Nature on Your Brain?

*Elective 2*

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| **Author(s):** | Josh Lake |
| **summary:** | Nature gives us a chance to change our perspective, to see the world, and ourselves, in a new way. - *Submitted by* *Josh Lake* |
| **Topic(s):** | Nature Games  Natural Perspectives |
| **Learning Objective:** | 1. Experience a little radical amazement 2. Glimpse secrets of nature 3. Inspire wonder |
| **Audience:** | Any age, from 6-20 people. |
| **TIMING:** | 90 minutes |
| **AppendiCes:** | 1. Text Study for Nature On Your Brain Josh Lake cornerstone elective 2 2017  2 Heschel Quote  3. Rav Nachman Quote |
| **Materials Needed:** | None |
| **Set-UP DETAILS:** | Outdoors |

**Session Timeline & Outline:**

**Introduction**

Plant the quote in the audience. Have them read it out loud.

“Our goal should be to live life in radical amazement. ...get up in the morning and look at the world in a way that takes nothing for granted. Everything is phenomenal; everything is incredible; never treat life casually. To be spiritual is to be amazed.” – Abraham Joshua Heschel (*Man in Search of God*)

Overarching question: How can we use the natural world to interact with and engage our campers?

***Pokeiach Ivrim*: Magic of Seeing (10 minutes)**

Find a tree. How big is this tree? Here is a new way of measuring trees. Come up with consensus. Say the blessing found in *Birkat Hashachar*. Baruch atah….pokeiach ivrim!

WOW! Look under the ground to see the full size of the tree!

Now, let’s really measure this tree. How tall is this actual tree? Let’s include the *shoreshim*, roots!

Teach about using an object finder to measure tree’s height. Stand next to tree, have Fellows back up until they make one finger held at end of arm equal to your height. Count up with finger and then multiply # of fingers by your height.

How does this apply to our campers? Remember, they are much more then we see, they have their roots, their histories. How much do we look at someone and size them up? How much do we not see? *Pokeiach Ivrim*, a blessing that some people say daily, reminds us to look deeper at our natural surroundings and at our campers’ inner natures.

Let’s take a walk to see about other things and games we can play in nature and how wonder, fun and engagement can happen outside of the bunk, dining hall, *shiur*, etc.

**Oak Gall and Torah (10 minutes)**

This is what wasps have learned to do:

They have learned to genetically manipulate a tree to grow a house/nursery around their babies!

Jews have derived Torah from this amazing interaction! Torah is *Eitz Chayim Hi*!

Now that you know **about** the oak gall, what can we learn **from** the oak gall?

What does it mean in Jewish terms? Learning about Torah is one thing; learning from Torah is something completely different. Share logic from Bal Tashchit.

***Hitbodedut* and Rav Nachman of Bratslav (15 minutes)**

Martin Buber’s idea of I and Thou (*Ich un du* in German*)* expresses two possible perspectives:

* I-Thou is when you recognize the uniqueness of the being/object with which you are speaking/ interacting.
* I-It is when you treat the object you are interacting with as other.

A Blessing – who do you thing wrote this? (Save name until after responses – Rabbi Nachman of Bratslav)

Master of the universe, grant me the ability to be alone;

May it be my custom to go outdoors each day among the trees and grass;

Among all growing things. …May I express there everything that is in my heart,

And may all the foliage of the field all grasses, trees, and plants,

Awake at my coming, to send the powers of their life into the words of my prayer….

*Hitbodedut* is the reflexive Hebrew word that means to cause one’s self to be alone. It is Jewish Meditation. Almost all of our prophets received prophecy in a meditative state. Now we will have a chance to practice Jewish meditation. Find a place where you can sit, stand or lie down comfortably. Ask permission to be in that location. I’ll call you back in about 5 minutes.

Debrief: How was that experience for you? What did you see? Notice? Hear?

**Debris Shelter (20 minutes)**

Sacred order of survival:

1. Shelter
2. Water
3. Fire
4. Food

Address shelter. Let’s build a shelter. Discuss different kinds of shelters: house, Temple, *Chuppah, sukkah, Mishkan, etc.* Debris shelters are one of the oldest types of shelters humans employ.

Place the ridgepole on a tree. Put “ribs” off ridgepole to ground. Cover with leaves. This could save you/or your camper’s, lives.

Debrief experience.

**Shomer Shabbat Camera (20 minutes)**

Split the group into pairs. Ask them to find a partner they have not worked with or don’t know. Pull one person from group as an example. “Can I have a volunteer as a *doogma* (example)? Thank you \_\_\_\_\_\_\_, this will be painless (I hope).”

Explain to the group, “There are many types of vision. For today’s exercise we will limit ourselves to three types of vision. 1. **Direct object vision**. 2. **Peripheral vision**. **3.** **Splatter vision**.

Here is a very brief description of each.”

1. **Direct object vision**: Some people see an object and can describe that object. They look at an animal, tree, flower etc. and can describe exactly what they see.
2. **Peripheral vision**: Some people look and see how one thing may effect or affect something else. For instance, they see a tree casting a shadow. They see the tree, but they are noticing something on the periphery of that tree, namely its shadow.
3. **Splatter vision**: Splatter vision is not seeing any direct object, or any object that affects something else. Splatter vision is a blurring of the picture in front your eyes; sort of like taking a snap shot of everything. Your eyes focus on nothing in order to easily pick up movement or changes in the scene.

All cameras have a few things in common. They have shutters, film or memory, timed exposures, etc. The person you are paired with now, your partner, is your camera. The shutter is that person’s eyes and the film is your partner’s brain/ memory. You can control the timing of the exposure with your shutter button, which is your partner’s earlobe.

* To start the game, your partner closes his/her eyes. (This is where you may employ blindfolds if you like, but it is not necessary.)
* Hold on to your partner’s arm and encourage him or her to keep his or her other arm raised in front of them (“bumpers up” in outdoor gaming terminology).
* Carefully walk your partner to something you would like to capture on film. Remind him/her that in the Torah it says that you should not put a stumbling block in front of the blind (Leviticus 19:14). Here is your blind person; you must not trick them and cause them injury.
* Position her/his eyes (lens) toward the picture you want to take. Photographers, remember the three lenses you can use to take a picture.
* To open the shutter, gently pull on your partner’s earlobe. The shutter will remain open for as long as you hold the earlobe.
* Camera, remember the three lenses you have to choose from.
* The photographer cannot tell the camera which lens s/he wants to use; it’s sort of a funny camera that way. This is where your skill as a photographer comes into play. Can you skillfully capture your desired image? Do not over expose the film or you won’t capture anything. Between 1 and 3 seconds is usually enough time.
* When you have taken the picture, release the earlobe and the shutter snaps closed (eyelids close).
* As with digital cameras, we can see the picture we took immediately.
* Ask your camera about what it saw. Is it what you wanted to capture? How does it differ? You may take 3-4 pictures.
* When you are finished, switch so that the camera now becomes the photographer and the photographer becomes the camera.

Debrief questions:

* What did you, the cameras, take pictures of?
* Did the pictures you took match what you photographers wanted to take a picture of?
* Was there any difference between what the photographers wanted to take a picture of and what the cameras captured? Why?
* Why is it important to recognize the differences in the results?
* Do you think that you see the world the same as your neighbor? Your friend? Someone who lives in Irian Jaya/Jacksonville, Florida/The Bayou in Louisiana/Kerela, India, etc.?

***Shinrin Yoku* Forest Bathing Text Study (20 minutes)**

Split into groups of 3-5 people. Each group gets a selected text (below). The group has 10 minutes to read the assigned text and, as a group, present a 2-minute synopsis of the text. Participants can present via report, poem(s), skits/acting, etc. They will give us the gist of what the text has to say. Strict 2-minute time frame!

**Hevruta Debrief (5 minutes)**

Get into groups of 2-to-3 people. Discuss: where and how do you take this program, or any part of it, back to camp?

**Howling! (2 minutes)**

As a pack, we will form a new pack by howling at whatever there is to howl at. The moon, the trees, the sun, etc. *Echad, Shtieem, Shalosh!* AAAAWHHHHOOOOOOOO!

**Additional Notes for Bringing it Back to Camp:**

[Use this space to recommend possible adaptations, modifications, creative twists, or other suggestions.]

**TEXT 1**

***Shinrin-Yoku***: **Forest Bathing**

* In 1982, the Forest Agency of the Japanese government premiered its *shinrin-yoku* plan. In Japanese *shinrin* means forest, and *yoku*, although it has several meanings, refers here to a “bathing, showering or basking in.” More broadly, it is defined as “taking in, in all of our senses, the forest atmosphere.” The program was established to encourage the populace to get out into nature, to literally bathe the mind and body in green space.
* Japanese researchers found that 20 minutes of *shinrin-yoku* (compared with 20 minutes in an urban setting) altered cerebral blood flow in a manner that indicated a state of relaxation. More specifically, **the total hemoglobin (as found in red blood cells) was decreased in the area of the prefrontal cortex** while in the forest setting. Hemoglobin levels are jacked up in this area during anticipation of a threat (stress) and after periods of intense mental and physical work—complex equations, computer testing, video game playing, exercise to exhaustion. So essentially, a decrease in levels means the brain is taking a time-out while in the forest.
* Stress hormones can compromise immune defense; in particular, the activities of frontline defenders, such as antiviral natural killer cells, are suppressed by stress hormones. Since forest bathing can lower stress hormone production and elevate mood states, it’s not surprising that it also influences markers of immune system strength. Qing Li and colleagues from the Nippon Medical School showed that forest bathing (either a day trip or a couple of hours daily over three days) can have a long-lasting influence on immune markers relative to city trips. Specifically, there were marked increases in the number of natural killer cells, increases in the functional activity of these antiviral cells, and increases in the amount of intracellular anticancer proteins.
* Dr. Roger Ulrich published in 1984 a landmark study in the prestigious journal *Science*. He collected records from a single suburban Pennsylvania hospital from 1972 to 1981. He was very specific in what he examined—adults who had undergone identical surgery to remove the gallbladder (cholecystectomy) during this time frame—and the only major distinction among the patients was the room into which they were wheeled for recovery. Rooms on one side of the hospital had windows with a view to a mini-forest, while rooms on the other side offered a dramatically different vista in the form of bricks du rouge. The results were quite dramatic: those who had an outdoor view to trees had significantly shorter hospital stays and fewer postsurgical complaints. They also used less-potent analgesic medications (aspirin instead of narcotics).

Ulrich, R. S. (*1984*) View through a window may influence recovery from surgery. *Science*, 224, 420–421.

* Norwegian research shows that having a plant at or within view of an office workstation significantly decreases the risk of sick leave. A 2010 study from the University of Technology, Sydney, Australia, reported that levels of anger, anxiety, depressive thoughts, and fatigue all reduced over a three-month period, and not just by a little bit—these parameters were reduced by about 40 percent, while reported stress was down by 50 percent. On the other hand, those without the stress buffer of a visible plant indicated that stress levels rose over 20 percent during the study.
* Research published in 2008 in the Journal of the Japanese Society for Horticultural Science showed that greening select high school classrooms with potted plants for a four-month trial period significantly reduced visits to the infirmary compared with age-matched students attending classes without the visible plants

Excerpted from *Your Brain on Nature* by Eva Selhub and Alan Logan (Wiley, 2012)

**TEXT 2**

**Paying Attention**

The philosopher and psychologist William James came up with 2 ideas of attention:

1. Directed attention
2. Involuntary attention (Fascination) (Heschel’s radical amazement?)

The psychologists Rachel and Stephan Kaplan, environmental psychologists at the University of Michigan, helped to define Directed Attention Fatigue.

**Directed attention fatigue** (**DAF**) is a neurological phenomenon that results from overuse of the brain’s inhibitory attention mechanisms, which handle incoming distractions while maintaining focus on a specific task. The greatest threat to a given focus of attention is competition from other stimuli that can cause a shift in focus. This is because one maintains focus on a particular thought by inhibiting all potential distractions and not by strengthening that central mental activity.

“Directed attention, or voluntary attention, requires a great deal of concentration and focus, and is employed in tasks such as problem solving. This type of attention employs the inhibitory mechanisms of the brain, which help block incoming stimuli that are unrelated to the task at hand. Several parts of the brain are involved in maintaining directed attention, primarily those located in the frontal lobe and the parietal lobe of the brain. **Specifically, the mechanism of directed attention employs the** **prefrontal cortex (PFC)**, the anterior cingulate cortex (ACC) and the brain stem’s basal ganglia. Some fMRI studies have shown that directed attention involves changes in the anterior cingulate cortex and the lateral prefrontal cortex, perhaps as a consequence of increased connectivity between these two areas. Evidence also suggests that the right inferior frontal cortex (IFC) plays a specialized role in response inhibition. It seems that this region plays a key role in the integration of bottom-up response-related information and facilitates goal-directed behavior. While these areas of the brain are known to be involved in DAF, their specific molecular mechanisms in the perpetuation of DAF symptoms are not yet known.”

* Retrieved from https://en.wikipedia.org/wiki/Directed\_attention\_fatigue on February 2, 2017.

**TEXT 3**

**Brain Structure of Someone with ADHD**

In children with ADHD, there is a general reduction of volume in certain brain structures, with a proportionally greater decrease in the volume in the left-sided prefrontal cortex The posterior parietal cortex also shows thinning in ADHD individuals compared to controls. **Other brain structures in the prefrontal-striatal-cerebellar** and prefrontal-striatal-thalamic circuits have also been found to differ between people with and without ADHD.

* Retrieved from https://en.wikipedia.org/wiki/Attention\_deficit\_hyperactivity\_disorder on February 2, 2017.

**Hiking in Nature Can Change our Brains**

Attention Deficit Hyperactivity Disorder (ADHD) is a common disorder among children. Those with ADHD generally have trouble staying focused, are easily distracted, exhibit hyperactivity, and have difficulty controlling impulses.

Raising children with ADHD can be perplexing for parents. Nonetheless, great news has emerged from the medical and scientific world. In a study conducted by Frances E. Kuo, PhD and Andrea Faber Taylor, PhD, researchers found that exposing children with ADHD to “green outdoor activities” reduced their ADHD symptoms. Thus, according to this study, the benefits of exposure to nature can extend to anyone with inattention and impulsivity.

Doctors conclude that simple changes that involve green activities or settings can improve attention. For example, increasing exposure to a window seat with a green view, participating in an afternoon nature hike, or simply playing ball in the park can ease unwanted ADHD symptoms.

* Marilyn Rodgers, Life Hack blog, February 2, 2017. *“Doctors Tell Us How Hiking Can Change Our Brains”* Retrieved from http://www.lifehack.org/363786/doctors-agree-hiking-good-for-your-mental-health.

**TEXT 4**

**How Nature Changes the Brain**

A walk in the park may soothe the mind and, in the process, change the workings of our brains in ways that improve our mental health, according to an interesting new study of the physical effects on the brain of visiting nature.

Most of us today live in cities and spend far less time outside in green, natural spaces than people did several generations ago.

City dwellers also have a higher risk for anxiety, depression and other mental illnesses than people living outside urban centers, studies show.

These developments seem to be linked to some extent, according to a growing body of research. Various studies have found that urban dwellers with little access to green spaces have a higher incidence of psychological problems than people living near parks and that city dwellers who visit natural environments have lower levels of stress hormones immediately afterward than people who have not recently been outside.

But just how a visit to a park or other green space might alter mood has been unclear. Does experiencing nature actually change our brains in some way that affects our emotional health?

That possibility intrigued Gregory Bratman, a graduate student at the Emmett Interdisciplinary Program in Environment and Resources at Stanford University, who has been studying the psychological effects of urban living. In an earlier study published last month, he and his colleagues found that volunteers who walked briefly through a lush, green portion of the Stanford campus were more attentive and happier afterward than volunteers who strolled for the same amount of time near heavy traffic.

But that study did not examine the neurological mechanisms that might underlie the effects of being outside in nature.

So for the new study, which was published last week in Proceedings of the National Academy of Sciences, Mr. Bratman and his collaborators decided to closely scrutinize what effect a walk might have on a person’s tendency to brood.

Brooding, which is known among cognitive scientists as morbid rumination, is a mental state familiar to most of us, in which we can’t seem to stop chewing over the ways in which things are wrong with ourselves and our lives. This broken-record fretting is not healthy or helpful. It can be a precursor to depression and is disproportionately common among city dwellers compared with people living outside urban areas, studies show.

Perhaps most interesting for the purposes of Mr. Bratman and his colleagues, however, such rumination also is strongly associated with increased activity in a portion of the brain known as the subgenual prefrontal cortex.

If the researchers could track activity in that part of the brain before and after people visited nature, Mr. Bratman realized, they would have a better idea about whether and to what extent nature changes people’s minds.

Mr. Bratman and his colleagues first gathered 38 healthy, adult city dwellers and asked them to complete a questionnaire to determine their normal level of morbid rumination.

The researchers also checked for brain activity in each volunteer’s subgenual prefrontal cortex, using scans that track blood flow through the brain. Greater blood flow to parts of the brain usually signals more activity in those areas.

Then the scientists randomly assigned half of the volunteers to walk for 90 minutes through a leafy, quiet, park-like portion of the Stanford campus or next to a loud, hectic, multi-lane highway in Palo Alto. The volunteers were not allowed to have companions or listen to music. They were allowed to walk at their own pace.

Immediately after completing their walks, the volunteers returned to the lab and repeated both the questionnaire and the brain scan.

As might have been expected, walking along the highway had not soothed people’s minds. Blood flow to their subgenual prefrontal cortex was still high and their broodiness scores were unchanged.

But the volunteers who had strolled along the quiet, tree-lined paths showed slight but meaningful improvements in their mental health, according to their scores on the questionnaire. They were not dwelling on the negative aspects of their lives as much as they had been before the walk.

They also had less blood flow to the subgenual prefrontal cortex. That portion of their brains were quieter.

* Gretchen Reynolds, *The New York Times*, July 22nd, 2015. Retrieved from <https://well.blogs>. nytimes.com/2015/07/22/how-nature-changes-the-brain/?\_r=0.