

## *Activity 1*

### **Placebo 1**



**W**hen fake acupuncture needles appeared to be inserted into subjects, the subjects felt the sensation of a needle entering their skin. Even though the needle retracted into its handle, the suggestion of insertion was so strong that the brain created an appropriate sensation to support its erroneous belief. This deception was successful enough to engage the placebo effect, thus producing the positive effects of acupuncture without needle insertion.

This activity page will offer:

- Experience in mind and body connection
- Unique tactile illusion
- Opportunity to explore how the brain interprets confusing sensations

### **Mind Over Reality?**

In this activity, you'll explore another aspect of brain trickery. This time the brain will get fooled into thinking that an image of a body part is actually detecting "touch" and sending signals to the brain. As you'll see, it is a bizarre illusion that thoroughly confuses your brain, resulting in the construction of an erroneous reality.

### **Materials**

- Printout of hand
- Digital Camera (optional)



### **Steps (For the set-up)**

1. Work with a partner. Chose one person to be the subject and one person to be the tester
2. Print this image of a hand. The printout should display a near life-size image of the body part.

NOTE: If you have access to a digital camera, ask your teacher if you can capture and use your own hand's image.

3. Sit on the right side of your subject. Both you and your subject should face the same direction.
4. Have your subject turn over her or his right hand so that the palm faces upwards.

5. Place the print out of the hand over the subject's own hand. Have the subject hold the picture with their left hand and position it so that the picture aligns above the subject's real hand.
6. With your right hand, gently touch the center of the image hand. At the exact same time, with your left hand touch the center of your subject's hidden hand.

NOTE: It is essential that the subject does not see you touching their real hand. They will be aware of it, but should not see it. The subject's observation should be limited to seeing you touch the image of the hand.

7. While keeping in constant contact, slowly move the position of your finger. Try short and long brush-like strokes. Circle your finger. It is important that the movement performed on the image is duplicated on the subject's hand.
8. After about 15 seconds, your subject may experience sensations arising from your contact with the picture.

## Questions

1. Describe the subject's experience?
2. Did the illusion of misplaced sensation occur immediately? Explain.
3. Why was it important to conceal the movements of the researcher's hand that was in contact with the subject's real hand?

## Stretching the Point

In this activity, you explored how the brain might integrate a picture of a matching hand into its dynamic concept of body image. But how far could you push this connection? Would the subject feel the same connection if a picture of a left hand covered the right hand? Suppose a picture of a foot was placed over the subject's right hand? What would happen then? Suppose a blank sheet of paper covered the hand. Would the subject assign the sensation of detection to the paper? Make a guess and with your instructor's approval try these simple changes to your experimental design.

## Acupuncture

What do you know about acupuncture? What is its ancient and recent history? Is it real or is it a sham? Use print and online resources to learn more about acupuncture. Then, write the radio script for a "public radio" show that explores acupuncture as both a valid alternative medicine that produces self-healing and a pseudoscience.

## A Placebo Switch

Suppose you were in charge of introducing the placebo effect to a group of traditional acupuncturists. What sort of challenges would you face? Do you think that established acupuncturists would support the effectiveness of acupuncture as a placebo? Why or why not? What strategies would you use to best insure that your audience understood and appreciated the implication of

the research finds?

## **Web Connection**

### **The Placebo's Effect on the Brain**

*<http://www.placebo.ucla.edu/news/PDF/dallasmn020121.pdf>*

A popular press article that explores the placebo effect on treating depression.

### **New Placebo Acupuncture Needle**

*<http://www.acupuncturetoday.com/archives2002/apr/04needle.html>*

Study that explores the credibility of a placebo acupuncture needle.

### **Acupuncture - A Skeptic's View**

*<http://www.theness.com/encyc/acupuncture-encyc.html>*

A skeptical introduction to acupuncture.

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## Activity 1 Placebo 1



### Questions

1. Describe the subject's experience?  
**(Answers will vary but most will report that the feeling of sensation was "transferred" to the image of the hand.)**
2. Did the illusion of misplaced sensation occur immediately? Explain.  
**(No. Although answers will vary, it takes ten to fifteen seconds before the brain is sufficiently confused and incorrectly integrates the image into the body's contact surface.)**
3. Why was it important to conceal the movements of the researcher's hand that was in contact with the subject's real hand?  
**(You did not want to give the subject any visual clues to the actual manner in which the hand was being stimulated.)**

#### Life Science :

Nervous system response to real and perceived stimulus

### NATIONAL SCIENCE STANDARDS (Grades 5-8)

#### Science as Inquiry- Content Standard A

Students will conduct a scientific investigation and analyze results.

Student observation will guide their exploration of cause and effect relationships.

**Life Science - Content Standard C**

Students will learn about interactions between human visual and perceptual systems.

**Science in Personal and Social Perspectives- Content Standard F**

Students will discuss how scientific understanding influences society.