**Mini-Lab Reflex Arcs**

Reflex arcs make up the neural circuit that travels through the spinal cord, providing a framework for reflex actions. Simple physical tests are used to check reflexes. In this investigation, you will observe the presence and strength of a number of reflex arcs.

**Materials**

Rubber reflex hammer or the edge of your hand

Penlight or small flashlight

**Procedure**

**Part I: Knee Jerk**

1. Find a partner. You will act as each other’s subjects.

2. Have your subject sit on a chair with their legs crossed. The subject’s upper leg should remain relaxed.

3. Locate the position of the kneecap and find the large tendon below the midline of the kneecap.

4. Using a reflex hammer, gently strike the tendon below the kneecap.

1. Describe the movement of the leg. (1 mark)

5. Ask the subject to clench a book with both hands and then strike the tendon of the upper leg

once again.

b. Compare the movement of the leg while the subject is clenching the

 book with the movement in the previous procedure. (1 mark)

1. Which functional neuron type carries the nerve impulse to the spinal cord?
2. Which functional neuron tupe carries the nerve impulse to the effector?
3. What is the specific effector in this reflex?

**Part II: Babinski Reflex**

6. Ask the subject to remove a sock. Have the subject sit in a chair, then place

 the heel of the bare foot on another chair for support. Quickly slide the reflex

 hammer (any hard object will do-ruler, wooden spoon) along the subject’s

 foot, beginning at the heel and moving toward the toes.

c. Describe the movement of the toes. (1 mark)

**Part III: Pupillary Reflex**

7. Have the subject close one eye for approximately 1 min. Ask them to open

 the closed eye. Compare the size of the pupils.

d. Which pupil is larger? (1 mark)

8. Ask the subject to close both eyes for 1 min, and then open both eyes. Shine

 a penlight in one of the eyes.

e. Describe any change in the pupils of the subject. (1mark)

**Analysis**

f. . How does the knee-jerk reflex change when the subject is clenching the book?

Why do you think this occurs? (2 marks)

g. What is the purpose of testing different reflexes? (1 mark)

**Evaluation and Synthesis**

h. Explain why the knee-jerk reflex is important in walking. (1 mark)

i. A person touches a stove, withdraws their hand and then yells. Why

 does the yelling occur after the hand is withdrawn? (4 marks)

j. While examining the victim of a serious car accident, a physician

 lightly pokes the patient’s leg with a needle. The pokes begin near

 the ankle and gradually progress toward the knee. Why is the

 physician poking the patient? Why begin near the foot? (4 marks)