in case it would yield a yummy morsel.

The test was run eight times. Each time, the food was placed in the same bowl and the hand that placed the food never touched the empty bowl.

The results of the testing were that the dog checked the bowl thoroughly on the first test, checked it a little more casually on the second test, and by the third test she was bypassing the first bowl completely.

The comparative analysis reveals that the results of the testing were essentially the same as the hypothesis. Given the food motivation of the dog, the handler was surprised that the dog failed to show interest in the empty bowl as quickly as she did. She expected it to take more than twice for the dog to learn. However, the dog quickly applied reasoning and memory skills to determine that the first bowl she encountered was going to be empty.

You will find other cognitive tests on the DSA web site on the Canine Cognition badge page.

The point of doing the test is to determine if you have a solid understanding of and are able to apply the canine cognition concepts you have learned. It does not matter if the actual results of your test match your hypothesis. You simply need to be able to clearly articulate the steps of the process and the comparative analysis. **The cognitive testing requirement tests the handler's understanding of canine cognition and fast-mapping, and not the dog's ability to perform the test.**

Your test is limited only by your imagination. What can you come up with?

Cognition Test Video Demo

RESOURCES: There are many videos online that effectively demonstrate the 'Cognition' protocol and there are many books readily available as well. For more information, please consider the following resources.

- Pat Miller, CBCC-KA, CPDT-KA Fairplay, MD peaceablepaws.com puppyworks.com
- Do As I Do, Claudia Fugazza (website)
- Do As I Do, Claudia Fugazza (book)
- Genius of Dogs, Brian Hare (book)
- Dognition, Brian Hare (Citizen Science)
- Chaser; Unlocking the Genius Of the Dog Who Knows 1,000 Words, Pilley (book)
- How Stella Learned to Talk, Christina Hunge (book)
- Canine Cognition Center at Yale
- Duke Canine Cognition Center (Hare)
- Family Dog Project, Adam Miklosi; Budapest, Hungary