




**Shinrin Yoku**  
**The Art & Science of**  
**Forest Bathing**  
**Therapy**

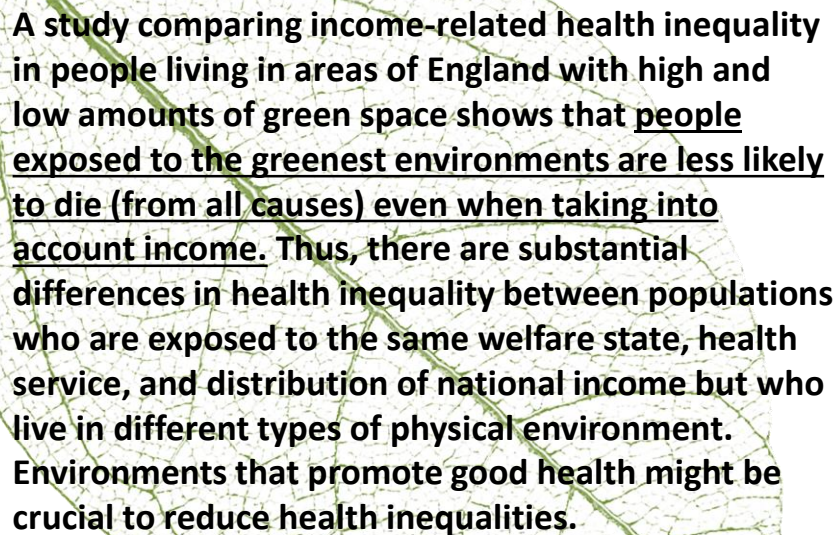
Chanchal Cabrera MSc.

FNIMH, RH(AHG)



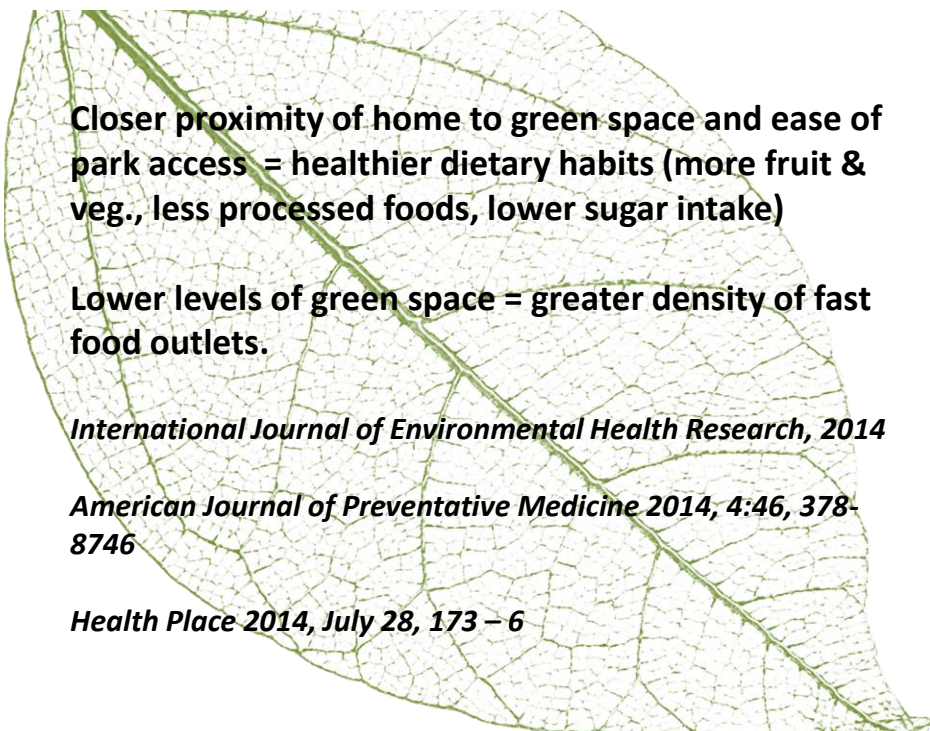
*Plants are to people as  
water is to plants*

**indispensable**  
**essential**  
**life giving**



**A study comparing income-related health inequality in people living in areas of England with high and low amounts of green space shows that people exposed to the greenest environments are less likely to die (from all causes) even when taking into account income. Thus, there are substantial differences in health inequality between populations who are exposed to the same welfare state, health service, and distribution of national income but who live in different types of physical environment. Environments that promote good health might be crucial to reduce health inequalities.**

The Lancet, Volume 372, Issue 9650, Pages 1655 - 1660, 8 November 2008



**Closer proximity of home to green space and ease of park access = healthier dietary habits (more fruit & veg., less processed foods, lower sugar intake)**

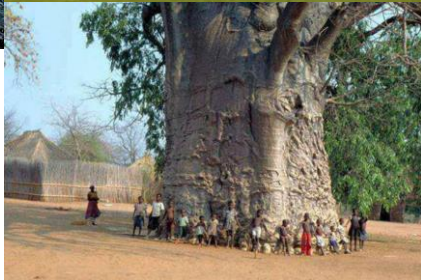
**Lower levels of green space = greater density of fast food outlets.**

*International Journal of Environmental Health Research, 2014*

*American Journal of Preventative Medicine 2014, 4:46, 378-8746*

*Health Place 2014, July 28, 173 – 6*







**OAK** Most Sacred The Door to the Otherworld  
 Symbol = Strength, Courage & Stability  
 assoc. w/ faeries, the green man (maale Gaia) and St Columella  
 Druids ate acorns in preparation for prophesying

**YEW** Symbol = Eternal Life  
 Communication with the Otherworld  
 Used in druidic divination rights  
 weapons made from yew were very auspicious

**ASH** the tree of life  
 growth, expansion, and higher perspective  
 assoc. w/ the connection of the upper & underworlds  
 the guardian of children and protector of youth

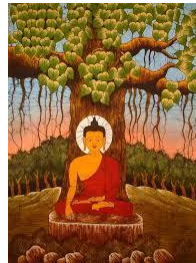
**HAWTHORN**  
 POWERFUL CIRCULATORY MEDICINE  
 POWER OF DUALITY & UNION OF OPPOSITES  
 SACRED TO THE FAERIES

**BIRCH**  
 assoc. w/ birth, renewal & purity  
 Used to drive out evil spirits in livestock  
 Medicine for gout, rheumatism, arthritis & skin complaints

**HOLLY**  
 THE SPIRITUAL WARRIOR  
 SIGNIFIES COURAGE  
 ASSOC. W/ DEATH & REBIRTH AND THE WINTER SOLSTICE



A - Ailm - Elm	January - Oak	
B - Beite - Birch	February - Ash	
C - Coll - Hazel	March - Willow	
D - Dur - Oak	April - Blackthorn	
E - Eagh - Aspen	May - Elm	
G - Gath - Ivy	June - Bramble	
H - Huath - Whithorn	July - Aspen	
I - Iogh - Yew	August - Bog Myrtle	
L - Luis - Quicken	September - Rowan	
M - Muin - Vine	October - Sycamore	
N - Nuin - Ash	November - Alder	
O - Oir - Spindle tree	December - Holly	
P - Peith - Pine	Bracken - Robertson & Chisholm	
R - Ruis - Elder	Scots Pine - MacGregors, MacQuarries, MacCauleys, MacAlpines & Grants	
S - Suil - Willow	Hazel - Calqhouns	
T - Teine - Furze	Rowan - MacLaughlins	
U - Ur - Heath	Birch - Buchanans	
	Bulrush - Mackays	
	Aspen - Fergusons	
	Bog myrtle - Campbells & MacIntyres	
	Box - MacPhersons & Macintoshes	
	Roseroot - (Sedum rosea) - Gunns	
	Broom - Forbes	
	Heather - MacDonalds & MacDougalls	



## Biophilia

**Biophilia – an innate feeling or caring (emotional affiliation) for all living forms and systems, activated through specific experiences.**

**Comes from our similarity of nature and our long close association throughout the emergence of our species.**

### ***Biophilia***

**German-born American psychoanalyst Erich Fromm in *The Anatomy of Human Destructiveness* (1973)**

**“the passionate love of life and of all that is alive.”**

**Biologist Edward O. Wilson in his work *Biophilia* (1984) “the tendency of humans to focus on and to affiliate with nature and other life-forms has, in part, a genetic basis”.**



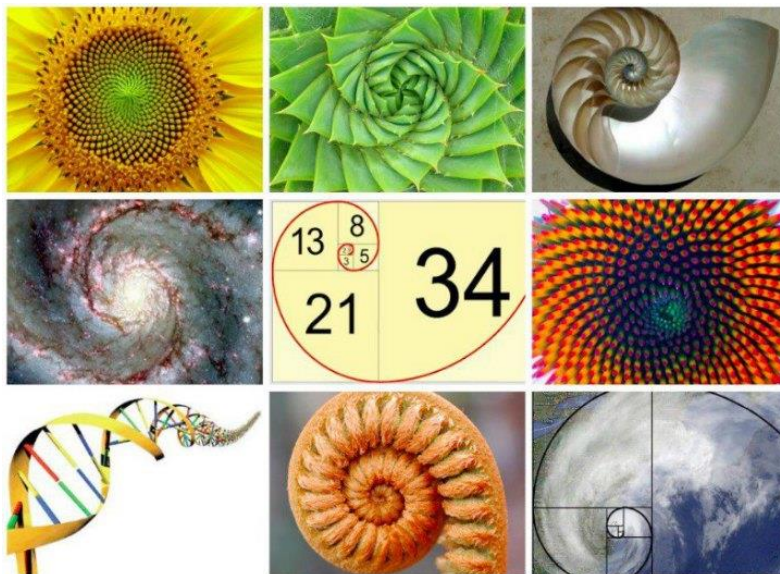
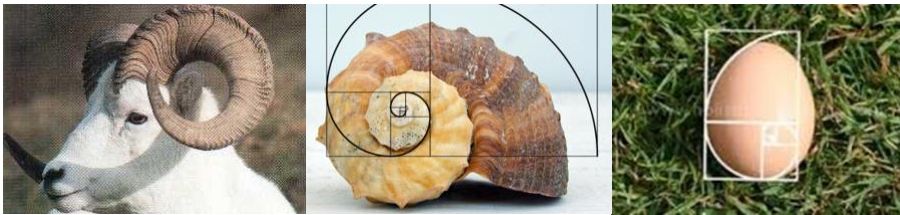
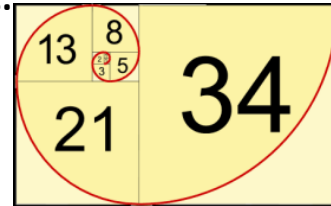
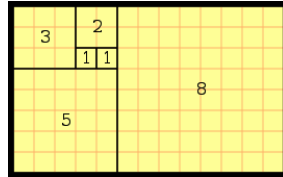
## Biophilia

**Other species are our kin...we arose from other organisms already here.**

**We are, by species history and genetic tendency, encoded for recognition of the aliveness of the world and an emotional bonding with it.**



In mathematics, the Fibonacci numbers (or Fibonacci series or Fibonacci sequence) are defined as a series where the first two numbers are 0 and 1, and each subsequent number is the sum of the previous two:  
 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89 ...



“Where there is matter, there is geometry.”

~ Johannes Kepler



### Number of Petals in a Flower

**3 petals (or 2 x3)**

**5 petals**

**8 petals**

**13 petals**

**21 petals**

**34 petals**

**55 petals**

**89 petals**

**lily, iris, tulip, daffodil**

**buttercup, wild rose, larkspur,  
columbine, periwinkle**

**delphinium, coreopsis**

**ragwort, marigold, cineraria**

**aster, black-eyed susan, chicory**

**plantain, daisy, pyrethrum**

**daisy, the asteraceae family**

**daisy, the asteraceae family**



Passion Fruit Flower – 55 Petals

There are exceptions to this list. Most fall into two categories; a doubling of the number of petals, and/or a variant of the Fibonacci Series called the Lucas Series (2, 1, 3, 4, 7, 11, 18, 29, 47, 76, etc.).

Mutations and individual variations from species to species also account for exceptions but when the number of petals in a species are averaged, the number will usually be a Fibonacci or Lucas Number.



## Fibonacci numbers and the Golden Ratio

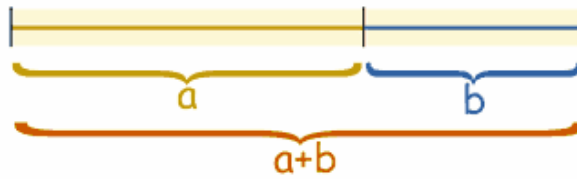
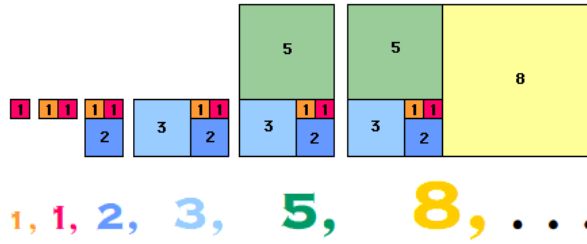
Divide any higher number in the Fibonacci sequence by the one before it, for example  $55/34$ , or  $21/13$ , and the answer is always close to 1.61803.

$1/1 = 1$ ,  $2/1 = 2$ ,  $3/2 = 1.5$ ,  
 $5/3 = 1.666\dots$ ,  $8/5 = 1.6$ ,  $13/8 = 1.625$ ,  
 $21/13 = 1.61538\dots$

1.61538 is called *phi*

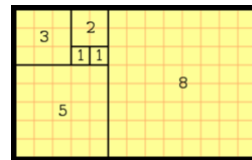
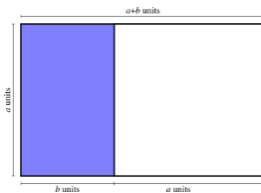


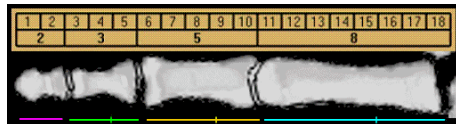
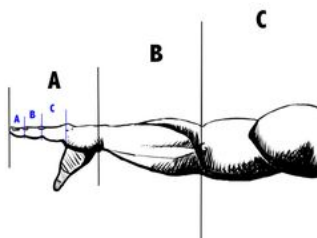
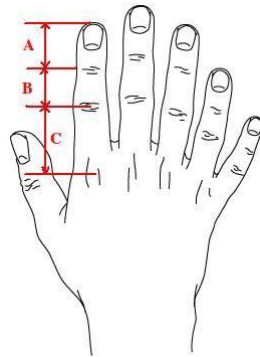
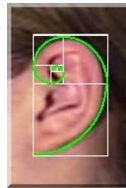
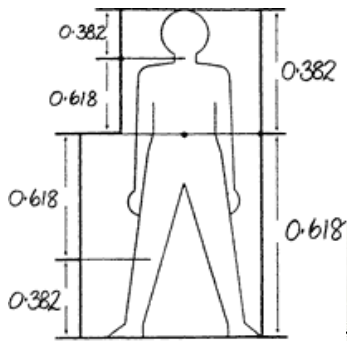
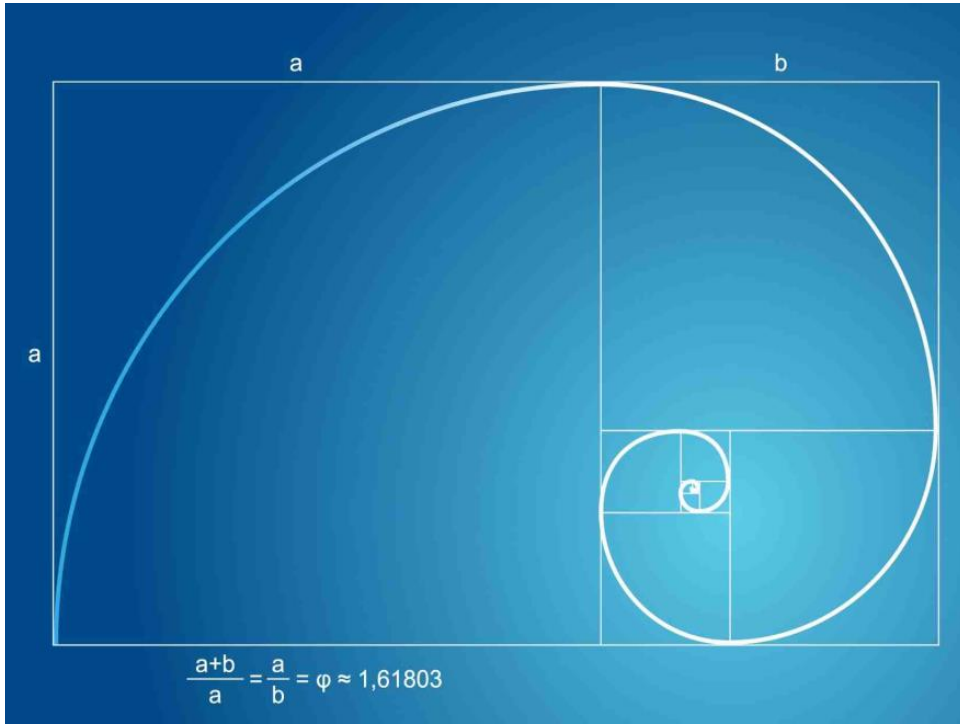
# THE GOLDEN RATIO



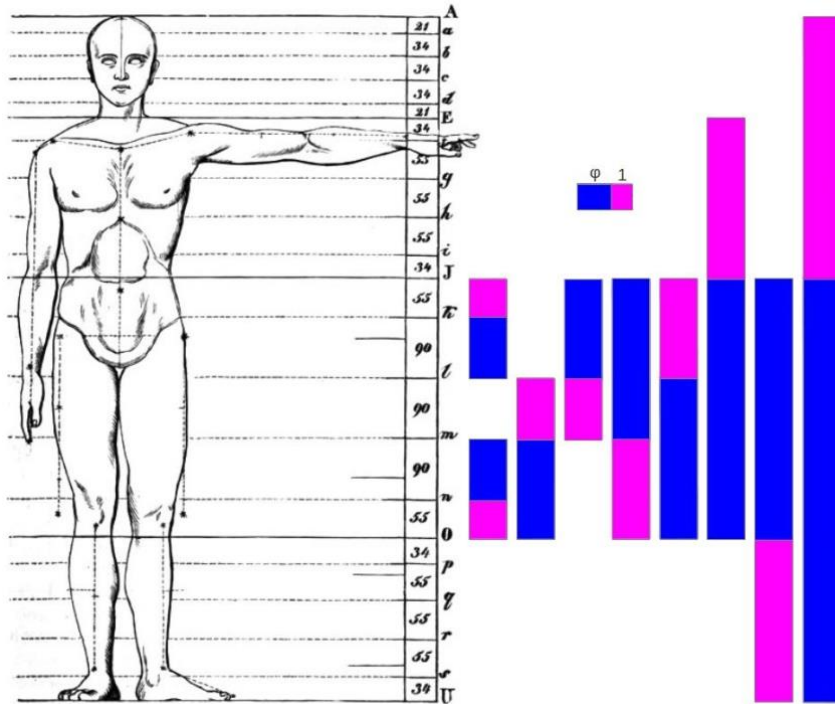
$$\frac{a}{b} = \frac{a+b}{a} = 1.618... = \phi$$

The ratio of a to a + b = the ratio of b to a

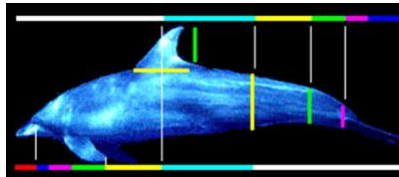








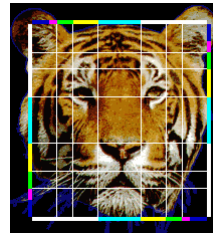
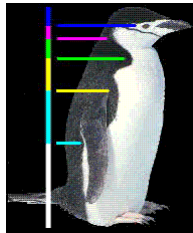
The eye, fins and tail all fall at golden sections of the length of a dolphin's body. The dimensions of the dorsal fin are golden sections (yellow and green). The thickness of the dolphin's tail section corresponds to same golden section of the line from head to tail.



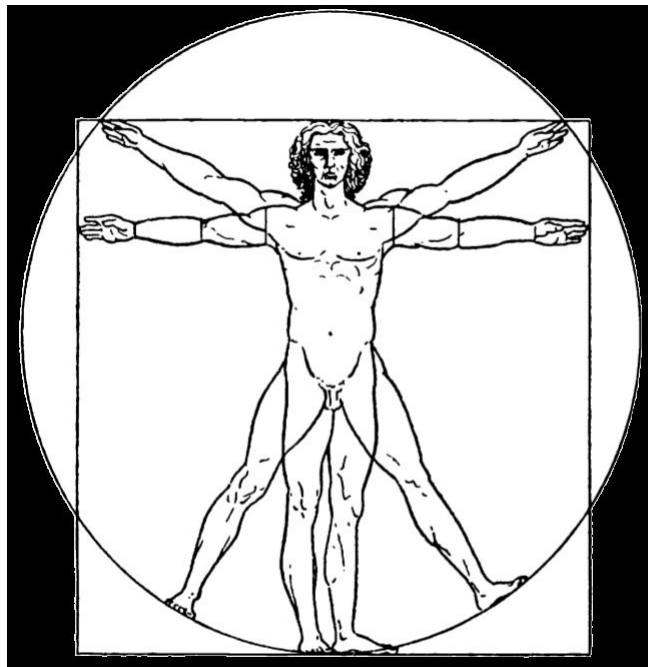
The eye-like markings of this moth fall at golden sections of the lines that mark its width and length.



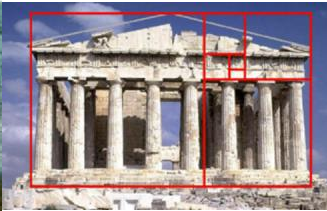
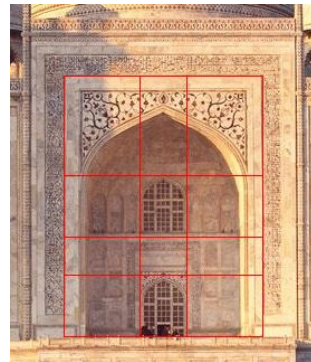
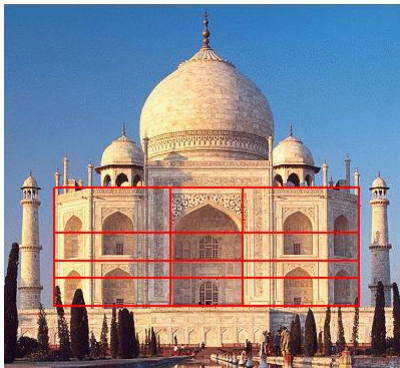
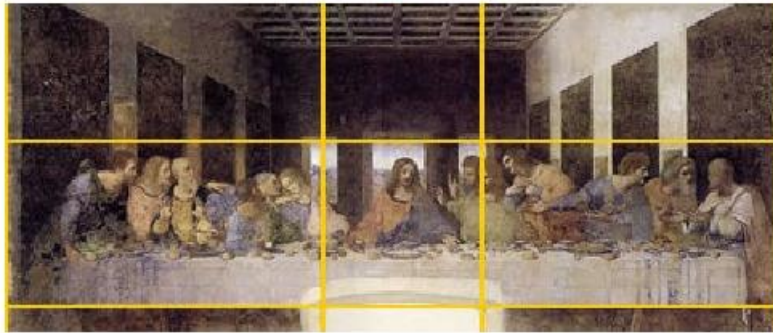
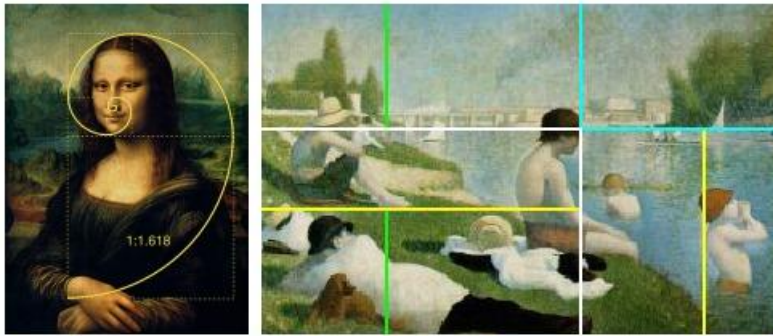
**The eyes, beak, wing and key body markings of the penguin all fall at golden sections of its height.**

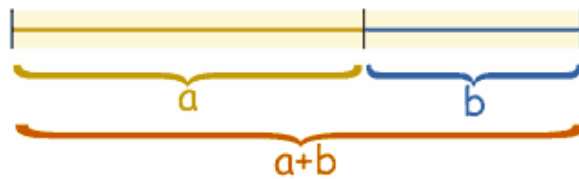
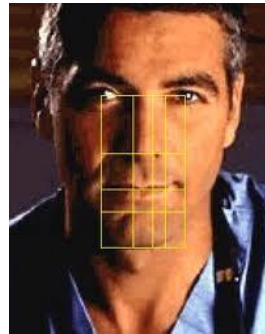
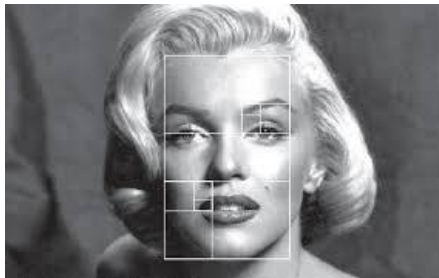
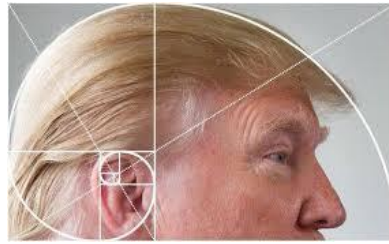


**All the key facial features of the tiger fall at golden sections of the lines defining the length and width of its face.**



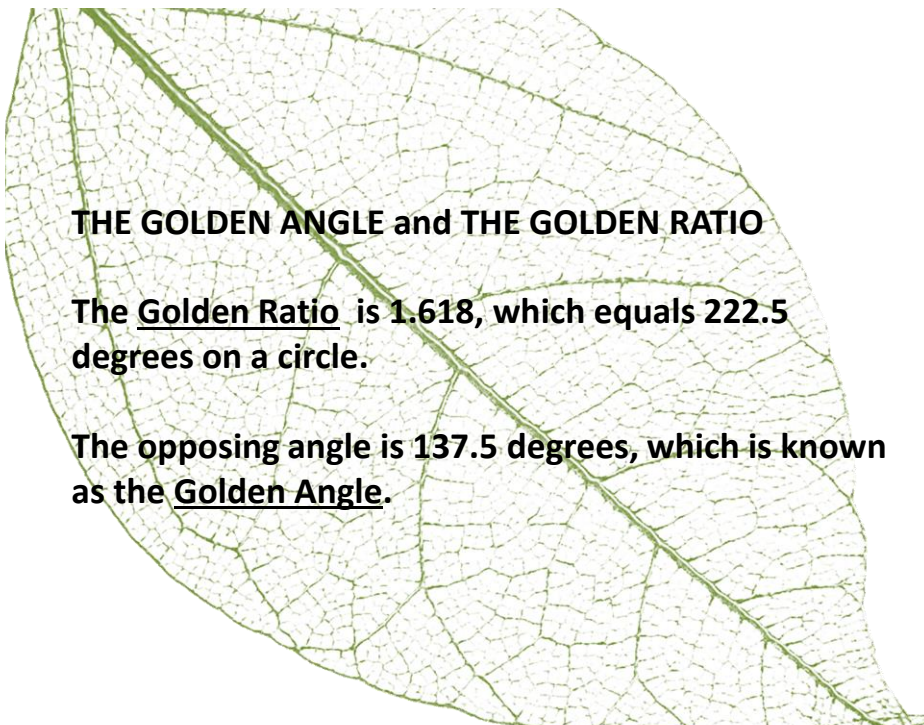
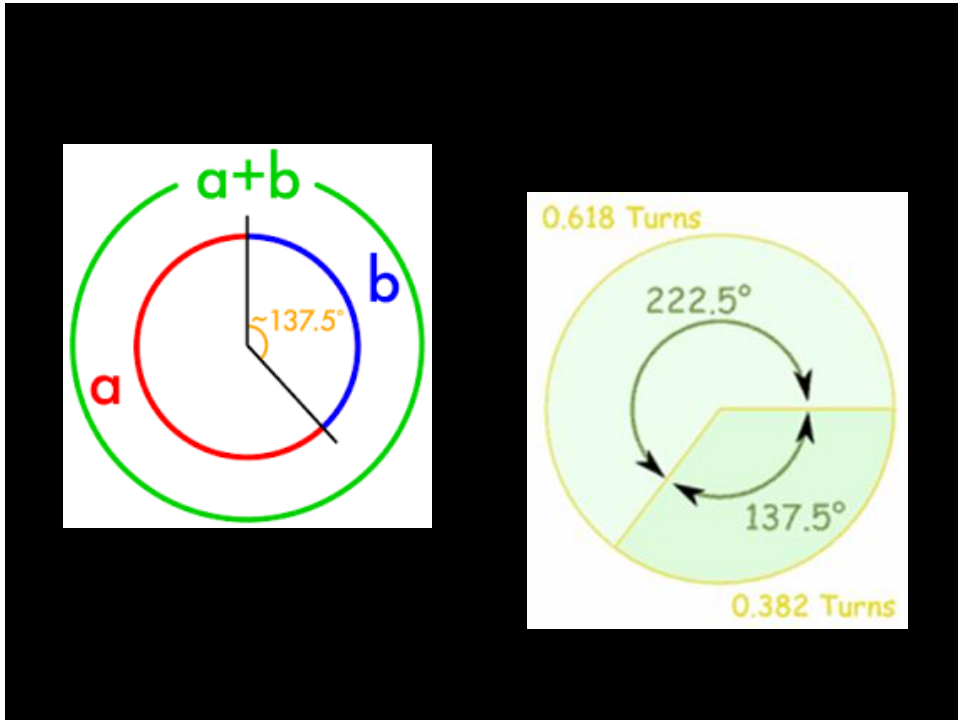




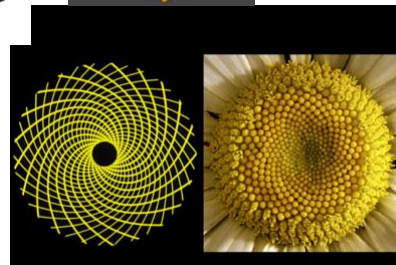
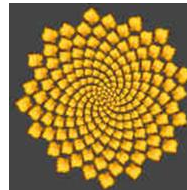
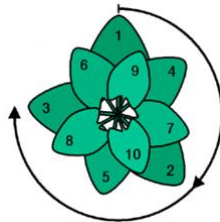
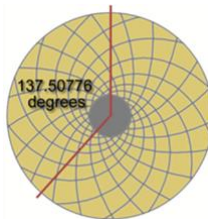
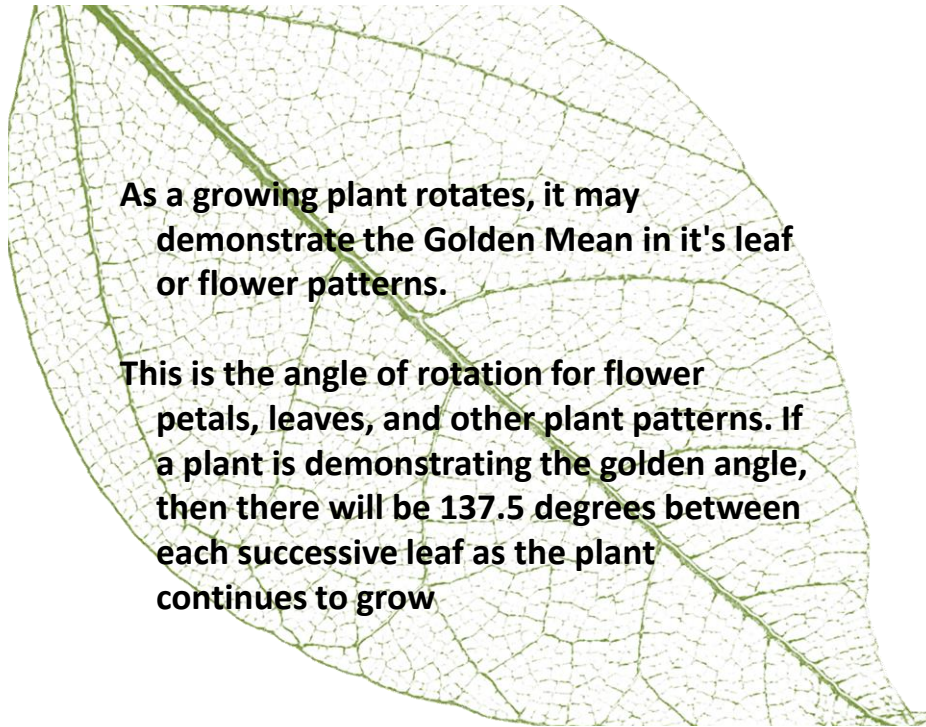


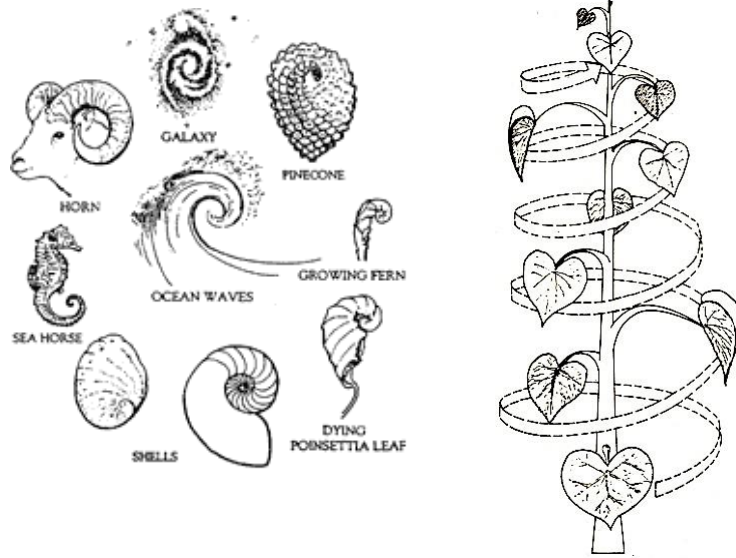
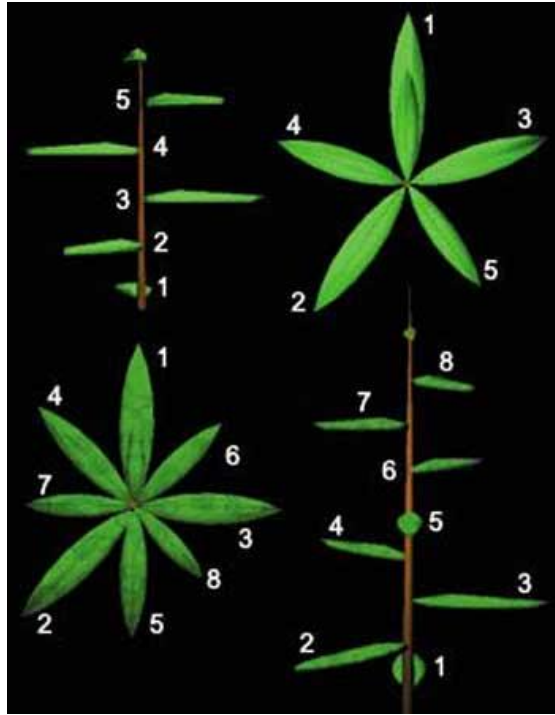
$$\frac{a}{b} = \frac{a+b}{a} = 1.618... = \varphi$$

Now imagine the 2 ends of a and b joining up to form a circle









“Look deep into nature, and then you will understand everything better.”

-Albert Einstein

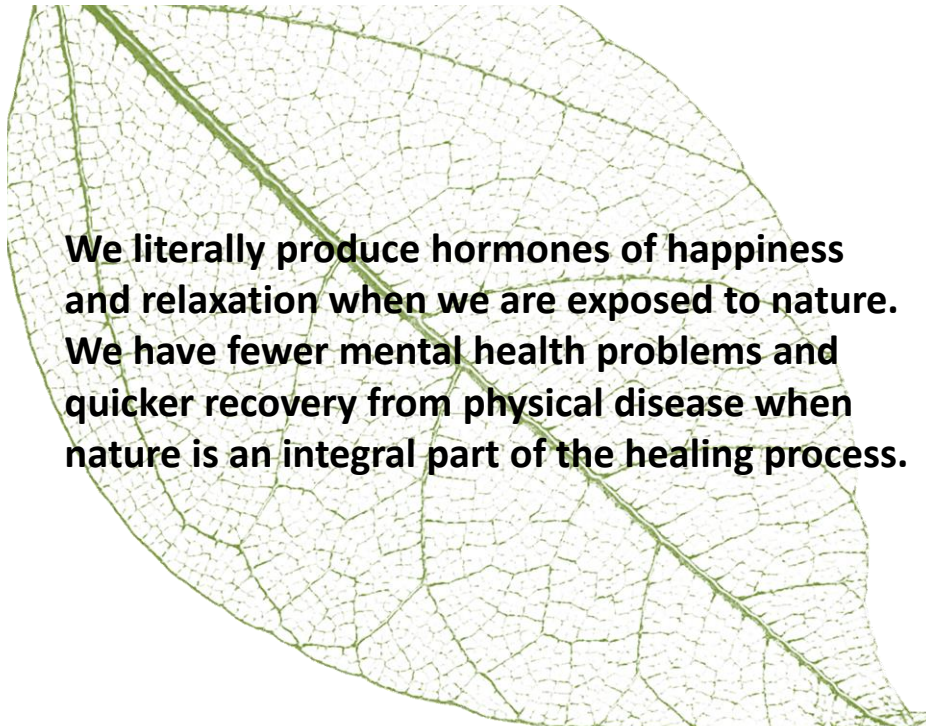




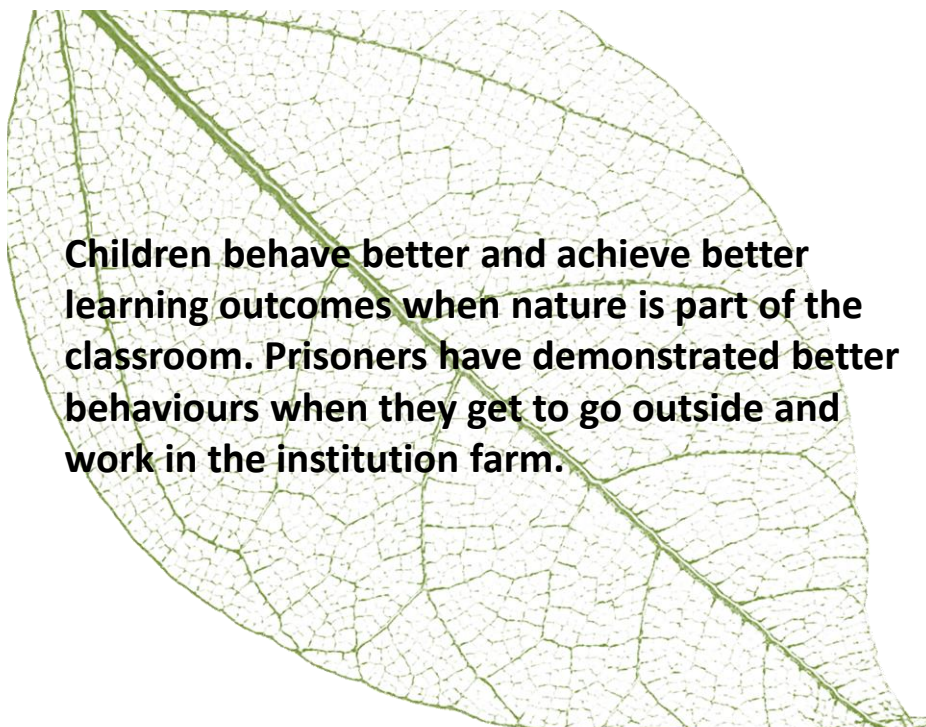
"Nature is not mute, it is a man who is deaf." - Terence McKenna

<http://www.youtube.com/watch?v=kkGeOWYOFoA&feature=plcp>





**We literally produce hormones of happiness and relaxation when we are exposed to nature. We have fewer mental health problems and quicker recovery from physical disease when nature is an integral part of the healing process.**



**Children behave better and achieve better learning outcomes when nature is part of the classroom. Prisoners have demonstrated better behaviours when they get to go outside and work in the institution farm.**





**In 2005 author and educator Richard Louv coined the term 'Nature Deficit Disorder'.**

**The innate, natural and intuitive connections that children feel to the natural world are part of our 'hard-wiring'.**

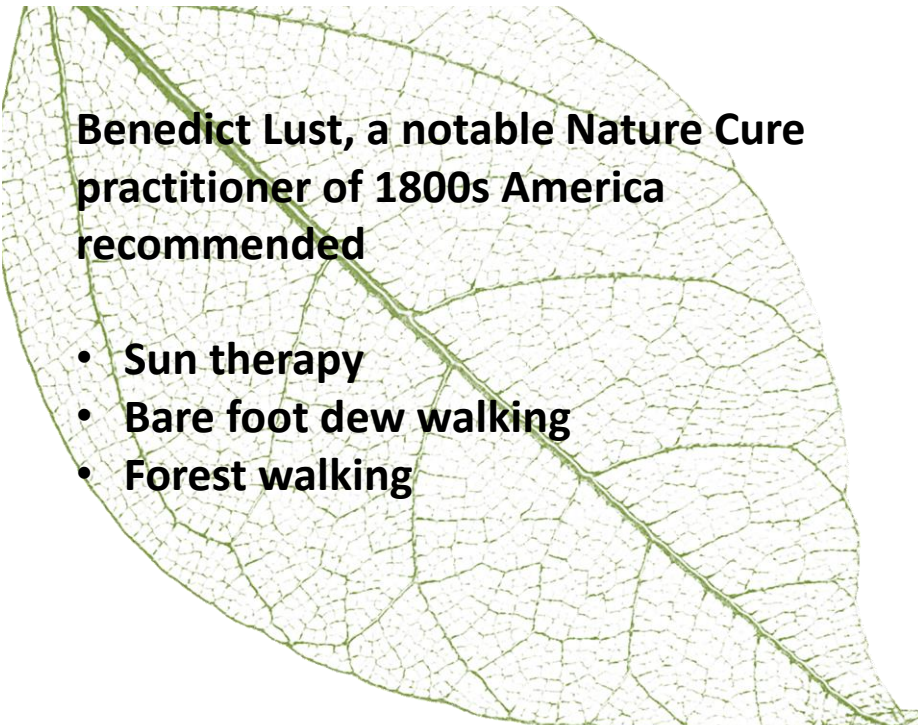
**Lack of exposure to nature in modern urban living is leading to a host of behavioral, physical and even spiritual disorder in adults as well as children.**





**Benedict Lust, a notable Nature Cure practitioner of 1800s America recommended**

- **Sun therapy**
- **Bare foot dew walking**
- **Forest walking**



**Old TB sanatoriums featured natural mountain locations, air baths, sun baths, walks, light diet and calm environments**







**St Michael's Hospital, Texarkana, Texas**  
 Rehab patients returning home in less than half expected time frame when gardening was included in daily regimen.

**Children's Hospital, San Diego**  
 Recovery and mental outlook improved in children who spent time in the garden.

**Danderyd Hospital, Sweden**  
 Brain injury rehab positively influenced by time spent outdoors.

Ref: Naturopathic Doctor News and Reviews, February 2016, Vol. 12, issue 2



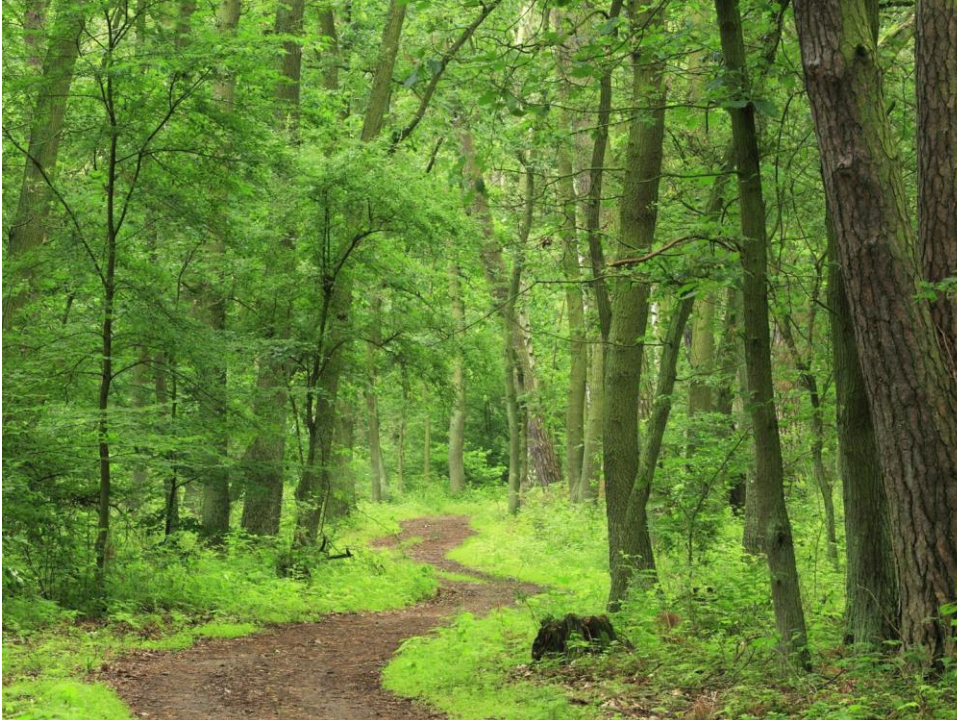
**Prospective cohort study of patients > 65 yo without cognitive impairment who gardened daily had significantly reduced risk of developing dementia over 16 years of the study.**



**Studies of dementia patients have found gardening and activities in nature contribute to improvements in**

- **Nap time**
- **Nocturnal sleep efficacy**
- **Nocturnal sleep time**
- **Agitation**
- **Cognition**
- **Confusion**

**30 minutes daily, 5 x per week**



## **Shin-rin yoku**

**This is a Japanese term meaning forest bathing therapy.**

**First used in 1982 and now a generic term for 44 approved nature sites regulated and managed by the Japanese Forest Therapy Executive Committee**





### **Mindfulness meditation in forests:**

- **contemplative walking in the woods**
- **sitting in silence in the forest**
- **chanting or singing in the trees**
- **practicing being present in nature**

### **Phytoncides**

**Anti-microbial volatile organic compounds released from trees – increases natural killer cell activity in test subjects**





*Abies koreansis*



**피톤치드(Phytoncide)**는 활엽수보다 침엽수에서 많이 발생한다. 식물 자신을 위협하는 해충과 박테리아, 각종 균에는 치명적으로 작용하지만 사람의 몸에는 많은 이로움을 주는 양면성을 갖고 있다. 피톤치드의 양은 겨울보다 여름에 더 많이 방출되며 피톤치드의 주성분인 테르펜이 가장 많이 나오는 나무로서 스트레스 해소, 면역력 강화 및 심폐기능을 강화, 천식과 아토피치료, 향균과 항염증작용 등 몸과 마음을 회복시켜 자연치유력을 높인다.

Phytoncide is produced more from conifers than from broad-leaved trees. Phyttonicide has double-sidedness. It has fatal effects on insects, viruses and various germs that are harmful to the trees themselves but it gives many benefits to human bodies. Phyttonicide is produced more in summer than winter. Gussang tree produces Terpene, the major element of phytoncide, more than any other tree. Terpene relieves stress, strengthens immunity and cardio pulmonary function, and beats the asthma and atopy with anti-virus and anti-inflammation effect. It also enhances the natural healing power by recovering the body and mind.

阔叶树相比，植物杀菌素在针叶树中更为常见。植物杀菌素然对威胁植物本身的害虫和细菌，各种病菌起着致命性的作用，但却对人的身体非常有益，具有两面性。植物杀菌素夏季、冬季释放出的量更多，并且其作为主要成分-烯释放量最多的树木，能够缓解压力，强化免疫力及强化心肺功能，治疗哮喘，促进身心健康的恢复。

フイトンチッドは広葉樹より針葉樹から多く発生する。脅威な害虫とバクテリア、各種の菌には致命的な作用、人間の体には色々な有益な影響を与える両面性を持つ。チッドは冬より夏に多い量が放出され、チョウセンシテ、ンチッドの主成分テルペン(terpene)が一番多く出る樹種。ストレス解消、免疫力強化、心肺機能強化、アトピー治療の効用など、身も心も回復させて自然治癒力を高め

## Shinrin-yoku

- **Lowers salivary cortisol**
- **Lowers subjective stress levels**
- **Lowers pro-inflammatory markers**
- **Reduces oxidative stress**





***Public Health (2007) 121,54–63***

**Psychological effects of forest environments on healthy adults: Shinrin-yoku (forest-air bathing, walking) as a possible method of stress reduction**

**E. Morita, S. Fukuda, J. Nagano, N. Hamajima, H. Yamamoto, Y. Iwai, T. Nakashima, H. Ohira, T. Shirakawa**



**Objectives:**

**Shinrin-yoku (walking and/or staying in forests in order to promote health) is a major form of relaxation in Japan; however, its effects have yet to be completely clarified. The aims of this study were:**

- 1) to evaluate the psychological effects of shinrin-yoku in a large number of participants; and**
- 2) to identify the factors related to these effects.**



**Methods:**

Four hundred and ninety-eight healthy volunteers took part in the study.

Surveys were conducted twice in a forest on the same day (forest day) and twice on a control day.

Outcome measures were evaluated using the Multiple Mood Scale-Short Form (hostility, depression, boredom, friendliness, wellbeing and liveliness) and the State-Trait Anxiety Inventory A-State Scale.

Statistical analyses were conducted using analysis of variance and multiple regression analyses

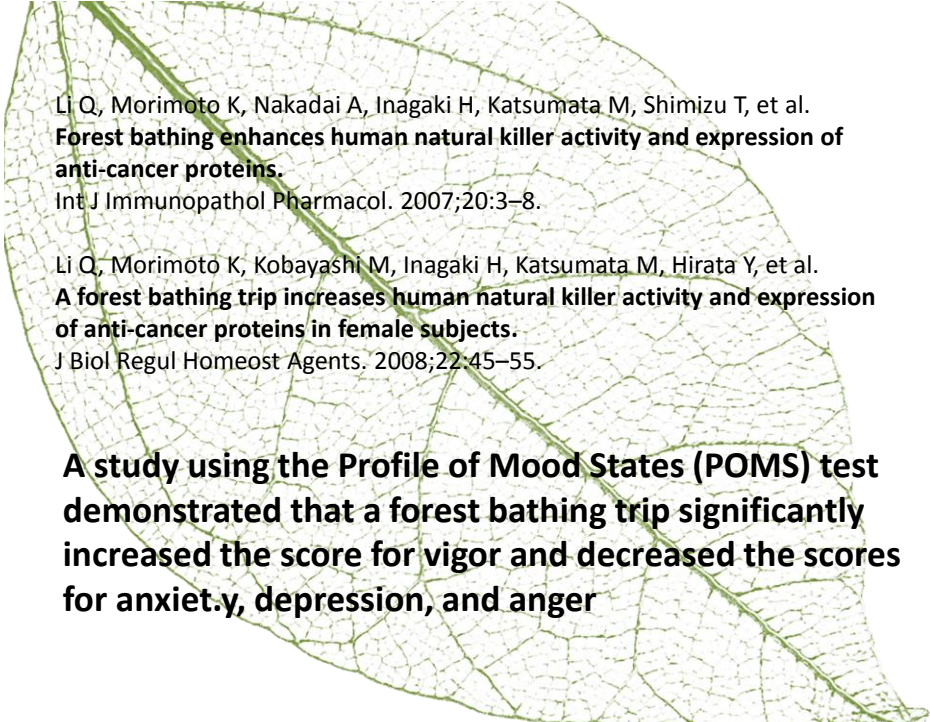
**Results:**

Hostility and depression scores decreased significantly, and liveliness scores increased significantly on the forest day compared with the control day. The main effect of environment was also observed with all outcomes except for hostility, and the forest environment was advantageous. Stress levels were shown to be related to the magnitude of the shinrin-yoku effect; the higher the stress level, the greater the effect.









Li Q, Morimoto K, Nakadai A, Inagaki H, Katsumata M, Shimizu T, et al.  
**Forest bathing enhances human natural killer activity and expression of anti-cancer proteins.**

Int J Immunopathol Pharmacol. 2007;20:3–8.

Li Q, Morimoto K, Kobayashi M, Inagaki H, Katsumata M, Hirata Y, et al.  
**A forest bathing trip increases human natural killer activity and expression of anti-cancer proteins in female subjects.**

J Biol Regul Homeost Agents. 2008;22:45–55.

**A study using the Profile of Mood States (POMS) test demonstrated that a forest bathing trip significantly increased the score for vigor and decreased the scores for anxiety, depression, and anger**



Int J Environ Res Public Health, 2016 Aug 3;13(8)  
**Physiological Effects of Nature Therapy: A Review of the Research in Japan.**

Song C, Ikei H, Miyazaki Y.

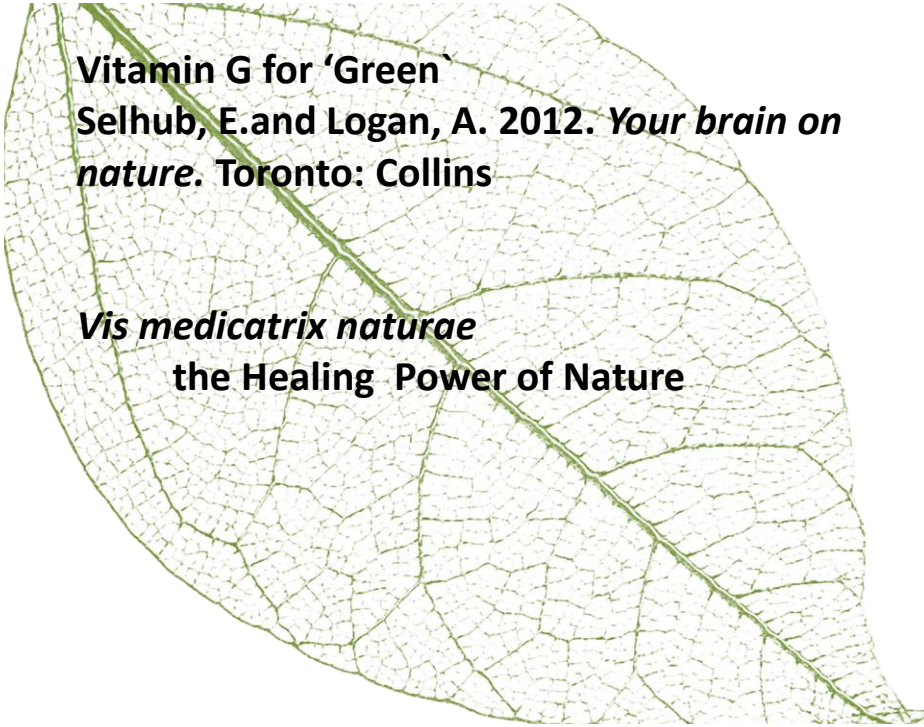
**Brain activity, autonomic nervous activity, endocrine activity, and immune activity is all affected by nature therapy and this will play an increasingly important role in preventive medicine in the future.**





**Vitamin G for 'Green'**  
**Selhub, E. and Logan, A. 2012. *Your brain on nature*. Toronto: Collins**

***Vis medicatrix naturae***  
**the Healing Power of Nature**







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